STEM High and Middle School

Science, Technology, Engineering and Math (STEM) High and Middle Charter Application

Relevant, Real World, Rigorous, Research School

Submitted By:
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September 8, 2009

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Dear Honorable School Board Members,

High schools and middle schools fulfill a crucial role in Colorado’s community. For students, this is a time for choosing their life’s ambition. Parents need to have confidence in what is being taught to those who are most precious to them, and employers rely on a well-prepared workforce in order to remain competitive. These are the consumers of the crucial service of teaching provided during the years of 6th through 12th grade education.

The community stakeholders who are working to build STEM High and Middle School believe that the disconnect between education and industry must be replaced with a mission of academic relevance. Colorado’s high-tech companies will participate directly in student success by maintaining a permanent presence onsite at the school campus to demonstrate how theory becomes profitable, applied science. The finest teachers will be recruited into a professional environment with deserving salaries that are augmented with summer internships in Colorado’s high-tech industry. STEM High, Middle School and Academy will create a sense of place for career-minded students, hopeful parents, collaborative employers, and inspirational teachers.

Please accept twenty copies of the charter application for STEM High and Middle School Charter School. Upon acceptance of our charter application, STEM High plans to open in the fall of 2010 beginning with 9th grade and adding a class each subsequent year. The Middle School will open after the High School is established. The school will be housed in a temporary location until the permanent facility can be built. STEM High and Middle School promise to be a new and innovative high and middle school, offering a rich Science, Technology, Engineering and Math focus. The proposed campus is designed to excite interest and stimulate study of the STEM fields for all students in DCSD and South Metro areas.

We look forward to partnering with DCSD and to a swift, amicable review process. Please inform us by October 1 of the review progress and a timeline for future progress.

Mark Baisley
Board President, STEM High and Middle School

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EXECUTIVE SUMMARY

The Challenge: America is facing a serious talent gap in the disciplines of Science, Technology, Engineering, and Mathematics (STEM). Educating more students in STEM studies is increasingly seen as an effective way to maintain our global leadership in innovation and research, to sustain our national security and to ensure the vitality of the United States economy. The challenge is to discover how we can capture the attention of our youth, excite them about the STEM fields of study, and prepare them for success in the new global workplace.

The Opportunity: Business and industry are calling for innovative ideas and plans to transform public schools. There is renewed national support for the reformation of America’s schools to create and promote world-class academic standards and curricula that foster critical thinking, problem solving, and the innovative use of knowledge. A STEM curriculum, thoughtfully pursued, holds the promise of preparing students to thrive in school, and emerge college and career ready. It is the goal of our current administration that America will regain its lost ground and have the highest proportion of students graduating from college in the world by 2020.

The Solution: The solution is STEM High and Middle School. As a small charter school it will offer a new and innovative opportunity for students and driven by business and industry in order to meet growing workforce demands. The goal is to become a premier public high school for STEM in Colorado and the Nation. Students who have a rich concentration in the STEM disciplines possess not only valuable skills of problem solving, logical thinking, and innovation but also the ability to enter college-level courses without first needing remediation.

STEM High School

STEM High is a small charter school with an expected enrollment of 600 to 700 students at capacity, grades 9-12, designed to provide a rigorous core education during the regular school day with a Science, Technology, Engineering and Math curriculum focus. STEM High is working towards setting a higher, more rigorous academic standard and believes that when we expect more, we will get more. The first task of the school will be to ensure that students more fully master the basic skills in reading, writing, communication, math and critical thinking as the tools to success in later learning, life and work. Students will be taught career navigation skills, business ethics with character education, personal responsibility, teamwork and problem solving with creativity.

Each STEM High student will complete a real-world junior/senior capstone research project at the STEM Academy Research Laboratories (Appendix P), or a job internship at one of the many high tech corporations in the South Metro area. Colorado’s high-tech companies will participate directly in student success by maintaining a permanent presence onsite at the school campus to demonstrate how theory becomes profitable, applied science. STEM High and Middle School will offer STEM enrichment classes for K-12 home school students. Students will receive 180 hours per year of engaged STEM instruction, from Colorado licensed or highly qualified instructors, in state-of-the-art labs and high tech classrooms.
STEM Middle School

STEM Middle School plans to open after STEM High School is established. This sixth through eighth grade program will, at capacity, have a maximum enrollment of 500 to 600 students. It is modeled closely after the high school and follows the same mission and vision, guiding principles, and core values. STEM Middle School program has a college preparatory focus, with an emphasis on developing core liberal arts skills in reading, writing, mathematics and science. This program will prepare students for the rigorous high school program at STEM High and will spark interest in STEM education at an early age. Students will succeed through a highly structured classroom environment with clear academic and behavioral expectations. STEM Middle will conform to DCSD regulations with respect to admissions procedures for charter schools. Admission to STEM Middle is granted through a lottery process.

STEM Academy

STEM High School will have access to the services of STEM Academy. STEM High and Middle School will contract STEM Academy to run its Expanded Learning Time. STEM academy is a privately funded separate non-profit arm of the STEM Campus that will manage the Expanded Learning Time (ELT) classes and activities and the Research Laboratories. While the traditional public schools limit the educational opportunities during regular school hours, STEM High will offer free and fee-based expanded learning time opportunities for students through the STEM Academy. Expanding the school day provides an opportunity to reinforce the relevance of the subjects students are studying and to keep them engaged and in school. (Appendix P, T, U and V) Industry professionals, working alongside certified instructors will provide credited Activity-based, Project-based and Problem-based Learning (APPB) for dual enrollment credit, career specific classes, STEM Career and Technical Education (CTE) certification classes and STEM Home School Enrichment Classes.

STEM Academy will offer such programs as private tutoring, differentiated instruction, after-school programs, and experiential learning offered by accountable and highly-effective public and private providers. STEM Academy is designed to have Research Laboratories within three separate academies including:

- STEM Academy of Science
- STEM Academy of Engineering
- STEM Academy of Math and Technology

These Research Laboratories (Appendix P) will allow business and industry stakeholders to have a permanent presence at the STEM High. Students will participate with real world projects and high-tech business leaders will offer mentoring, job shadowing and internship opportunities.

Together, STEM High, Middle School and STEM Academy have been designed to maintain a self-supporting system through the cultivation of partnerships, collaborations and alliances with business, industry, universities and colleges to sustain and subsidize our unique programming for the future workforce.
1. **THE MISSION STATEMENT OF THE DISTRICT CHARTER SCHOOL THAT SHALL CLEARLY STATE THE PURPOSE(S) OF THE SCHOOL AND THAT MUST BE CONSISTENT WITH THE PRINCIPLES OF THE COLORADO GENERAL ASSEMBLY’S DECLARED PURPOSES AS SET FORTH IN THE CHARTER SCHOOLS ACT, AS AMENDED (“ACT”)** - The proposed mission statement must also be consistent with the mission statement of the Douglas County School District (“District”). The process used to develop this mission statement must be included.

**Mission Statement**

STEM High and Middle School will provide an integrated educational system of high standards to engage all students in an academically rigorous core curricula, promoting a strong foundation in the sciences, technologies, engineering and math, relevant to real-world contexts, and building on student character and community assets to prepare students for successful post-secondary endeavors.

**Vision Statement**

All graduates ready for college, careers and active civic participation.

**Core Values**

**Rigorous curricula** – We believe in providing academically rigorous curricula that meet or exceed established standards, and in providing accelerated learning opportunities to help all students meet or exceed standards. We will work to align with curricula and entrance requirements for post-secondary education and careers.

**Relevant** – We believe that a strong foundation in science and mathematics provides a critical component to a successful 21st Century career. We believe each individual student should participate in the development of their educational goals and in building students' capacity to critique their own work and learning process. We believe in the integration of technology throughout the curricula and in instruction that provides supports that meet the varied learning needs of multiple student populations.

**Real-World** – We believe in connecting curriculum to real-world contexts that build upon student and community assets by emphasizing project-based learning and other engaging, inquiry-based teaching methods that provide opportunities for students to master academic content, learn workforce skills, and develop personal strengths.

**Build Student Character (Respect) and Student Assets** – We believe in educating the whole student including development of the student’s character, and in providing opportunities for students to develop personal strengths, exercise leadership and be ready for active civic participation. The goal is to build internal student assets, as listed in the 40 Developmental Assets (Search Institute, 2009).
Community Assets – We believe in partnering with businesses and industry in the local community to help provide students with real-world workforce skills through job shadowing and internships opportunities, as well as, engaging state, district, school, community, youth, and municipal leaders in a shared vision for all high-school-age youth and in defining accountability at each level. We will provide an external, asset-rich environment for students to grow and develop, based on the 40 Developmental Assets (Search Institute, 2009).

The Development/Design Team of STEM High and Middle School developed the mission statement through a long and thoughtful process. At a Development/Design Team meeting we listed our “We Believe Statements” and documented all of the ideas we had for a new, academically-focused school of choice that would focus on math and science. Through the process of creating the statements, it became clear that a STEM focus with emphasis on relevant, real-world, rigorous and character (respected) were the priorities upon which we all agreed. Using these priorities and the “We Believe Statements” as a guide, we drafted our mission statement.

STEM High and Middle School Mission and Colorado Charter Schools Act

STEM High and Middle School’s mission is also in keeping with the stated purposes of the Colorado Charter Schools Act. We will address each purpose individually:

- C.R.S. §§ 22-30.5-101(a) states, “To improve pupil learning by creating schools with high, rigorous standards for pupil performance.” This is consistent with rigorous education.
- C.R.S. §§ 22-30.5-101(b) states, “To increase learning opportunities for all pupils, with special emphasis on expanded learning experiences for pupils who are identified as academically low achieving.” STEM High and Middle School will have systems in place to promptly identify low-achieving children and address them individually as addressed later in this application. STEM Academy will provide fee-based opportunities to address low achieving students’ needs and provide remedial assistance.
- C.R.S. §§ 22-30.5-101(c) states, “To encourage diverse approaches to learning and education and the use of different, innovative, research-based, or proven teaching methods.” APPB learning is proven and research-based.
- C.R.S. §§ 22-30.5-101(d) states, “To promote the development of longitudinal analysis of student progress, in addition to participation in the Colorado student assessment program, to measure pupil learning and achievement.” Educational Program and Pupil Achievement addresses how we will track longitudinal data and use assessments to drive instruction. The Colorado Growth Model will be implemented.
- C.R.S. §§ 22-30.5-101(e) states, “To create new employment options and professional opportunities for teachers and principals, including the opportunity to be responsible for the achievement results of students at the school site.” STEM High and Middle School’s teachers and administrator(s) will be responsible for assessment results and student achievement.
C.R.S. §§ 22-30.5-101(f) states, “To provide parents and pupils with expanded choices in the types of education opportunities that are available within the public school system.” STEM High and Middle School will provide a unique choice in public education in Douglas County.

C.R.S. §§ 22-30.5-101(g) states, “To encourage parental and community involvement in public schools.” STEM High and Middle School requires parental and community involvement as demonstrated by our governance structure and school culture plan.

C.R.S. §§ 22-30.5-101(g.5) states, “To address the formation of research-based charter schools that use programs that are proven to be effective.” STEM High and Middle School’s curriculum is research based with proven results.

C.R.S. §§ 22-30.5-101(h) states, “To hold charter schools accountable for meeting content standards, as measured in part by the Colorado student assessment program and by longitudinal analysis of student progress, through state accreditation, and by adequate yearly progress as defined by federal law.” The goals of STEM High and Middle School are consistent with this purpose.

**STEM High and Middle School’s Mission and the DCSD Mission**

The Mission of the Douglas County School District is, “to provide an educational foundation that allows each student to reach his or her individual potential.” The vision of the Douglas County School District (DCSD) is “to help students acquire the knowledge and abilities to be responsible citizens who contribute to our society.” The STEM High and Middle School’s mission will “provide the tools” for just that purpose. Our mission is consistent with that of Douglas County School District. The Douglas County School District Eight Core Values and the mission of STEM High and Middle School are congruent and compatible as demonstrated below:

**Educational Excellence**

DCSD Core Value: “High expectations are the focus of everything we do. We challenge all people to acquire a foundation of knowledge and academic skills, and to achieve their highest potential.”

*STEM High and Middle School* has placed an emphasis on providing a rigorous core education using the best assessment tools available to provide the inspiration for each student to excel with their best work.

**Human Diversity**

DCSD Core Value: “Varied beliefs and backgrounds strengthen a public education system. We respect differences which contribute to a better society for all human beings.”

*STEM High and Middle School* will welcome all students from the South Metro area and especially those who are from the underserved and underrepresented populations. There is a shortage of female and minority students entering STEM fields both State and Nationwide. STEM High and Middle School will place priority on recruiting and serving these individuals.
Individual Potential  
**DCSD Core Value:** “Individuals develop within an environment that nurtures intellectual, social, emotional, physical and aesthetic growth.”

*STEM High and Middle School* will encourage each individual student to participate in the development of their educational goals and in building student’s capacity to critique their own work and learning process. *STEM High and Middle School* will provide a state-of-the-art, high tech environment which will allow all students to develop to their highest potential.

Lifelong Learning  
**DCSD Core Value:** “Education is a process that begins at birth and continues throughout life. We foster curiosity, motivation and the desire to learn that extends beyond school settings.”

*STEM High and Middle School* will encourage all students to pursue higher learning after college graduation.

Productive Effort  
**DCSD Core Value:** “The pursuit of greater knowledge and more powerful thinking demands hard work, perseverance and commitment.”

*STEM High and Middle School* will motivate each student to work hard, persevere and commit to doing their best work despite adversity and challenge. Competence includes failure and learning how to respond.

Shared Responsibility  
**DCSD Core Value:** “The partnerships among parents, students, staff and community members are characterized by mutual commitment and collaborative effort.”

*STEM High and Middle School* will foster educational partnerships with community members, parents, staff in order to advance the greatest benefit to all the students at *STEM High and Middle School*.

Ethical Behavior  
**DCSD Core Value:** “Our actions are distinguished by the highest standards of personal behavior, including trust, honesty, fairness, integrity and mutual respect.”

*STEM High and Middle School* will promote a character education program which includes all the qualities listed above.

Continuous Improvement  
**DCSD Core Value:** “Our district, its systems and processes will be subject to continual scrutiny and improvement. We will be recognized for management by fact, results focus and a long range outlook.”

*STEM High and Middle School* proposes to implement the use of the district authorized student information system, formative assessments and data management to increase student
achievement and set goals using student-level data from the Colorado Growth Model. STEM High and Middle School will promote programs that are research and evidence based, which focus on facts, results and long range outlook.

**GOALS AND OBJECTIVES**

2. **THE OVERALL GOALS AND OBJECTIVES OF THE SCHOOL FOR THE PERIOD OF THE PROPOSED DISTRICT CHARTER CONTRACT, INCLUDING TIMELINES FOR THE ACHIEVEMENT OF THESE GOALS AND OBJECTIVES** - The process used to identify the goals and objectives shall also be included.

Goals were defined using the SMART process. The SMART process ensures that progress against the goals can be determined in a systematic way.

**SMART** stands for:
- Specific and Standards-based
- Measurable
- Ambitious and Attainable
- Research and Evidence Based
- Time-specific

Our mission can be broken down into four major components: relevance, real-world, rigorous and respect and each of our four goals focus on one of these components. Then, we broke each goal down into indicators that are specific, standards-based, measurable, ambitious, attainable, and time specific.

The goals and objectives of STEM High and Middle School reflect the school’s vision and mission. STEM High and Middle School understands that it will be held accountable for the goals as articulated in the charter contract with the school’s charter authorizer. The proposed goals detailed below focus on both educational performance and organizational and management performance:

**Goals, Objectives and Measures**

STEM High and Middle School has developed its goals based on the major components of our mission. The Douglas County School District End Statements developed on April 7, 2009 are referenced for each goal as specified (Appendix AB).
- Rigor and academic excellence
- Math, science and technology focus
- Effective structures to support relevant and real-world context
- Character development
- Respectful school culture

**Goal #1- Ensure that students reach the highest educational standards necessary to be successful in their post-secondary endeavors. (DCSD/BOE 4/7/09, End Stmt 1.7)**
Objective 1.1 – STEM High and Middle School will achieve “Excellent” or “High” on the annual DCSD School Accountability Report.

Measure 1.1 – The scores received for the CSAP and ACT will qualify STEM High and Middle School to receive an “Excellent” or “High”. The aggregate CSAP scores will demonstrate 80% proficient and advanced in all subject areas. Baseline will be established in the Spring of 2014 with the first graduating class.

Objective 1.2 – Obtain and maintain a graduation rate of 90%.

Measure 1.2 – The baseline graduation rate will be established in the Spring of 2014 with a minimum expectation of 90%.

Objective 1.3 – Demonstrate that students are making one year’s progress in one year’s time utilizing the Colorado Growth Model.

Measure 1.3 – Baseline CSAP will be established in Spring of 2014.

Objective 1.4 - Upon acceptance to the school, students and their parents will attend a mandatory meeting to increase their understanding of what is required to establish goals for high school achievement and attend college.

Measure 1.4 – 100% of students and parents will attend the mandatory meeting before entering the school. Transfer students will be required to attend a New Student Orientation and given the same information.

Goal #2 – Provide a technologically integrated, academically rigorous, core body of knowledge in all content areas with a focus on science and math. (DCSD BOE 4/7/09 End Stmt 1.8)

Objective 2.1 – Students will successfully complete 5.5 credits of science to graduate.

Measure 2.1 – Students will receive a “C+” or above for all science coursework. Five and one-half years of science will be required for graduation. The percentage of students receiving a “C+” or higher will be measured and increased each year once the baseline has been established.

Objective 2.2 – Students will successfully complete 4 credits of math with a minimum of pre-calculus to graduate.

Measure 2.2 – Students will receive a “C+” or above for all math coursework. Four years of math will be required for graduation with all students completing pre-calculus. The percentage of students receiving a “C+” or higher will be measured and increased each year once the baseline has been established.

Objective 2.3 – Students will successfully complete 4 credits of humanities, 3 credits of foreign language to graduate with an emphasis on excellence.
Measure 2.3 – Increase by 1/10 the percentage of 9th grade students succeeding in the English portion of the Humanities program until 100% of students are receiving at least a “C+” in the course.

Measure 2.3.1 – Increase the percentage of students performing at or above the proficient level on state-mandated CSAP tests until at least an 80% rate is achieved. The percentage of 9th grade students scoring a “C+” or higher in the English portion of the Humanities program.

Objective 2.4 – Integrate technology and incorporate daily as part of the curriculum in every academic discipline.

Measure 2.4 – Students will demonstrate technological proficiency based on performance-based assessments to be determined.

Objective 3.1: Each year by June, the staff will develop a professional development plan for the following school year, in part based on either strengths or weaknesses in the previous year’s activities, and present the plan to the Principal. In the first two years of operation, these plans will be school-wide; by the school year the plans will include individual and/or department-wide professional development opportunities.

Measure: 3.1 Documented by the STEM High and Middle School Principal.

Objective 3.2: 95% of the instructional staff will meet the requirements of a “Highly Qualified” teacher as defined by the state.

Measure 3.2: Data compiled for the School Accountability Report.

Objective 3.3: 90% of instructional staff will be trained in the use of current technology, the use of the online grading programs and other technology uses pertinent to their job performance at least once yearly.

Measure 3.3: Documented by the STEM High and Middle School Principal and the yearly Professional Development Plan.

Objective 3.4 - Build teacher capacity to use project-based learning using performance-based assessments to assess student outcomes.

Measure 3.4 – Teachers will attend yearly in-services to develop their capacity to master skills necessary to provide project-based learning opportunities and learn to use performance-based assessments.
Objective 3.5 – Students will expand future opportunities and explore career areas by doing a real-world internship their senior year, in order to expand future opportunities.

Measure 3.5 – One hundred percent of students will complete a mentorship, job shadow, internship or research project their senior year.

Goal #4 – Develop a school culture that promotes respect, discipline and individual responsibility and provide students with a safe, respectful and orderly school environment that promotes student achievement. (DCSD BOE 4/7/09 End Statement 1.2 and The One Report)

Objective 4.1: 75% or more of senior high students will indicate that they feel safe in school.

Measure 4.1: Scores obtained from a survey to be determined.

Objective 4.2: 100% of the STEM High and Middle School staff will engage in safety training and the school will have a crisis team trained for crisis and emergency situations.

Measure 4.2: Documented by the STEM High and Middle School Principal and included in each staff contract.

Objective 4.3: 80% or more of senior high school students will report that bullying is not tolerated in their school.

Measure 4.3: Scores obtained from a survey to be determined.

Objective 4.4: STEM High and Middle School will implement a prevention/character building program from the research-based list or as approved by Safe & Drug Free Schools.

Measure 4.4: Documented by the STEM High and Middle School Principal.

Objective 4.5: STEM High and Middle School will implement strategies to welcome students who are newcomers and to instruct them in the behavior expectations of the District (Student Conduct Code) and school.

Measure 4.5: Documented by the STEM High and Middle School Principal.

Objective 4.6: STEM High and Middle School will establish the expectation that all students, parents, and staff will immediately report concerns about or threats to student safety.

Measure 4.6: Parent and student response to confidential surveys regarding to what degree the actual reporting of concerns or threats to student safety is occurring will demonstrate that at least 90% of parents and students believe concerns or threats to student safety are immediately addressed by school administration.
Objective 4.7: STEM High and Middle School will establish the expectation that staff members will intervene with and report to an administrator inappropriate behavior and threats to student safety 100% of the time.

Measure 4.7: Response to parent, student, and staff confidential surveys.

Objective 4.8: 100% of STEM High and Middle School staff will participate in threat assessment training.

Measure 4.8: Documented by the STEM High and Middle School Principals.

Objective 4.9: STEM High and Middle School will develop a system to recognize students who consistently demonstrate respectful behavior.

Measure 4.9: Documented by the STEM High and Middle School Principal.

Objective 4.10: STEM High and Middle School will ensure that 100% of parents receive information related to school safety and crisis plans.

Measure 4.10: Signatures on “Parent/Student Contract with STEM High and Middle School.”

Objective 4.11: STEM High and Middle School will develop and implement instruction so that all students understand expectations for reporting procedures and expectations for behavior from the Student Conduct Code.

Measure 4.11: Response to student confidential survey.

Objective 4.12: 72% or more of STEM High and Middle School students will say their teachers are easily accessible and they are comfortable approaching them when they need help.

Measure 4.12: Response to student confidential survey.

Goal #5 – Align all courses and student assessments with the District’s model content standards (DCSD One Report, 2008)

Objective 5.1: By the end of the second year of operation, 100% of STEM High and Middle School department chairs will indicate that their curriculum and assessments are aligned with model content standards. Alignment will be done annually in the spring.

Measure 5.1: The STEM High and Middle School Curriculum Coordinator will annually document the responses of department chairs to a query of what percentage of their curriculum is aligned to standards. The STEM High and Middle School Principal will oversee an audit of each department’s curriculum at least once every five years to ensure alignment with model content standards.
Objective 5.2: By the end of the second year of operation, 100% of STEM High and Middle School visual arts, music, physical education and foreign language teachers will indicate that their curriculum and assessments are aligned with model content standards.

Measure 5.2: The STEM High and Middle School Curriculum Coordinator will annually document the responses of the visual arts, music, physical education and foreign language instructional staff. The STEM High and Middle School Principal will oversee an audit of the visual arts, music, physical education and foreign language curricula at least every 8 years to ensure alignment with model content standards.

Objective 5.3: The STEM High and Middle School Library Media Specialist will indicate familiarity with and use of information literacy standards integrated with reading, writing, math, science, and social studies curricula as well as integrating technology proficiencies.

Measure 5.3: The STEM High and Middle School Curriculum Coordinator will annually document the response of the Library Media Specialist.

Goal #6 – Ensure that there is staff, community and parent involvement needed to connect students to real world experience and provide opportunities for students to master academic content, learn workforce skills, and exercise leadership and civic engagement.

Objectives 6.1: Ninety percent of parents will volunteer 20 or more hours per year.

Measure 6:1: Student Services Department will provide monthly hours report.

Objective 6.2: Community business and industry will commit to provide job shadowing, mentorships, internships, power lunches and other real world work experience and opportunities for students including opportunities at the STEM Academy Research Laboratories.

Measure 6:2: Student Services Department reports will show that 100% of seniors will have had workforce experience or internships in the community or at STEM Academy Research Laboratories.

Objective 6:3: STEM High and Middle School, will work with STEM Academy to create a staff position to recruit business and industry and parents to ensure that each student has a personal real world experience.

Goal #7: Develop and implement strategic planning to provide for continuous improvement.

Objective 7.1: Annually in the spring, the School Steering Committee will develop a strategic plan for the upcoming school year.

Measure 7.1: Complete strategic plan annually in the Spring.
**ACADEMIC ACHIEVEMENT AND ACCREDITATION INDICATORS**

3. THE PUPIL PERFORMANCE STANDARDS TO BE ACHIEVED BY THE DISTRICT CHARTER SCHOOL - These pupil performance standards must meet or exceed any student proficiencies and performance standards adopted by the District's Board of Education (“Board of Education”) and State Model Content Standards adopted by the Colorado State Board of Education (“State Board”) and be designed to ensure that the goals in number 2 above are reached and that adequate yearly progress, as required under federal law, is made.

STEM High and Middle School understands that DCSD charter schools are accredited through the authorizer and subject to the authorizer’s accreditation requirements. The STEM High and Middle School Accountability/Accreditation plan will align with the Colorado Department of Education Accreditation Indicators. Available at: [http://www.cde.state.co.us/cdeedserv/download/pdf/AccredGuidelines.pdf](http://www.cde.state.co.us/cdeedserv/download/pdf/AccredGuidelines.pdf)

**Indicator A. Educational Improvement Plan:**
Our improvement plan will be reviewed by the administration, educators, Board of Directors, and School Accountability and Assessment Committee on a yearly basis and updated as appropriate. The plan will contain high measurable objectives and will identify research-based strategies to improve achievement of all students. The plan will outline the use of standardized criteria and assessments to monitor and report progress to the authorizer. The plan will recognize high performing groups and/or individuals and identify strategies to target low performing groups and/or individuals for intervention.

**Indicator B. CSAP Goals:**
Our academic achievement goals will: (1) seek one year’s growth on average for all students in reading, writing, and mathematics; (2) improve CSAP indices in reading, writing, and math; (3) reduce achievement gaps between the lowest subpopulations and the overall group CSAP indices in reading, writing, and math. CSAP data in 2010-2011 will be used as benchmarks to measure growth.

**Indicator C. Closing Achievement Gaps:**
STEM High and Middle School will conduct a yearly review of previous years’ CSAP data to establish realistic, yet aggressive goals for reduction in the achievement gaps between high and low subpopulations. Goals will be expressed in point value reduction in gaps.

**Indicator D. Value-Added Growth:**
Longitudinal assessment of each individual student will be a focus of our data collection. The goal for individual students will be one year of academic growth on average for each school year based on weighted CSAP score indices in reading, math, and writing, as well as a variety of internal assessments.
Indicator E. Other Curriculum Areas Not Assessed by CSAP:
Colorado Model Content Standards in other curricular areas will be the yearly standard for
achievement. The percentage of students earning a passing grade will be 95% or greater.
Students not earning at least a C+ will begin the evaluation process to participate in remedial
strategies. Annual review of individual student achievement will result in a goal of one year of
academic growth for each school year for each student.

Indicator F. School Accountability Report and Indicator G. Annual Report to the Public:
STEM High and Middle School acknowledges its responsibility in timely and accurate reporting
of data to its authorizer. The authorizer is ultimately accountable for producing an annual School
Accountability Report (SAR) and distributing it to the public, including parents and citizens.
Publishing an Annual Report will address the progress on school accreditation indicators
annually. Both the SAR and the Annual Report are important tools in externally demonstrating
school-level performance.

Indicator H. Safe Schools Act:
Prior to the opening of school, the staff will develop a Safe School Plan that addresses conduct,
discipline codes, policies and procedures for dealing with disruptive students, anonymous
student reporting, bullying prevention, lockdown procedures, formation of a threat assessment
team, formation of a violence prevention program, development of an emergency crisis plan, and
compliance with the Gun-Free Act.

Indicator I. Colorado Basic Literacy Act:
Each school year, staff will administer curriculum-based placement assessments as part of a body
of evidence to initially identify students in need of an Individual Learning Plan (ILP).
Implementation of IDCSD for students needing intervention will result in an increased
proficiency in reading as assessed by CSAP results and analysis of other internal assessment
tests. In the case of ILP’s for incoming students identified by their prior school, staff will arrange
for transitional meetings with the students, parents/guardians, educators, advisors, and special
education personnel (if the student is also on an IEP).

Indicator J. Educational Technology & Information Literacy/Recruitment & Retention of
Teachers/Contextual Learning:
The educational technology and information literacy plan will address all of the required
elements. The Principal plans to aggressively recruit the competent teachers and ensure that they
are continually supported in effective research-based strategies and best practices to improve
student achievement.

Indicator K. Budgeting, Accounting, and Reporting Requirements:
STEM High and Middle School, through the Board of Directors Budget Committee will provide
assurance that it is in full compliance with all requirements outlined in SB-03-248. Audits and
reviews will show no violation of state statute. STEM High and Middle School standards for
pupil performance are those adopted by the State of Colorado. Any additional standards
developed by the school will meet or exceed state standards. Skills standards will be developed
in detail by the school’s Principal. All skills standards will meet or exceed Colorado State skills
standards.
Indicator L: Digital Portfolios
Every STEM High and Middle School student will be required to create a personal digital portfolio. A Student Services Representative will oversee each student’s portfolio in the development and support of the portfolios. Although students may take creative license in the design of their portfolio, each portfolio must include the following:

- Career/Educational - A career and educational objective, a web-based resume and a standard, printable resume;
- Projects - Samples of best work accompanied by reflections on their learning; and
- Art and Design – A simple, easy to navigate design.

Indicator M: Capstone Projects
Every STEM High student will generate projects that were based on their individual interests, representing the pursuit of a true question. Students will present their capstone projects, and the final assessment focuses on analytical skills and the depth of intellectual work. Teachers, parents, administrators, and community members sit on the capstone presentation panels.

Academic Internship Standards
Every STEM High student will complete an academic internship as a graduation requirement can be included as a portion of the capstone project. Students work with individual mentors on challenging and meaningful projects at companies and organizations in the Denver area. The students’ performance in their academic internships is evaluated in these ways:

- Through an internship showcase on campus, during which students describe their responsibilities and accomplishments at their internship site;
- Reflections in student internship journals, which are reviewed by school staff; and
- Evaluation of authentic work, through rubrics completed by site mentor.
(Appendix I)

EDUCATIONAL PLAN

4. A DESCRIPTION OF THE CURRICULUM TO BE USED IN THE DISTRICT CHARTER SCHOOL THAT MUST BE RESEARCH-BASED, PROVEN TO BE EFFECTIVE, AND DESIGNED TO ENABLE EACH PUPIL TO ACHIEVE THE PERFORMANCE STANDARDS DEFINED IN NUMBER 3 ABOVE - The curriculum must include state-mandated areas of instruction.

STEM HIGH Educational Plan

STEM High provides a comprehensive curriculum, emphasizing the sciences, mathematics, and technology. Students follow an intensive four-year program that includes Computer Science, Humanities, Foreign Languages, Fine Arts and Physical Education. All seniors are required to complete a laboratory project as the culmination of their STEM High academic experience, either in one of specialized Research Laboratories, or through the STEM High Internship/Mentorship Program.
The STEM High eight-period school day begins at 7:30 a.m. and ends at 2:50 p.m. Seven periods are devoted to academic coursework and one period is designated for student activities and activity-related coursework. Student and faculty research is supported by STEM Academy.

The school maintains a schedule of eight class periods on Monday and block classes the rest of the week. Though no formal classes are offered during eighth period, it is a required part of a school day. Monday's eighth period is known as TA (teacher advisory), which is similar to homeroom. Wednesday and Friday's eighth period is devoted to study halls, clubs and teams, and other extracurricular activities. Since the school day ends at 2:50, eighth period enables students to explore a wide variety of interests, including the Expanded Learning Time (ELT) activities. Every Thursday, the school day known as STEM Learning Community (SLC) begins at 9:00 rather than 8:30 to allow for Professional Learning Communities (PLC).

The foundation of the curricular program at STEM High focuses on an interdisciplinary approach aimed at maximizing the full potential of each student's intellectual, technological and affective skills. Course work such as the ninth grade integrated Biology, English and Technology program and Humanities courses are driven by six learning methodologies: acquiring powerful communication skills; developing collaborative skills, thinking and working in the context of systems; working with real projects and problems; managing change; and developing an ethical culture. In order to maximize collaborative team work among the staff and nurture an interdisciplinary environment for learning, the departments are grouped together logically into divisions:

- Science and Technology
- Math and Computer Science
- Humanities
- World Languages
- Physical Education
- Department of Student Services

The following programs are unique to STEM High and are among some of the specialized coursework required of our students:

- IBET (Integrated Biology, English and Technology)
- STEM High Academies and Research Laboratories
- STEM High Mentorship/Job Shadow Program

Students enrolling in STEM High may have rich curricular experiences; however, many have not mastered inquiry and research skills. In addition, many of the students may have worked in cooperative learning groups but do not have experience working in collaborative teams. The difference between cooperative learning groups and collaborative teams is significant—especially in preparing for future research and field experiences that will be required during the students’ junior and senior years at STEM High. Collaborative student teams have a focus on individual and group learning outcomes, development of communication skills, creates a problem based learning experience, generates multiple perspectives, and allows students to make their own informed decisions. The 9th grade IBET experience gives students the opportunity to learn the elements of the collaborative research model as well as hone their individual inquiry and research skills. The focus of the collaborative research model allows students to strengthen their
individual research skills and learn to work in a learning team-simulating work teams in the workplace.

**Model School: Thomas Jefferson High School of Science and Technology**

STEM High is modeled after one of the most successful STEM magnet high schools in the United States located in Fairfax County, Virginia, called the Thomas Jefferson School of Science and Technology. (Appendix K) TJHSST was named the top high school in the Nation by U.S. News and World Report two years in a row. TJHSST has fielded more National Merit Semifinalists than any other high school in America for most of the 1990’s and 2000’s. From 2000 to 2005, it fielded more USAMO qualifiers than any other high school in America and has a distinguished history of U.S. Physics Olympiad Team members and medal winners. In 2007, TJHSST had more Intel Science Talent Search Semifinalists than any other school. In 2009, TJHSST repeated this feat with 15 semifinalists. Two students - Naren Tallapragada and Alex Kim - were named finalists, and both were top 10 winners in the competition, placing 4th and 7th respectively. TJHSST was ranked as the top high school in the nation by PrepReview in 2004. In that year, TJHSST also had the highest average SAT score among all American high schools, both public and private. TJHSST was also ranked #1 among "America's Best High Schools" in a study by U.S. News and World Report in 2007 and 2008. Each year, over a quarter of its graduating class accepts admission to the University of Virginia. The other major schools attended by graduates are College of William and Mary, Virginia Tech, Duke University, and Princeton University in that order. Other graduates attend Ivy League schools and high-ranking public and private schools across the nation. For schools with more than 800 students in grades 10-12, TJHSST was cited as having the highest-performing AP Calculus BC, AP Chemistry, AP French Language, AP Government and Politics: U.S., and AP U.S. History courses among all schools worldwide.

**Science and Technology**

Each student will complete four years of laboratory science beginning with Biology (integrated with English as well as Design and Technology) followed by Chemistry, Physics, and Geosystems. Each science course has substantial laboratory experiences. Science electives assist students in preparing for their senior research projects and include advanced placement courses in biology, chemistry, physics and an array of other courses described in the Course Selection Guide.

Freshmen enroll in the Design and Technology course integrated with Biology and English. This required course is designed to help each student explore and acquire basic skills needed for later experience in research laboratory courses. The integration of these content areas requires teacher collaboration to identify multiple skills needed in each content area as well as appropriate projects that students work through during the school year. Each project will require increasing expectations of rigor and meaningful assessment coupled with student products that reflect performance assessment as well as assessment of individual student mastery of skills. In order to develop these integrated skills, students will be placed in cohort groups for each of the projects in the IBET experience. The cohort groups should not remain the same during the school year.
but change with each new project that the IBET teaching team develops. The cohort student teams will be created and assigned by IBET teachers.

During the sophomore and junior years students are expected to prepare for senior research through coursework in science, technology, and computer science electives. All seniors are expected to complete a major science or engineering research project, either by working in one of the science and technology research laboratories, or by working in a commercial, government or university research lab or technical facility through our mentorship program.

**Integrated Biology, English and Technology (IBET)**
This advanced first year course utilizes a molecular approach to the study of fundamental concepts in biology. Students learn basic concepts about the life-sustaining processes that occur within the cell, the anatomy and physiology of complex multi-cellular organisms, and the ways by which various life forms have adapted to the environment. The course content is structured to prepare students to have the foundation necessary to be successful when studying higher levels of biology. Discovery, inquiry, and laboratory experiences are of central importance. Interdisciplinary research projects, special reports on recent developments in biology, and a field study are used to encourage students to analyze the scientific, social, political, economic, and ethical issues related to progress in a technological age. Experiences in biotechnology are incorporated into this course.

**Design and Technology**
This course is designed to help each student explore and acquire basic skills needed for later experience in science, pre-engineering and applied technology laboratory courses. Students learn how people apply physical science to develop and use tools and materials that change aspects of their lives and work. To accomplish this goal, the course surveys the following elements: 1) the application and use of testing and measurement devices; 2) presentation and communication skills; 3) application of engineering design to the problem solving process; 4) study and application of mechanical concepts, of work, effort, efficiency, and mechanical advantage; 5) the application and use of spatial G.P.S., G.I.S. data technologies; 6) communication of concepts, designs, and ideas using artistic and technical drawing; 7) study and application of flexible automation and programmed control of systems; and 8) basic electronics including DC electronics, theory, component recognition circuit design, prototype construction, testing, and analysis.

**Chemistry 1**
This rigorous, honors-level course centers on the compositions of the world around us and the changes it undergoes. Chemical principles are modeled in laboratory activities using a wide range of evolving technologies and scientific equipment. Laboratory experiments precede classroom discussion of concepts whenever possible so that chemical theory is developed from laboratory observations. Upon completion, students take the Chemistry learning end-of-course test.

**Physics 1**
Students study the most central concepts of physics including mechanics, wave motion, electromagnetism, special relativity, geometric optics, and the conservation laws (energy and
momentum). This course is laboratory-centered and is designed to give students a rigorous exposure to the methods of scientific inquiry and rational problem solving as well as a solid background in the conceptual basis of physics.

Geosystems
This course is where it all comes together: Biology, Chemistry, Physics, and Math. Geosystems is the study of the earth’s many interfaces between the atmosphere, hydrosphere, rock structures, and biosphere that includes both internal energy sources and external energy from the sun that drive the varying changes on our planet. The course requires a prior knowledge of biology, chemistry, and physics and is highly quantitative. All students will encounter problems that will exercise their math skills up through calculus and opportunities arise for the application of multivariable calculus and differential equations for those students so prepared.

Mathematics and Computer Science

Mathematics
Mathematics is the core of this school and an essential discipline. Mathematics not only facilitates a pattern of logical thinking but also presents a system of valuable skills that are applicable to one’s everyday life. Thus, our primary goal is to help our students understand the value of mathematics and then provide them with the skills they need to achieve their full potential in this field of study. We will accomplish this in the following manner:

- Require our students to understand the concrete and abstract concepts of mathematics as well as demonstrate an ability to apply those concepts in their everyday lives
- Challenge our students to be responsible and active learners who confidently communicate their learning to others
- Maintain high expectations of our students
- Let our students know we believe in their ability to succeed in math
- Make our very best effort to place students at a level where they are challenged yet successful
- Strive to maintain a quality education for our students and regularly seek to improve our classroom pedagogy.

Direct Instruction is a highly structured approach to math instruction designed to accelerate the learning of students at all levels of achievement. STEM middle and high school will use this approach coupled with collaborative student teams for their math program. This approach has been shown to achieve high academic success in all areas of education but especially in mathematics. Mathematics is a subject that builds upon the previous year’s retention of information. If a student does not master the concepts from a particular grade level in math, they will begin to struggle the following year and continue to struggle because the information gap will increase as the years of formal math instruction continue. It is imperative that teachers can document mastery of students’ acquisition of skills as well as formatively evaluate gaps in skills for individual students.
The textbooks chosen for math classes at STEM High School reflect the Direct Instruction approach. The math department will use the Larson, Boswell, Kanold, and Stiff series from McDougal Littell with appropriate supplements for the general courses and the Foerster series for advanced students. We have chosen both the Larson series and the Foerster series for the following reasons:

- The curriculum is taught in small steps and each new topic builds upon the previous lessons;
- There are continuous increments of explicit instruction, guided practice, and independent practice;
- Frequent assessments (small quizzes, chapter tests) allow teachers to monitor progress as well as retention of skills, providing early identification of problems;
- The series implement the concept of “learning by doing” through frequent problem solving and hands on learning to demonstrate concepts presented;
- There are different levels of instruction/problems and topics within a section for the average student up to and including the advanced student.

References for Direct Instruction:
http://people.uncw.edu/kozloffm/dihighschool.html (Appendix W)
http://www.projectpro.com/ICR/Research/DI/Summary.htm (Appendix X)

References for Books:
http://www.phschool.com/classics/math_foerster_alg_and_trig.html(Appendix Y)
http://mathforum.org/library/topics/

Computer Science

STEM High will offer a full four-year sequence in Computer Science. The Computer Science Team is part of the Math/CS Division and the Computer Systems Lab is part of the Science and Technology Division. Our collective goal is to provide a world class Computer Science education to our students and to disseminate curriculum materials to other academic institutions.

Introduction to Computer Science
A mandatory course for all students, the intro course assumes no prior programming experience. Students study object-oriented programming and develop fundamental programming skill. In preparation for the AP course, Java is the language of instruction.

AP Computer Science
An elective course available to all students who have completed Introduction to Computer Science, APCS follows the College Board topic outline. This course carries an additional 1.0 quality point in GPA calculation and prepares students to take the APCS Exam given each May.

Accelerated Computer Science
A non-traditional route designed for experienced programmers only, this course requires exceptional problem solving skills.
Artificial Intelligence 1 & 2
Half-credit semester courses requiring APCS as a prerequisite, students program in Python in a Linux environment. These classes carry the same extra grade point value as an AP course.

Parallel Computing 1 & 2
Half-credit semester courses with a suggested APCS prerequisite, students program in C with MPI and OpenGL in Linux and Solaris. Other systems may include CUDA, OpenMP and XMT-C.

Humanities
The English 9 curriculum is integrated with biology and technology. It emphasizes basic communication skills of reading, writing, speaking, and listening to process content material and to enhance critical thinking and inquiry across all academic disciplines. In grades 10 and 11, students study World Civilization and American Civilization in an integrated social studies and English humanities program. In grade 12, students may elect advanced placement courses as well as a variety of courses for English credit.

The four-credit social studies required curriculum enables students to develop the knowledge to understand the changing relationship between human beings and their environment, past, present, and future, and to appreciate diverse beliefs and values. Students in grades 10 and 11 take the English and social studies humanities program, and in grade 12, regular and advanced placement courses are available. Students also take World History and Geography II in the 11th or 12th grade. A full range of electives is offered in grades 10, 11, and 12.

The Humanities Department challenges students to strive for mastery in all areas of Language Arts in order to become excellent scholars in all disciplines. The Department promotes effective expression, critical thinking, and life-long learning. The Department is committed to fostering a passion for literature and love of reading and writing for every student. The texts taught in English classrooms are chosen based on literary merits, importance in a college preparatory curriculum, and character education themes. English classrooms are nurturing environments where students of all abilities feel safe to take risks and challenge themselves. Department members regularly call on one another to provide assistance, inspiration, feedback, and guidance, to share strategies and information, and to support one another through peer observations and review. Humanities Department teachers encourage, celebrate, and champion their students.

STEM High offers a literature-based curriculum that exposes students to many of the major works in the English literary canon. As an Advanced Placement school, STEM High selects literature from the AP list of suggested authors. Chosen texts reflect variety in genre (novels, plays, etc.) and variety in authors (gender, race, era, etc.) while at the same time providing thematic coherence to a given course. Each course focuses on responding to and analyzing written works orally and in writing, with strong emphasis on the writing of essays and other full-length products. In addition, the English Department spirals grammar study throughout each level, with topics introduced or re-taught as necessary.
The Humanities Department engages its students in a learning process in which every student’s ideas and participation is valued. Students are encouraged to be intellectually curious, seek multiple perspectives in reading and discussion, and question what they read and hear in and outside of the classroom. Critical thinking skills are taught and supported at each level as students address historical triumphs and tragedies. To achieve these goals, department members model collaboration, self-evaluation, flexibility, motivation, and openness to constructive criticism as a means to improving how they teach each day. Ultimately, the department’s objectives are: to excite students about history and lifelong learning, to attend to students’ academic needs, and to assist students in achieving their academic potential. To motivate student involvement in the school and local communities, the department promotes creative decision-making, engages students in current events and international affairs, and teaches the skills necessary to help students become active and engaged citizens. Department members make history relevant and challenge their students to grasp the interdependence of diverse peoples and cultures, both past and present.

Character development is intrinsic to the social studies curriculum across all levels. As the school grows, the department is committed to re-evaluating the direction of its curriculum and course offerings. The addition of new electives and college prerequisites over time, in conjunction with a firm grasp of student needs, will keep the department’s students inspired throughout their high school careers and beyond.

**World Language**

The World Languages Department strives to develop a greater awareness of and appreciation for other cultures through the study of modern languages. The department believes that through the exposure to other cultures when learning another language, students will not only have a better understanding of the global community but will also become more active in their role as world citizens. As the department seeks to have the students learn the target language as effectively as possible, the emphasis in class will begin with oral and listening skill development with reading and writing done within a cultural context as well. As students gain oral fluency, the balance will shift to more reading and writing as the academic year progresses and as they take more advanced courses. The ability to communicate orally and learning about the different cultures will always be an integral part of each course. As the cultures are different than the American culture, there will be mature subject material in the upper level classes. The objectives of the World Languages Department are to:

- Introduce world language as early as possible as part of the daily classroom experience
- Teach awareness of different language patterns and logic
- Develop a level of fluent and effective communication that allows the exchange of ideas, information, and opinions in our global society
- Foster awareness and appreciation for diversity in cultures, lifestyles, and values as found in the Francophone and Hispanic cultures
- Expand career possibilities by developing a marketable skill
- Immerse the students in the target language as much as possible including homework online, project outlines, and other written materials as well.
Encourage students to engage in daily language contact year-round to encourage fluency and to retain information over a long period of time.

Globalization requires that students learn and understand other cultures. Through STEM High’s program of applied and integrated learning, students will not only spend three years learning another language, they will also learn about the culture and develop an open minded and broadened world view along with the character trait of “humanity”.

**Health and Physical Education**

The physical education and health program emphasizes health and physical fitness, as well as individual and team sports. Family Life Education and classroom driver education are also included in the physical education program. The goals of the program are to equip students with skills contributing to lifelong fitness and to develop students' interests in sports and physical activity, which they may pursue as adults. Health and physical fitness are an integral part of the overall well-being of STEM High students.

**Fine Arts and Electives**

Students select electives courses such to fulfill the fine arts graduation requirement. Electives STEM High plans to promote creative thoughts to solve real world problems and believe that a balanced lifestyle including fine arts, music and fitness provide a required base for inspired ideas and insights into difficult issues. Our students will receive motivation and stimulation as they explore the world through the sights and sounds of the humanities.

**Department of Student Services**

The mission of STEM High’s Student Services Department (SHSSD) is to provide students with a safe, optimum environment in which to grow and realize their potential in the academic and personal/social areas of their lives.

The holistic education of each young person is the foundation of our approach for and with students. All individual conferences, group meetings, school-wide programs, and the other services we provide encompass this mission.

From the beginning of freshman year to graduation day, the Student Services Department continuously works with students and their parents/guardians to design an academic plan that advances personal goals and satisfies the rigorous graduation requirements for a STEM High diploma.

During the academic year, the Student Services Department offers a variety of programs on subjects ranging from ethics and leadership to the college application and transition process. Through newsletters, guidebooks and other publications, the SHSSD keeps the STEM High community informed of student-related issues, resources and important calendar dates.

This office will coordinate activities between STEM High and Middle School and the Academy.
STEM High Graduation Requirements

STEM High and Middle School graduation requirements have been developed based on the entrance requirements of top colleges and universities as well as through analysis of the components of a strong, academic high school curricula. Students are expected to complete 4 years of mathematics, English and social studies, and five and one-half years of science of which two of the science units are lab based.

STEM High and Middle School will exceed the graduation requirements established by the Colorado Commission on Higher Education Admission Requirements (HEAR), and the DCSD requirements for graduation. Students must successfully complete a minimum of 29 credits in order to graduate from STEM High and Middle School. Students are highly encouraged to complete 2 AP classes and/or take 2 college classes from any of our college partnerships including: Arapahoe Community College or Project Lead the Way with University of Colorado at Colorado Springs or other college courses that we will offer partnerships in the future. All students will have completed a Senior Research Project or internship.

Community Service

In addition, each STEM High School student is required to complete 20 hours of community service hours during their freshman and sophomore years as a graduation requirement. During the student’s junior and senior years will be focused on job opportunities within the community, senior projects and internships.

Colorado Commission on Higher Education Admission Requirements (HEAR), State Standards

The Colorado Commission on Higher Education has established guidelines known as the Higher Education Admission Requirements. The HEAR guidelines specify the courses your student will need to complete in high school to qualify for admission to a public four-year college or university in Colorado. This includes CU (Boulder, Denver, and Colorado Springs); CSU (Ft. Collins and Pueblo); UNC; Colorado School of Mines; Metro State College; Fort Lewis, Adams State, Western State and Mesa State. These Higher Education Admissions Requirements go into effect in two phases: Phase 1 for students graduating in 2008 and 2009, and Phase 2 for students graduating in 2010 and beyond. If your student will graduate from high school in 2008 or later and plans to attend a four-year college or university in Colorado, he or she will need to complete the following coursework to fulfill the Higher Education Admissions Requirements:

<table>
<thead>
<tr>
<th>High School Academic Area</th>
<th>Graduates 2010+</th>
</tr>
</thead>
<tbody>
<tr>
<td>English</td>
<td>4 years</td>
</tr>
<tr>
<td>Mathematics (Algebra I level and higher)</td>
<td>4 years</td>
</tr>
<tr>
<td>Natural/ Physical Sciences (two units must be lab-based)</td>
<td>3 years</td>
</tr>
<tr>
<td>Social Sciences (at least one unit of U.S. or world history)</td>
<td>4 years</td>
</tr>
<tr>
<td>Foreign Language</td>
<td>2 years</td>
</tr>
<tr>
<td>Academic Electives</td>
<td>2 years</td>
</tr>
</tbody>
</table>
The Higher Education Admissions Requirements do not apply to community colleges (for example, Arapahoe Community College, Community College of Denver) which have open enrollment policies. Students applying to community colleges do not need to meet the admissions requirements outlined above. For information to help your student plan for college, the state’s free college-prep website, www.CollegeInColorado.org, is one excellent resource. The “Choices Planner” web tool that DCSD high schools use in the Educational and Career Planning (ECP) process is another.

**DCSD Graduation Requirements**

To receive a diploma and graduate from a Douglas County high school, a student must earn a minimum of 25.5 credits. These academic requirements reflect the minimum program which a student can complete and still earn a high school diploma. For the majority of high school students, particularly those students who are planning post high school education, pursuit of a challenging academic program may become the most important consideration.

A unit of credit is defined as the amount of credit given for the successful completion of a course which meets at least 40 minutes daily, five days per week for one year (36 weeks) on a traditional schedule or, a four or more hour college semester hour course (1 credit); the equivalent time is 120 clock hours. One-half credit is given for successful completion of a class which meets at least 40 minutes daily five days per week for one semester (18 weeks) on a traditional schedule or a two or more hour college semester hour course. Non-traditional schedules will be translated to this standard for the purpose of determining course credit.

Douglas County students will begin accruing credits towards earning a diploma and graduation beginning in the ninth grade.

**A. To receive a diploma a student must meet all of the following:**

1. Earn a minimum of 25.5 units of credit. Specifically, students must successfully complete:

<table>
<thead>
<tr>
<th>DCSD High School Graduation Requirements – 2012</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Language Arts</td>
<td>4</td>
</tr>
<tr>
<td>Mathematics (Algebra I level and higher)</td>
<td>3</td>
</tr>
<tr>
<td>Natural/ Physical Sciences (two units must be lab-based)</td>
<td>3</td>
</tr>
<tr>
<td>Social Studies</td>
<td>3.5</td>
</tr>
<tr>
<td>Practical Arts</td>
<td>1.0</td>
</tr>
<tr>
<td>Fine Arts</td>
<td>1</td>
</tr>
<tr>
<td>Physical Education</td>
<td>1</td>
</tr>
<tr>
<td>Speech Communication</td>
<td>.5</td>
</tr>
<tr>
<td>Electives</td>
<td>8</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>25.5 credits</strong></td>
</tr>
</tbody>
</table>

*At least one of the three credits of mathematics must include Algebra 1.*
2. Demonstrate proficiency on the Douglas County School District Content Standards in reading, writing, and on standards in mathematics, science, and social studies as identified in IKF-R. Documentation that these standards have been achieved will be through teacher judgment based on District assessments, end-of-course tests or other measurements; Students identified as disabled and having IRP's may demonstrate that they have met the Douglas County Content Standards by successfully completing the standards identified in their Individual Education Plan (IEP). Course content and/or graduation requirements may be adjusted for those students identified as disabled, under the Individuals With Disabilities Education Act through the IEP process as identified in IKF-R.

3. Demonstrate their proficiency on the use of technology as identified in IKF-R; and,

4. Document a minimum of twenty hours of community service while enrolled as a high school student.

B. To earn credit in a class, students must demonstrate proficiency on the content standards embedded in the course.

Documentation that these standards have been achieved will be through teacher judgment based on District assessments, end-of-course tests or other measurements as well as meeting other stipulated course expectations. Students who do not achieve these standards will be enrolled in courses or programs as prescribed by the school principal and faculty.

C. With prior approval of the high school principal, up to a total of (6) credits of approved correspondence, college/university courses (for 11th/12th grade students only through the post secondary options act), and/or on-line courses may be used to meet either the electives or required portion of the academic requirements to receive a diploma.

**STEM High Core Academic Program**

<table>
<thead>
<tr>
<th>STEM High School Graduation Requirements</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Humanities</td>
<td>4</td>
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<tr>
<td>Mathematics (Algebra I level and higher)</td>
<td>4</td>
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<tr>
<td>Natural/ Physical Sciences (two units must be lab-based)</td>
<td>5.5</td>
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<tr>
<td>Foreign Language</td>
<td>3</td>
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<tr>
<td>Academic Electives</td>
<td>2</td>
</tr>
<tr>
<td>Physical Education</td>
<td>1</td>
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<tr>
<td>Health</td>
<td>.5</td>
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<tr>
<td>Internship</td>
<td>.5</td>
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<tr>
<td>Senior Project</td>
<td>.5</td>
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<tr>
<td>Electives</td>
<td>8</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>29 credits</strong></td>
</tr>
</tbody>
</table>
Core Curriculum and Electives

Humanities – 4 years including:
- Freshman IBET
- American Literature
- World Literature
- College Prep English
- World History or AP European History
- U.S. History or AP U.S. History
- Civics

Mathematics – 4 Years including Pre-Calculus:
- Algebra 1
- Algebra 1 Honors
- Geometry
- Proof Geometry Honors
- Algebra 2/Trig
- Algebra 2/Trig Honors
- Pre Calculus
- Pre Calculus Honors
- AP Calculus AB
- AP Calculus BC
- AP Statistics
- Calculus 3/Differential Equations Honors

Natural Sciences – 5.5 Years including 1.5 of Science/Tech Electives:
- Physics
- Physics Honors
- Chemistry
- Chemistry Honors
- AP Chemistry
- Biology (IBET)
- Biology Honors
- Biochemistry/Environmental Biology Honors
- Advanced Physics/Engineering Honors
- AP Physics
- AP Biology
- AP Computer
- Science, Earth Science, Electives
- Geosystems

Foreign Language – 3 Years
- Spanish
- Possible Chinese, Latin, French
Physical Education – 1 Year
Health – .5 Year
Internship – .5
Junior/Senior Capstone Project – .5 Year

Electives – Up to 8 Electives may be taken
Science and Technology Possible Elective Courses:
- Astrophysics
- Biotechnology
- Building Bridges
- CAD Design
- Creative Engineering of Sound
- Environmental Biology
- Explosions
- Crashes and Biohazards
- Genetics
- JavaScript Programming
- Medical Imaging
- Neurobiology
- Robotics

Other Possible Electives
- Choir
- Instrumental
- Photography
- Ethics and Philosophy
- Film
- Mock Trial Competition/Debate
- Newspaper
- Graphic Design
- Sculpture and Painting

Internship Program and Research Laboratories

Students will be required to complete real-world research project during their senior year. STEM High is located in close proximity to United Launch Alliance, Lockheed Martin and an abundance of high tech business and industry in the South Metro area. Therefore the opportunity for meaningful work exposure will allow for building workforce experience. Students will know how to thrive in a professional setting and will be able to connect their coursework to the experiences they have in the working world. Or, students may elect to do their internship project at the STEM Academy Research Lab located on the STEM Campus. (Appendix P)

Internships will be rigorous academic pursuits in which students will be required to complete a comprehensive project and present their findings to a board of teachers, parents and industry leaders for evaluation.
STEM High will engage the STEM High Student Services Department (SHSSD) to evaluate internship opportunities, to create a strong link between the school and the internship, to train mentors at internship sites, and to assist students in the application and interview process. During the internship experience, each student will be assigned a teacher to support the work of the student at the school. Students must have a content teacher that is familiar with the problem being addressed at their internship site. The SHSSD Representative will help assign students to mentor teachers based on students’ request as well as teachers’ area of expertise in the field the student is conducting his/her research.

STEM High believes the internship placement process should reflect the real world. Students will be required to interview and compete for internship opportunities. The SHSSD Representative will work to meet the needs of each student by identifying a variety of challenging and dynamic opportunities.

**Junior / Senior Research Project – Capstone**

STEM High believes the best indicator of student performance is student work. Students at STEM High will design and build a comprehensive project, allowing them to synthesize the information and skills developed across the curriculum. Students will work with their advisors to establish benchmarks, track and evaluate progress, and challenge and refine process and results. Upon completion of the senior project, students will present their projects to a panel of industry and community leaders, other students and faculty through the Digital Research Portfolio and Presentation of Learning. Students engaged in the internship program should use their internship experiences as a means to complete their capstone project. In other words, the students’ internship should be directly connected to the student’s research project.

The junior/senior research project or Digital Research Portfolio is intended to be a comprehensive illustration of student knowledge and skills, is a requirement for graduation, and serves as the capstone of the school’s curriculum.

**Respect and Character Education**

_“We must remember that intelligence is not enough. Intelligence plus character – that is the goal of true education.”_ Reverend Martin Luther King, Jr.

STEM High and Middle School will be a school which commands respect from students and is also respected within the community. In keeping with the APPB learning activities, STEM High and Middle School has adopted the Project Management Institute’s Code of Ethics and Professional Conduct (2007) as the ethical standard for the school. Four main character traits from the PMI Code of Ethics and Professional Conduct are emphasized at STEM High and Middle School learning environment including: 1.) respect, 2.) responsibility, 3.) fairness, and 4.) honesty.

The Project Management Institute’s Code of Ethics and Professional Conduct will be used in conjunction with Dr. Sara Salmon’s, research and evidence based curriculum called Peace 4 All Kids, (2008). Dr. Salmon’s curriculum uses **fifteen character traits** and that were developed in conjunction with Boeing Corporation under the collaboration of Sandy C. McDonnell who is the
former vice-chairman of McDonnell Douglas. With the help of the St. Louis community and McDonnell Douglas, fifteen character traits emerged as important for students to have when they entered the work world. These character traits were implemented in all twenty three school districts in St. Louis, Missouri and went on to become a national model.

The traits include:
- Caring
- Cooperation
- Goal setting
- Honesty
- Humanity
- Gratitude
- Respect
- Responsibility
- Self esteem
- Self control
- Patience
- Perseverance
- Service
- Courage
- Integrity

The original model was developed for all kids in all schools with the NASA and the business community agencies and families. Students receive lessons and practice in the aforementioned traits. It is evidence based and encompassed the traits that businesses felt were important.

Respect and responsibility will be emphasized at STEM High and Middle School. In the GoodWork study authored by Howard Gardner (2007) three main types of ultimate responsibility in the workplace were identified: 1.) responsibility for the ethical conduct of an organization and its workers, 2.) responsibility for fulfillment of the organization’s professional or business purposes, and 3.) responsibility for the broader social good.

**Remedial Classes Overview**

Electives will be offered to students who have not met standards in mathematics and English. Expanded Math and Expanded English classes will be required for students who do not meet standards.

Remediation classes will be offered the summer prior to entering STEM High. Students will be expected to have completed Algebra I their 8th grade year prior to entering STEM High. Algebra I summer school classes will be offered (at the Academy) the summer prior to entering STEM High.

**Technology Overview**

There will be three essential roles of technology in the academic program. 1) To be used as a tool to enhance learning across the curriculum. 2) To develop student technology skills to prepare
them for our increasingly technology-based society. 3) Implement a powerful student information system that can provide real-time information on student achievement to students, teachers and parents. However, technology will not replace the teacher or great teaching. Rather it is a powerful tool that students and teacher share that will strengthen student learning.

**Use of Technology**

Because of the school’s emphasis on applied technologies, some teachers may require in-service training on how to implement applied technology for use in the classroom instruction, in assignments and projects, and for course management and record-keeping. In-services will be provided on an as needed basis.

**Essential Design Elements**

- A Intro to Computer Science course to provide all students a baseline set of skills in the 9th grade year.
- Student digital research portfolios that are created and maintained in the advisory program.
- Integrated use of technology in all courses where it will enhance student learning (the writing process, graphing calculators, sketchpads, measurement in science.
- Create a web-based interactive student information system that is easily accessible to all school constituents.
- Regular professional development working with teachers to understand how to best use technology in their teaching.

If adequate funding can be secured, STEM High and Middle School will pattern their school after the Denver School of Science and Technology, (DSST), which offers laptops to each student. DSST was the first public high school in Colorado where every student will use a wireless networked laptop. This eliminates the "digital divide" and enables students to be able to operate at a very high technology level, both at school and at home.

**1 to 1 Study**

During the fall of 2007, renowned educational technology consultant, Andy Zucker, conducted an in-depth study of DSST's One-to-One program. The results of that study confirm the value of DSST’s technology as part of its overall strategy for student learning and teacher effectiveness. In addition to the overall study, DSST has undertaken a TCO (Total Cost of Ownership) study to round out the picture of technology at DSST. In comparison to other districts without 1 to 1 programs, DSST’s technology cost per student is still on the low end of the scale. This study indicates that DSST is achieving an incredible value for its students and staff. (Appendix Q) The STEM High Curriculum Committee will evaluate the feasibility of using on-line text books.

These two studies are now available via these links:

- [1-to-1 Study Executive Summary](#)
- [1-to-1 Full Report with Executive Summary](#)
Technology must not be a simple replacement or enhancement of non-technological methods of learning. Technology is too expensive to be a simple substitute for the pencil and the chalkboard. Instead it must invite and enable higher order thinking, more creative thinking, learning and expression. It must engender more intense investment and engagement by the student. It must enable collaboration, extrapolation, projection, analysis, demonstration, and closer, tangible interaction with the subject under study that is extremely unlikely or even impossible without it. It must transport the student to places, experiences, modes of thinking, cultures, and people otherwise impossible to reach for the normal high school student.

Technology should empower and enable, and never replace or reduce the central human role of the teacher in a liberal arts education. The role of a liberal arts education is to enable and facilitate the creation of leaders who value community, individuals and the creation of a truly human society. Technology must serve this end.

**IT Infrastructure**

STEM High and Middle School’s infrastructure will consist of file, print, e-mail, backup and application servers, as well as Cisco network switches and access points all supporting a totally wireless laptop/tablet environment. We will also take advantage of a DS3 Internet connection as well as voice over IP (VoIP) telephone communications.

We will use technology on a daily basis for virtually every facet of our school's work. We view technology not as a subject to be learned, as much as a tool in the educational and administrative processes.

**Curriculum Committee**

STEM High School has worked with Dr. Darlene Yanez, (Appendix O), a Director for the T-STEM Initiative in the State of Texas, to develop a rigorous, real-world, relevant and research school curriculum modeled after Thomas Jefferson High School of Science and Technology.

Once the STEM High and Middle School charter has been approved by our Authorizer, DCSD, the STEM High Board President, Mr. Mark Baisley will appoint a Curriculum Committee for STEM High and STEM Middle School. Mark Baisley will work closely with a Curriculum Committee comprised of staff members/principal, (if they have been hired), educators, experts in the field of study, parents and community members.

This charter application contains textbook lists from: Thomas Jefferson School of Science and Technology, (Appendix R), Denver School of Science and Technology, (Appendix AA), Discovery Canyon Campus High School, a STEM high school in Colorado Springs, (Appendix AM ) and others which have been recommended by educational experts in the math and science fields including proposed math texts (Appendix Y) from a math educator who also has a Master’s and Bachelor of Science in Petroleum Engineering from Colorado School of Mines and
has experience teaching at a charter and public high schools. A complete list of text books for a premier high school is listed in (Appendix AI).

These lists represent possible texts for STEM High and Middle School which will be finalized by the Curriculum Committee once appointed. Please see (Appendix AE, AF, AG, AH) for Curriculum and Textbook Selection Process adapted from The Classical Academy in Colorado Springs.

**Block Schedule**

STEM High will incorporate a Block Schedule patterned after TJHSST with an eight-period school day beginning at 7:30 a.m. and ending at 2:50 p.m. Seven periods are devoted to academic coursework and one period is designated for student activities and activity-related coursework. Student and faculty research is supported by STEM Academy.

Every week follows a regular class meeting pattern. All days are either block days, where 4 classes are held, each one hour and thirty minutes long, or regular days, where 8 classes are held, each forty-five minutes long. Tuesday and Thursday Block days will be where class periods 1 - 4 are held, or Wednesday and Friday, where classes 5 - 8 are held. In addition, 8th period is subdivided into two halves, A block and B block. There is a plan to designated Thursday as a STEM High Learning Day where classes begin at 9:00 a.m.

**STEM Middle School Educational Plan**

STEM Middle is dedicated to providing an outstanding liberal arts education, with a focus on science and technology. Our curriculum is designed to ensure 100% student proficiency on state standards in math, science and English and a 90% student acceptance and graduation rate from four-year colleges. By starting in the sixth grade, we feel we can reach this ambitious goal. In order to meet these goals, our academic program is founded on the following principles:

**High Expectations:** All students are required to complete a rigorous college-preparatory curriculum that includes seven years of secondary math through pre-calculus – regardless of their math level when they enter STEM Middle in the 6th grade and eight years of integrated laboratory science. There is no remedial track at STEM High and Middle School. Every student completes the core curriculum or a challenge course in each subject. Our requirements well exceed Colorado's higher education entrance requirements.

**High-Accountability School Culture:** STEM Middle has created a high-accountability culture where doing your best in your classes is expected.

- A homeroom advisor for every student, who will check student readiness in the mornings (collect homework, check planners, binder organization), monitors student performance and maintains regular communication with parents/guardians
- College Prep, a required after-school study hall for students who have not completed their homework
- Mandatory teacher tutoring for students who fail a quiz or test or need support
- A learning culture that communicates to students that learning the concepts and skills is more important than grades
• Weekly recognition of students for academic effort and success and demonstrating core values

**Balanced Curriculum Approach:** STEM Middle has a balanced pedagogical approach that includes:

• Combined traditional and inquiry-based instructional practices to ensure that students master both concepts and skills in all of their classes. We are committed to teaching our students, rather than to a prescribed curriculum.

• Spiraling of concepts in our teaching, so that students revisit core skills and concepts many times throughout the year.

• Real-world application and project-based learning that reinforce important concepts in a pragmatic, inquiry-based setting.

**Use of Technology:** STEM Middle employs our technology to transform teaching and learning in the following ways:

• A wireless one-to-one teaching learning environment for all students and staff.

• Pedagogy that utilizes technology to enhance and transform outstanding teaching practices.

• The use of technology throughout school-wide assessment practices to efficiently analyze and act on data.

**Core Curriculum**

STEM Middle School will use the Core Knowledge Sequence as it was meant to be implemented. Eighty to one-hundred percent of the Core Knowledge curriculum will be used, representing about half of the school’s complete curriculum. We plan to supplement Core Knowledge with several carefully selected programs in language arts, mathematics, science, technology, and character development as well as including any elements of State and District standards not addressed by Core Knowledge.

The Core Knowledge Sequence is a research-based program that is utilized in hundreds of school districts across the country and is based on the premise that a grade-by-grade core of common learning is necessary to ensure a sound and fair elementary education. The Core Knowledge curriculum was developed by Dr. E. D. Hirsch, Jr. and is based on a large body of research in cognitive psychology, as well as a careful examination of several of the world's fairest and most effective school systems. Dr. Hirsch has argued that, for the sake of academic excellence, greater fairness, and higher literacy, early schooling should provide a solid, specific, shared core curriculum in order to help children establish strong foundations of knowledge. The Core Knowledge Sequence prepares students for a lifetime of learning in a manner that can be described as solid, sequenced, specific, and shared. (Appendices AJ, AK and AL give curriculum for 6th, 7th, and 8th grades respectively.)

• **Solid**— grade by grade comprehensive outline including history, language arts, science, math, art, music and more for kindergarten through 8th grade

• **Sequenced**— builds upon prior knowledge, preventing repetition and gaps as well as ensuring a deep and broad comprehension of subject matter
- **Specific**— allows teachers to count on prior knowledge and ensures that every child is fully prepared to move on to the next grade
- **Shared**— prepares students to enter the world with a common body of knowledge

The Core Knowledge Sequence maps out a complete program in Kindergarten through Grade 8 that provides the student with a broad-based education, free of significant gaps. It clearly defines the content knowledge and skills that each student must be taught at each grade level and creates high levels of academic expectations. In addition, the Core Knowledge curriculum not only eliminates some of the gaps and repetition characterized in standard curriculums, but it also aids in delivering cultural literacy in a systematic manner while leaving room for creativity.

Below is the Core Knowledge at a Glance, Major Topic Headings, 6-8

### Core Knowledge at a Glance: Major Topic Headings, 6–8

<table>
<thead>
<tr>
<th>Language Art / English</th>
<th>Sixth Grade</th>
<th>Seventh Grade</th>
<th>Eighth Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Writing, Grammar, and Usage</td>
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<tr>
<td>II. Poetry</td>
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<tr>
<td>III. Fiction and Drama (Stories; Shakespeare; Classical Myths)</td>
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<td>IV. Sayings and Phrases</td>
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<tr>
<td>I. Writing, Grammar, and Usage</td>
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<td>II. Poetry</td>
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<tr>
<td>III. Fiction, Nonfiction, and Drama</td>
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<tr>
<td>IV. Foreign Phrases Commonly Used in English</td>
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<table>
<thead>
<tr>
<th>History and Geography</th>
<th>World</th>
<th>World</th>
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<tbody>
<tr>
<td>I. World Geography (Spatial Sense; Deserts)</td>
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<tr>
<td>II. Lasting Ideas from Ancient Civilizations (Judaism, Christianity; Greece and Rome)</td>
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<td>III. Enlightenment</td>
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<td>IV. French Revolution</td>
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<tr>
<td>I. America Becomes a World Power</td>
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<tr>
<td>II. World War I, “The Great War”</td>
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<tr>
<td>III. Russian Revolution</td>
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<tr>
<td>IV. America from the Twenties to the New Deal</td>
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<tr>
<td>I. Decline of European Colonialism</td>
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<td>II. Cold War</td>
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<td>III. Civil Rights Movement</td>
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<td>IV. Vietnam War and the Rose of Social Activism</td>
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<td>V. Middle East and Oil Politics</td>
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<td>VI. End of the Cold</td>
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<td>STEM High / Middle School</td>
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<td><strong>American</strong></td>
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<td>V. Romanticism</td>
<td>V. World War II</td>
<td>War: Expansion of</td>
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<td>VI. Industrialism,</td>
<td>VI. Geography of</td>
<td>Democracy and Continuing</td>
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<td>VII. Latin American</td>
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<td>VII. Civics: The</td>
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<td>Independence Movements</td>
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<td>Constitution —</td>
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<td>Principles and</td>
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<td>VIII. Geography of</td>
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<td>Canada and Mexico</td>
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<td><strong>Visual Arts</strong></td>
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<td>I. Art History: Periods</td>
<td>I. Art History: Periods</td>
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<td>and Schools (Impressionism;</td>
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<td>Gothic; Renaissance;</td>
<td>Post-Impressionism</td>
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<td>Abstraction; Modern</td>
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<td>Romantic; Reality)</td>
<td>American Painting)</td>
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<td>II. Reform</td>
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<td>I. Art History: Periods</td>
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<td>Photography; 20th-Century</td>
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<td>Sculpture)</td>
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<td>II. Architecture Since</td>
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<td><strong>Music</strong></td>
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<td>I. Elements of Music</td>
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<td>II. Classical Music:</td>
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<td>From Baroque to</td>
<td>(Romantics and</td>
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<td>Nationalists (Brahms,</td>
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<td>Haydn, Mozart, Beethoven,</td>
<td>Berlioz, Liszt,</td>
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<td>Wagner, Dvorak, Grieg,</td>
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<td>Schumann)</td>
<td>Tchaikovsky)</td>
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<td>III. American Musical</td>
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<td>Traditions (Blues and</td>
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<td>Jazz)</td>
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<td>I. Elements of Music</td>
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<td>II. Non-Western Music</td>
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<td>III. Classical Music:</td>
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<td>Bartok, Rodrigo,</td>
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<td>Copland, Debussy,</td>
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<td>Stravinsky)</td>
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<td>IV. Vocal Music (Opera;</td>
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<td>American Musical Theater)</td>
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<tr>
<td>Math</td>
<td>I. Numbers and Number Sense</td>
<td>II. Pre-Algebra (Properties of the Real Numbers; Polynomial Arithmetic; Equivalent Equations and Inequalities; Integer Exponents)</td>
<td>I. Algebra (Properties of the Real Numbers; Relations, Functions, and Graphs; Linear Equations and Functions; Arithmetic of Rational Expression; Quadratic Equations and Functions)</td>
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<td>II. Ratio and Percent</td>
<td>II. Geometry (Three-Dimensional Objects; Angle Pairs; Triangles; Measurement)</td>
<td>II. Geometry (Analytic Geometry; Introduction to Trigonometry; Triangles and Proofs)</td>
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<td>III. Computation</td>
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<td>Science</td>
<td>I. Plate Tectonics</td>
<td>I. Atomic Structure</td>
<td>I. Physics</td>
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<td>II. Oceans</td>
<td>II. Chemical Bonds and Reactions</td>
<td>II. Electricity and Magnetism</td>
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<td>III. Astronomy: Gravity, Stars, and Galaxies</td>
<td>III. Cell Division and Genetics</td>
<td>III. Electromagnetic Radiation and Light</td>
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<td>IV. Energy, Heat, and Energy Transfer</td>
<td>IV. History of the Earth and Life Forms</td>
<td>IV. Sound Waves</td>
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<td>V. Human Body (Lymphatic and Immune Systems)</td>
<td>V. Evolution</td>
<td>V. Chemistry of Food and Respiration</td>
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<td>VI. Science Biographies</td>
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(http://coreknowledge.org/CK/about/6-8glance.htm)

We selected Core Knowledge curriculum for the following reasons:

- **Comprehensive** - Core Knowledge thoroughly covers our common body of knowledge in a very specific and sequenced way. The lessons build on one another, grade by grade, allowing for broad and deep knowledge.
- **Integrated** - Core Knowledge is structured such that lessons in core subject areas being learned concurrently are related, whenever possible. For example, when the
Renaissance period is being studied in history, students are reading related books in language arts, and studying the paintings and music from the period as well.

- **Elimination of Repetition** – Repetitions in curriculum can cause boredom in children and that boredom can turn off learning in young children. Because Core Knowledge is so specific and comprehensive, repetitions are eliminated.

- **Elimination of Gaps** – likewise, without a highly specific curriculum, gaps in learning often happen. For example, students may learn about rainforests three times and never be exposed to the American Indians, depending on what path of teachers, etc they followed. By having a grade by grade, specific curriculum, Core Knowledge ensures that every topic is covered.

- **Research-Based** – The Core Knowledge curriculum is research based with proven results. The latest research on Core Knowledge, compiled in January of 2004, including data from Colorado, can be found in (Appendix AN).

- **Colorado Results** – (Appendix AN) contains CSAP data showing the percent of Core Knowledge that performed above state averages by subject and grade level. The CSAP scores for the Core Knowledge schools in Colorado can also be found in (Appendix AN, AO, AP, AQ, AR, AS, AT, AU, AV, AW, and AX).

- **Overall Core Knowledge Schools** have seen very positive results.

- **Core Knowledge Standards** line up with Colorado Standards. [http://www.ckcolorado.org/standardsdocs.asp#six](http://www.ckcolorado.org/standardsdocs.asp#six)

**Language Arts**

While STEM Middle School will emphasize Math, Science, and Technology, implementation of an effective Language Arts program has to be the cornerstone of this philosophy. Without the basic abilities to read, write, and communicate, students cannot fully participate in the educational process. Therefore, at STEM Middle, we will focus intensely on early literacy to ensure that every child has an opportunity to learn and grow.

**Mathematics**

Saxon Math will be the program implemented for mathematics at STEM Middle School. The scope and sequence of Saxon math is a perfect complement to Core Knowledge. Instead of relying on rote memorization, Saxon math is taught incrementally, such that each lesson builds on previous lessons, resulting in a deep and lasting understanding. Studies have shown the effectiveness of cumulative learning through distributed instructions. STEM Middle plans to implement flexible grouping based on mastery of skills in conjunction with the Saxon Math program. Saxon Math will be supplemented with the Key Curriculum Press materials.

**Reasons we selected Saxon Math:**

- The curriculum is taught in small, easy to grasp, increments that build on one another
- Continuous increments of explicit instruction, guided practice, and independent practice
- Frequent, cumulative assessment allows teachers to monitor progress as well as
• retention of skills, providing early identification of problems
• Implements the concept of “learning by doing” through frequent problem solving and hands on learning to demonstrate concepts presented

See the Saxon Math overview in (Appendix AY) for more information and the latest 2004 research on Saxon Math. See (Appendix AC) for the CSAP data from Colorado Core Knowledge schools using Saxon Math.

Science

The Core Knowledge Sequence covers scientific concepts that build from grade to grade. STEM Middle will select textbooks and programs that align with the Core Knowledge curriculum, such as FOSS kits for early grades and Prentice Hall texts for upper grades. Children will experience science in a hands-on manner as well as study and apply the processes used by scientists. Armed with these processes, children will be able to become scientists in and out of the classroom. Through the Math, Science, and Technology (MST) Discovery Week program, children will be exposed to the applications and implications of scientific concepts learned in the Core Knowledge curriculum.

Technology

Technology will be integrated into everyday learning at STEM Middle School. It will be used as a learning enabling tool, an output tool, an assessment tool, and a subject for study. Research based and proven software programs will be integrated in the regular curriculum. Students will be taught to become very familiar with computers, through explicit instruction on keyboarding, basic navigation, and important applications such as word processing, spreadsheet, email, and presentation software. Being able to use a computer as a tool to communicate and articulate is an essential skill in today’s society and STEM Middle will ensure this skill becomes as much of a habit as walking and talking. These skills will be aligned and integrated with the Core Knowledge curriculum. For example, while learning Power Point, kids may be asked to develop a presentation on an historical figure they are studying in their classroom.

Science, Technology and Math Emphasis

As a result of inadequate attention to math, science, and technology in U.S. education, the National Science Foundation and the National Science Board concluded that “this nation’s capability to innovate, solve problems, and produce--to sustain world leadership--is in jeopardy.” The National Commission on Mathematics and Science Teaching for the 21st Century (http://www.ed.gov/inits/Math/glenn/report.pdf), concluded in an age now driven by the relentless necessity of scientific and technological advance, the current preparation that students in the United States receive in mathematics and science is, in a word, unacceptable” These conclusions demonstrate the need for education with an additional emphasis in math, science, and technology STEM Middle has chosen to address math, science, and technology in particular, because these are fundamental and vital skills that form the basis for success in many modern career paths. Engineering, finance, economics, biotechnology, medicine, music, and technology are only a few examples of where interest and aptitude in math, science and technology could lead our children.
History, World Civilizations, and Geography

The Core Knowledge Sequence thoroughly covers History, World Civilizations and Geography. We will select textbooks in this area that are in alignment with CK as well as Colorado and Douglas County requirements. As the students progress through these subjects, they should understand the shared values of a civilized society, be able to follow the threads throughout world history that provide a context for the founding of America, and trace the emergence of the principles on which our nation was founded. Additionally, these studies should provide a historical basis for the establishment of the modern world.

Music and Art

Music and art are essential components of a well rounded curriculum. The Core Knowledge curriculum includes art and music and we will use those components. Teachers will tie art and music with other curriculum components in history, language arts, and technology. For example, as different periods are being discussed in history, the great art works and music from that period will be also be studied. Science can be tied in through a study on how art is authenticated or how musical instruments are designed. Technology can be tied in through a study of graphic art or modern music.

Physical Education

Regular physical activity is an essential component of a healthy life. Children will develop this important habit. The physical education program will develop coordination and motor skills, foster teamwork, and expose children to a variety of sports and games.

STEM Middle School standards for pupil performance in Physical Education are those adopted by the state of Colorado. Any additional standards developed by the school will meet or exceed state standards. Skills standards will be developed in detail by the school’s Academic Director. All skills standards will meet or exceed Colorado state skills standards.

Content Standards

Standards must meet or exceed any content standards adopted by the District. A complete mapping of the Core Knowledge curriculum standards and the Colorado state standards has been developed by the Colorado Core Knowledge Coordinator and can be found on the Colorado Core Knowledge website, www.ckcolorado.org; http://www.ckcolorado.org/standardsdocs.asp#six

School Calendar

STEM High and Middle School will operate on a semester system and will follow the school district calendar of Douglas County School District (DCSD). The school year at STEM High and Middle School will total approximately 180 days per year. The total number of student hours in school will equal or exceed those of the state minimum requirements. Once a Principal and staff have been hired, both a daily schedule and an academic calendar will be finalized by the Principal and Board.
STEM High and Middle School Honor CODE

As members of STEM High / Middle, we honor academic and personal integrity. We uphold the values of honesty, integrity, respect, and responsibility. (Appendix AD)

STEM High / Middle Athletics and Clubs Overview

The initial goals of the athletic and club program are:

- To provide each student with the opportunity to participate in a fitness activity to build a healthy lifestyle and to build a lifelong interest in an activity
- To build the foundation for future successful athletic teams in select sports
- Club/Athletic times will take place at the end of the school day.
- Need 6-7 options for students to choose from each trimester given a range of 18-25 students per activity.
- STEM High / Middle sports teams would consist of club teams in year 1 and 2
- Student participation in athletics/clubs at the end of the day would be predicated on a student completing homework and meeting academic requirements during the day.
- Establish a clear set of expectations and guidelines for all activity leaders (faculty and non STEM High / Middle staff).

Possible sport options include:

- Golf, tennis, cross-country, track, baseball and softball
- Co-ed intramural and club sports

EDUCATIONAL PHILOSOPHY

STEM High and Middle School has adopted an educational philosophy which reflects the vision and mission of the school. It includes, but is not limited to the following:

- Creativity
- Discovery and Innovation
- Small School Environment
- APPB Learning
- Founding Fathers Historical Application

Creativity

STEM High and Middle School is redefining learning in the classrooms, and specifically requires that learners move beyond the lower levels of Bloom’s Taxonomy, which focus on knowledge/comprehension (facts and fact regurgitation) rather than understanding and remixing. The 2001 revision of Bloom’s Taxonomy which places the creative act at the top of the pyramid can be a guiding framework for lesson development.
STEM High and Middle School will allow students to go beyond the test taking phase and move into creative thought. The gifted and talented classroom will be driven by creative students, not the calendar or the typical classroom model. According to Ormdal, Richards, Brennan and Gonzales, “Creative thinking is the essential factor in innovation, invention, and research. When schools emphasize memorization of facts without an opportunity to use those facts by posing questions and solving real world problems, students associate the STEM fields as a disengaging process of cataloging and computing information. Curiosity and creativity lead to innovation and invention, as well as the ability to solve critical problems. Gifted education includes many research-based activities that enhance creativity in students. High ability learners need an opportunity to develop their creative thinking abilities so innovation, invention, and research will continue in STEM areas” (p. 13, 14). (Appendix S)
Discovery and Innovation

STEM High and Middle School will emphasize innovation and invention. The 2½% group at the beginning of the bell curve represents the innovators. Developing innovators is the focus of STEM High and Middle School. Students will be encouraged to think critically and use scientific method through project-based programs to discover their own conclusions. The technology program at STEM High is designed to develop in our students substantial experience and proficiency in laboratory based research, project planning, experimentation, problem solving, design, modeling, fabrication, testing, evaluation, documentation, and presentation related to engineering, scientific and other technical areas. By initiating curriculum exploration and development in new high technology fields, and by integrating elements from science and computer science as well as from the technical curriculum, the technology program derives strength from its links with businesses, industry, scientific and academic institutions. Structurally, it is comprised of both a technology electives curriculum and a science and technology laboratory research program.

Ninth grade students begin their technology education by taking a required full-year technology survey course which is integrated with Biology and English courses. Through an active, project-oriented approach to learning, the technology survey course introduces students to the engineering design process and provides a uniform foundation in knowledge of content and basic skills upon which students may draw for later work in science and technology.

During the tenth and eleventh grades, all students are expected to explore their science and technology interests through elective courses. A broad range of technology courses are currently offered through the Science and Technology research laboratories. Through these electives, students learn the specific formal content and skills required for their senior research project.

During the 12th grade, all students are expected to complete a major science or engineering research project, either by working in one of the science and technology research laboratories, or by working in a commercial, government or university research lab or technical facility through our mentorship program.

12th grade students conduct the majority of their work in a specific laboratory, but are encouraged to make use of the facilities, equipment and resources in any of the laboratories. The mentorship program offers the students an opportunity to pursue research under the guidance of professionals from the scientific and technological community in a professional laboratory or worksite. Students are matched with a mentor based on mutual scientific and technological interests, as well as the goals of the senior research program. We have several letters of support and contributions from the scientific and technological community of South Metro Denver to help mentor students or provide other resources for student project work to our school-based research lab program. These contacts provide students electing to remain at the school an enhanced research experience.
Small School Environment


- Student performance
- School climate
- Professional collegiality
- Parent satisfaction

A small school with personalized instruction means students are known by their instructors and classmates. High academic expectations for all means each student is challenged at an appropriate level and given support to succeed. Each student sets individual academic goals with teachers. A high level of accountability includes teacher-advisors’ guarantee that each student is known and supported in school.

Nathan and Thao, (2007) in Studies from Smaller, Safer, Saner, Successful Schools demonstrate a schools' ability to improve academic achievement and behavior in safe, nurturing, and stimulating environments. Case study analysis reveals that on average, smaller schools can provide a safer and more challenging school environment that creates higher academic achievement and graduation rates, fewer disciplinary problems, and greater satisfaction for families, students, and teachers.

STEM Middle School is projected to open a 6th, 7th, and 8th grade class with 200 students in each class after the High School is built and established. It is projected that there will be attrition in each class. STEM High School will open with 175 students in 2010 and will continue to add a grade level each year. This will be evaluated after the Board has been elected and is subject to change.

APPB Learning

APPB (activity, project, and problem based learning), is defined by the Buck Institute for Education, (2003) as, “A systematic teaching method that engages students in learning knowledge and skills through an extended inquiry process structured around complex questions and carefully designed products and tasks.”

APPB learning activities are:

- Learning by doing
- Learning by creating
- Learning by thinking
- Learning by presenting

APPB learning, according to the Center for Occupation Research and Development (2007), allows students to learn through hands-on projects and presentations, deepening the learning process. Working individually, in teams, and in pairs, students learn content and communication
skills. APPB learning links the mind and the hands. Teachers pose authentic questions, which are then explored and answered by students.

According to educational consultant Kimberly Liegel (2004), “Projects require a complex set of competencies such as problem solving, decision-making, time management, research, analysis and synthesis of information, communication, and conflict resolution, especially in a collaborative team environment. But they also require strategies and methods for planning, doing, and completing them,” (p. 1).

The projects implemented by students at STEM High and Middle School will be rooted in Colorado state standards, and developed and facilitated by teachers, who ask students “essential questions” to guide students' collaborative learning in small group settings. Students learn best if they collaborate around projects with the teachers facilitating learning.

**ACCELERATION PROGRAMS**

**Advanced Placement School**

STEM High students will be strongly encouraged to take multiple AP classes. The College Board’s Advanced Placement (AP) Program is a challenging academic program designed to provide motivated high school students with college level academic courses. The courses provide an excellent opportunity to build study skills for a successful college experience. Attending a high school that offers numerous AP courses, such as STEM High, provides the following benefits for students:

- More than 90% of U.S. colleges and universities give college credit to students who achieve a qualifying grade on the exam.
- More than 300 additional universities in 20 countries recognize AP courses and exams.
- Approximately 50% of U.S. colleges grant a full year of credit (sophomore standing) to qualifying students.
- The AP organization has three levels of AP diploma recognition.
- Students choose subject areas of strength to qualify for the AP diploma.
- Students may take AP courses in all high school years if prepared for the coursework.

STEM High expects that all students who take an AP course also take the exam. Students who cannot afford fees associated with the AP exam should consult appropriate STEM High personnel to arrange for scholarships.

The Advanced Placement Program recognizes high school students who have demonstrated outstanding college level achievement through AP courses and exam grades. STEM High students can qualify for the following awards through the Advanced Placement Program:
AP Scholar Award
Grade of three or higher on at least three full-year AP exams

AP Scholar with Honors Award
Grade of three or higher on four full-year AP exams and have an average exam grade of at least 3.25

AP Scholar with Distinction Award
Grade of three or higher on at least five full-year AP exams and have an average exam grade of 3.5

As STEM High students advance to higher-level courses, additional AP classes will be added incrementally. While college requirements and student interest will determine final course offerings, it is expected that STEM High will offer the following AP classes; courses indicated by an asterisk will be offered as the school develops:

- AP Literature & Composition
- AP Language & Composition
- AP Spanish Language
- AP Spanish Literature
- AP Human Geography
- AP U.S. Government & Politics
- AP U.S. History
- AP European History
- AP World History
- AP Calculus AB
- AP Calculus BC
- AP Statistics
- AP Biology
- AP Chemistry
- AP Physics *
- AP Computer Science AB
- AP Music Theory
- AP Studio Art (AP World History alternates w/ AP European History)

CU Succeed Gold Program

STEM High is pleased to offer CU courses through the University of Colorado’s Succeed Gold Program. The CU Succeed Gold program provides STEM High School students with the opportunity to take college courses at STEM High during school hours, while simultaneously earning college credits through the University of Colorado at Denver. Students who take a qualifying course can earn college credit at a fraction of the cost of most university courses.

Program Features
- Take CU courses listed in the University's catalogue, not high school courses with university credit.
- Courses are taught by CU adjunct professors who are on staff at SM STEM High.
Like other CU courses, CU Succeed Gold courses are recorded on an official University of Colorado transcript.

**Program Benefits**
- Convenience: Courses are offered at STEM High during regular school hours.
- Lower tuition: Significantly lower than the same courses on the CU campus.
- Earn both high school and college credit: Students can earn college credits while satisfying STEM High’s course requirements.
- Waived admission application fee at CU Denver.

For more information about the CU Succeed Gold Program: [www.cudenver.edu/cusucceed/](http://www.cudenver.edu/cusucceed/).

Additionally, students may concurrently enroll in post-secondary classes while still attending STEM High provided they maintain the minimum class load. Post-secondary classes taken while a student is attending STEM High will appear on the high school transcript, and grades will be used to determine the GPA. Note that grades earned in post-secondary coursework will be weighted in calculation of the student’s GPA, based on a five-point grade points scale.

Here is the link for the CU Denver online course catalog.
[http://www.cudenver.edu/Academics/Catalog/Documents/w11Course%20Descriptions_FIN.pdf](http://www.cudenver.edu/Academics/Catalog/Documents/w11Course%20Descriptions_FIN.pdf)

(Appendix A) for Letter of Support from Danny Martinez, CU Succeed Gold Coordinator.

### ADDITIONAL STEM EDUCATION PROGRAMMING

#### Home School College Ready Program

STEM High will seek to offer a tuition free - College-Ready Program through local community colleges, including Arapahoe Community College. Articulation agreements will be secured once the charter is approved by the Douglas County School District Board of Education. This Homeschool College Ready Program will be similar to The Classical Academy Homeschool College Ready Program with Pikes Peak Community College.

#### College Ready – Dual Enrollment Classes with Arapahoe Community College and other Colorado Community Colleges

Once the charter is secured, articulation agreements will be negotiated with Arapahoe Community College and other community colleges to offer College Ready, Dual Enrollment Classes to STEM High School and Academy students. When possible, STEM High will offer Dual Enrollment Classes to students, especially Humanities, English, and History classes. The primary focus of the STEM High curriculum however, will be on AP classes. STEM High will follow the courses outlined in the following Arapahoe Community College/DCSD brochure: [http://www.arapahoe.edu/applyregister/d-college-ready-brochure.pdf](http://www.arapahoe.edu/applyregister/d-college-ready-brochure.pdf)
Virtual STEM Middle and High School

STEM Middle and High School have had requests for programming options from students in rural Colorado settings and reserves the right to explore options for opening a Virtual On-Line STEM Middle and High School in the future.

Additional STEM Programming Financed through STEM Academy

STEM Academy will offer additional STEM Programming which will not be financed through STEM High. For a list of possible additional STEM Programs please see the (Appendix P and AZ). This additional STEM Programming will be funded through 1) student fees 2) business and industry involvement, 3) private donations, and 4) grants.

AT-RISK AND COMMUNITY INVOLVEMENT

5. A DESCRIPTION OF PROGRAMS AND MEANS FOR INCREASING THE EDUCATIONAL OPPORTUNITIES OF AT-RISK STUDENTS, MEANING THOSE STUDENTS WHO, BECAUSE OF PHYSICAL, EMOTIONAL, SOCIOECONOMIC, OR CULTURAL FACTORS, ARE LESS LIKELY TO SUCCEED IN SCHOOL, AS WELL AS FOR STUDENTS WHO ARE IDENTIFIED AS ACADEMICALLY LOW-ACHIEVING.

STEM High and Middle School, has a program in place to increase the educational opportunities of at-risk children, who are less likely to succeed in school because of the following criteria.

- Physical Factors
- Emotional Factors
- Socioeconomic Factors
- Cultural Factor
- Academically Low-Achieving

STEM High and Middle School is marketing to students from the South Metro Denver area that otherwise would not have this opportunity to attend a world-class science and technology school will have this opportunity. Special attention will be given to market to minority students and to females, who are the least represented population groups in the high tech engineering industry.

STEM High and Middle School will set grade-level and above standards for all students in all classes. Part of the school’s mission is to ensure that all students have the opportunity for scholastic achievement and as a result STEM High and Middle School will implement a program for quick and productive corrective action when students are at-risk of academic failure. The system of having each student linked to a Student Services Advisor who will track their progress throughout their entire high school experience supports this philosophy.

On a continuing and immediate timeline, the principal, advisors, and teachers will address the student’s educational needs by developing formative assessments to monitor student achievement on a daily and weekly basis. Student progress will be reviewed for the academic achievement of all students in order to determine successful outcomes. Further, the Student
Support Team will monitor individual student academic achievement, and students who are not progressing according to state standards will be addressed immediately. An intervention plan will be developed in order to prevent the student from falling behind. The educator and the child will collaborate to implement a system of re-teaching and assessment to ensure proficiency in standards. A student who is failing two or more academic classes or having an overall GPA below 2.0 will be put on “Academic Watch.”

A student on Academic Watch will automatically be disqualified from after-school sports or other extracurricular activities. A student who goes on Academic Watch will meet with their Advisor and the two will devise a plan to help the student improve his or her grades. As a part of this plan, the student will be required to attend after-school Study Tables and/or tutoring (frequency will be determined by the Principal). In addition, teachers will fill out a grade report for the student every two weeks. This report will go to the Advisor and the student’s parents. Administration and/or staff may use other exercises to improve academic achievement, such as regular meetings with teachers, peer tutoring, parent tutoring, homework plans, etc.

If no academic improvement is noted during a period of one month, a mandatory meeting will be conducted by the student’s Advisor and will include the Principal, guidance counselor, parents, the student’s teachers, and the student. The student’s learning plan will be evaluated and revised as needed to help the student achieve academic success. The Student Support Team will be kept apprised of progress and discussions with the student. If intervention should become necessary, the Student Support Team will enter into the situation.

**Special Needs**

STEM High and Middle School will co-operate with the Douglas County School District to ensure that students with special needs receive an appropriate level of service. We plan to purchase non-instructional services such as nursing, psychotherapy, social work, speech and occupational therapy, from the district. The school will assume responsibility for classroom instruction for students with special needs and will comply with all district regulations for accommodating such students, including providing teachers with the required certifications. Specific resources allocated to special needs students will be determined as needed and on an individual basis. The primary goal will be to allow students to fully participate in mainstream classes to the greatest extent possible. For students who require more individualized instruction or specialized classroom aids, the school will take whatever actions are deemed necessary by the district and by the Principal.

The curriculum of STEM High and Middle School will be designed to accommodate a wide range of learning styles. In general, instruction will be child-specific and will be accelerated, not decelerated, for students with all types of special needs. As a small school, our teachers can remain quite flexible in how they challenge individual students. This personalized approach is critical to any student's eventual success.

APPB curricula also have the advantage of requiring a variety of skills from students, not just the narrow competencies that have traditionally defined children as gifted or slow. Our goal is that all students will be challenged to move beyond self-imposed limits. Because we believe that all
students have intellectual ability, we see it as our responsibility to provide a variety of routes to let them exercise it.

**Plan for Special Education**

Because STEM High and Middle School is initiated in the sixth grade, the majority of students requiring special education services will have been designated by their previous school. Through the registration process (after a student has been accepted for enrollment) STEM High and Middle School will identify all special education students, request each student’s file from their prior school, and meet with the student, his/her parents, resource teachers and other applicable personnel to begin the transition process.

**Educational Program**

As required by federal and state statutes and regulations, each special education student eligible under the Individuals with Disabilities Education Act (IDEA) will be provided a free, appropriate public education (FAPE) in the least restrictive environment. To meet each student’s needs, STEM High and Middle School will focus on providing educational enhancement services such as assistive technology, in-class tutorial assistance, small group and individual instruction and note-taking services within the regular education environment.

Individualized Education Programs (IEPs) will be developed for each eligible student. The school will also be responsible for delivering Section 504 services. Devised by the student, advisor, parents, school staff, and special education specialists, these plans will specifically address needs, timelines and special adaptations necessary for successful completion of the STEM High and Middle School educational program. As needed, teachers will be able to accommodate and/or modify assignments, tests, and evaluations according to an individual student’s needs.

The primary goal will be full inclusion: to allow students to fully participate in mainstream classes to the greatest extent possible. Decisions regarding the above are the responsibility of the Individualized Education Team, as formulated in a written plan and with full parental consent. STEM High and Middle School will fully comply with any Individual Education Plans established for special needs students and will participate in the IEP team for any enrolled students with special needs.

STEM High and Middle School will co-operate with its charter authorizer to ensure that students with special needs receive an appropriate level of service. Special education staff hired by STEM High and Middle School will have or obtain proper licensure and endorsements as stated in the Individuals with Disabilities Education Act (IDEA) and Colorado Exceptional Children’s Educational Act (ECEA). STEM High and Middle School may purchase non-instructional services such as speech therapy, physical therapy, occupational therapy and nursing services on a contractual basis from Douglas County School District as needed or required by law. Specific resources allocated to special needs students will be determined on an individual basis.

Prior to the opening of STEM High in the fall of 2010, the Principal and designated staff will meet with the Douglas County School District 1) to discuss in detail contracted special education services, 2) to develop effective procedures for conducting the December special education count day, 3) to develop effective record-keeping and reporting procedures on required student, staff,
revenue and expenditure data, and 4) to obtain copies of resource documents such as local special education policies, procedures, and guidelines. The development of an effective working relationship with DCSD will better serve STEM High and Middle School students.

**Student Discipline**

STEM High and Middle School administrative staff, assigned the responsibility for student discipline, will immediately contact special education staff whenever a student is involved in a disciplinary issue. STEM High and Middle School will be responsible for holding manifestation determination reviews in connection with student discipline proceedings and will comply with Colorado laws related to student discipline for special education students. STEM High and Middle School special education staff will immediately consult with the student’s district if any disciplinary consequences will effect change of placement. If a change of placement is being considered, the appropriate persons will participate in a review of the IEP or 504 Plan.

**Confidentiality and Special Education Records**

Pursuant to the IDEA, the ECEA, and the federal Family Educational Rights and Privacy Act and the Colorado Public Records Act, STEM High and Middle School will establish policies and procedures to maintain the confidentiality of personally identifiable information in special education records during all stages of their collection, storage, disclosure and destruction.

**Plan for Gifted Students**

STEM High and Middle School will work closely with students identified as gifted through their prior school. Transitional meetings will be held for students on Advanced Learning Plans (ADCSD) with students, teachers and parents. STEM High and Middle School will also arrange similar transitional meetings at parent request for students who attend private schools who may not have been officially identified as gifted, following the authorizer’s process for the identification of students.

The curriculum at STEM High and Middle School allows teachers to personalize offerings according to individual students’ abilities in each subject area. For two students in the same physics class, one might be building a hovercraft while another is building a sailboat. STEM High and Middle School teachers work to challenge and support each student to aim for their personal best. Students wishing to pursue enrichment opportunities may consider the Postsecondary Options program, online courses, or Independent Study options.

**Compliance with Colorado Basic Literacy Act (CBLA)**

To measure students’ literacy levels, teachers will utilize the CBLA 6-12 grade proficiencies as a baseline for assessment, and will analyze incoming students’ performance on CSAPs to identify students needing remediation. Using multiple measures and developing a body of evidence over time, including the NWEA (which are aligned with Colorado Model Content Standards) and other assessments, teachers will measure students’ progress in developing their literacy.

STEM High and Middle School will meet all requirements of federal and state law relative to students on Individual Literacy Plans (IDCSD), including all reporting requirements.
Plan for English Language Learners

STEM High and Middle School will meet all requirements of federal and state law relative to equal access to the curriculum for English language learners (ELL). The goal is to develop high quality instructional programs and services for English language learners that allow them, within a reasonable amount of time, to achieve the same challenging grade level and graduation standards as native-English speaking students.

STEM High and Middle School’s APPB approach is particularly effective with English language learners for a number of reasons. First, the small group instruction that accompanies projects allows for teachers to differentiate supports for students based on individual needs. Second, ELL students participate in group problem-solving with native English speaking students and learn from those interactions. Third, STEM High and Middle School’s focus on applying knowledge to real-world projects encourages comprehension and learning for all students.

At STEM High and Middle School, content knowledge is not inert or solely textbook-driven; rather, it is applied, and transformed in ways that deepen the learning for all students. As required by law, STEM High and Middle School will administer the Colorado English Language Assessment to all new students with a home language other than English and to all English language learners annually to determine each student’s individual proficiency level and to reclassify students to Fluent English Proficient (FEP) where appropriate. Once an English language learner is identified, a conference will be scheduled with the parent to outline the instructional program, the teacher’s role in implementation, and the teacher’s, parents’ and school’s role in providing support. At least twice each semester, the instructional program will be reviewed and discussed.

Food Service for Free and Reduced Lunch Students

STEM High and Middle School does not currently plan to provide food service to its students. However, STEM High and Middle School is exploring options for students who qualify for Free and Reduced Lunch. Options may include encouraging vendors to bring food to the school, collaborating with the local soup kitchen. STEM High and Middle School will explore governmental and private funding options to make this affordable to the students who qualify for Free and Reduced Lunch.

PLAN FOR EVALUATING PUPIL PERFORMANCE STANDARDS

6. A DESCRIPTION OF THE DISTRICT CHARTER SCHOOL’S PLAN FOR EVALUATING PUPIL PERFORMANCE IN ACHIEVING THE STANDARDS DEFINED IN NUMBER 3 ABOVE, THE TYPES OF ASSESSMENTS THAT WILL BE USED TO MEASURE PUPIL PROGRESS TOWARD THE STANDARDS, THE TIMELINE FOR ACHIEVEMENT OF SUCH STANDARDS, AND THE PROCEDURES FOR TAKING CORRECTIVE ACTION IN THE EVENT THAT PUPIL PERFORMANCE AT THE DISTRICT CHARTER SCHOOL FALLS BELOW SUCH STANDARDS - In addition to student participation in the Colorado Student Assessment Program (“CSAP”), the
application must promote the development of longitudinal analysis of student progress and describe the manner in which longitudinal assessment data will be collected and used to improve student achievement.

High / Middle School Pupil Performance Evaluation

High and Middle School will comply with State testing and assessment requirements, including the use of CSAP. Every student will be tested and reported in accordance with state law. The school’s counselors and special education co-coordinator will manage all testing programs and develop a system to track and maintain the status of testing on all students.

During the course of the year, several methods will be used to evaluate and report student performance including 6-week grade reports; regular testing in all classes; and teacher/parent/student conferences each semester. Conferences will be an opportunity for the teacher and student to review the student’s progress toward the school’s educational goals and to set further individual goals.

Types of Assessments

High and Middle School plans to use several assessments in the Fall to allow the results to be used in the current school year to address student needs. All 9th grade students will take the EXPLORE exam. All 10th grade students will take the PLAN exam. All 11th grade students will be encouraged to take the PSAT. These assessments will give teachers a view of where students are currently functioning and allow the focus of instruction to shift if needed.

When High and Middle School implements tests used by the District or State, the results obtained may be used for comparison of performance with all middle and high school students of the District. Furthermore, High and Middle School will use testing procedures and instruments to supplement those used by the District. In all classes, teachers will use a variety of assessment methods to determine students’ progress towards meeting class objectives and benchmarks. Types of assessments that teachers may choose to use include written objective examinations, essay examinations, essays, oral examinations, and speeches.

NWEA, C-Snap and Colorado Growth Model

High and Middle School will both use MAPS testing through the NWEA to transform student educational achievement, and instructional practices with substantial results at every level. MAPS has been selected because it does not limit and is useful in showing results with gifted and talented students. Through the use of NWEA, MAPS testing, administrators, counselors, and educators will target the following areas:

- Individual Student Growth
- Classroom Achievement
- School Level Benchmarking and Growth
- Program Level Change

C-snap results will assist educators in making curriculum decisions in order to ensure at least one year or greater student growth in order to comply with the Colorado Growth Model. Staff and
faculty will use C-snap to analyze reports related to students’ ability to achieve a year’s worth of growth and they will make curriculum adjustments and differentiate instruction in order to increase or achieve at least one year’s growth. Educators will be able to analyze C-snap data to close learning gaps in the following areas:

- Ethnic
- Gender
- Socio-economic

Teachers will collaborate with each other by analyzing C-snap data, communicate growth with parents through individualized test results, and assist students in setting individual goals towards self-improvement and growth in the Colorado State Standards. Administrators, counselors and educators will set SMART goals to target areas in need of intervention. Colorado Growth Model results will assist staff and faculty in locating any deficiencies or gaps in the learning needs of the student population.

**What the Model Measures**

Colorado's Growth Model measures student progress from one year to the next in the context of a student's “academic peers.” The Growth Model compares each student's performance to students in the same grade throughout Colorado who had similar CSAP scores in past years and calculates a growth percentile. A student growing as well or better than 60 percent of his or her academic peers would be at the 60th percentile.

Student growth percentiles can be used to determine “How much growth is enough?” The percentiles show the amount of growth necessary for each student to reach proficiency (“catch up”) or maintain proficiency (“keep up”) within three years or by 10th grade.

[http://www.cde.state.co.us/cdeedserv/GrowthModelDistSchReport.htm](http://www.cde.state.co.us/cdeedserv/GrowthModelDistSchReport.htm)

**Response to Intervention (RtI)**

STEM High and Middle School has adopted the RtI Pyramid of Intervention approach to assist in identifying and individually tracking the progress of students experiencing difficulty in learning. The RtI Pyramid tracks individual learners’ academic achievement to assure maximum potential is achieved in the classroom for student success.

The RtI Pyramid for STEM High and Middle School involves a three-tier approach including the following levels:

**Tier 1 Intervention**

Students will be tracked through routine assessments and measures. Teachers will implement the following instructional strategies in order assist students in academic achievement:

- Differentiate Instruction
- Reduce classroom distraction
- Structured classroom routine
- Parent contact
- Attendance letters
• Use of time out or supervised isolation
• Schedule change
• Modify seating chart
• Use study carrel or screen
• Sign planner
• Shorten or simplify instruction
• Partner reading
• Extra time

**Tier II Interventions**
If Tier I intervention prove unsuccessful, the following Tier II strategies will be used to further students in academic achievement.

• Additional Instruction time at STEM High and Middle School T and in the STEM Academy Expanded Learning Time (ELT)
• Special Grouping
• Parent Contact
• Consultation with Literacy specialist or GT Facilitator
• ALP
• ILP
• After-school Homework Clubs
• Modified material
• Modified work
• Peer Tutor
• Oral testing
• Attendance/behavior contract

**Tier III**
If student achievement is lacking with Tier I and Tier II intervention strategies, then Tier III intervention will be tracked individually using:

• Special Education
• Modified Standards
• Intensive Intervention

The RtI protocol will follow the cyclical six-step protocol including:

1. Gathering data
   • CSAP scores – lowest 10 percent of proficient and below
   • Grades
   • MAPS and other assessments

2. Convene an intervention team
   • RtI Committee Members will facilitate
   • Any teacher can bring students to intervention meetings
   • An Intervention Team consists of all teaching staff within a department, counselor, special educator and dean.
3. Study data
   - The Intervention Facilitator for the committee will introduce individual cases and discuss current status of academic achievement.
   - The Intervention Team will discuss what Tier I interventions have been implemented and the results of interventions.

4. Develop practical ways of improving the student’s performance.
   - Intervention Team will ask questions about how and when student will receive extra teacher time?
   - Intervention Team will develop a plan for communicating with parents.

5. Progress Monitoring
   - Intervention Team will track individual student progress a minimum of every two weeks using the RtI Pyramid of Intervention and documenting all strategies used. Data will be stored in a confidential location where teachers may access the needed information.

6. Reflect on the Progress
   - Necessary adjustments will be made based on the success of intervention strategies.

http://www.cde.state.co.us/RtI/downloads/PDF/RtIGuide.pdf

**Timeline**

The following assessment timeline has been adopted by STEM High:
   - Fall - Initial standardized testing, first year
   - Fall - Test results obtained, baseline established utilizing PLAN, EXPLORE, PSAT, 9th and 10th grade
   - Fall - Test results reported to the District and the State, first year
   - Spring – Annual CSAP and ACT testing, each year
   - Summer - Test results obtained, each year
   - Fall - Annual report of test results made to the Board, each year

The following assessment timeline has been adopted by STEM Middle:
   - Fall – Fall MAPS testing
   - Winter – Winter MAPS testing
   - Spring – Spring MAPS testing, and CSAP in March
   - Quarterly assessments will be given throughout the year by all departments
Corrective Action

STEM High and Middle School will set grade-level and above standards for all students in all classes. As a result of having such a rigorous academic program, the school realizes that some students may struggle academically. Part of the school’s mission is to ensure that all students have the opportunity for scholastic achievement and as a result STEM High and Middle School will implement a program for quick and productive corrective action when students are at-risk of academic failure. The system of having each student linked to a Student Services Advisor who will track their progress throughout their entire high school experience supports this philosophy.

On a continuing and consistent basis, the Principal, Advisors, and teachers will review the academic achievement of all students for successful progress. Further, the Student Support Team will monitor individual student academic achievement. A student is failing two or more academic classes or having an overall GPA below 2.0 will be put on “Academic Watch.” A student on Academic Watch will automatically be disqualified from after-school sports or other extracurricular activities. A student who goes on Academic Watch will meet with their Advisor and the two will devise a plan to help the student improve his or her grades. As a part of this plan, the student will be required to attend after-school Study Tables and/or tutoring (frequency will be determined by the Principal). In addition, teachers will fill out a grade report for the student every two weeks. This report will go to the Advisor and the student’s parents. Administration and/or staff may use other exercises to improve academic achievement, such as regular meetings with teachers, peer tutoring, parent tutoring, homework plans, etc.

If no academic improvement is noted during a period of one month, a mandatory meeting will be conducted by the student’s Advisor and will include the Principal, guidance counselor, parents, the student’s teachers, and the student. The student’s learning plan will be evaluated and revised as needed to help the student achieve academic success. The Student Support Team will be kept apprised of progress and discussions with the student. If intervention should become necessary, the Student Support Team will enter into the situation.

STEM Middle School Pupil Performance Evaluation

Assessments will occur in several ways. First, STEM Middle will use the exams required by the state and Douglas County School District, such as the CSAP, online computer-adapted benchmark assessments, and national norm referenced tests. These tests will determine performance based on state standards as well as measure adequate yearly progress as required by the No Child Left Behind Act of 2001, and literacy progress as required by the Colorado Basic Literacy Act.

Second, STEM Middle intends to facilitate accurate flexible grouping through the use of intermittent, real-time testing for all subjects and grades 6th through 8th. Our goal is to quickly and efficiently assess student academic progress, both individually and by groupings of students, in order to provide teachers with immediate, real-time diagnostic information on: learning objectives a student has not completed, effectiveness of flexible groups, and academic gains made by individual and groups of students.
We are currently evaluating various products offered by NWEA and Scantron, such as Performance Series (web-based testing application and real-time assessments for academic strands of individualized state standards) and Skills Connection (web-based testing application and real-time assessments for learning levels on a per-skill basis, in subjects such as mathematics, language arts and life science). Use of one of these tools will allow frequent, customized testing with instant feedback without adding an additional burden on the teacher. Teachers can use the results to modify instruction level and methods in a timely manner.

Some assessment tools being evaluated are capable of generating individual problems or worksheets based on skill mastery of each child. The use of this technology will allow the teacher to focus on working with the students and facilitate individualized instruction without the burden of building individualized assignments by hand.

Finally, STEM Middle School may decide to use the classroom assessments developed by the Core Knowledge Foundation in order to assess progress as it pertains to the Core Knowledge curriculum. The school’s Academic Director will be responsible for creating an assessment rubric that specifies what assessment will be used for each subject, when and how it will be given, as well as who is responsible for giving the assessment.

In our first two years of operation, STEM Middle will use CSAP scores (including CSAP scores for each student from the year prior to entering STEM Middle, if applicable. STEM Middle School will assess and report performance through detailed, longitudinal data collection, quarterly report cards, and proactive notification of concerns. This section will also discuss how performance will be communicated to parents.

We will track individual students longitudinally as they go through the school so that we can continuously adapt our curriculum, teaching strategies, and content delivery to guide individual students to success and to facilitate continual academic improvement. The cornerstone to this fine tuning is timely and longitudinal data collection.

**Student data to be collected while attending STEM Middle School:**
- Personal Identifiers
- Family Demographics
- Time at STEM Middle School
- Attendance record
- Extracurricular Activities
- Behavior Record
- Assessment record – internal, CSAP, and national norm-referenced
- Skills mastery
- Retention

**Student data we hope to collect after students leave STEM Middle School**
- High school programs (honors, AP, etc)
- High school graduation
- College acceptance
- College major field of study
STEM High / Middle School

- College graduation

This data will be used for measuring the progress of individual students as well as the progress of the school towards achieving academic excellence. Parents will be notified of student progress in several ways. First, up to date reporting of assessment data for individual students will be available to their parents via a secure login and connection on the STEM Middle School website.

Report cards will be issued quarterly, with letter grades in each subject based on the following scale: A - 90% or better; B – 80 to 89%; C – 70 to 79%; D – 60 to 69%; F – under 60%. Finally, if teacher observations and assessment data reveal a concern in a particular subject area, the teacher will notify the parent in a proactive manner.

**Timelines for achievements of these standards**

STEM Middle will make substantial progress towards academic excellence within the first three years of operations. STEM Middle will be a high achieving school that shows strong longitudinal progress for students not yet proficient on state and Core Knowledge standards. Students already proficient will maintain or enhance their proficiency level.

Each year, we expect (1) an increasing percentage of our students to show the longitudinal growth needed for them to become proficient or better with respect to state and district standards, (2) the snapshot of our school performance (status measure) to be considered “high achieving” based on district accreditation criteria, and (3) our school to make AYP under NCLB. We will establish specific annual targets for our indicators and measures each year as part of our annual school improvement plan.

Data will be collected from the first year of operation forward. Parents should be able to view student assessment data on the STEM High and Middle School website. Report cards and concern notification will take place starting the first year of operation.

**EVIDENCE OF SUPPORT**

7. **EVIDENCE THAT AN ADEQUATE NUMBER OF PARENTS, TEACHERS, PUPILS, OR ANY COMBINATION THEREOF, SUPPORT THE FORMATION OF A CHARTER SCHOOL** - This will include evidence that District parents, community members, and possible employees support the establishment of this district charter school.

**District Parent Support -- Letters of Intent and Support**

**Five hundred thirty-three Letters of Intent** (LOI) showing community interest have been solicited from local parents in Douglas, Arapahoe and Jefferson, and Denver Counties. All data has been entered by parent volunteers into an Excel spreadsheet. During the spring and summer of 2009, several emails were sent out to parents who had filled in a Letter of Intent in 2007 and
2008. They were asked to update their data on-line in order to renew their LOI. Numbers below reflect this data. (Appendix H)

<table>
<thead>
<tr>
<th>Total Number of Letters of Intent by School</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>American Academy</td>
<td>121</td>
</tr>
<tr>
<td>Renaissance Montessori Academy</td>
<td>2</td>
</tr>
<tr>
<td>Platte River Academy</td>
<td>56</td>
</tr>
<tr>
<td>St. Thomas Moore Catholic School</td>
<td>2</td>
</tr>
<tr>
<td>Parker Core Knowledge</td>
<td>47</td>
</tr>
<tr>
<td>North Star Academy</td>
<td>41</td>
</tr>
<tr>
<td>Challenge to Excellence</td>
<td>40</td>
</tr>
<tr>
<td>Littleton Academy</td>
<td>33</td>
</tr>
<tr>
<td>Coyote Creek Elementary</td>
<td>12</td>
</tr>
<tr>
<td>Aspen Academy</td>
<td>10</td>
</tr>
<tr>
<td>Cherry Creek Academy</td>
<td>9</td>
</tr>
<tr>
<td>Northridge Elementary</td>
<td>7</td>
</tr>
<tr>
<td>Trailblazer Elem</td>
<td>7</td>
</tr>
<tr>
<td>Fox Hollow Elementary</td>
<td>6</td>
</tr>
<tr>
<td>Prairie Crossing Elementary</td>
<td>6</td>
</tr>
<tr>
<td>Core Knowledge in Parker</td>
<td>5</td>
</tr>
<tr>
<td>Arrowwood Elementary</td>
<td>4</td>
</tr>
<tr>
<td>Pre-School</td>
<td>4</td>
</tr>
<tr>
<td>Acres Green Elementary School</td>
<td>3</td>
</tr>
<tr>
<td>Buffalo Ridge Elementary</td>
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</tr>
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</table>

<table>
<thead>
<tr>
<th>Total Fresmen Students Per Year</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>2010</td>
<td>56</td>
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<tr>
<td>2011</td>
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<td>2014</td>
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<tr>
<td>2015</td>
<td>44</td>
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<tr>
<td>2016</td>
<td>71</td>
</tr>
<tr>
<td>2017</td>
<td>26</td>
</tr>
</tbody>
</table>
DCS Montessori 3  Jubilee Preschool 1
Frontier Valley Elementary 3  Montessori of Denver 1
Parker Montessori 3  None-Too Young 1
Pine Lane 3  Primrose 1
Rocky Heights Middle School 3  Red Hawk Ridge Elementary 1
Saddle Ranch Elementary 3  Redstone Elementary 1
Ave Maria Catholic School 2  Ricks Center for Gifted Children 1
Cottonwood Creek Elementary 2  Rolling Hills Elementary 1
Cougar Run Elem 2  Sand Creek Elementary 1
COVA 2  Shepherd of the Hills 1
Coyote Hills Elementary 2  Southeast Christian 1
Kindercare 2  Saint Mary’s Academy 1
Lone Tree Elementary 2  The Challenge School 1
Mark Twain Elementary 2  Walnut Hills Elementary 1
Monument Academy 2  Wildcat Mountain Elementary 1
Mountain View Elementary 2  Woodlands Academy 1
Powell Middle School 2  Cottonwood Creek Elementary 1
Heritage Hills Elementary 1

LOI’s by County/District

Arapahoe 7
Aurora 3
Cherry Creek 27
Douglas County 469
Elbert County 1
Elizabeth 3
Jeffco 1
Littleton 14
Monument 2

Educational Partners (Appendix A)

Chancellor Bruce Benson
University of Colorado at Boulder

Danny Martinez
University of Colorado at Denver and Health Sciences Center

Bill Lehman
Project Lead the Way Coordinator
University of Colorado at Colorado Springs

President and Senator Bill Armstrong  
Colorado Christian University

Dr. Mark Pieffer, President  
Colorado Technical University Denver South

Educational Mentors (Appendix B)

Norwood Robb  
Immediate Past Board President  
Denver School of Science and Technology

Tony Fontana  
Executive Principal  
Peak to Peak Charter High School

Congressman Bob Schaeffer  
State Board of Education Member

Government and Political Leaders (Appendix C)

Steve Ward  
State Senator

Joe Rice  
State Representative

Frank McNulty  
State Representative

Jeff Wasden  
Highlands Ranch Community Association Board President

Ted Harvey  
State Senator

Dave Schultheis  
State Senator

David Casiano  
Parker Mayor
John Andrews
Senator

Mark Scheffel
Senator

Business, Industry and Community Members (Appendix D)

Southeast Business Partnership
South Metro Chamber of Commerce
Community Leaders
High Tech Business Leaders

Volunteer Network Forms (Appendix Z)

Over 50 of these forms have been collected from parent and community volunteers. It is the goal to solicit one volunteer form per family and from hundreds of community and high tech business partner volunteers. A volunteer army will be mobilized to manage the in-school and the Expanded Learning Time (ELT) educational programs. These volunteers have expressed interest in volunteering for:

- Fundraising Committee
- Letter of Intent/Support Committee
- Publicity Committee/Advertising and Public Relations
- Instruction/Curriculum
- Charter School Application
- Data Entry Volunteers
- Web Site Support
- Architecture and Building Design
- Grant Writing – Grant opportunities

8. EVIDENCE THAT THE PLAN FOR THE DISTRICT CHARTER SCHOOL IS ECONOMICALLY SOUND - This must include a proposed balanced budget for the term of the charter; and a description of the manner in which an annual audit of the financial and administrative operations of the charter school, including any services provided by the District, State or third party is to be conducted. Funding for a district charter school will be in accordance with the Act. Any percentage of funding above the minimum in the Act will be determined by the Board of Education with consideration given to specifics of the proposal.
STEM High and Middle School’s proposed operating budget and performance cash flows are included as a (Appendix G) in this document. STEM High and Middle School has obtained numerous operating budgets from successful charter schools, and our financial projections draw on the experience of these schools. Revenue projections are based on current Douglas County School District arrangements with other public schools. Expenses are based on data gathered from outside consultants, other charter schools, and public high schools of similar size.

STEM High and Middle School will rely and solicit private donations from business and industry, especially the high tech business partners that are present in the South Metro area. South Metro Chamber of Commerce has partnered with the school to assist with fundraising efforts.

In addition to the funds anticipated from the start-up grant and PPOR monies, STEM High and Middle School, will secure private donations to support operations in the early years. These private donations will be used to purchase furniture and equipment, supplement operational revenue in the early years and build a reserve fund that will be used for emergencies and unforeseen expenses. With the use of these supplemental funds, STEM High and Middle School will manage to meet all of its expenses beginning in the first year of operation. As student enrollment grows the school will have even greater financial resources and will be able to expand the number of programs and the resources offered to students. The Board may also choose to conduct fundraising campaigns to supplement PPOR and fund special projects.

The initial term of the charter will be five years. Accordingly, the budget is projected over a five-year period. In accordance with C.R.S. 22-30.5-104(4.5)(b), when STEM High and Middle School begins negotiating a long-term lease, facility acquisition or a financing bond, the school will be requesting a longer charter to coincide with the financing term.

Financial Management

STEM High and Middle School will operate with acute fiscal responsibility. A balanced budget will be presented annually and compared for variances to previous years. A certified public accounting firm will be hired annually to prepare an assurance report of STEM’s financial position and continuing operations. Asset acquisition and purchasing that supports general operations will only be made following appropriate purchasing and requisition procedures.

LIABILITY AND INSURANCE

9. A PROPOSED AGREEMENT BETWEEN THE PARTIES REGARDING THEIR RESPECTIVE LEGAL LIABILITIES AND APPLICABLE INSURANCE COVERAGE - A detailed summary of all intended insurance coverage shall be included.

Insurance

STEM High and Middle School will arrange for Comprehensive General Liability, Building and Contents, Errors & Omissions (school leaders), Blanket Occupational Accident, and Excess
Workers Compensation Insurance coverage to extend to STEM High and Middle School site, Governing Board and employees, and school activities. STEM High and Middle School may pay the District a negotiated amount per student enrolled at the school as reimbursement for the cost of providing this insurance coverage.

STEM High and Middle School agrees that it will notify the District through prompt reporting of any and all pending or threatened claims, will file in a timely manner any notices of claim, will cooperate fully with the District in the defense of any claims, and will comply with the defense and reimbursement provisions of the Colorado Governmental Immunity Act and the Districts applicable insurance policies. STEM High shall neither compromise, settle, negotiate, nor otherwise affect any disposition of potential claims asserted against it without the District’s prior written approval.

**Faith and Credit**

STEM High and Middle School agrees that it will not extend the faith and credit of the District to any third person or entity. STEM High and Middle School acknowledges and agrees that it has no authority to enter into a contract that would bind the District, and that STEM High and Middle School’s authority to contract by the amount of funds obtained from the District as provided hereunder, or from other contracts to which STEM High and Middle School is a party, are subject to the requirements and limitations of the Colorado Constitution, State law, District policies (unless specific exemptions have been obtained), the provisions of the Charter Schools Act, and this Charter.

**GOVERNANCE**

10. **A DETAILED DESCRIPTION OF THE GOVERNANCE AND OPERATION OF THE DISTRICT CHARTER SCHOOL, INCLUDING THE NATURE AND EXTENT OF PARENTAL, PROFESSIONAL EDUCATOR, AND COMMUNITY INVOLVEMENT IN THE GOVERNANCE AND OPERATION OF THE DISTRICT CHARTER SCHOOL** - This should include a conflicts of interest policy, and information pertaining to day-to-day financial operations. Also, include bylaws for the governing board, if available.

A group of concerned business leaders, educators and parents are the stakeholders who have been active for the last three years in the design and development of a STEM charter high school in the South Metro area of Denver. The challenge has been to design a school that would serve ultimately to increase the pipeline supply of qualified workers for employment in the fields of Science, Technology, Engineering and Mathematics, (STEM), and would be relevant to Colorado’s high tech industry. The school is driven by business and industry concerns. The Development / Design Team has met at various times over the last year to finalize the design of the school.

Once the charter has been approved by the Authorizer, a more formalized STEM High School Board will be elected and a School Advisory Council (SAC) formed. The elected Board members will be asked to attend Board Trainings and complete training modules in preparation for serving. Elected Board Members will be required to sign a Board Agreement that will
stipulate the qualification, responsibilities and expected behaviors of the individual board members and the governance structure. An agreement form is currently in the process of development in preparation for the transition of the Development Team to a formal Board. The governing board will operate in compliance with the Colorado Open Meetings Law (C.R.S. 24-6-401) and Public Records Act (C.R.S. 24-720201) as well as the Family Educational Rights and Privacy Act (20 U.S.C. Sect. 1232).

STEM High has been incorporated as a 501(c)(3) nonprofit organization in the State of Colorado. A copy of the articles of incorporation and bylaws are included as an (Appendix L and M). The Board of Directors will be responsible for the overall direction of the school, but under the board’s “policy governance” model the school will be administered on a day-to-day basis by the administration.

**Board of Directors**

The Board of Directors will consist of five members in two classes. There will be two Class A members of the board and three Class B members of the board. Class A members will be elected by the parents of the students enrolled in the school. Class B members will be appointed by majority vote of the Class B members then in office. The Principal and the business manager will attend all Board meetings, but will not have voting authority. No member of the Board will receive compensation for their role.

**Duties**

The duties of the Board include, but are not limited to, approving school policies:

- Electing officers
- Electing new Board members (Class B only)
- Establishing and appointing committees
- Establishing the overall curriculum philosophy from an engineering and business perspective
- Principal Hiring and Evaluation Committee – responsible for recruiting and recommending a Principal, and writing a formal job description for the position. Final approval of the job description and selection of the final candidate will be done by the full Board. The committee will conduct a performance review of the Principal at least once per year. If his/her performance is found to be below expectations, the Committee will form a remediation plan and will make a recommendation for further action to the Board.
- Setting policy in accordance with the mission and vision of the school
- Approving the annual school budget
- Assessing school performance

**Development Team / Design Team**

**Mark Baisley:** Mark graduated from the Colorado Campus of Columbia College with majors in Computer Information Systems and Business Administration. His professional career spans thirty years of information technology in aerospace, engineering, and education environments. He is currently President and CEO of Slipglass, Inc., a homeland security advanced technology
engineering firm. In addition to his role as a Colorado businessman, Mr. Baisley has served as Chairman of the executive board of the Colorado Space Business Roundtable, and is an active member of The Space Foundation. His community service involvement includes years of voluntary work for Colorado public schools and the Odyssey of the Mind program. Mark is a former board member of the Littleton Foundation. Mr. Baisley is the recipient of the 1999 Professional Achievement Award from his alma mater, Columbia College, where he contributes as a member of the Board of Trustees. He is co-founder of the Colorado Nanotechnology Initiative and currently serves his community as Finance Chairman for the Boy Scouts in the South Metro Denver area and on the Board of Directors for Liberty Day. Mark served as treasurer of the Colorado Republican Party and is currently Vice-Chairman of the Douglas County Republican Party.

Barry Brannberg
Barry Brannberg studied education and environmental science at the University of Northern Colorado and Mechanical Engineering at Colorado State University. He is the visionary for STEM High and Middle School and the Expanded Learning Time (ELT) STEM Academy. He provides technical support, graphic design and is the webmaster. Barry comes from a family of educators and has more than 25 years experience working with youth in a variety of capacities.

Dr. Deborah Brennan
Dr. Brennan has her Ph.D. in Special Education with an emphasis in Gifted and Talented Education from UNC and is currently an administrator at Stony Point High School in Round Rock, Texas. From 2001 to 2008 she worked in DCSD as a teacher at HRHS and was Associate Principal at TRHS. Dr. Brennan was the Advanced Placement Coordinator, created and organized a district-wide training for AP/Pre-AP vertical curriculum alignment at DCSD, and created a summer accelerated academy in math and science for highly able students. Dr. Brennan supervised a pilot project using technology for formative assessment in math classrooms with targeted feedback to students. Dr. Brennan is a member of several state groups for gifted education, including the Colorado Association for Gifted and Talented, Meeting of the Minds advocacy group, Colorado Academy of Gifted Educators, and the Colorado State Advisory Committee for Gifted Education. She created and organized a state-wide speakers’ bureau to address issues in gifted and talented education and served on a state-wide committee at University of Northern Colorado to facilitate curriculum development in Gifted and Talented education. Dr. Brennan created and organized the Colorado Association for Gifted and Talented state conference, including budget, facility management, presenter and speaker selection, committee management, and advertising. Dr. Brennan created and piloted an observation instrument for practicum students in a master’s in gifted and talented education program at the University of Northern Colorado. She is co-author of white paper 2006: STEMming the Tide: A Colorado Response to the Crisis in Science, Technology, Engineering and Math.

Dr. James Crowder
Dr. James A. Crowder comes to STEM High with over 25 years experience in technology and education. He holds a BS and MS in Electrical Engineering in Control Systems and Signal Processing, an MS in Applied Math in Applied Probability Theory, and a Ph.D in Electrical Engineering in Chaos Theory and Stochastic Processing. He has worked in the Aerospace and Engineering field for over 25 years with Lockheed Martin, General Dynamics, TRW, and now Raytheon Intelligence and Information Systems Division. He has received many awards along
the way, including Innovator of the Year, Technologist of the Year, and awards from NASA. He has over 60 publications, is a Chief Systems Architect for Raytheon, a Raytheon "small business mentor," and is the current Raytheon Subject Matter Expert in Artificially Intelligent Reasoners. He has been an affiliate faculty member at Colorado Christian University (CCU) for 5 years, teaching Computer Information Systems and Project Management courses, both at the undergraduate and graduate level, and was a graduate advisor at Colorado Technical University for 4 years. Dr. Crowder is beloved by his students. Dr. Crowder is a very strong supporter of education and is working with CCU currently to update their Information Technology curriculum. A supporter of college preparation and certification courses at the High School level, his oldest son Alan graduated from Warren Tech in Information Technology with certifications in LINUX, Oracle, C#, A+, and JAVA and is now studying engineering in college.

Matthew Lenda
Matt Lenda is a student at University of Colorado at Boulder and is currently in the final year of a 5-year combined BS/MS degree program in Aerospace Engineering with a focus in Vehicle Systems and Controls. He is a national member of the American Institute for Aeronautics and Astronautics as well as a former member of the Design/Build/Fly (DBF) Club at CU. He has a wide range of basic engineering design experience. Most notably: the Edge of Space Sciences (EOSS) Experimental GPS Cubesat project in 2006 as the Structural Lead; and the Miniature Aircraft Deployment System (MADS) Capstone senior design project in 2008 and 2009 as the Avionics and Electronics Engineer. MADS is looking forward to an extension and continuation to the graduate level for the 2009-2010 school year under the guidance of the CU Research and Engineering Center for Unmanned Vehicles, to which Matt will continue to contribute as the Project Manager.

Matt also works for the Laboratory for Atmospheric and Space Physics (LASP), doing mission operations work for five different satellites: AIM, SORCE, QuikSCAT, ICESat, and Kepler. His primary role at LASP is to conduct real-time planning, scheduling, and commanding of the spacecraft, carry out level-0 mission analysis and flight segment health/status reporting, and develop ground segment tools for use in the LASP mission operations framework. He works closely with engineers at Ball Aerospace and Orbital Sciences Corporation to meet their needs and spacecraft mission requirements. Matt is a 2005 ThunderRidge High School graduate and finished in the within the top 5 of his graduating class. He participated in seven Advanced Placement classes while at TRHS.

John Lucas
John Lucas is currently entering his senior year studying mechanical engineering with a business minor at Colorado State University. His main areas of interest are computer modeling/analysis, energy transfer, and fluid mechanics. In addition to his studies, John is the president of CSU's chapter of the American Institute for Aeronautics and Astronautics (AIAA), and a member of the American Society of Mechanical Engineers (ASME). As an employee of the Engines and Energy Conversion Lab, he has been involved with the design, fabrication, and testing of environmentally friendly clean cookstoves for third world countries. In the past John has worked for CSU on the NASA funded DEMOsat project, which resulted in a first place session award at the Colorado Undergraduate Space Research Symposium, and been employed by the Public Works department of the Highlands Ranch Metro Districts as an engineering intern. John has
provided his engineering knowledge as a consultant to start-up multi tool company Frontline Tools and Equipment, and participated in the development of a hydrogen fuel cell UAV through CSU. The department occasionally calls on him to represent the school on various engineering related panels in Denver and Fort Collins. He plans on earning his masters in engineering then entering the aerospace sector, and someday attaining a doctorate in order teach at the college level. On the side John enjoys playing the drums, volunteering with the Larimer County Sheriff's Office, and helping orient new students to the CSU Department of Mechanical Engineering. STEM High and Middle School and STEM Academy will benefit from John's direct experience with engineering education, as well as his connections with engineering departments at CSU and CU.

**Jason Lundberg**

Jason Lundberg is currently a graduate student at the University of Denver pursuing his Master’s in Business Administration with an emphasis on Innovation and Entrepreneurship. Jason is a 2005 graduate of ThunderRidge High School. While at TRHS, Jason held many leadership positions in his school and the Douglas County School District. As a member of the TRHS Senate, Jason was elected to serve as both Student Body Vice-President and President in subsequent terms. At a district level, Jason was a very active member on the DCSD Student Advisory Committee. As a member of the DCSD SAC, Jason focused on initiatives and studies concerning high school graduation requirements for students throughout the district. As one of ten nominated student members, Jason represented the voice of the students throughout the school district. While pursuing his BS in Accounting at the University of Denver, Jason has served as President of the Programming Board, Senator for the Daniel’s College of Business, and chairperson of the undergraduate Finance Committee. Also while at DU, Jason completed a year-long service project with DCSD students that culminated in a proposal to the DCSD Board of Education regarding student membership and direct representation on the BOE. As a natural entrepreneur and dedicated community member, Jason is an asset to the STEM development and design team.

**Brian McGrane**

Brian McGrane has a Masters in Science Education and taught Middle School prior to spending the past 25 years in high technology sales and software development. His achievements include starting a high technology company focused on Bar Code applications and working for leading software companies such as Sun Microsystems, SAP and Oracle. Brian is currently a manager at AT&T focusing on data applications where his role is educating, managing and motivating other sales executives. Brian is currently VP of the non-profit Colorado RFID organization and has volunteered in the Whiz Kids and Junior Achievement organizations.

**Mimi Tilton**

Mimi was born and raised in Hong Kong where she was an English and Math teacher. Mimi and her husband Ken are the parents of two children who attend Littleton Academy charter school. She has a BS degree from Colorado Christian University in Human Resource Management.

**Matthew Smith**

Matthew Smith is Vice President of Engineering for United Launch Alliance (ULA) headquartered in Denver, Colo. In this role, Smith has company-level responsibility for
engineering personnel, processes, tools, products, technical oversight and launch readiness certification activities. Prior to joining ULA, Smith served as technical director and chief engineer for Lockheed Martin Space Systems Company, Atlas programs. Previously, Smith served as director of Atlas Propulsion Systems. Smith began his career with the Atlas program in 1983 as a pneumatics system design engineer for the General Dynamics Convair division. Following this assignment, Smith assumed a number of increasingly responsible positions on the Atlas program including propulsion and fluid systems lead for Atlas I and II development, recurring programs chief engineer, chief engineer for Atlas IIAS launch pad development at Vandenberg Air Force Base, Calif., and chief engineer for Atlas V/EELV. Smith received his bachelor of science degree in applied mechanics and engineering science from the University of California San Diego. Matthew is a member of Governor Ritter's Systems Transformation Sub-Committee for the P-20 Education Counsel.

**Candis Voien**

Candis Voien recently moved from California to Colorado due to the relocation of her husband’s job with United Launch Alliance. She holds a degree in Biological Sciences from the University of California Davis and is currently working towards her MBA at CCU. She worked for eleven years in the development of hands-on science programs for teens and children.

**Mike Woodley**

Michael Woodley is the Owner and Founder of Woodley Architectural Group, Inc., an award-winning architectural and planning firm. Their work is represented coast to coast throughout the continental United States, as well as Hawaii, China, Egypt, Dubai, Mexico, and France. Michael Woodley's creative and functional solutions have resulted in widespread industry recognition and countless awards.

**DuWayne Worthington**

DuWayne Worthington was born in Idaho and attended Albertson’s College of Idaho, where he graduated summa cum laude with a Bachelor’s degree in Biology and a minor in Chemistry. He then moved to Hawaii to obtain a Masters degree in Zoology, with an emphasis in Marine Biology. DuWayne has taught a variety of science courses over the past 21 years, including Biology and Honors Biology (21 years), AP Biology (13 years), Chemistry and Honors Chemistry (1 year), Marine Science (6 years), and Astronomy (6 years). He has done scientific research in Australia, The Marshall Islands, Fiji, Tahiti, Alaska, and several of the Hawaiian Islands. One of his favorite memories was swimming with wild dolphins and manta rays, and scuba diving on the Great Barrier Reef for 6 weeks. DuWayne is married with 2 children, ages 10 and 14. He loves many sports, including golf, scuba diving, skiing, basketball, and bowling. DuWayne is currently employed at Valor High School where he is the chair of the science department. He wrote the science curriculum and designed the labs at VHS.

**Dr. Darlene Yanez**

Dr. Yanez has Ph.D., in Education Administration with a specialization in Program Evaluation, Education Reform/Systematic Reform and Curriculum and Instruction in Math and Science from the University of Texas at Austin. Dr. Yanez is the Project Director at the Texas Center for Science, Technology, Engineering, Mathematics Education from 2006 to the present. She works at The University of Texas at Austin, where she provides project management duties with a
cross-functional team at the Charles A. Dana Center. The duties include strategic planning, budgetary management, and coordination with external entities including the Texas Education Agency, seven T-STEM Centers, thirty-eight T-STEM Academies and their community college partners, other university partners, community and stakeholder groups. Primary objectives include supporting the Texas High School Project’s T-STEM initiative, populating the T-STEM portal with current research on successful high performing STEM-focused campuses, conducting research and disseminating findings of the research throughout the state and nation. (Appendix O).

**Educators on the Development Team / Design Team**

Two DCSD math instructors, including one high school and one middle school teacher, contributed to writing the STEM High and Middle School Charter proposal, together with a Jefferson County middle school math instructor. These DCSD employees did not want their names published in this document.

**Committees**

Standing committees will be created by the Board and will be charged with gathering information and exploring alternatives. Recommendations will be brought to the Board of Directors by the Committees. Committee members will be appointed by the Board and will include faculty, students, parents, outside professionals and school volunteers. Standing committees may include, but will not be limited to:

- Budget Committee – responsible for developing and submitting an annual balanced budget to the Board and, after Board approval, making the budget available to the public. The Budget Committee will also prepare the annual report, including audited financial statements, and make it available to the public.
- Curriculum Committee
- Discipline Committee
- Transportation Committee
- Volunteer Coordination
- The Board may, at its discretion, create and appoint other committees including, but not limited to: Facilities, Policy, Outreach, Fundraising, Communications, Enrollment, and Technology
- School Advisory Council (SAC).

**School Advisory Council**

STEM High and Middle School shall have a School Advisory Council (SAC). As a standing committee, in accordance with Colorado Law, CRS 22-7-106 and CRS 22-7-107. The SAC shall:

- Discuss the means for determining whether decisions affecting the educational process are advancing or impeding student achievement;
- Report on the educational performance of the school, as required;
- Make recommendations on the expenditure of school monies, including grants;
- Discuss safety issues related to the school environment;
STEM High / Middle School

- Support the activities of the Chief Administrative Officer and the school administration in carrying out the policies of STEM High and Middle School, as established by the Board;
- Confirm that STEM High and Middle School, its Board, advisory boards, and committees, are operating in accordance with the by-laws, the charter contract between the Douglas County School District and STEM High and Middle School, and all other policies, rules and regulations applicable to STEM High and Middle School;
- Participate in the DCSD accountability process in accordance with the policies of the DCSD Board of Education;

Prepare an annual improvement plan which will address the following:
- Progress made toward the school goals set forth in the charter;
- Plan for further progress;
- Development of additional goals as appropriate to address areas of concern;
- Plans to resolve areas of concern reflected in the annual survey;
- Perform such other responsibilities as directed by the Board;
- The SAC will function as a committee of the Governing Board.

Parent Volunteer Participation

Parents will be encouraged to participate in their child’s education. Children whose parents have high expectations of them and who support them in their academic pursuits have a greater chance of success than students whose parents are not involved. To that end, we will endeavor to create convenient opportunities for meaningful parent involvement in the school. Because parent involvement is integral to the success of this school, STEM High and Middle School expects that each family serve 20 volunteer hours each academic year. Volunteer hours will be recorded in the school office or online at the school web site. It is important the school keep a cumulative record of volunteer hours served since that information is requested by the DCSD as well as various grants for which we apply. STEM High and Middle School will track these hours and coordinate volunteer efforts. While parents are expected to contribute volunteer hours, there will be no penalty for failure to do so.

Student Senate

There will be some form of student government at STEM High and Middle School, but we believe that the structure of this group should be determined with students rather than imposed on them. Regardless of the final form the student council takes, the responsibilities of the group will include:
- Selecting a representative to attend all meetings of the Board of Directors;
- Providing input to the board on policies that impact students;
- Surveying students about their satisfaction with the school at least one time per year and reporting the results of the survey to the Board of Directors;
- Creating and implementing social events at the school which help to foster a shared sense of community. Members of the Student Council may also be asked by the Board of Directors to serve on any of the Board’s standing committees.
STEM High and Middle School will provide an annual report to DCSD and the school community. The school will also provide a report on October 1, specifying enrollment as required to obtain Per Pupil Operating Revenue (PPOR).

EMPLOYMENT PLAN AND PRACTICES

11. AN EXPLANATION OF THE RELATIONSHIP THAT WILL EXIST BETWEEN THE PROPOSED DISTRICT CHARTER SCHOOL AND ITS EMPLOYEES, INCLUDING EVIDENCE THAT THE TERMS AND CONDITIONS OF EMPLOYMENT HAVE BEEN ADDRESSED WITH AFFECTED EMPLOYEES AND THEIR RECOGNIZED REPRESENTATIVE, IF ANY - This must include the employment policies and practices of the proposed school including a description of the qualifications for the teachers and classified employees, the employee compensation schedule, recruitment procedures, and a plan for resolving employment-related problems. If teachers will be licensed, please list licenses.

STEM High and Middle School is committed to maintaining a low student/teacher ratio. While most public schools rely on a lean staff to support a large student body, our vision is to have a larger staff to support a smaller student body.

Administration and Key Personnel

The Principal will be charged with implementing the educational mission of the school and with the day-to-day administration of the organization. He will have the power to hire and fire the faculty of the school, subject to the personnel policies established by the Board. The Principal will also be responsible for student discipline, again subject to Board-established policies. In the first year, the Principal will be the only onsite manager. He may, at his discretion, delegate certain administrative responsibilities to other faculty members. Once the school reaches a student body of 300, it is envisioned that a Dean of Students will be hired to assist the Principal with day-to-day administration. The Principal will report regularly to the School Board and keep them apprised of all administrative issues.

The role of the faculty at STEM High and Middle School will be far greater than simply teaching classes in a specific subject area. Every teacher and administrator will serve as an advisor to a group of 15-20 students. They will be responsible for monitoring the academic performance of their advisees, working with struggling students to develop improvement plans, counseling students on academic matters, and maintaining frequent contact with the parents of their advisees. The advisor will serve as a mentor, advocate and coach for the advisee. We believe that this role is every bit as important as the instructional role that teachers and administrators will play.
Staffing Plan

- Principal
- Curriculum Development - Student Dean
- Counselors
- Business Manager – Financial
- Attendance Secretary
- Teachers
- Director of Technology
- Custodian
- Office Manager and secretaries
- Student Services Department Representative

The Principal will be charged with recruiting the teaching and support staff. We anticipate hiring the Principal 6-9 months before the school opens, which should provide ample time for hiring the teachers needed for the first year of instruction.

We will be seeking teachers with three different types of backgrounds:

- Veteran teachers who have significant experience in both direct teaching methods and APPB teaching
- Experienced professionals with corporate or scientific backgrounds who bring deep knowledge of the kinds of skills students will be expected to have once they leave school and who can make education relevant
- New teachers who have recently completed their teacher training and are open to new kinds of teaching methods

The exact mix of teachers will be determined based on the available pool of candidates. We anticipate having at least half of the initial group coming from education backgrounds.

STEM High and Middle School also anticipates using a variety of volunteers to assist with student instruction. We are currently exploring potential partnerships with teacher training programs around the city to create student teaching opportunities. Parents and community volunteers will also be called on to serve as tutors and mentors for students. STEM High and Middle School has developed a policy plan for volunteers who include background checks and fingerprinting with local law enforcement agencies.

To locate potential teachers, the Principal will attend recruitment fairs, will publish job descriptions on the school’s website and other websites, will place announcement in local newspapers and national trade magazine, and will call on his own network of educators.

Before being offered positions, all teachers will be interviewed at least once by an interview team and the second interview is a tape of the candidate teaching. Because the selection of the first group of teachers is so critical to STEM High and Middle School’s success, we also anticipate forming a committee of board members and subscribers who will conduct additional
interviews and make recommendations to the Principal. The Principal will have the final decision regarding hires.

**Employment Policies**

Attracting and retaining faculty members who strongly support the mission of the school is critical to STEM High and Middle School’s long-term success. We will hire individuals who are skilled in their subjects and have a demonstrated commitment to education and to children. We plan to hire a mix of veteran educators and individuals who are new to the profession. All staff will be hired under “at-will” employment terms. The first interview will be by a team which the principal appoints and the second interview will be a tape of them teaching. All employment terms will be fully disclosed to candidates at the time of their application for employment.

The Principal will, within guidelines set by the Board, determine initial salary and benefits on an individual basis. Teachers who are offered contract renewals will conduct salary and benefit negotiations with the Principal at the time of renewal.

STEM High and Middle School will be an equal opportunity employer, and will not discriminate on the basis of race, religion, color, creed, national origin, gender or age.

In accordance with the Colorado Charter Schools Act, STEM High and Middle School employees will participate in the (PERA.). Employees will also receive health insurance benefits. The Principal will determine the details of the benefit package prior to initiating the teacher recruitment program.

**Performance-Based Compensation**

In addition to standard salary and benefit packages, STEM High and Middle School intends to offer performance-based compensation to teachers whose instruction and dedication to students meets or exceeds Board expectations. The Board will determine the structure and amount of such compensation, using input from administrators, students, and the assessment tools described in this plan. At this point the performance-based compensation will take the form of salary increases for subsequent years of employment. (Appendix J)

**Qualifications**

STEM High and Middle School teachers will have four essential qualifications: 1. They will be highly skilled in their subject areas, they will have a demonstrated commitment to education, and they will have a genuine interest in children. 2. We will seek both experienced teachers and people who do not have formal teaching experience with children in some significant capacity in their specific fields of expertise. 3. It is our hope that by providing an environment where teachers are encouraged to be creative and independent we can attract and retain certified and highly qualified teachers who are bright and energetic instructors. 4. Because of the unique focus of this school with STEM, we are looking for teachers who have had work and career experience in the business community, so that they bring relevancy into the classroom.
STEM High and Middle School will have or are planning to build in a high degree of flexibility in attracting quality teachers. For professionals who are new to the field, the school will provide onsite training and will also seek out supplemental developmental programs to ensure that all teachers are prepared to lead a class effectively.

**Background Checks**

All staff members will comply with the background checks provision of the Colorado State law.

**Guest Instructors from Business and Industry**

STEM High and Middle School will recruit and partner from some of our areas larger corporations including Lockheed Martin and United Launch Alliance, to bring in guest instructors who meet the Highly Qualified requirement. They will work with a classroom teacher to bring a fresh new relevance to traditional education and eliminate the “boring” factor which often hinders student achievement. These guest instructors will be properly trained and serve under the guidance of a certified teacher.

**Leaves of Absence**

In accordance with Douglas County School District policy, employees of STEM High and Middle School who transfer to the school from the District will be granted a one-year leave absence. The employee may request that the leave be extended to two years if the request is made prior to April 1 of the first year of service. If an employee who is on leaves wishes to return to the District, he or she will be provided an appropriate position.

**Evaluations**

All teachers should be held accountable for the performance of the students they instruct. We feel that excellent teaching is a critical element in the continued success of the school. Similar to the combination of formal and informal assessment tools that will be used to evaluate students, we will use a range of instruments to measure teacher performance. A teacher’s assessment will include a review of student test scores and other performance measures, surveys of student and parent satisfaction, and informal observations by the Principal and other teachers.

All teachers will undergo a formal or informal written evaluation at least once per academic year. Teachers will also receive regular informal feedback from the Principal and from their peers. New teachers and teachers who have had poor performance reviews may receive formal evaluations more frequently. Teachers whose performance is deemed to be below the expected level will be placed on a Level Two and an improvement plan will be implemented.

The Principal will also undergo an annual review process. The Board of Directors will determine the measures of evaluation and the form of feedback for the Principal.

STEM High and Middle School will have a salary agreement with each staff member. Compensation will be based on education, experience, and performance of the individual employee. The Executive Board will consider extra performance pay and all annual salary
increases. Salary increases shall be based on the performance of the individual employee in the following areas: embracing and implementing the school’s philosophy, teamwork as a member of the staff, and continued professional development.

**Benefits**

Employees shall be entitled to receive the benefits described in the budget. Unless otherwise agreed in writing, all benefit programs will be handled and administered by STEM High and Middle School.

**Staff Leave Days or Sick Days**

All full-time employees will be given 10 paid staff leave days. These days may be used for a variety of purposes. Staff leave may be used for illness, family illness, bereavement, or observance of religious holidays. Whenever possible, staff is expected to notify administration in advance when using staff leave days. Staff leave days may be accrued for all salaried employees after two years with STEM High and Middle School up to 60 days.

**Paid Personal Days**

Each full-time salaried employee shall receive two paid personal days off per school year. Since these are personal, no reason need be given, but appropriate notification is expected when the employee knows of the absence in advance. Personal days may be accrued up to 10 days for all salaried employees after two years with STEM High and Middle School.

**Health Insurance**

STEM High and Middle School shall provide health insurance for all full-time employees. STEM High and Middle School may contract with the District for participation in its group plan.

**PERA Membership**

All STEM High and Middle School employees shall be members of the Public Employees’ Retirement Association and subject to its requirements. STEM High and Middle School shall be responsible for the cost of the employer’s respective share of any required contributions.

**Working Conditions and Employee Conduct**

The Executive Board with the Principal shall set the schedules of employees after receiving recommendation from the Principal.

**Employee Welfare and Safety**

STEM High and Middle School will comply with all applicable Federal and State laws, concerning employee welfare, safety and health issues, including, without limitation, the requirement of Federal law for a drug-free workplace.
Conflict of Interest

All employees of STEM High and Middle School shall comply with the Governing Board’s policies and procedures as set forth by its by-laws or otherwise. Employees will also comply with applicable State law concerning conflict of interest.

Political Activity

No employee of STEM High and Middle School shall attempt to direct or coerce any other employee of STEM High and Middle School to contribute to or participate in any political campaign, activity or cause at any school location or during the performance of any job related duties.

Adverse Actions

Any employee of STEM High and Middle School may be subjected to adverse actions for below average performance or violation of any school policy or State or Federal law or regulation. The nature and severity of adverse actions shall be based on the seriousness of the conduct, past record of conduct, and any previous adverse actions taken with the employee.

Adverse actions may include a written reprimand, disciplinary probation, and suspension with or without pay or dismissal. The Principal shall make a recommendation to the Executive Board for final action on dismissal.

Employee Records

STEM High and Middle School shall comply with all applicable Federal and State laws concerning the maintenance and disclosure of employee records, including, without limitation, the requirements of the Colorado Open Records Law, C.R.S. Sec. 24-72-204 et seq.

Job Descriptions for High School and Middle School Principal

The Principal shall be responsible for the operation of STEM High and Middle School in all areas. The Principal shall report directly to the Board. The Principal shall be appointed by the governing board, and may be removed by the same authority, with or without cause. The Principal’s duties shall include but not necessarily be limited to:

Qualifications:

- An advanced degree in educational and/or business administration.
- Ideally minimum three years successful administrative experience.
- Ideally minimum five years successful teaching experience.
- Ideally minimum five years successful high tech business experience.

Leadership duties:

- Demonstrates commitment to STEM High and Middle School’s vision and mission and communicates that vision and mission to school personnel, the students and families and the community.
Models school values for students, parents and the Charter High School Board of Directors.
Is a visible leader maintaining frequent contact with students and staff.
Exercises a participatory management style with staff when at all possible.
Communicates effectively by written and oral methods.
Fosters a climate of innovation.
Facilitates activities for families and staff to encourage community and shared purpose.

Educational leadership duties:

- Hires and evaluates staff.
- Oversees planning and evaluation of programs and priorities.
- Coordinates design of curriculum with staff.
- Administers all school-based programs.
- Administers services of resource personnel.
- Assists staff in evaluating their methods and instructional materials.
- Designs schedules.
- Develops cooperation and teamwork within staff.
- Assists staff in accommodating individual student needs and abilities.
- Monitors student progress, discipline, health and safety.
- Provides perspective on educational issues with the STEM High and Middle School board on a regular basis.
- Establishes a plan for improvement of instruction, school philosophy and school policies.
- Assists board in evaluating the school’s progress on established priorities.

Community relations duties:

- Promotes and develops a professional relationship with the STEM High and Middle School board and staff.
- Seeks and considers opinions of others in a timely fashion.
- Provides information to community, media and interested parties about the school, its’ programs and progress towards goals.
- Develops all printed materials needed for the operation of the school.
- Serves in a liaison capacity with the school District on any administrative and/or educational matters.
- Assists with the recruiting, scheduling and training of volunteers within the school.

Managerial duties:

- Approves and authorizes:
  - Budget items
  - Permanent record maintenance
  - All school based activities and schedules
- Approves and authorizes:
  - Purchase and utilization of material resources
Equipment
Textbook and supplies
- Establishes organization pattern for the school.
- Plans and implements the staff development program.
- Delineates all responsibilities and authority, establishing lines of communication and supervision.
- Develops enthusiasm and promotes positive morale among staff and parents.
  - Prepares master budget.
  - Assumes all additional responsibilities as directed by the Board of Directors.
  - Develops a program with colleges and Universities that will provide for a strong working relationship between STEM High and Middle School and post-secondary educational institutions.

Teachers

Teachers for all grades will be responsible for implementing the curriculum, maintaining current student performance level information, assigning appropriate additional or alternative studies to students either not meeting or exceeding attainment, keeping accurate and concise records, maintaining work portfolios, establishing classroom procedures, coordinating with interns and volunteers in the classroom, and reporting all education related activities.

All teachers will be required to work 40 hours per week within the school timetable, including lunch duties, and planning days. The Principal may occasionally request after hours work. Teachers will also be required to assist with extra-curricular programs on a rotating basis.

All teachers must have a minimum of a B.A./B.S. in their respective specialty and a strong desire to work in a parent participation school with a high tech, project based, educational program. They must possess the ability to work well with others. Teachers are expected to bring in additional expertise to supplement their instructional areas.

STEM High and Middle School is specifically seeking teachers who have high tech work related experience.

Special Education Teacher(s)

The Special Education teacher or teachers will work with children one-on-one, in small groups, or supporting the regular teacher, for all grade levels. The special education teachers will be hired by STEM High and Middle School in coordination with the District. STEM High and Middle School will cooperate with the District in staffing the special education program to meet the needs of each special education student and meet or exceed District policy.

If the special education teacher is employed full time at STEM High and Middle School, he or she will be required to work a 40-hour workweek. Occasionally, after hour’s work may be required, the special education coordinator will be trained and certified in administering test and evaluations to determine special needs and educational processes.
STEM High and Middle School realizes the importance of Special Education services in the educational system and intends to increase the number of Special Education Coordinators as student enrollment rises. The Coordinators will provide day-to-day oversight of the Special Education program at STEM High and Middle School and will coordinate the use of psychologists, social workers, and therapists to evaluate and implement designed IEP programs for students.

**Technology Coordinator**

The Director of Technology will need to have a BA in Information Technology or 3 years of verifiable work experience. He or she will also hold a MCSE certification. Responsibilities include:

- Setup and maintain server.
- Maintain Single Domain model for 100+ computers and manage user accounts, groups, and dial in privileges.
- Configure and set up all new computers for faculty and students.
- Install and manage the entire suite of software products.
- Order new systems when needed.
- Setup and configure network hubs/switches/routers.
- Work with facilities on network wiring and communicate to the Board additional items needed for network hardware/software, etc.
- Serve as a member of the technology committee and assist the Dean of Academics in the hiring of all technology teachers

**Custodian(s)**

STEM High and Middle School will employ one or more custodians who will be responsible for facility maintenance and repair. The work of the custodian may be contracted out at the discretion of the Dean of STEM High and Middle School if that provides for better utilization of resources.

**Student Services Department Representative**

STEM High will engage the STEM High Student Services Department (SHSSD) Representative to meet the needs of each student by identifying a variety of challenging and dynamic opportunities. The SHSSD Representative will work:

- to evaluate internship opportunities
- to create a strong link between the school and the internship
- to train mentors at internship sites, and
- to assist students in the application and interview process.
- to place students at an off campus real-world work site or,
- to place students at a STEM Academy Research Laboratory
- to coordinate activities between STEM High and STEM Academy

During the internship experience, each student will be assigned a teacher to support the work of the student at the school. Students must have a content teacher that is familiar with the problem
being addressed at their internship site. The SHSSD Representative will help assign students to mentor teachers based on students’ request as well as teachers’ area of expertise in the field the student is conducting his/her research.

STEM High believes the internship placement process should reflect the real world. Students will be required to interview and compete for internship opportunities.

**Definitions**

- Full-time employee – employee working 35 hours or more per week on a permanent basis.
- Full-time status – Achieved when an employee has worked 35 hours or more per week for 30 calendar days in any position(s).
- Hourly employee – Any employee whose pay rate is based on an hourly rate.
- Salaried employee – Any employee whose pay rate is based on the school year.

**Establishment of Policies**

The Governing Board of STEM High and Middle School will adopt written policies in compliance with Federal and State law concerning the recruitment, promotion, discipline and termination of personnel; methods for evaluating performance; and a plan for resolving employee related problems, including complaint and grievance procedures. STEM High and Middle School shall not have authority, by virtue of such policies or procedures or other action of the Governing Board, to change the “at will” nature of the employment relationship.

**Performance Bonus**

It is the intent of STEM High and Middle School Board to develop and implement a performance based bonus system that will motivate employees and compensate them for their achievements and contributions to STEM High and Middle School. The Teacher Review Committee and Principal will annually recommend performance-based bonuses. All such increases will be subject to Board Approval. (Appendix J)

**Professional Development**

The Board of Directors understands the commitment and skills necessary to implement this rigorous and relevant curriculum, one in which technology standards and skill development are embedded. Investments in professional development designed to meet teachers’ needs will increase student achievement while supporting the mission of the school.

Initial needs assessments will be completed by the Principal upon his/her hiring. Ongoing needs assessments and evaluations will be conducted on a regular basis to ensure that all members of the STEM High and Middle School staff have adequate training and education to support the school’s rigorous curriculum. The focus of the needs assessments will be continual instructional improvement that will lead to improved student performance and create and support master educators.
Teachers are integral to the effectiveness the school. The high value placed upon the teachers and the culture of excellence developed in this small school environment appeals to experienced and qualified teachers. Many local educators have expressed enthusiasm for the model. STEM High and Middle School will hire individuals with a natural affinity for the school model and will supplement this with regular and focused professional development as detailed below.

Professional Development will be required to train all educators and staff about the APPB educational model. Denver School of Science and Technology’s Board President, Norwood Robb will be helpful in guiding our school to the proper support team. Peak to Peak’s Principal, Tony Fontana has also volunteered to mentor us through this process. (Appendix B)

**Principal**

The STEM High and Middle School Board will support the professional development of the Principal by conducting yearly needs assessments. The Board will use such tools as performance evaluations, teacher feedback, and introspective evaluation to provide guidance to the Principal. Annually, the he/she will submit professional goals to the Board and follow-up on the progress of these goals throughout the year.

**Faculty**

The STEM High and Middle School Board of Directors and administration will support the professional development of its teachers by encouraging collegial coaching and the suggestions and observations of master educators. Each teacher will come to STEM High and Middle School with unique strengths and challenges. Therefore, each individual teacher’s training needs will vary. With teachers in core subject areas having fulfilled the “Highly Qualified” criteria, initial subject mastery will be addressed. In order to integrate specific subject content within the STEM High and Middle School philosophy, on-going evaluations, observations, and collegial coaching will address individual needs, and teachers will include content area mastery as part of their annual professional development plans.

The needs of teachers will be determined on an individual basis as supported by administrator evaluations, classroom observations, teacher requests and input, student performance data, and professional goals. Teachers will submit individual professional goals to the Principal at the beginning of each school year and both the Principal and individual teachers will follow up on the progress of these goals throughout the year. Evaluations will be conducted both formally on a biannual basis for new or improving teachers, and annually for master teachers; and informally throughout the year for all teachers. At year end, teachers and the Principal will collaboratively assess the progress and challenges for the year, and draft each teacher’s individual professional development plan for the following year.

**School-Wide Professional Development**

School-wide professional development will be conducted twice annually, or more frequently as needed. The faculty will be surveyed, professional evaluations will be reviewed by the Principal for areas of need, student assessment data will be disaggregated and evaluated, and from this
information, group training needs will be determined by topic. In some cases, the school faculty may be divided into smaller groups to differentiate the training more appropriately.

**Professional Learning Communities**

STEM High and Middle School’s commitment to professional development extends to the structure of the daily schedule. Thursday mornings will be reserved for PLC meeting for:

- Grade-level team meetings to examine student work and select student exemplars
- Conduct lesson study and other methods to improve instructional strategies and curriculum
- Discipline-specific meetings to address issues related to instruction and vertical articulation of curriculum
- School-wide examination of student work
- Identify and recognize teacher’s exemplary classroom practices and projects
- Discussion of articles and other professional readings
- School-wide staff meeting with a focus on instruction and school goals
- Integrated planning meetings

On-going faculty participation in daily professional learning communities serves to develop collegial trust and support. By building collegial relationships, teachers can share ideas about their successes and challenges in the classroom and collaboratively improve the educational practices at the school, which in turn, will improve student outcomes. Individuals new to the profession will receive instructional feedback, learning strategies and techniques from master teachers. Team-teaching and the observations that peers glean from the practice can aid in developing competencies. Moreover, within this small cohort, teachers become accountable not only to their students, but also to one another. The collegiality and accountability that develops from this structure, its impact on teacher satisfaction, the school environment, and teaching practices, ultimately enhance student achievement.

**Advisory Groups Training**

Another anticipated area of professional development is training teacher-advisors to work with their advisory groups. To be effective, advisors need to be confident in their ability to conduct rewarding community service projects, and understand the social/emotional learning needs of students. Bringing in local experts to address these topics as on-going continuing education for teacher-advisors can provide both needed training and local resources.

**Advisory Program Overview**

Advisory program is an essential component to creating a powerful learning community centered on our core values and fulfilling our principle of personalization. Each student will be known through the advisory program, both cared for and held accountable for his/her community participation, academic effort and achievement. The advisory program will serve as the primary locus for the parent-school relationship. Advisors will help provide the social emotional academic learning program. All students will apply to at least three colleges, one of them being a “stretch” for them.
Essential Design Elements

*Less is more first year - primary goals:*

- Connect/support students
- Web-folio
- Small “community” groups: 1:15 Ratio or smaller
- Multi-age groups (as we build by grade)
- Program features: 1) one-one conferencing time 2) community reading circles/discussion groups 4) web-folio (student research portfolio)
- Regular time to be a “community”
- Home visits by community advisors
- Trimester conferences with parents and students
- Community competitions between communities - intramurals etc…
- Schedule as many weekly and daily community “touches” as possible
- Possible Four Year Plan/Focus (for a non-multi-age system)

Ninth

- Who am I?
- Web-folio: bio, resume, individual goals

Tenth

- How do I fit into my community?
- College campus visits, community service, leadership

Eleventh

- How do I apply my learning?
- College plan internship program

Twelfth

- What has my experience meant to me?
- Senior project
- School leadership
- College applications

College Placement

We believe that the STEM High and Middle School students who choose to enroll in post-secondary education programs should be prepared for and have the opportunity to attend a competitive four-year institution. The school will provide a turnkey college-planning program for all students. STEM High and Middle School will hire a full-time faculty member whose primary responsibility will be coordinating communication between students and their perspective post-secondary institutions. The College Coordinator will meet with each student and family at the time of admission to STEM High and Middle School to devise a post-secondary education and scholarship plan.
In addition, the ongoing relationship between student and advisor will focus on making sure that the student is meeting the milestones needed in order to achieve the agreed upon academic and career goals.

NSDC will also support the ongoing collaboration between CU Boulder and post-secondary institutions to seek approval of STEM High and Middle School course offerings.

### ACADEMIC ACCOUNTABILITY

12. A DESCRIPTION DETAILING THE PLAN OF THE PROPOSED DISTRICT CHARTER SCHOOL FOR ACADEMIC AND FISCAL ACCOUNTABILITY - Specifics will include provisions to be made for a representative school accountability committee, representation on the District Accountability Committee ("DAC"), development of a School Improvement Plan which includes measurable school improvement goals based upon complete school profile information and action plans to accomplish those goals, and accountability reporting procedures to the District and the school community. Fiscal accountability shall include plans for a regular fiscal report to the District and the Board of Education.

#### Accountability for Continuous Improvement

Charter schools have five points of accountability for accreditation and adequate yearly progress (AYP). The five areas include; achievement growth and status, achievement gaps, post secondary readiness, compliance with assurances (including safety and finance) and a quality of education improvement plan. To ensure continuous improvement, the school will implement assessment tools as recommended by the Colorado League of Charter Schools to create a data-driven culture within the school. Data-driven decision-making is facilitated by the use of performance management strategies and technologies that gather, organize, analyze, report and share information about student and school performance. STEM High and Middle School proposes to implement the use of the district authorized student information system, formative assessments and data management to increase student achievement and set goals using student-level data from the Colorado Growth Model.

### FINANCIAL ACCOUNTABILITY

STEM High and Middle will operate with acute fiscal responsibility. A balanced budget will be presented annually and compared for variances to previous years. A certified public accounting firm will be hired annually to prepare an assurance report of STEM’s financial position and continuing operations. Asset acquisition and purchasing that supports general operations will only be made following appropriate purchasing and requisition procedures.
Financial Accountability will be achieved through

- Maintaining the school’s financial records according to generally accepted accounting principles (GQAAP) for governmental entities.
- Maintaining the school’s financial records in accordance with all applicable federal, state and local laws, rules and regulations and will make such records available to the District and the public as allowable, upon request.
- Regular fiscal reporting to the STEM High and Middle School Executive Board, the District and its Board of Education.
- STEM High and Middle School will maintain a comparison of actual revenues and expenditures to budgeted revenues and expenditures.
- The school will establish an in-house computerized accounting program and will reconcile its books with the District’s records of income and expenses on a quarterly basis.
- A record of assets with a fair market value of over $500 will be kept.
- Donations or grants in excess of $500 will be reported to the School District on a quarterly basis. The charter school will maintain a record of all donations and grants in excess of $50, available upon request.

Revenue

During the first year of the charter, the District shall provide funding to STEM High and Middle School in the amount set forth in the attached budget. That amount will be 100% of the Per Pupil Revenue less Central Administrative Costs as defined in C.R.S. 22-30.5-112(2)(a.5)(f). Funding will be based on the projected student count until after the October 1 count has been completed and then adjusted accordingly.

Capital Reserves

STEM High and Middle School shall annually allocate the minimum per pupil dollar amount specified in C.R.S. 22-54-105(2)(b), multiplied by the number of students enrolled in STEM High and Middle School to a fund created for Capital Reserve purposes, solely for the management of risk-related activities as identified in C.R.S. 24-10-115, and article 13 of title 29, C.R.S., or among such allowable funds.

Entitlements

Pursuant to the federal Charter Schools Expansion Act of 1998 and No Child Left Behind, Title V, STEM High and Middle School shall receive from the District the commensurate share of funds for programs under which the Secretary of Education allocates funds to states on a formula basis in the first year of operation and in succeeding years. Such funds will be received within five months of the date STEM High and Middle School opens.

Annual Audit

STEM High and Middle School agrees to maintain appropriate financial records in accordance with all applicable federal, state and local laws, rules and regulations, and make such records
available to the District as may be requested from time to time. STEM High and Middle School agrees to engage and participate in an independent, outside audit of its financial and administrative operations annually. Such audit will be conducted by a certified public accountant. The letter of engagement shall be signed by the STEM High and Middle School board president and treasurer. STEM High and Middle School shall choose its own auditor.

**Annual Budget**

On or before April 1 of each year of the charter, STEM High and Middle School and the District will negotiate in good faith per pupil costs to STEM High and Middle School for purchased services in order that the amounts may be determined in conjunction with the District’s and STEM High and Middle School’s budget development and adoption process.

**Balanced Budget**

The steering committee of STEM High and Middle School acknowledges that STEM High and Middle School must have a balanced budget. It is the intent of the school to create a contingency reserve fund as a percentage of the annual budget.

**Endowments**

All private endowments, gifts, donations, etc. to the District will be shared with STEM High and Middle School if the endowments are district-wide. The amount transferred to STEM High and Middle School shall be based on the ratio of the number of students enrollment in STEM High and Middle School compared to the District’s total student population. If another basis is used for distribution, STEM High and Middle School will receive the applicable pro-rated amount based on the applicable method of distribution. Endowments specifically earmarked for a project or a single school may be exempted. All private endowments made directly to STEM High and Middle School will be the sole possession of STEM High and Middle School.

**Line of Credit and Grant**

Upon approval of the charter contract, the DCSD will extend a line of credit to STEM High and Middle School in the amount of $100,000 over a three year period should STEM High and Middle School need additional, start-up funds. At the completion of the three years, STEM High and Middle School agrees to have paid the District back in full, without any additional interest or fees accumulated.

**Payroll**

STEM High and Middle School will provide its own payroll services.

**Strategic Plan**

As an additional method of accountability and planning the Board will develop a strategic plan to assist the process of the charter application; beginning with the application submission phase through the contract portion finishing with the opening of school in Fall 2010. Additionally short
and long-term goals to aid in the procurement of facilities and educational materials and allow for adequate staff growth to support the increased student load will be established.

**Purchased Services**

STEM High and Middle School plans to provide all instructional and administrative services directly. There may be some non-instructional services that can be provided more efficiently by the Douglas County School District system given their large-scale purchasing power. The only service that DCSD is certain it will purchase from the district is special education, as mandated by the district. As part of its annual budgeting process, STEM High and Middle School will evaluate the services available for purchase from the district, weigh the cost of purchasing the services from the district against other options, and make a decision about the services to be purchased for that year. Services under consideration for purchase from the district include:

- Educational Resource Services
- Testing and Assessment
- Benefits administration
- Purchasing/Warehouse
- Insurance
- Special Ed

**Tabor Reserve Fund**

STEM High and Middle School will retain the required 3% of the annual increase in per public and state funding to the district, as required by law.

**Displacement Plan**

**Plan for Displaced Students, Teachers and District Employees**

STEM High and Middle School does not anticipate displacing any students, teachers or other district employees. The school will not replace any existing school nor will it use any facilities currently used by public school students, teachers or employees. As a school of choice, STEM High and Middle School will help to relieve overcrowding in existing public schools rather than exacerbating this problem.

**FACILITIES**

13. A DESCRIPTION OF THE FACILITIES TO BE USED BY THE DISTRICT CHARTER SCHOOL AND THE WAY THEY WILL BE OBTAINED, FUNDED, AND MAINTAINED - Indicate if there is a proposed lease.
STEM High and Middle School is working with David Drahn, Commercial Real Estate Broker with Century 21 in order to secure a temporary location for STEM High and Middle School to open the school in the Fall of 2010 (Appendix E). Several possible options are currently being explored.

**Long Term**

STEM High and Middle School is in negotiations for 48 acres of land, south of the Lucent/Avaya building on Lucent and Plaza Drive. A Letter of Intent to Lease is in this charter, (Appendix F). Thirty-eight acres of the land are tied to McClellan Reservoir which is north of this property. This piece of ground is owned by a private foundation, with governing directors, who are all Englewood City employees, the Englewood McClellan Reservoir Foundation. A long-term lease for 80 years is being negotiated. The other ten acres are owned by Shea Homes and may be purchased. Shea Homes owns the 10 acres just adjacent to the south of this property and a purchase is being negotiated.

Reflecting the vision of the school, the building will serve as the intellectual hub of the school and provide a setting for a strong community feeling. The facility will offer the space and technology necessary for hands on learning and collaboration – for students, teachers, and the community alike. In addition to having a wireless laptop network and seminar rooms, the building will feature a commons room, a cafeteria/assembly hall and a physical education center, offering a wide variety of lifelong sports options for the students.

Michael Woodley, AIA, the Owner of Woodley Architectural Group is designing the plans for STEM High and Middle School and Academy. Woodley Architectural Group, Inc, is an award-winning architectural and planning firm with offices in Southern California and Denver, Colorado. The firm’s large range of projects include high-density multi-family and single family homes, luxury and custom homes, as well as public buildings. Their work is represented coast to coast throughout the continental United States, as well as Hawaii, China, Egypt, Dubai, Mexico, and France. Michael Woodley’s creative and functional solutions have resulted in widespread industry recognition and countless awards.

**Building Plan**

The current plans call for a STEM Campus for STEM High and Middle School and Academy. The building will be designed to be flexible enough to meet the changing needs of the school, but will include features that are critical to the unique educational approach of the school. For example, there will be large open spaces where students may work collaboratively. There will also be a heavy emphasis on integrating technology into the classroom.

STEM High and Middle School has embarked on a major fundraising and capital campaign to fund the development of this building and has applied for a major grant which would underwrite all of the building/land costs.
TRANSPORTATION

14. A DESCRIPTION OF HOW THE DISTRICT CHARTER SCHOOL PLANS TO MEET THE TRANSPORTATION NEEDS OF ITS PUPILS AND, IF THE DISTRICT CHARTER SCHOOL PLANS TO PROVIDE TRANSPORTATION FOR PUPILS, A PLAN FOR ADDRESSING THE TRANSPORTATION NEEDS OF LOW-INCOME AND ACADEMICALLY LOW-ACHIEVING PUPILS.

STEM High and Middle School is committed to making its program accessible to students throughout South Metro Denver and recognizes the need to assist students with transportation plans. A detailed list of transportation options will be provided to all students before classes begin. Highlands Ranch is served by RTD, and students will also be encouraged to carpool and use alternative forms of transportation.

RTD

STEM High and Middle School will publish the bus schedule on the school website and distribute it to all students at the start of the school year. Students who are eligible for the Federal free and reduced lunch program will also be issued monthly bus passes upon request.

Carpool

Carpools will be the responsibility of parents and/or a parent organization. Students and their parents are encouraged to carpool when the other transportation options do not fit their needs.

Student Driving

Driving to and from school will be permitted for students possessing a valid driver’s license. Parking permits will be issued and STEM High and Middle School reserves the right to revoke parking permits at any time due to careless or disruptive behavior.

Alternate Transportation

Students who live reasonably close to the campus will be encouraged to walk or bike to school.

FOOD SERVICE

The ability of STEM High and Middle School to provide food service is contingent on the facilities acquired for the school. STEM High and Middle School has chosen to waive the requirement of food service and reserve the right to add this service in the future. STEM High and Middle School may provide lunch service to students through a third party provider. The school will work with the District to ensure that procedures for competitive bids and services are compliant with fair bidding practices.
15. A DESCRIPTION OF THE DISTRICT CHARTER SCHOOL’S ENROLLMENT POLICY, INCLUDING NONDISCRIMINATORY CRITERIA FOR ENROLLMENT DECISIONS, THAT IS CONSISTENT WITH STATE AND FEDERAL LAW, INCLUDING THE ACT - This must include a description of the proposed school’s plan to include academically low-achieving and at-risk students, to promote diversity and plans for educational programs for exceptional students, including a detailed plan for how students with disabilities will receive special education and related services. A current list of enrolled students must be provided to the District no later than April 1 of the school year preceding the opening of the school. Additional information regarding projected enrollment numbers for each grade level and in total and whether such numbers are planned to increase over the term of the requested charter should be included.

This section of the application is intended to summarize the STEM High and Middle School Enrollment Policy. This policy supersedes this section of the charter application.

In order to enroll, parents must submit a Letter of Intent to Enroll form prior to or during the school’s open enrollment period. Students with disabilities, “at risk” students, girls or boys and gifted and talented students will be enrolled in the same manner as other students.

The overall priority for new enrollments will be as follows:

- Children of subscribers
- Siblings of current STEM High and Middle School students (these can be automatically enrolled)
- Children of STEM High and Middle School Teachers
- Children who reside within five miles of the school and within Douglas County School District boundaries
- Children who do not reside within five miles of the school but do reside within DCSD boundaries

If the number of Intent to Enroll forms received is greater than the number of student spaces available for any grade, the school will hold a lottery on the first school day of February to determine enrollment.

When a vacancy is created during the school year, the vacancy may or may not be filled at the Principal’s direction. If the school chooses to fill the vacancy, priority will be given as specified above. If there are more applicants in the enrollment pool than spaces available, the spaces will be filled by lottery amount those students currently in the enrollment pool.
Founding Family Policy

While STEM High and Middle School is spending Colorado Department of Education (CDE) charter school startup and implementation grant funds, the school will enroll no more than 20% of its students annually from either Founding Families or children of teachers.

The Board will establish detailed enrollment policies and procedures will be responsible for resolving any disputes. The policies will be made available on the schools website and will be included in informational packets distributed to prospective students. This policy has not been developed yet.

Target Neighborhoods

As noted above, students who currently reside near the school will be given priority in our admission process, and will therefore be the focus of our recruitment efforts. One of our primary goals is to attract and retain a diverse student body. We believe the best way to achieve this is to actively recruit students from a wide range of neighborhoods with different demographics. We plan to reach out to students in a number of neighborhoods, with special emphasis on the following:

Recruiting

Our long-term hope is to reach interested students early in their middle school careers and to foster a relationship with them during these preparatory years. Part of the job of the staff will be to monitor the academic progress of prospective students and to offer support, guidance and resources to potential students as they complete the application process.

Other options under consideration for the first class of students including creating a summer rep program for students who may have some educational deficits and offering distance learning for prospective students. We will evaluate these options once we have a better sense of the background of the students who will be applying to the school.

ADMISSIONS

16. A DESCRIPTION OF THE DISTRICT CHARTER SCHOOL’S ADMISSION PREFERENCES AND POLICIES - These policies must comply with law, including but not limited to state open enrollment requirements. Also, verification that tuition will not be charged should be provided.

STEM High and Middle School is strongly committed to providing an excellent education to a diverse group of students. The school will not discriminate on the basis of race, creed, color, ethnicity, national origin, or eligibility for services for exceptional children. There are no entrance exams and STEM High and Middle School will not have any specific entrance requirements.
Detailed application instructions and forms will be available on the school’s website at: www.stemhigh.com and will be distributed to various locations including middle schools in the metro area. STEM High and Middle School will also notify media outlets about the application procedure. Applications will only be accepted for students who are eligible for matriculation in the following school year. If the number of students applying for entrance exceeds the number of students whom can be accommodated by the school, STEM High and Middle School will conduct a lottery to determine the students who will be admitted. Applications completed on or before a specified closing date will be included in the lottery. Parents of students who are accepted for admission will be notified in writing. Students who are not selected in the lottery will be placed on a waiting list. The order of the waiting list will also be randomly determined. Parents will have 10 days from the date of the offer of admission to accept or decline.

School Openings

The Board will establish the number of openings available each year. It is anticipated that in the first year, the school will accept 200 students in 9th grade. STEM High and Middle School students are guaranteed enrollment for each succeeding year and will not be required to re-enter the lottery in following years. A small number of new students may be admitted in the 10th grade, on a space available basis. It is not likely that the school will accept new students in the 11th or 12th grade, but the Board may, at its discretion, choose to open a limited number of spaces in these upper grades. Spaces that are open for enrollment in the upper grades will be filled using the same admissions procedure as those for 9th grade.

Non-Discrimination

STEM High and Middle School, as a charter school, will follow all federal and state laws and constitutional provisions prohibiting discrimination on the basis of disability, race, creed, color, gender, national origin, religion, ancestry, or need for special education services. There is strength in diversity; therefore students, staff and parents will respect the unique attributes and qualities of every individual.

In accordance with C.R.S. 22-30.5-104(2), “a majority of the charter school’s pupils will reside in the chartering school district or in districts continuous thereto.” Enrollment will be open to any child who resides with the school district (C.R.S. 22-33-106 (3)(a)(b)(c)(e) or (f).

DISCIPLINE

17. AN OUTLINE OF ANTICIPATED STUDENT DISCIPLINE AND ATTENDANCE POLICIES, THAT MUST COMPLY WITH LAW.

Overview

To create a proactive, preventative discipline system that supports a powerful learning community centered on our core values. The system’s purpose is to define clear expectations for what it means to live our core values, build the skills and behaviors of students to meet these
expectations, and hold them accountable to doing so. The system’s aim is to have students take ownership of consistently living the core values in their daily life. The system is predicated on the belief that little things matter and when students understand this, larger issues/situations will be less frequent. We seek to understand the reason behind the behavior - not just punish the behavior.

**Essential Design Elements**

A student discipline code will be developed by the administrative staff with input from the community advisory board and students. A system of prevention and student hearings will be developed and published to each student and family.

- Clearly defined core values that are intricately woven into the school community (the fifteen character traits)
- Define expectations as to how students live the core values that are very explicit and the why is clear.
- Discipline consequences will include: 1) mandatory conference 2) community service 3) silent lunch 4) detention 5) in school suspension 6) out of school suspension 7) expulsion
- Advisor systems are first communication lines for students.
- A common set of classroom expectations shared by all teachers. These rules will be posted and reinforced with students weekly. Students will sign the Student Agreement for Respect.
- The classroom management and school management is shared with the students through leadership roles.
- An Honorand Dress Code - student/faculty designed to manage academic integrity.
- Whatever expectations and rules are created will be enforced. Don’t create rules that won’t be enforced and enforce all rules that are created.

Five standard questions when a student “makes a wrong choice”

- What was going on?
- What were you thinking and feeling when it was going on?
- What did you do in response?
- Why did you do it - or what were you seeking to accomplish?
- What was the result?

Restorative Justice will be included as part of the disciplinary system; students will be held accountable for their infractions and staff will be trained in holding RJ conferences where students will be allowed to make amends. Peace Circles will be implemented as preventative discipline so students will be allowed to surface issues and participate in creating positive, cooperative learning culture.

**Disciplinary Process**

Students who demonstrate frequent behavioral problems may be suspended or expelled. Every effort will be made to work with problem students to take corrective actions, and expulsion will be used only as a last resort.
The following is a tentative list of offenses that could lead to suspension or expulsion.

- Threatened, attempted or caused physical injury to another person.
- Possessed, sold or furnished a firearm, knife, explosive or other dangerous object.
- Possessed, used, sold, furnished or been under the influence of a controlled substance, or alcoholic beverage, or an intoxicant of any kind.
- Committed robbery or extortion.
- Caused or attempted to cause damage to school or private property.
- Committed an obscene act (including those motivated by bias or prejudice) or engaged in habitual profanity or vulgarity.
- Offered, furnished or sold any drug paraphernalia.
- Engaged in sexual harassment.
- Cheated on assigned school work
- Plagiarism

If a student is accused of committing an offense that is serious enough to merit consideration of suspension or expulsion, a written complaint will be made to the Principal. Any faculty member may submit the complaint. Within one week of receiving a complaint, the Discipline Committee will convene a meeting with the accused student and a faculty advisor of the student’s choice. The committee will work with the student and his advisor to develop a plan to correct the student’s behavior and, if necessary, make reparations for the offense. The committee may also choose to recommend suspension or expulsion.

Principal
The Principal may expel a student from STEM High upon the finding that the student committed one or more of the offenses and that (a) other means of correction are not feasible or have repeatedly failed to bring about proper conduct or (b) that due to the nature of the violation, the presence of the student causes a continuing danger to the physical safety of the student or other students and staff. In cases of expulsion, the student must not go on the school campus unless otherwise authorized by the school administration.

Attendance Policy
STEM High and Middle School have adopted a rigorous attendance policy. Tardiness will be rigorously enforced. School attendance is required by law for every child between the ages of seven and 16 years old and for any six-year-old child who has been enrolled in a public school in the first grade or in a higher grade level, unless the parent or guardian chooses to withdraw the child. Attendance in class is an integral part of the educational process and students are required to be in attendance every day school is in session each academic year. Parents, guardians, and legal custodians of students between the ages of seven and 16 years, or students ages six if in the first grade or higher grade level, are obligated by state law to ensure the child’s attendance. If student is absent too many days then he is given 1 yr. contract will not renewed and he will not be allowed to return to school.

Absences
An absence consists of failure to appear at the assigned school and remain there throughout the entire school day unless dismissed earlier by proper authority. Failure to appear and remain
throughout the entire tie of a scheduled class period shall also constitute an absence from that class used dismissed earlier by proper authority.

**Excused Absences**

Excused absences are those resulting from: Temporary or extended illness, injury, or physical, mental or emotional disability; family emergencies; absences excused by the principal though prior requests of parents or guardians; absences pursuant to school release permits under District policy JHD; absences which occur when a student is in custody of a court of law enforcement authority; and any other absence approved by the principal.

**Unexcused Absences**

Unexcused absences are those which or without prior knowledge and upon approval of the parents but for reasons not acceptable to the principal. Unexcused absences include those resulting from suspensions and expulsions.

**Tardiness**

Tardiness is a failure to appear on time and is considered a form of absence. Repeated tardiness shall be reported to the building attendance officer.

**Readmission**

Students will be readmitted to school after an absence. A written or telephone message should be received from a parent or guardian explaining the student’s absence at the time of readmission or as soon after that time as stipulated by the building principal. An absence not so clarified within the time limit will be treated as an unexcused absence. When a physician has been treating the student, the physician’s statement that the student is well enough to return to school should be presented.

**Notification of Absences**

Schools shall make a reasonable effort to notify parents, guardians, or legal custodians by telephone as soon as possible when students are absent from school or from assigned classes without acceptable excuse. If students stand to lose course credit because of absence, reasonable effort shall be made to notify the parents, guardian, or legal custodian in advance so that remedial action can be taken.

At the beginning of each school year, and upon the enrollment of a new student, a telephone number or other means for contacting each student’s parents, guardian, or legal custodian during the day shall be obtained by the school. Principals or their designees should contact parents to determine the reasons for excessive absences and shall attempt to work with parents to encourage good attendance.

**Academic Sanctions**

Credit for work missed during excused absences will be allowed with the required work has been satisfactorily completed within the time specified. When a student fails to complete course requirements, or when the principal considers a student’s absences so excessive as to prevent that student from meeting course requirements, credit for the course may be denied pursuant to the administrator’s decision.
As a general guideline, a student who has five or more unexcused absences from any course in any semester will not receive credit for the course unless, in the judgment of the principal, the student can meet the course requirements satisfactorily in other ways. No credit shall be permitted for any student for any class or portion of a class during which time the student was absent without acceptable excuse. Students with unexcused absences are responsible for work missed and are expected to make it up for their own benefit. Credit for such work will not be allowed. STEM High will establish penalties for unexcused absences and shall communicate such penalties to students and parents. If a student makes up missed time, transportation is the responsibility of the parents.

**Habitually Truant Students**

Students subject to the compulsory attendance laws who have four or more full day unexcused absences from school in any one month or ten full day unexcused absences during any school year are considered to be “habitually truant” under state law. For purposes of this policy, an “absence” is the accumulation of any and all class/period absences on any school day. Absences due to suspension or expulsion shall not be considered for purposes of determining habitual truancy.

Once a student is determined to be habitually truant, the school’s attendance officer shall notify the student’s parents, guardian, or legal custodian, in writing, of the student’s unexcused absences and of the fact that the student is habitually truant. When a student is declared habitually truant, the school shall, in cooperation with the student and parent, guardian, or legal custodian, develop a plan to assist the child to remain in school. Court action may be initiated by the designated school authorities when deemed necessary to enforce school attendance requirements.

**Notification to and Acknowledgement of Parents of Obligation**

At the beginning of each year, and upon enrollment of each new student subject to the compulsory attendance laws, parents, guardians, and legal custodians shall be notified in writing of their legal obligation to ensure their child’s attendance at school and shall be requested to sign and return to the school a written acknowledgement of such obligation and to furnish the school with a telephone number or other means of contacting them during the school day. In addition, the District will notify parents of students who have dropped out of the District but who are not subject to compulsory attendance laws (such as students age 16 or older), of the long-term ramifications of dropping out of school, and encourage the students to return to School. The Board authorizes the Superintendent or designee to develop a notice and notification procedures to achieve this objective.

**Internal Dispute Resolution Plan**

While STEM High and Middle strives to create a community where students, teachers, parents and employees all work together toward their mutual goals, we recognize that conflict is an inevitable part of a community of any size. We believe that outlining policies and procedures for handling conflicts will help us to resolve problems in a fair and efficient manner.
Hearing Committee

The STEM High and Middle School governing board will form an ad hoc committee that will be responsible for addressing concerns raised by students, parents or faculty, which involve other parents or faculty members. This committee is not intended to address matters of students of parents, staff, and students to recommend discipline.

Discipline and dress code policies have been established to address disciplinary issues. The Hearing Committee will also not address concerns about academic performance.

The Hearing Committee will be made up of the Principal and two board members. The President of the Board will choose the Board representative. The Principal will select the faculty representative. (Appendix N)

If any member of the Hearing Committee has a conflict of interest with a hearing, he will be asked to excuse himself from the proceedings and the President of the Board will select an alternate representative for the given matter.

Dispute Resolution Procedures

In the event of a problem or dispute between personnel, students, parents, or an employee, the following process will be used to resolve the problem. The Board may choose to modify this procedure, but the spirit of the process will remain intact. The goal is to encourage conflicting parties to find their own solution to the problem. Only in the event that such cooperation is impossible will the Hearing Committee become involved in the matter. Again, this dispute resolution process is not intended to apply to matters of student discipline.

Below are our basic discipline procedures.

- The person making the complaint will make a good faith effort to resolve the problem with the parties involved. Resources will be available for educating all members of the community on conflict resolution. In general, people will be encouraged to identify the problem, suggest possible solutions, and agree on a course of action with all parties.
- If the issue is not resolved after a good faith attempt as outlined above, the complaining party will submit a grievance in writing to the Principal.
- Within one week of receipt of the written complaint, the hearing committee will schedule a hearing at a mutually convenient time and place for discussion of the complaint with all parties involved. The process is similar to that of the initial good faith attempt at a resolution.
- A decision shall be rendered at the completion of the hearing process.
- Appeals should be made as soon as possible. Written appeals should be addressed to the President of the Board.
- If the Board of Directors is unable to find a solution that all parties find acceptable, the school may call in mediators. Mediation will always be used guidelines which the discipline committee will use before the school resorts to formal legal action.
If a matter cannot be resolved through mediation, the school will seek legal counsel and will work to solve the problem through legal action.

**Positive Behavior Support**

STEM High and Middle School will implement Positive Behavior Support (PBS) throughout the school. The mission of the Colorado School-wide Positive Behavior Support Initiative (Colorado Department of Education, 2008), is to establish and maintain effective school environments that maximize academic achievement and behavioral competence of all learners in Colorado.

**Attendance Policy**

STEM High and Middle School will develop and enforce its own school attendance policy. While STEM High and Middle School envisions itself as a school of daily attendance, there is a possibility of independent study as a conceivable adjunct to its regular program.

**POLICY WAIVERS**

18. A SPECIFIC REQUEST FOR WAIVER OF EACH POLICY OF THE BOARD OF EDUCATION THAT THE APPLICANTS REQUESTS NOT BE APPLICABLE TO THE PROPOSED DISTRICT CHARTER SCHOOL - The request must include a complete statement of rationale for each policy waiver requested and a plan for addressing the subject of the policy. A specific request for each state statute and/or State Board Regulation the proposed school requests be waived must also be submitted. This request must include a specific statement of rationale for each statute or regulation waived and a plan for addressing the subject of the statute or regulation.

**Request for Waiver of Colorado Revised Statutes Description and Rationale**

C.R.S. § 22-9-106 (4) Local Board of Education – Duties (substantive) Certificated Personnel Evaluations

This section requires that employee performance evaluations be performed by a person holding an administrative certificate (Type D).

**Rationale:** The STEM High and Middle School principal must have the ability to perform the evaluation of all personnel. Should the principal not have a Type D certificate, this should not preclude him or her from administering the evaluations.

**Plan:** The STEM High and Middle School Performance Appraisal System will be outlined after the charter is granted.

**Duration of the Waivers:** The STEM High and Middle School requests that the waiver be for the duration of its contract with the Douglas County School District Board. Therefore, the waiver is requested for five academic operating years, through June 30, 2015.
**Financial Impact:** The STEM High and Middle School anticipates that the requested waiver will have no financial impact upon the Douglas County School District Board or the STEM High and Middle School budget.

**How the Impact of the Waivers will be Evaluated:** Since teacher performance has a critical impact on the performance of the entire school, the impact of this waiver will be measured by the same performance criteria and assessments that apply to the senior high, as set forth in this Charter School Agreement.

**Expected Outcome:** With this waiver, STEM High and Middle School will be able to implement its program and evaluate its teachers in accordance with its Performance Appraisal System, which is designed to produce greater accountability and be consistent with the school’s goals and objectives. This will benefit staff members as well as students and the community.

**C.R.S. § 22-32-109 (l)(b)  Boards of Education – Specific Duties (delegation) Grants board of education the authority to adopt policies and prescribe rules and regulations for efficient administration of the district.**

**Rationale:** STEM High and Middle School will be operating independently from other schools in the district and should be delegated the authority to develop, adopt, and implement its own operational policies, rules and regulations, subject to the limitations in the Charter School Agreement.

**Replacement Plan:** The Board of Directors of STEM High and Middle School will adopt policies and the principal of STEM High and Middle School will prescribe rules and regulations.

**Duration of the Waiver:** STEM High and Middle School requests that the waiver be for the duration of its contract with the Douglas County School District. Therefore, the waiver is requested for five academic operating years, through June 30, 2015.

**Financial Impact:** STEM High and Middle School anticipates that the requested waivers will have no financial impact on Douglas County School District. STEM High and Middle School will be able to adopt policies and prescribe rules and regulations consistent with its budget.

**How the impact of the Waiver Will be Evaluated:** The impact of this waiver will be measured by the performance criteria and assessments that apply to STEM High and Middle School as set forth in this Charter School Agreement.

**Expected Outcome:** As a result of this waiver, STEM High and Middle School will be able to carry out its educational program, administer its affairs in an efficient manner, and accomplish its mission as set forth in the Charter School Agreement.

**C.R.S. § 22-32-109 (l)(f)  Boards of Education – Specific Duties (delegation)Requires the Board of Education to employ all personnel and fix their compensation.**
**Rationale:** STEM High and Middle School will be responsible for its own personnel matters, including employing its own staff and establishing its own terms and conditions of employment, policies, rules and regulations, and providing its own training. Therefore, the senior high requests that these statutory duties be waived or delegated from the Douglas County School District Board of Education to the principal and Board of Directors of STEM High and Middle School. The success of STEM High and Middle School will depend in large part upon its ability to select and employ its own staff and to train and direct that staff in accordance with this Charter School Agreement and the goals and objectives of the school. All STEM High and Middle School staff will be employed on an at-will basis.

**Replacement Plan:** The senior high will be responsible for these matters rather than the District.

**Duration of the Waivers:** The senior high requests that the waivers be for the duration of its contract with the Douglas County School District (DCSD) or Douglas County School District Board, (DCSD). Therefore, the waivers are requested for five academic years, through June 30, 2015.

**Financial Impact:** The STEM High and Middle School anticipates that the requested waiver will have no financial impact upon the Douglas County School District. The senior high must operate within its budget and the cost of employing staff has been included in that budget.

**How the Impact of the Waivers will be Evaluated:** The impact of the waivers will be measured by the same performance criteria and assessments that apply to STEM High and Middle School, as set forth in this Charter School Agreement.

**Expected Outcome:** As a result of these waivers, STEM High and Middle School will select, employ and provide professional development for its own teachers and staff, in accordance with the terms and conditions set forth in the Charter School Agreement.

**C.R.S. § 22-32-109 (l)(t) Boards of Education – Specific Duties (delegation) Grants board of education authority to determine the educational program to be carried on in schools of the district and to prescribe textbooks.**

**Rationale:** The Douglas County School District Board has granted to the Board of Directors of STEM High and Middle School the authority to determine the educational program and textbooks to be used. The District R-1 Board retains the right of final approval of the educational program through this Charter School Agreement.

**Replacement Plan:** The STEM High and Middle School educational program and curriculum is detailed in this Charter application.

**Duration of the Waiver:** The STEM High and Middle School requests that the waiver be for the duration of its contract with the Douglas County School District Board. Therefore, the waiver is requested for five academic operating years, through June 30, 2015.
Financial Impact: The STEM High and Middle School anticipates that the requested waivers will have no financial impact upon DCSD or STEM High and Middle School.

How the Impact of the Waiver Will be Evaluated: The impact of this waiver will be measured by the performance criteria and assessments that apply to STEM High and Middle School, as per this Charter School Agreement.

Expected Outcome: STEM High and Middle School expects that as a result of this waiver it will be able to implement its curriculum and ensure that students meet the educational standards of the school.

C.R.S. § 22-32-110 (1) (h) Local Board Powers (delegation,) Makes Board of Education responsible for terminating personnel.

Rationale: STEM High and Middle School will be responsible for its own personnel matters, including employing its own staff and establishing its own terms and conditions of employment, policies, rules and regulations, and terminating its own employees. Therefore, STEM High and Middle School requests that these statutory duties be waived or delegated from the Douglas County School District (DCSD) or Douglas County School District (DCSD) Board of Education to the principal and Board of Directors of the STEM High and Middle School. The success of STEM High and Middle School will depend in large part upon its ability to select and employ its own staff and to terminate individual staff members should they not perform in accordance with this Charter School Agreement and the goals and objectives of the school. All STEM High and Middle School staff will be employed on an at-will basis.

Replacement Plan: STEM High and Middle School will be responsible for these matters rather than the District.

Duration of the Waiver: STEM High and Middle School requests that the waivers be for the duration of its contract with the Douglas County School District Board. Therefore, the waivers are requested for five academic operating years, through June 30, 2015.

Financial Impact: STEM High and Middle School anticipates that the requested waivers will have no financial impact upon the Douglas County School District. The High and Middle School must operate within its budget and the cost of employing staff has been included in that budget.

How the Impact of the Waivers Will be Evaluated: The impact of the waivers will be measured by the same performance criteria and assessments that apply to STEM High and Middle School, as set forth in this Charter School Agreement.

Expected Outcome: As a result of these waivers, STEM High and Middle School will select, employ and provide professional development for its own teachers and staff, in accordance with the terms and conditions set by this Charter School Agreement.

C.R.S. § 22-32-126 Employment & Authority of Principals (delegation) Authorizes Board of Education to employ Principals.
**Rationale:** STEM High and Middle School will be responsible for its own personnel matters, including employing the principal, its own staff and establishing its own terms and conditions of employment, policies, rules and regulations, and providing its own training. Principals employed at STEM High and Middle School will be employed on an at-will basis. Therefore, STEM High and Middle School requests that these statutory duties be waived or delegated from the Douglas County School District (DCSD) or Douglas County School District (DCSD) Board of Education to the Board of Directors of STEM High and Middle School. The success of STEM High and Middle School will depend in large part upon its ability to select and employ its own principal and staff in accordance with this Charter School Agreement and the goals and objectives of the school.

**Replacement Plan:** STEM High and Middle School will be responsible for these matters rather than the District. The STEM High and Middle School principal and teachers will have flexibility in structuring professional development and school policies to meet their needs.

**Duration of the Waiver:** STEM High and Middle School requests that the waivers be for the duration of its contract with the Douglas County School District Board. Therefore, the waivers are requested for five academic operating years, through June 30, 2015.

**Financial Impact:** STEM High and Middle School anticipates that the requested waivers will have no financial impact upon the Douglas County School District R-1 School District. The Senior High must operate within its budget and the cost of employing staff has been included in that budget.

**How the Impact of the Waivers Will be Evaluated:** The impact of the waivers will be measured by the same performance criteria and assessments that apply to STEM High and Middle School, as set forth in this Charter School Agreement.

**Expected Outcome:** As a result of these waivers, STEM High and Middle School will select, employ and provide professional development for its principal, teachers, and staff, in accordance with the terms and conditions set by the Charter School Agreement.

**C.R.S. § 22-63-201 Employment – Certificate required**
Prohibits board from entering into an employment contract with a person who does not hold a teacher’s certificate or letter of authorization.

**C.R.S. § 22-63-402 Services – Disbursements (substantive) Prohibits disbursement of district monies to teacher without a valid teacher’s certificate, letter of authorization or written authorization.**

**Rationale:** STEM High and Middle School should be granted the authority to hire teachers and principals that will support the schools goals and objectives. The Principal will not function as a traditional district school principal, but rather will be responsible for a wider range of tasks and act as STEM High and Middle School’s chief executive officer. STEM High and Middle School will seek to attract principals and teachers from a wide variety of backgrounds, including, but not limited to teachers from out-of-state, teachers with a lapsed Colorado certificate, persons with
several years of successful teaching experience in a setting not requiring a license, as well as persons with business or professional experience. All employees of STEM High and Middle School will be employed on an at-will basis.

**Replacement Plan:** STEM High and Middle School will, where possible, hire certified teachers and principals. However, in some instances it may be advantageous for STEM High and Middle School to be able to hire teachers and/or principals without a certificate and who possess unique background and/or skills or fill the need of STEM High and Middle School.

**Duration of the Waivers:** STEM High and Middle School requests that the waivers be for the duration of its contract with the Douglas County School District. Therefore, the waiver is requested for five academic operating years, through June 30, 2015.

**Financial Impact:** STEM High and Middle School anticipates that the requested waivers will have no financial impact on Douglas County School District and STEM High and Middle School.

**How the Impact of the Waivers Will be Evaluated:** The impact of these waivers will be measured by the performance appraisal criteria and assessments that apply to STEM High and Middle School, as per this Charter School Agreement.

**Expected Outcome:** As a result of these waivers, the STEM High and Middle School will be able to employ professional staff possessing unique skills and/or background filling all staff needs.

C.R.S. § 22-63-203  Probationary Teachers – renewal and non-renewal of employment contract
– Specific Duties

Provides for contract with probationary teachers and allows for non-renewal and renewal of employment contract.

C.R.S. § 22-63-403 Payment of Salaries (substantive)
Govern payment of salaries upon termination of employment of a teacher.

**Rationale:** STEM High and Middle School should be granted the authority to develop its own employment contracts and terms and conditions of employment. STEM High and Middle School will be operating differently from other schools with a unique curriculum for which having the proper teaching staff is essential. Not every teacher who is successful in the regular public school will be successful in the Senior High. All employees of STEM High and Middle School will be employed on an at-will basis.

**Duration of the Waivers:** STEM High and Middle School requests that the waivers be for the duration of its contract with the Douglas County School District (DCSD) or Douglas County School District (DCSD). Therefore, the waiver is requested for five academic operating years, through June 30, 2015.
Financial Impact: STEM High and Middle School anticipates that the requested waivers will have no financial impact on Douglas County School District or STEM High and Middle School.

How the Impact of the Waivers Will be Evaluated: The impact of these waivers will be measured by the performance appraisal criteria and assessments that apply to STEM High and Middle School, as per this Charter School Agreement.

Expected Outcome: As a result of these waivers, STEM High and Middle School will be able to employ professional staff possessing unique skills and/or background, filling all staff needs.

C.R.S. § 22-63-206 Teacher Employment, Compensation and Dismissal Act (substantive)
Permits transfer of teachers between schools upon recommendation of district’s chief administrative officer.

Rationale: STEM High and Middle School is granted the authority under the Charter School Agreement to select its own teachers. The District should not have the authority to transfer its teachers into STEM High and Middle School or transfer teachers from STEM High and Middle School to District schools, except as provided for in the Charter School Agreement.

Replacement Plan: STEM High and Middle School will hire teachers on a “best qualified” basis. Teachers who wish to transfer from STEM High and Middle School may follow District procedures.

Duration of the Waiver: STEM High and Middle School requests that this waiver be for the duration of its contract with the Douglas County School District District Board. Therefore, the waiver is requested for five academic operating years, through June 30, 2015.

Financial Impact: STEM High and Middle School anticipates that the requested waivers will have no financial impact on Douglas County School District District or STEM High and Middle School.

How the Impact of the Waiver Will be Evaluated: The impact of this waiver will be measured by the performance criteria and assessments that apply to STEM High and Middle School, as set forth in this Charter School Agreement.

Expected Outcome: STEM High and Middle School expects that as a result of this waiver it will be able to manage its own personnel affairs. Consistent with the terms of this Charter School Agreement and the Colorado Charter School Law, STEM High and Middle School will provide the opportunity for teachers to transfer back into the District if they so choose.

C.R.S. § 22-63-301 Transfer Employment, Compensation and Dismissal Act, Grounds for dismissal.

C.R.S. § 22-63-302 Procedures for dismissal of teachers. (substantive)

Rationale: The success of STEM High and Middle School in accomplishing its mission is dependent primarily upon the talents, skills and personal commitment of its teachers. STEM
High and Middle School must be able to terminate employees who cannot deliver its educational program successfully. The concept of tenure does not apply to STEM High and Middle School as the school is only of limited duration. All employees of STEM High and Middle School will be employed on an at-will basis.

Replacement Plan: Continued employment in STEM High and Middle School shall be subject to an annual satisfactory performance evaluation. Teachers who are rated unsuccessful may be terminated by STEM High and Middle School.

Duration of the Waivers: STEM High and Middle School requests that the waivers be for the duration of its contract with the Douglas County School District Board of Education. Therefore, the waivers are requested for five academic operating years, through June 30, 2015.

Financial Impact: STEM High and Middle School anticipates that the requested waivers will have no financial impact on Douglas County School District District or STEM High and Middle School. STEM High and Middle School must operate within its budget and the cost of employing staff has been included in that budget.

How the Impact of the Waivers Will be Evaluated: The impact of these waivers will be measured by the performance criteria and assessments that apply to STEM High and Middle School, as set forth in this Charter School Agreement.

Expected Outcome: As a result of these waivers, STEM High and Middle School will be able to provide instruction in accordance with the philosophy and mission as stated in this Charter Proposal.

C.R.S. § 22-63-401 Transfer Employment, Compensation and Dismissal Act (delegation) Provides for district board of education to adopt a salary schedule and place teachers on the schedule.

Rationale: STEM High and Middle School should be delegated the authority to determine compensation rates, in accordance with the Charter School Agreement. The workday and work year in STEM High and Middle School may be different from that of the District and compensation must be adjusted accordingly.

Replacement Plan: STEM High and Middle School will adopt its own salary schedule. STEM High and Middle School will set competitive rates for each level of teachers it employs. The STEM High and Middle School principal will determine the placement of teachers on the salary schedule. The District salary schedule will be used as a guideline for developing the STEM High and Middle School salary schedule.

Duration of the Waiver: STEM High and Middle School requests that the waivers be for the duration of its contract with the Douglas County School District. Therefore, the waiver is requested for five academic operating years, through June 30, 2015.
**Financial Impact:** STEM High and Middle School anticipates that the requested waivers will have no financial impact on Douglas County School District. STEM High and Middle School will be able to employ teachers and determine a salary schedule consistent with its budget.

**How the impact of the Waiver Will be Evaluated:** The impact of this waiver will be measured by the performance criteria and assessments that apply to STEM High and Middle School as set forth in this Charter School Agreement.

**Expected Outcome:** As a result of this waiver, STEM High and Middle School should be able to attract qualified personnel and provide instruction in accordance with the philosophy and mission as stated in this Charter Proposal.

STEM High and Middle School reserves the right to identify, during its implementation period, those Colorado Revised Statutes which are impediments to effective operation and to request waivers of those statutes, as specified in C.R.S. 22-2-117 (1) and (2).

C.R.S. § 22-35-101  Postsecondary Enrollment Options Act
Provides for Dual Enrollment Credit Option. This article shall be known and may be cited as the "Postsecondary Enrollment Options Act"

**Rationale:** STEM High and Middle School should be delegated the authority to determine compensation rates, in accordance with the Charter School Agreement. The workday and work year in STEM High and Middle School may be different from that of the District and compensation must be adjusted accordingly.

**Replacement Plan:** STEM High and Middle School will adopt its own salary schedule. STEM High and Middle School will set competitive rates for each level of teachers it employs. The STEM High and Middle School principal will determine the placement of teachers on the salary schedule. The District salary schedule will be used as a guideline for developing the STEM High and Middle School salary schedule.

**Duration of the Waiver:** STEM High and Middle School requests that the waivers be for the duration of its contract with the Douglas County School District District. Therefore, the waiver is requested for five academic operating years, through June 30, 2015.

**Financial Impact:** STEM High and Middle School anticipates that the requested waivers will have no financial impact on Douglas County School District. STEM High and Middle School will be able to employ teachers and determine a salary schedule consistent with its budget.

**How the impact of the Waiver Will be Evaluated:** The impact of this waiver will be measured by the performance criteria and assessments that apply to STEM High and Middle School as set forth in this Charter School Agreement.

**Expected Outcome:** As a result of this waiver, STEM High and Middle School should be able to attract qualified personnel and provide instruction in accordance with the philosophy and mission as stated in this Charter Proposal.
STEM High and Middle School reserves the right to identify, during its implementation period, those Colorado Revised Statutes which are impediments to effective operation and to request waivers of those statutes, as specified in C.R.S. 22-2-117 (1) and (2).

C.R.S. SS 22-33-104(4) Compulsory School Attendance (School Attendance Law) 22-33-1 07 Enforcement of Compulsory School Attendance

**Rationale:** These statutes require the local school district to adopt and enforce a written policy setting forth the district’s attendance requirement.

**Replacement Plan:** STEM High and Middle School will develop its own attendance policy commensurate with its academic programs.

**Duration of the Waivers:** STEM High and Middle School requests that the waiver be for the duration of its contract.

**Financial Impact:** STEM High and Middle School anticipates that the requested waiver will have no financial impact upon the authorizer’s or the school’s budgets.

**How the Impact of the Waiver Will be Evaluated:** The impact of these waivers will be measured by the performance criteria and assessments that apply to STEM High and Middle School, as set forth in the approved Application and the contract.

**Expected Outcome:** STEM High and Middle School will develop and enforce its own school attendance policy. While STEM High and Middle School envisions itself as a school of daily attendance, there is a possibility of independent study as a conceivable adjunct to its regular program.

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**DISSOLUTION**

**19. A DESCRIPTION OF THE PROCESS TO BE USED TO DISCONTINUE THE OPERATION OF THE SCHOOL.**

In the event that STEM High and Middle School should cease operations for whatever reason, including the non-renewal or revocation of its Charter, it is agreed that the Governing Board shall supervise and have authority to conduct the winding up of the business and affairs of the school provided, and that in doing so, the District does not assume any liability incurred by the school beyond the funds allocated to it by the District under this Charter. The District’s authority hereunder shall include, but shall not be limited to, the return and disposition of any assets acquired by purchase or donation by the school during the time of its existence.

**Indemnification**

To the extent not covered by insurance or otherwise barred by the Colorado Governmental Immunity Act, STEM High and Middle School agrees to indemnify and hold the District and its
agents and employees harmless from all liability, injury, personal injury, sickness, disease, death, property loss or damage, or any other losses of any kind whatsoever which arise out of, or are in any manner connected with, school operations. The foregoing provision shall not be deemed a relinquishment of any kind of applicable limitations of liability provided by the Colorado Governmental Immunity Act.

**Nonreligious, Nonsectarian Status**

STEM High and Middle School agrees that it shall operate, in all respects, as a nonsectarian, nonreligious, non-home-based public school. STEM High and Middle School shall not be affiliated with any nonpublic or sectarian school or religious organization.

**Commitment to Nondiscrimination**

STEM High and Middle School shall comply with all applicable federal, state, and local laws, rules and regulations, including, without limitation, the constitutional provisions prohibiting discrimination on the basis of disability, age, race, creed, color, gender, sexual orientation, national origin, religion or ancestry.

**CONTRACT DISPUTE RESOLUTION PLAN**

20. A DESCRIPTION OF A DISPUTE RESOLUTION PROCESS TO BE USED TO RESOLVE DISPUTES BETWEEN THE PROPOSED DISTRICT CHARTER SCHOOL AND THE DISTRICT.

STEM High and Middle School will always attempt to resolve any disagreement with the Douglas County School District amicably. In the event of a contract dispute between STEM High and Middle School and the DCSD, the school will make a good faith effort to resolve the conflict through informal means. A designated representative of the school will meet with representatives from DCSD to discuss possible resolutions to the dispute and to attempt to reach an agreement. If such an attempt at informal resolution fails, the school will comply with a mutually agreed upon dispute resolution plan which may include some or all of the following steps:

- Written notification of the dispute, identifying the specific topic of disagreement and the facts that support the compliant, submitted by either party in a timely manner
- Outside mediation conducted by a skilled, independent mediator
- Non-binding arbitration that includes a hearing and recommendation. The costs of such arbitration shall be borne equally between the parties.
- An option to appeal to the District Board if the parties are unable to negotiate a resolution through arbitration
Except those disputes between Douglas County School District and STEM High and Middle School relating to provisions of the charter, all disputes involving STEM High and Middle School will be resolved by the school according to its policies.

**CHARTER SCHOOL IS ACCOUNTABLE TO THE BOARD OF EDUCATION**

21. **INDICATION THAT THE APPLICANT/APPLICANT GROUP UNDERSTANDS AND THE DISTRICT CHARTER SCHOOL AGREES THAT IN ACCORDANCE WITH STATE LAW, THE DISTRICT CHARTER SCHOOL SHALL BE A DISTRICT PUBLIC SCHOOL THAT IS ACCOUNTABLE TO THE BOARD OF EDUCATION.**

STEM High and Middle School understands that the District charter school agrees to be in accordance with State Law, shall be a DCSD public school and is accountable to the Board of Education.

**APPLICANT GROUP HAS NEVER OPERATED AS A PRIVATE SCHOOL OR NON-PUBLIC HOME-BASED EDUCATIONAL PROGRAM**

22. **ASSURANCES THAT THE PROPOSED DISTRICT CHARTER SCHOOL AND/OR APPLICANT GROUP HAVE NEVER OPERATED AS A PRIVATE SCHOOL OR NON-PUBLIC HOME-BASED EDUCATIONAL PROGRAM** - Such assurances must include a description of the authority that the founding applicant group of the proposed district charter school has to enter into a charter contract (i.e. a description of the type of entity that is proposed or existing).

STEM High and Middle School has never operated as a private school or non-public home-based educational program.

**CONCLUSION**

STEM High and Middle School promises to be one of the most innovative schools available to students in the South Metro area. With a combination of high expectations for all students and a small, supportive community, we feel that we can give students an unparalleled opportunity. Few other schools in the country can offer students the combination of rich resources, a small school setting and a free education that STEM High and Middle School will offer.

Using an appropriate combination of direct instruction, APPB learning and real-world experience, we will give the students of STEM High and Middle School the skills they need to succeed in post-secondary education and beyond. Our faculty will be dedicated to empowering children to realize their dreams, and our school will be managed with care and integrity.
REFERENCES


Developing Performance Goals That Reflect Your School’s Mission by Margaret Y. Lin and Richard J. Wenning.


Ormdal, Stuart N., Richards, Mary-Anne, Brennan, Deborah, & Gonzales, Julie (2006). Science technology engineering mathematics STEMming the tide: a Colorado response to the national crisis in stem education. *A white paper by the Colorado association for gifted and talented and center for the education and stud of te gifted, talented, creative university of northern Colorado*


U.S. Department of Labor Employment & Training Administration, Elaine L. (Chao). The stem workforce challenge: the role of the public workforce system in a national solution for a competitive science, technology, engineering, and mathematics


9/14/08

Mark Baisley
South Metro High Tech High
PO Box 631086
Highlands Ranch, CO 80163

Mark,

The purpose of this letter is to add my support as President of Colorado Technical University – Denver to the Charter School Application. Colorado Technical University – Colorado Springs already supports a Charter School and I have seen the difference this is making in some of those High School Student’s lives. With your high level support for STEM courses; I see nothing but absolute success.

If there is anything further that I can do as a President at Colorado Technical University to support this great effort, please let me know. My office number is 303-362-2900 and my email address is mpieffer@coloradotech.edu.

Sincerely,

Mark A. Pieffer, Ph.D.
President
Denver Campuses
September 9, 2008

Mark Baisley
South Metro Science Technology
Aerospace and Research School
PO Box 631086
Highlands Ranch, CO 80163

Dear Mr. Baisley:

Ms. Judy Brannberg, Project Manager of South Metro STAR School, has inquired about the future possibility of the school offering courses for high school and college credit through our CU Succeed Gold program at the University of Colorado Denver. The program makes it possible for high schools to offer university courses taught by the schools’ faculty who have the credentials necessary to be granted adjunct faculty status by an academic department at the University. Tuition for the courses, which is paid either by the school or the students, is a mere $50 per credit, far less than what students would pay to take a course on campus.

CU Succeed Gold courses are offered in over 90 high schools in Colorado to well over 4,000 students per year. We would be pleased to add South Metro STAR School to our list of high school partners when the school is ready to make CU Succeed Gold offerings available to its students. We look forward to working with the administration and faculty at South Metro STAR School to enhance the students’ learning experience.

Sincerely,

Danny E. Martinez
Director
Mark Baisley  
South Metro High Tech High School  
PO Box 631086  
Highlands Ranch, CO 80163

Dear Mark,

We are pleased and thrilled to partner with your new charter high school!

Project Lead The Way, (PLTW) is the nation’s premier high school pre-engineering program! Project Lead The Way is a four-year course of study integrated into the students’ core high school curriculum. The combination of traditional math and science courses with innovative Project Lead The Way courses prepares students for college majors in engineering and E/T fields and offers them the opportunity to earn college credit while still in high school. Project Lead The Way courses engage high school students through a combination of activities-based, project-based, and problem-based (APPB) learning. APPB learning creates an environment for applying engineering concepts to real world problems.

Project Lead The Way was selected as a “Best Practice” STEM Education program (Science, Technology, Engineering and Math) in 2007 by the National Academies of Sciences, Engineering and Medicine at the Education Diversity Forum in Washington D.C. and also was recognized as a STEM model at a recent National Governor’s Education Conference.

Each participating Colorado school district implements PLTW in partnership with our community colleges and universities. Each school operates a Partnership Team with members drawn from higher education and the private sector. School Partnership Teams advise and support the schools in their plans. We offer Teacher Training, On-Going Training and Professional Development, and College Credit through the University of Colorado at Colorado Springs.

We look forward to providing you technical assistance as you work through the PLTW implementation process.

Sincerely,

Bill Lehman, Director  
*Colorado Consortium of Project Lead The Way Schools*  
PLTW State Leader  
E-Mail: bill_lehman@att.net or Phone: 719.661.4076
August 16, 2008

Mr. Mark Baisley  
P.O. Box 631086  
Highlands Ranch, CO 80163

Re: South Metro Tech High

Dear Mark —

Bravo!

I understand you are leading an effort to establish South Metro Tech High as a new charter school for the Littleton School District. I don’t have all the details, but I do have an opinion — this sounds like a great idea to me.

I’ve been told that the emphasis will be on the STEM curriculum — Science, Technology, Engineering and Math. This is a wonderful notion and will provide a terrific preparation for students who want to go to the best colleges and universities in America or go directly to work in high tech occupations.

I wish you much success with this noble venture. It will be great for students, the community, for colleges and universities who will actively court graduates of the caliber you’ll be turning out and for companies who need the kind of graduates SMTH will produce.

I wish you much success. In fact, I wish you success far beyond anything you are now dreaming of or contemplating. All the best,

Sincerely,

William L. Armstrong
September 23, 2008

South Metro High Tech High  
Mr. Mark Baisley, Board President  
PO Box 631086  
Highlands Ranch, CO 80163

Dear Mark,

We are pleased to extend our support to your new high tech charter school focusing on STEM education in the South Metro area. There are extensive workforce demands in the areas of aerospace, bioscience, energy and information technology and we know that your school will make every effort to train students to meet these needs.

As the Immediate Past Board President for the Denver School of Science and Technology I will continue to mentor your school and provide leadership and guidance suggestions to you and your staff in regards to curriculum development, professional development, board training and by providing other assistance to your school. We know the rigorous process that you must undergo to open a high tech educational facility.

The Denver School of Science and Technology has been the leader in our city and state in regards to training students to meet the demands of our 21st century, high tech global economy.

Congratulations again for your new school.

Sincerely,

[Signature]

Norwood Robb  
Immediate Past Board President  
Denver School of Science and Technology
September 15, 2008

South Metro High Tech High
Mr. Mark Baisley, Board President
PO Box 631086
Highlands Ranch, CO 80163

Dear Mark,

We are pleased to extend our support to your new high tech charter school focusing on STEM education in the South Metro area. There are extensive workforce demands in the areas of aerospace, bioscience, energy and information technology and we know that your school will make every effort to train students to meet these needs.

As the Executive Principal for Peak to Peak, we will continue to mentor your school and provide the leadership and guidance to you and your staff need in regards to curriculum development, professional development, board training and by providing other resources to your school. We know the rigorous process that you must undergo to open a high tech educational facility.

Peak to Peak has been the leader in our state in regards to training students to meet the needs of postsecondary education and in training educators.

Congratulations again for your new school.

Sincerely,

[Signature]

Tony Pontana
Executive Principal
Peak to Peak
September 7, 2009

Mark Baisley
STEM High and Middle School
P.O. Box 631086
Highlands Ranch, CO 80163

Dear Mark Baisley:

As you know from my resume submittal, I am highly interested in teaching or administration at STEM High and Middle School. I’ve always believed that learning is easier when the course-work is presented with real-world applications. The teacher of my Calculus class in high school was a former auto industry engineer; he was able to show how Calculus was relevant. In college, I took several graduate-level classes in which the professors were industry leaders in their respective fields (i.e., Propulsion, Thermodynamics, and Spacecraft Design). These classes were always somehow easier and more interesting than others.

Because of my interest in teaching, I have initiated the process of obtaining an alternative Educator’s License. I also plan to take course work that would allow me to acquire a regular license. With 25 years in the Aerospace industry as a Test Engineer / Manager for launch vehicle and satellite programs, it has always been my aim to gain a systems-level perspective on the systems I was testing. This provided for a much more comprehensive test program with close-to-actual atmospheric conditions and vehicle dynamics (test-as-you-fly methodology). While managing, I have learned what it takes to run a division for a company that is publically traded, with 50 engineers and support staff geographically dispersed throughout the United States. I feel that my knowledge base would greatly benefit your program at STEM High and Middle School.

Thank you for your time and consideration.

Respectfully,

Laura Grant

(303) 908-1272

laura_grant_16@comcast.net
Laura F. Grant
3326 W. White Oak Lane
Highlands Ranch, CO 80129
(303) 908-1272
laura_grant_16@comcast.net

SUMMARY

Significant professional experience and proven track record in developing, staffing, and managing Software Test and Information Assurance / Security programs. Successful in meeting program schedule and budget requirements, resulting in 100% customer satisfaction. Additional successes in technical innovation, process improvement, and establishing / maintaining secure environments. A unique combination of people and technical leadership skills used to build highly successful teams, accomplishing all program objectives while meeting or exceeding customer and corporate expectations.

- Software Test Programs
- Requirements Analysis
- 6σ Specialist Qualified
- Government Contracting
- Schedule and Cost Management
- Active SSBI & SCI Clearances
- GSA Schedules
- COMSEC Manager
- IT Security Management

PROFESSIONAL EXPERIENCE

RAYTHEON COMPANY, Aurora, CO

Principal Test Engineer / Integration & Test Lead

April 2007 – August 2009

Responsible for the test program on several National Security projects.

- Solely responsible for the generation of test plans, cases, procedures, and reports.
- Presented the test approach to the customer and industry community.
- Became proficient with the UNIX operating system and UNIX-based software tools.

Worked on the NPOESS program in the System Integration & Test group as Lead Test Conductor for Dry-Run and Run-for-Record testing on the Ground System at the installation facilities.

ANALEX CORPORATION, Littleton, CO

1987 – 2006

Director / Deputy Director, Denver Operations

2000 – 2006

Led a $10M P&L center with forty-five direct reports. Managed several concurrent multi-million dollar government contracts including: Launch Vehicle Software Independent Verification and Validation (IV&V); Information Assurance IV&V; and Information Security (Risk Assessment and Certification / Accreditation).

- Consistently met schedules and budgets and obtained consistent 100% (or higher) award fee ratings from customers.
- Active in the development and maintenance of an ISO 9001:2000 certified quality system, and the establishment of a GSA Schedule for Professional Engineering Services.
- Established a SCIF, including procedure development and training, and performed associated duties of Facility Security Officer and COMSEC Manager.
- Participated in proposal generation and other business development efforts; established the new Information Assurance / Security business areas.
- Reduced overhead spending in several operational areas, thereby significantly increasing profit margins.
Laura F. Grant

Launch Vehicle Programs (LVP) Manager 1999 – 2000
Ensured successful completion of all software IV&V activities while meeting schedules and budgets, and served as a direct interface to the customer on contractual and technical issues.
- Participated directly in automation of test set-up, execution, and analysis and in other process improvements; documented processes in detail with limitations, mitigations, inputs / outputs, and truth sources.
- Developed and negotiated many winning proposals.
- Trained LVP staff members on task assignments and championed their professional development.

Titan IV/Centaur Program Manager 1997 – 1999
Managed Titan IV/Centaur flight software IV&V efforts.
- Developed and maintained schedules and budgets, and formulated a multi-contract management system.
- Provided management leading to several successful launches and the IV&V start-up for several concurrent missions; performed technical tasks when needed to meet launch schedules.

Led Atlas flight software IV&V efforts.
- Developed new IV&V test approaches, generated technical Basis of Estimates, and assisted with proposal activities.
- Managed budgets, schedules, and manpower planning; performed a significant portion of the IV&V technical tasks and generated the associated test documentation in addition to program management activities.

Mission Manager / Test Engineer 1987 – 1994
Supervised Centaur Upper Stage flight software IV&V technical tasks.
- Developed and implemented new IV&V plans and procedures.
- Instrumental in the successful completion of multiple Mission Integration (MI) and Tested and Guaranteed (TAG) cycle efforts, and test site support activities.

ROCKWELL INTERNATIONAL, Downey, CA 1984 – 1987
Member of Technical Staff II
Provided engineering support for Space Shuttle missions, including real time flight support on-station, real time and post flight data analysis and evaluation, flight report generation, and flight documentation review.
- Developed and tested FORTRAN programs to automate flight data reduction and to model system performance, resulting in a several contributions to a data book publication used by NASA.
- Designed and implemented an operational instrumentation flight support database to assist in real time systems monitoring.
EDUCATION AND PROFESSIONAL DEVELOPMENT

B.S., Aerospace Engineering  
University of Colorado  
Boulder, CO

- COMSEC Manager Course
- Lockheed Martin Atlas Supplier Development Program
- Leadership Development Program
- The Power Principle: Influence with Honor
- Management Problems of the Technical Person in a Leadership Role
- Dealing Effectively with Unacceptable Employee Behavior
- Preventing Human Error: A Practical Guide to Quality, Safety, and Effectiveness
- Fundamentals of Orbital Mechanics: Booster Rockets and Space Flight Maneuvers
- 6σ Specialist Qualified
- Provisionally Approved as an IPT Lead

Licensed in Colorado for Life Insurance and Securities (July 2007)

SECURITY CLEARANCES

SECRET since 1987; TS/SCI since 1997; SSBI since 2007

AWARDS

- Raytheon Company Certificates and Letters of Merit
- Analex Corporation Certificates and Letters of Merit
  - Recognition of Professional Performance as Deputy Director
  - Recognition of Excellence: Titan IV/Cassini FCS-024 Software Testing
  - Outstanding Performance of Atlas II IV&V Tasks
- Lockheed Martin Special Recognition in an Award Fee Presentation (105% Awarded)
- Lockheed Martin Certificate of Outstanding Contribution for Titan IV-16 Mission Support
- Lockheed Martin Certificate of Achievement for TIVB-25 Launch Support
- NRO Certificates of Appreciation for AC-109 and AC-157 Mission Support

PROFESSIONAL AFFILIATIONS

AIAA Senior Member

PUBLICATIONS

- NASA Shuttle Operational Data Book (SODB): Reaction Control Subsystem (RCS) Propellant Tank Blowdown Capability (Rockwell International Document No. 287-302-87-042)
- NASA SODB: RCS Propellant Tank On-Orbit Expulsion Efficiency and Mixture Ratio Determination (Rockwell International Document No. 287-3-2-86-088)
TO: President of the Board and Douglas County School Board Members
FROM: Darlene Yañez
DATE: September 3, 2009
RE: Letter of Support
STEM High and Middle School Charter

As an educator for the last 30 years and having extensive experience in reviewing and evaluating STEM-focused schools and programs nationally, I enthusiastically support the Douglas County’s Science, Technology, Engineering and Math (STEM) High and Middle Preparatory School Charter. The essence of the charter creates an environment that emphasizes learning through pedagogical practices that focus on academic excellence and individual skills’ development through rigorous standards-based curriculum. The basic foundation of the schools’ work is research-based and reflects best practices of academic research and field research in education.

The charter outlines the path that will lead to and ensure structures are in place for teachers to implement sound instructional strategies and innovative methodologies that will result in significantly raising students’ interest in STEM-focused content areas as well as increase the rigor of the students’ learning. The STEM High and Middle School Charter promise to provide students in the Douglas County area an opportunity to prepare for college and careers in an innovative way – in an environment that focuses on high expectations for students and teachers. Your students will be receiving curriculum and instruction that meets and/or exceeds learning experiences used by the top schools in the United States. It is a rare opportunity to work with and endorse a quality program that focuses on teaching and learning in an innovative environment.

I strongly support the efforts of the Douglas County community to respond to a local and national need to prepare students for college and careers in the 21st Century. I look forward to the opening to these innovative schools in your community. It is this kind of forward thinking that will support and encourage students to develop and cultivate their talents and skills.

Darlene A. Yañez, Ph.D.
Director, Texas Center for STEM Education
Austin, Texas
July 5, 2007

Douglas County Board of Education
620 Wilcox Street
Castle Rock, CO 80104

Dear Board of Education Members:

We would like to take this opportunity to thank you for your work on behalf of the students of Douglas County and to support efforts to establish a new high school charter school dedicated to a rigorous STEM curriculum to be located in northern Douglas County.

As workforce demands in the aerospace, bioscience, energy and information technology fields continue to grow, it is important that Douglas County make every effort to meet this need.

A charter high school dedicated to curriculum focused on science, technology, engineering and math will provide a unique opportunity to do so and will enhance efforts already set in motion by Douglas County schools.

We hope that you will look favorably on these efforts as proposals are submitted to the Douglas County Board of Education.

Sincerely,

Frank McNulty
State Representative

Victor Mitchell
State Representative
From The Desk Of Jeff Wasden

To Whom It May Concern:

Please accept this letter of support for South Metro High Tech High. I have been honored to have a small role in support of this project over the past years and am so pleased and encouraged with the recent changes and direction SMHHTH is headed. In my role as Board President for the Highlands Ranch Community Association, I understand the importance of support from multiple organizations and how crucial it is to the success of any idea, no matter how big or small. The Littleton Public School District is a first class organization committed to providing an outstanding learning environment for all kids. SMHHTH fills a valuable role for LPS in providing another high level, rigorous learning environment that will meet the needs of students. As President of HRCA, I am excited about this development and encourage the LPS Board to do whatever necessary to make this a reality.

I am a former LPS teacher and coach. I have been honored to be nominated for 9 News Teacher’s Who Care, Who’s Who in Education, and received the Distinguished Educator Award from Littleton High School and addressed their graduates. I coached high school tennis and middle school sports, passed my PLACE Test, have a Masters in Educational Leadership and have a Type D license. I share that so you understand my background in lending this letter of support, my commitment to LPS, our students, and the vision of SMHHTH. As a former educator in the LPS family, I know the fit for SMHHTH and LPS, how they can work well together, and offer a win-win for the district, SMHHTH supporters, and ultimately, the numerous students who stand to benefit.

The volunteers and Board of SMHHTH are committed, involved, and able to make this a reality. They have a rich history in education and technology. They have the passion to bring technology to the youth of the south metro area.

It is without reservation I lend my support of the South Metro High Tech High proposal and ask you for your support and vision in bringing this project forward. Together, SMHHTH and LPS can ensure all students have access to the highest curriculum in an environment best suited to develop their talents. Please do not hesitate to contact me if you have any questions.

Sincerely,

Jeff Wasden
HRCA Board President
3081 W. White Oak Trail
Highlands Ranch, CO 80129
720-628-4787
September 9, 2008

South Metro High Tech High
Board President Mark Baisley
PO Box 631086
Highlands Ranch, CO 80131

Dear President Baisley:

It is with great pleasure that I present my Letter of Support for your South Metro High Tech High charter high school. As you know I am a strong champion of school choice. I believe it is our responsibility as a society to provide every academic opportunity possible for our children to achieve their greatest individual potential. South Metro High Tech High is certainly a much needed option that our children in South Metro Denver are currently lacking. It will provide innovative, creative, cutting-edge high tech instruction designed to meet Colorado’s growing high tech workforce development demands.

As you know, the research demonstrates the benefits of learning in a relevant project-based, authentic learning environment. Retention of information is high and real world application enlightens students. The internship, job shadowing and mentoring aspect of the proposed high school is most fascinating and will provide teaching and learning partnerships and collaborations between education and high tech industry in the South Metro area. There is a huge lack of qualified students going into the fields of Science, Technology, Engineering and Math (STEM) careers. This school will train students to pursue higher education to prepare them for high tech careers in our area.

As a believer in Choice Schools, I know that all schools in the South Metro area will be favorably impacted through this education project. Competition is a healthy sign of a successful school district.

Godspeed and good luck in your efforts to make South Metro High Tech High a reality! Please do not hesitate to call on me if I can be of assistance to you.

Sincerely,

[Signature]
Senator Ted Harvey
June 16, 2007

Judy Brannberg
South Metro High Tech High
Project Coordinator
PO Box 261086
Highlands Ranch, CO 80163

Dear Judy:

Thank you for the opportunity to express support for the new high school charter school proposal, South Metro High Tech High, which is being submitted to the Douglas County Board of Education in August 2007. There are many reasons to support this school initiative.

South Metro High Tech High will endeavor to raise the ceiling for the South Metro area’s most able learners by challenging them to achieve with a rigorous STEM curriculum, focusing on science, technology, engineering, and math. SMHTH will focus their educational curriculum to meet the growing demands of workforce development in the areas of aerospace, bioscience, energy and information technology.

Because of the rich high-tech, industry corporations that make their home in the south metro area, SMHTH, will offer active learning experiences, with creativity and innovation through internships and mentorships with our high tech industry partners.

South Metro High Tech High will offer a research-based foundation that will reverse the current STEM crisis in Colorado and the Nation. It is the goal of SMHTH to become a trendsetter in high-tech education for our nation.

Please approve the charter application for SMHTH so that the students of Douglas and Arapahoe County will have the opportunity to thrive and excel in a high-tech school.

Sincerely,

Dave Schultheis
State Senator
August 27, 2008

Mr. Mark Baisley, Board President
South Metro High School
PO Box 631086
Highlands Ranch, CO 80163

David Casiano, Mayor
Town of Parker
20120 East Mainstreet
Parker, CO 80138

Mr. Baisley:

I am much honored to write a letter of recommendation for the new South Metro High School. As an educator teaching at Lutheran High School of Parker, I see the need for more educational choices regarding our young people. The South Metro High School offers that choice and much more.

Interactive technology is a must for the continued success of our young students to compete in the world-market place. Offering a strong AP curriculum enabling college credit allows students and parents to save in tuition costs while introducing the student to the rigors of college learning. Industry professionals in partnership with our students education opens the door to real-world experience and answers the age-old question of “How do I apply this to real life?” Rigorous core STEM curriculum (science, technology, engineering and math) helps to fill the void felt by many companies that will be looking for top-notch employees. Field projects with student research in areas of enrichment helps to promote the desire to learn and the enjoyment of learning. Specific service learning projects allows the students to add to their community and not subtract from it. Enrichment activities associated with theories and practices in authentic learning and project based education shows the students why they are learning what they are learning. Building personal integrity builds good-future citizens ready to serve their community. Internships, community projects and digital research portfolios not only give real-world experience but helps showcase a resume to illustrate actual accomplishments. An extended day program gives students a leg up in learning as opposed to the old fashion and outdated agricultural calendar.
August 27, 2008

I am truly excited for the South Metro High School and I believe it will be a tremendous asset to our community as it moves forward.

I wholeheartedly support and endorse the chartering of the South Metro High School.

Sincerely,

[Signature]

David Casiano, Mayor
Town of Parker
dcasiano@parkeronline.org
September 15, 2008

Mr. Mark Baisley, Board President
South Metro High School
PO Box 631086
Highlands Ranch, CO 80163

Dear Mark:

I am delighted to learn of your plans to establish new charter high school in Douglas County, focusing on science, technology, engineering, and mathematics (STEM).

America's lagging performance in this field is an urgent concern for its global competitiveness in the 21st century, and Colorado particularly needs more STEM education to sustain the current strength of our high-tech economy among the states.

Charter schools are a huge asset in our state's educational marketplace of competition and choice. It's been my privilege to be closely involved with the charter school movement in Colorado from its inception in 1993, when I headed the Independence Institute and helped Bill Owens with the first legislation, through my time in the Senate when I worked with Peter Groff on statewide alternative chartering.

Your proposal for South Metro High School is in the very best of that strong 15-year charter school tradition, and I wish you all success with it. You and your capable associates in this project deserve the gratitude of the community and the full cooperation of the authorities in bringing the idea to fruition.

Sincerely,

John Andrews

JOHN ANDREWS
Senior Fellow, Claremont Institute
Former President, Colorado Senate
September 20, 2008

Southmetro STEM High
Southmetro Science Technology Engineering and Math High
Mark Baisley, Board President
PO Box 631086
Highlands Ranch, CO 80163

Dear Mark:

Thank you for your efforts to start a new charter high school in the south metro area. I write to offer my support for your efforts and to offer assistance as appropriate.

As you know, the Littleton Public School District has previously granted charters to two different K-8 schools. Littleton Academy and Littleton Prep have been very successful for both the families who attend these schools and for the school district.

In an era when many parents struggle with finding the right school environment for their children, charter schools have become a very important and popular option. Currently, this option is not available for families with children of high school age. The proposed STEM High School with a curriculum emphasizing math and science will be an important and welcome addition for families in the south metro area.

For the Littleton School District, I am sure that STEM High School will be a welcomed addition as well. With the area experiencing declining school enrollments, I am sure this new charter high school will attract a significant number of students from neighboring districts.

Thanks again for your efforts to bring this important and needed element of school choice to the south metro area. I enthusiastically support your efforts. Please feel free to contact me if I can assist with your efforts.

Sincerely,

[Signature]

Steve Ward
State Senator
District 26
September 29, 2008

Southmetro Science Technology Engineering and Math (STEM) High
Mark Bailes, Board President
PO Box 631086, Highlands Ranch, CO 80163

Dear Mark,

It is with great enthusiasm that I offer my support to you and the other “agents of change” who are pursuing a new charter high school, Southmetro STEM High! Colorado and the nation as a whole are experiencing a shortage of students pursuing math and science careers. I enthusiastically support Southmetro STEM High so that we will have a pipeline to fill future workforce demands in the high tech industry.

I am thrilled to support the new school, STEM High which will offer:

- Interactive technology
- A partnership with Universities in Colorado supporting STEM Education
- Offer a strong AP curriculum enabling college credit
- Industry professionals in partnership with our students education
- Rigorous core STEM curriculum
- Field projects with student research in areas of enrichment
- Specific service learning projects
- Enrichment activities associated with theories and practices in authentic learning
- Building personal integrity and business ethics
- Internships, community projects and Digital Research Portfolios
- An Expanded Learning Time program

Please thank everyone involved for your efforts to partner with the high-tech and business communities to help fill the workforce demands in the South Metro area.

Sincerely,

JOE RICE
State Representative
September 25, 2008

Southmetro STEM High
Mark Baisley, Board President
PO Box 631086
Littleton, CO 80163

Dear Mark,

Congratulations on your high tech high school! We are thrilled that you have chosen to charter your school in Littleton Public Schools. Please count us in for support in your STEM education project.

As you know the South Metro Chamber of Commerce has taken the lead in the STEM-EC Project for the South Metro area. We are networked with the most prestigious business and industry leaders, high tech education innovators, and government and political partners. We are pleased to open doors for you with all of our community partners.

As you are aware of, the U.S. Chamber of Commerce has adopted a STEM plan that includes Expanded Learning Time. We hope to send Chamber members to volunteer at your school in order to educate students in math and science.

Good luck in your endeavor and know that we are here to support you in every way possible.

Sincerely,

John Brackney
South Metro Chamber President

Brian Barton
Renewable Energy Coordinator
A Resolution Supporting
South Metro High Tech High (SMHTH)

WHEREAS, SMHTH will be responsive to the requirements of business and industry leaders so that Colorado businesses may compete in the global economy; and

WHEREAS, SMHTH will provide innovative, creative, cutting-edge high tech curriculum designed to meet Colorado’s growing high tech workforce development demands; and

WHEREAS, SMHTH will provide teaching and learning partnerships and collaborations between industry and education; and

WHEREAS, SMHTH will promote academic learning with workplace readiness in STEM (Science, Technology, Engineering and Math) subjects; and

WHEREAS, SMHTH will provide real world project-based learning opportunities in the classroom; and

WHEREAS, SMHTH will revise and enhance curriculum to address business/industry needs; and

WHEREAS, SMHTH will provide dual credit STEM courses with Arapahoe Community College; to enable students to seamlessly move from high school to higher education; and

WHEREAS, SMHTH will allow students to receive dual transcripts from SMHTH and Arapahoe Community College when they graduate from high school; and

WHEREAS, SMHTH will allow gifted and talented students to move faster and further in rigorous STEM fields; and

WHEREAS, SMHTH will collaborate and partner with high tech business and industry leaders to provide vision and inspiration to students to encourage STEM-related career choices; and

WHEREAS, SMHTH will collaborate and partner with high tech business and industry leaders to provide job shadowing, mentoring and coaching experiences for students; and

WHEREAS, SMHTH will collaborate and partner with high tech business and industry leaders to provide meaningful internships for high school students; and

WHEREAS, SMHTH will provide opportunities for business and industry leaders to teach classes through Adjunct Professorships offered through ACC.

NOW THEREFORE BE IT RESOLVED THAT, the Southeast Business Partnership fully support the efforts of South Metro High Tech High and will assist them in every way possible.

DATED: July 11, 2007
South Metro High Tech High
Letter of Support

I support the idea of South Metro High Tech High for the following reasons:

- SMHHTH will be responsive to the requirements of business and industry leaders so that
  Colorado businesses may compete in the global economy.
- SMHHTH will provide innovative, creative, cutting-edge high tech curriculum designed
  to meet Colorado’s growing high tech workforce development demands.
- SMHHTH will provide teaching and learning partnerships and collaborations between industry
  and education.
- SMHHTH will promote academic learning with workplace readiness in STEM (Science,
  Technology, Engineering and Math) subjects.
- SMHHTH’s goal is to graduate 120 qualified students each year with rigorous STEM degrees.
- 100% of SMHHTH students will pursue higher education to prepare them for high tech careers.
- SMHHTH will provide real world project-based learning opportunities in the classroom.
- SMHHTH will revise and enhance curriculum to address business and industry needs.
- SMHHTH will provide dual credit STEM courses with Arapahoe Community College and
  to enable students to seamlessly move from high school to higher education.
- SMHHTH will allow students to receive dual transcripts from SMHHTH and Arapahoe
  Community College when they graduate from high school.
- SMHHTH will allow gifted and talented students to move faster and further in rigorous STEM
  fields. SMHHTH will not hold students back who want to transition quicker.
- SMHHTH will collaborate and partner with high tech business and industry leaders to provide
  vision and inspiration to students to encourage STEM-related career choices.
- SMHHTH will collaborate and partner with high tech business and industry leaders to provide
  job shadowing, mentoring and coaching experiences for students.
- SMHHTH will collaborate and partner with high tech business and industry leaders to provide
  meaningful internships for high school students.
- SMHHTH will provide opportunities for business and industry leaders to teach classes through
  Adjunct Professorships offered through ACC.

[Signature]
Name, Title: Associate Professor of Pathology

[Signature]
Company

8/6/07
Date

(303) 266-4953
Phone Number

Please send responses to South Metro High Tech High, PO Box 261086, Highlands Ranch, CO 80163. For more
information please visit our website at www.southmetrohightechhigh.com
South Metro High Tech High
Letter of Support

I support the idea of South Metro High Tech High for the following reasons:

☐ SMHTH will be responsive to the requirements of business and industry leaders so that Colorado businesses may compete in the global economy.
☐ SMHTH will provide innovative, creative, cutting-edge high tech curriculum designed to meet Colorado's growing high tech workforce development demands.
☐ SMHTH will provide teaching and learning partnerships and collaborations between industry and education.
☐ SMHTH will promote academic learning with workplace readiness in STEM (Science, Technology, Engineering and Math) subjects.
☐ SMHTH's goal is to graduate 120 qualified students each year with rigorous STEM degrees.
☐ 100% of SMHTH students will pursue higher education to prepare them for high tech careers.
☐ SMHTH will provide real world project-based learning opportunities in the classroom.
☐ SMHTH will revise and enhance curriculum to address business and industry needs.
☐ SMHTH will provide dual credit STEM courses with Arapahoe Community College and to enable students to seamlessly move from high school to higher education.
☐ SMHTH will allow students to receive dual transcripts from SMHTH and Arapahoe Community College when they graduate from high school.
☐ SMHTH will allow gifted and talented students to move faster and further in rigorous STEM fields. SMHTH will not hold students back who want to transition quicker.
☐ SMHTH will collaborate and partner with high tech business and industry leaders to provide vision and inspiration to students to encourage STEM-related career choices.
☐ SMHTH will collaborate and partner with high tech business and industry leaders to provide job shadowing, mentoring and coaching experiences for students.
☐ SMHTH will collaborate and partner with high tech business and industry leaders to provide meaningful internships for high school students.
☐ SMHTH will provide opportunities for business and industry leaders to teach classes through Adjunct Professorships offered through ACC.

[Signature]
Robert Mahoney, Director of Engineering

[Signature]
Denver Water

Date
9/2/07

Phone Number
303-828-6611

Please send responses to South Metro High Tech High, PO Box 261086, Highlands Ranch, CO 80163. For more information please visit our website at www.southmetrohightechhigh.com
September 1, 2009

Mr. Mark Baisley, Board President
STEM High / Middle School
PO Box 631086
Highlands Ranch, CO 80163

Dear Mark,

It is with great enthusiasm that I write this Letter of Support to insert in the charter application for STEM High / Middle School. Starting a Science, Technology, Engineering and Math (STEM) high school has long been a goal of mine, because of the science high school I attended in West Bloomington, Michigan in the early 70’s. It was during my AP Biology class, taught by a talented educator, that I first decided to join the medical field. This high school education sparked my interest in medicine and today I am a leading Podiatric surgeon in the Denver Metro area. Some of my clients include the Denver Broncos and Nuggets.

Recently I was appointed by the Presbyterian / St. Lukes Hospital network to lead their residency program starting in the summer of 2010. As part of my duties, I would like to arrange for the best and brightest high school students from STEM High, to take part in mentoring, internship and job shadowing opportunities at some of the nation’s finest medical institutions here in the Denver Metro Area.

I am also a member of the adjunct faculty of a new medical school located in Parker, called Rocky Vista Medical School. I would be glad to help network STEM High with talented professors who can offer real-world teaching experience and other resources.

Thank you for this opportunity to increase the pipeline of students joining the medical, bioscience field.

Best wishes,

[Signature]

Dr. Paul Stone
Advanced Orthopedics
Parker, Colorado
01 October 2008

Letter for the Record
Subject: Support for STEM Charter High School

To whom it may concern,

Slipglass, Inc. enthusiastically supports the creation of the STEM Charter High School. The increasing demand for creative technologists in Colorado, coupled with the aging aerospace engineering workforce, motivate our involvement.

We are encouraged that this new school will maintain close relationships with the advanced technology business community, producing our employees in the next decade. As residents of Colorado, it is our intention to maintain a long term, contributing relationship with STEM Charter High School.

Regards,

Mark Baisley
President
Slipglass, Inc.
September 25, 2008

Southmetro STEM High
Mark Baisley, Board President
PO Box 631086
Littleton, CO 80163

Dear Mark,

Congratulations on your high tech high school! We are thrilled that you have chosen to charter your school in Littleton Public Schools. Please count us in for support in your STEM education project.

As you know the South Metro Chamber of Commerce has taken the lead in the STEM-EC Project for the South Metro area. We are networked with the most prestigious business and industry leaders, high tech education innovators, and government and political partners. We are pleased to open doors for you with all of our community partners.

As you are aware of, the U.S. Chamber of Commerce has adopted a STEM plan that includes Expanded Learning Time. We hope to send Chamber members to volunteer at your school in order to educate students in math and science.

Good luck in your endeavor and know that we are here to support you in every way possible.

Sincerely,

John Brackney
South Metro Chamber President

Brian Bartony
Renewable Energy Coordinator
A Resolution Supporting
South Metro High Tech High (SMHTH)

WHEREAS, SMHTH will be responsive to the requirements of business and industry leaders so that Colorado businesses may compete in the global economy; and

WHEREAS, SMHTH will provide innovative, creative, cutting-edge high tech curriculum designed to meet Colorado’s growing high tech workforce development demands; and

WHEREAS, SMHTH will provide teaching and learning partnerships and collaborations between industry and education; and

WHEREAS, SMHTH will promote academic learning with workplace readiness in STEM (Science, Technology, Engineering and Math) subjects; and

WHEREAS, SMHTH will provide real world project-based learning opportunities in the classroom; and

WHEREAS, SMHTH will revise and enhance curriculum to address business/industry needs; and

WHEREAS, SMHTH will provide dual credit STEM courses with Arapahoe Community College; to enable students to seamlessly move from high school to higher education; and

WHEREAS, SMHTH will allow students to receive dual transcripts from SMHTH and Arapahoe Community College when they graduate from high school; and

WHEREAS, SMHTH will allow gifted and talented students to move faster and further in rigorous STEM fields; and

WHEREAS, SMHTH will collaborate and partner with high tech business and industry leaders to provide vision and inspiration to students to encourage STEM-related career choices; and

WHEREAS, SMHTH will collaborate and partner with high tech business and industry leaders to provide job shadowing, mentoring and coaching experiences for students; and

WHEREAS, SMHTH will collaborate and partner with high tech business and industry leaders to provide meaningful internships for high school students; and

WHEREAS, SMHTH will provide opportunities for business and industry leaders to teach classes through Adjunct Professorships offered through ACC.

NOW THEREFORE BE IT RESOLVED THAT, the Southeast Business Partnership fully support the efforts of South Metro High Tech High and will assist them in every way possible.

DATED: July 11, 2007
Douglas County Board of Education,

I wish to sign this Letter of Support for the new charter high school project called, South Metro High Tech High. We encourage you to approve this charter school.

Sincerely,

Name: Lee Zhang

Address: 9257 Roadrunner ST.

City: Highlands Ranch State: CO Zip: 80129

Email Address: L @ aoka. com

Phone Number: (303) 346-2397

Business (Optional)
South Metro High Tech High
Letter of Support

Douglas County Board of Education,

I wish to sign this Letter of Support for the new charter high school project called, South Metro High Tech High. We encourage you to approve this charter school.

Sincerely,

Name: Aziz Khan

Address: 7525 S. Utica Dr. #137

City: Littleton State: CO Zip: 80125

Email Address: Khan_a2o@hotmail.com Alex Khan 13

Phone Number: 720-981-5755

Business (Optional) 303-757-9522
Douglas County Board of Education,

I wish to sign this Letter of Support for the new charter high school project called, South Metro High Tech High. We encourage you to approve this charter school.

Sincerely,

Name: Patty McMurray

Address: 15560 N. Castlewood Dr.

City: Franktown State: CO Zip: 80116

Email Address: jeffmemurray@hotmail.com

Phone Number: 303-660-0316

Business (Optional) 720-933-7373 (patty)
South Metro High Tech High
Letter of Support

Douglas County Board of Education,

I wish to sign this Letter of Support for the new charter high school project called, South Metro High Tech High. We encourage you to approve this charter school.

Sincerely,

Name: Libby Wunderlich

Address: 9018 N. Parker Rd.

City: Castle Rock State: CO Zip: 80108

Email Address: jimwunder @ aol.com

Phone Number: 303-799-8367

Business (Optional)
Douglas County Board of Education,

I wish to sign this Letter of Support for the new charter high school project called, South Metro High Tech High. We encourage you to approve this charter school.

Sincerely,

Name: John Smilley
Address: 1081 S. Jasper St.
City: Aurora State: CO Zip: 80017
Email Address: jdsmilley@comcast.net
Phone Number: 303-745-4081

Business (Optional)
South Metro High Tech High
Letter of Support

Douglas County Board of Education,

I wish to sign this Letter of Support for the new charter high school project called, South Metro High Tech High. We encourage you to approve this charter school.

Sincerely,

Name: Debra Smilley

Address: 1081 S. Jasper St

City: Aurora State: CO Zip: 80017

Email Address: debbie-smilley@comcast.net

Phone Number: 303-745-4081

Business (Optional) 720-286-2704 dsmilley@chem.com
South Metro High Tech High
Letter of Support

Douglas County Board of Education,

I wish to sign this Letter of Support for the new charter high school project called, South Metro High Tech High. We encourage you to approve this charter school.

Sincerely,

Natalie Tennison

Name: Natalie Tennison / Andy Tennison

Address: 10129 S. Jill Ave.

City: Highlands Ranch

State: CO

Zip: 80130

Email Address: Natalie.Tennison@yahoo.com

Phone Number: 303-470-9720

Business (Optional) Air Traffic Controller (FAA)
South Metro High Tech High
Letter of Support

Douglas County Board of Education,

I wish to sign this Letter of Support for the new charter high school project called, South Metro High Tech High. We encourage you to approve this charter school.

Sincerely, 

[Signature]

Name: Maureen Butler

Address: 37A Shoreham Circle

City: Castle Rock State: CO Zip: 80108

Email Address: MaureenButler@comcast.net

Phone Number: 303 660 3809

Business (Optional)
South Metro High Tech High
Letter of Support

Douglas County Board of Education,

I wish to sign this Letter of Support for the new charter high school project called, South Metro High Tech High. We encourage you to approve this charter school.

Sincerely,

Name: Diana Haney

Address: 10530 Wagon Box Circle

City: Highlands Ranch  State: CO  Zip: 80130

Email Address: thehaneys@qwest.net

Phone Number: 303-791-1203

Business (Optional)
Douglas County Board of Education,

I wish to sign this Letter of Support for the new charter high school project called, South Metro High Tech High. We encourage you to approve this charter school.

Sincerely,

Name: Lynette AND Bill Guenther

Address: 15589 Flowershil Cir

City: Parker State: CO Zip: 80134

Email Address: Lguenther@abrakadoodle.com
              WJG22Z@hotmail.com

Phone Number: 303-841-4008

Business (Optional) INFO TECH AND ART EDUCATION
Douglas County Board of Education,

I wish to sign this Letter of Support for the new charter high school project called, South Metro High Tech High. We encourage you to approve this charter school.

Sincerely,

Name:  

Address: 20878 East Sussex Court

City: Parker State: CO Zip: 80138

Email Address: ctcerdemmann@msn.com

Phone Number: 303-805-8747

Business (Optional) 

P.O. Box 261086  Highlands Ranch  Colorado  80163  303.522.2158
Douglas County Board of Education,

I wish to sign this Letter of Support for the new charter high school project called, South Metro High Tech High. We encourage you to approve this charter school.

Sincerely,

Name: Michael Kjar

Address: 11140 Colorado Ave

City: Parker State: CO Zip: 80138

Email Address: jokjar@comcast.net

Phone Number: 303-840-4800

Business (Optional)  

P.O. Box 261086  HIGHLANDS RANCH  COLORADO  80163  303.522.2158
South Metro High Tech High
Letter of Support

Douglas County Board of Education,

I wish to sign this Letter of Support for the new charter high school project called, South Metro High Tech High. We encourage you to approve this charter school.

Sincerely,

Name: Greg & Richelle Berkley

Address: 46379 Needleleaf Lane

City: PARKER State: CO Zip: 80138

Email Address: richelle@richelleberkley.com
              gregberkley@yahoo.com

Phone Number: 303-840-6644

Business (Optional)
Douglas County Board of Education,

I wish to sign this Letter of Support for the new charter high school project called, South Metro High Tech High. We encourage you to approve this charter school.

Sincerely,

Name: Candace Reed

Address: 2677 W. Long Place

City: Littleton State: CO Zip: 80120

Email Address: Candacecreed@msn.com

Phone Number: 303-794-1234

Business (Optional) 303-649-4500
Douglas County Board of Education,

I wish to sign this Letter of Support for the new charter high school project called, South Metro High Tech High. We encourage you to approve this charter school.

Sincerely,

Name: Mary Jostes
Address: 10051 Heatherwood Dr
City: Highlands Ranch Zip: 80126
State: Co
Email Address: mjjacjostees@juno.com
Phone Number: 303.470.3427

Business (Optional)
South Metro High Tech High
Letter of Support

Douglas County Board of Education,

I wish to sign this Letter of Support for the new charter high school project called, South Metro High Tech High. We encourage you to approve this charter school.

Sincerely,

Name: 

Marla Maestas

Address: 

10759 Foothill Way

City: Parker State: CO Zip: 80138

Email Address: 

Maestasboys @ msn.com

Phone Number: 

303.840.3840

Business (Optional) 

Kaiser Permanente
Douglas County Board of Education,

I wish to sign this Letter of Support for the new charter high school project called, South Metro High Tech High. We encourage you to approve this charter school.

Sincerely,

Name: Camie Lakos

Address: 7950 Eagle Feather St.

City: Lone Tree State: CO Zip: 80124

Email Address: camneddy@idcomm.com

Phone Number: 303-706-1048

Business (Optional)
Douglas County Board of Education,

I wish to sign this Letter of Support for the new charter high school project called, South Metro High Tech High. We encourage you to approve this charter school.

Sincerely,

Name: Nitin and Manju Kulkarni

Address: 4515 Hunterwood Dr

City: Highlands Ranch State: CO Zip: 80120

Email Address: manjushwek@yahoo.com

Phone Number: 303. 471. 9207

Business (Optional) Software Development

P.O. Box 261086 Highlands Ranch Colorado 80163 303.522.2158
Douglas County Board of Education,

I wish to sign this Letter of Support for the new charter high school project called, South Metro High Tech High. We encourage you to approve this charter school.

Sincerely,

Name: Paige Borlase

Address: 10123 S. Jill Ave.

City: Highlands Ranch  State: CO  Zip: 80130

E-mail Address: paigeneb@comcast.net

Phone Number: 720-344-4002

Business (Optional):
South Metro High Tech High
Letter of Support

Douglas County Board of Education,

I wish to sign this Letter of Support for the new charter high school project called, South Metro High Tech High. We encourage you to approve this charter school.

Sincerely,

Name: Kat & Jonathan Wagner

Address: 1003 Fieldstone Pl

City: Highlands Ranch State: CO Zip: 80126

Email Address: AVSKat@comcast.net

Phone Number: 303-471-1377

Business (Optional)
Douglas County Board of Education,

I wish to sign this Letter of Support for the new charter high school project called, South Metro High Tech High. We encourage you to approve this charter school.

Sincerely,

Name: Catherine Gordon

Address: 9595 East Aspen Hill Circle

City: Lone Tree  State: CO  Zip: 80124

Email Address: JGordon03@comcast.net

Phone Number: 303-723-0790

Business (Optional)
South Metro High Tech High
Letter of Support

Douglas County Board of Education,

I wish to sign this Letter of Support for the new charter high school project called, South Metro High Tech High. We encourage you to approve this charter school.

Sincerely,

Name: Zina Cole

Address: 10128 Jill Ave

City: Highlands Ranch    State: Co    Zip: 80120

Email Address: ZinaCole@Qwest.net

Phone Number: 303-471-1784

Business (Optional)
South Metro High Tech High
Letter of Support

Douglas County Board of Education,

I wish to sign this Letter of Support for the new charter high school project called, South Metro High Tech High. We encourage you to approve this charter school.

Sincerely,

Name: Patricia Cone

Address: 9467 Painted Canyon Cir

City: HE  State: CO  Zip: 80129

Email Address: carezone7@yahoo.com

Phone Number: 303 471 8556

Business (Optional)
Douglas County Board of Education,

I wish to sign this Letter of Support for the new charter high school project called, South Metro High Tech High. We encourage you to approve this charter school.

Sincerely,

Name: Patricia Connell — (Spanish Instructor)

Address: 4611 E. Whimbrel Dr.

City: Whitley State: Co Zip: 80126

Email Address: p2connell@comcast.net

Phone Number: 303-781-1196 Cell 303-319-1951

Business (Optional)
Douglas County Board of Education,

I wish to sign this Letter of Support for the new charter high school project called, South Metro High Tech High. We encourage you to approve this charter school.

Sincerely,

Name: Stacey Curtis & Patrick Curtis

Address: 11512 Foxtrail Ln

City: Parker State: CO Zip: 80135

Email Address: CurtisPorky@msn.com

Phone Number: 303-840-3733

Business (Optional) 303-696-5431
Douglas County Board of Education,

I wish to sign this Letter of Support for the new charter high school project called, South Metro High Tech High. We encourage you to approve this charter school.

Sincerely,

Yvonne & Steve Miller
Name: Steve and Yvonne Miller

Address: 5595 S Clarkson St

City: Littleton State: CO Zip: 80121

Email Address: steve.miller@sitelinkinternational.com

Phone Number: 303-761-2978

Business (Optional) 303-387-4403
South Metro High Tech High
Letter of Support

Douglas County Board of Education,

I wish to sign this Letter of Support for the new charter high school project called, South Metro High Tech High. We encourage you to approve this charter school.

Sincerely,

Name: Louie and Naomi Armenta

Address: 10575 Newlin CT.

City: Parker  State: CO  Zip: 80134

Email Address: Luna 10575@msn.com

Phone Number: 303.841.5775

Business (Optional): (Louie) Quest comm B.896-9203
(Naomi) Douglas County School District
Douglas County Board of Education,

I wish to sign this Letter of Support for the new charter high school project called, South Metro High Tech High. We encourage you to approve this charter school.

Sincerely,

[Signature]

Name: Kimberly C. Westrick

Address: 9775 Townsville Circle

City: Highlands Ranch, Colorado, 80130

Email Address: kimwestrick@qwest.net

Phone Number: 303-471-4432

Business (Optional)

P.O. Box 261086   Highlands Ranch   Colorado   80163   303.522.2158
South Metro High Tech High
Letter of Support

Douglas County Board of Education,

I wish to sign this Letter of Support for the new charter high school project called, South Metro High Tech High. We encourage you to approve this charter school.

Sincerely,

[Signature]
Name: Kimberly C. Westrick

Address: 9775 Townsville Circle

City: Highlands Ranch, Colorado, 80130

Email Address: kimwestrick@qwest.net

Phone Number: 303-471-4432

Business (Optional)

P.O. Box 261086   Highlands Ranch  Colorado  80163   303.522.2158
Douglas County Board of Education,

I wish to sign this Letter of Support for the new charter high school project called, South Metro High Tech High. We encourage you to approve this charter school.

Sincerely,

Name: Beekee Telesz

Address: 11440 S. Hilary Ct.

City: Parker  State: CO  Zip: 80138

Email Address: Beekee.comcast.net

Phone Number: 303-840-3513

Business (Optional)
South Metro High Tech High
Letter of Support

Douglas County Board of Education,

I wish to sign this Letter of Support for the new charter high school project called, South Metro High Tech High. We encourage you to approve this charter school.

Sincerely,

Name: Orpha Fermin
Address: 5375 Twilight Way
City: Parker State: CO Zip: 80134
Email Address: Orphafermin@comcast.net
Phone Number: 303-954-8376

Business (Optional)
South Metro High Tech High
Letter of Support

Douglas County Board of Education,

I wish to sign this Letter of Support for the new charter high school project called, South Metro High Tech High. We encourage you to approve this charter school.

Sincerely,

Name: Georgina El-Dirani

Address: 3159 East Otero Place

City: Centennial
State: CO.
Zip: 80122

Email Address: georginadirani@hotmail.com

Phone Number: (303) 779-9133

Business (Optional)
Douglas County Board of Education,

I wish to sign this Letter of Support for the new charter high school project called, South Metro High Tech High. We encourage you to approve this charter school.

Sincerely,  Debra Butte

Name:  Debra Butte

Address:  10952 Independence Drive

City:  Parker  State:  CO  Zip:  80134

Email Address:  debbutte@yahoo.com

Phone Number:  303-805-0954

Business (Optional)
South Metro High Tech High
Letter of Support

Douglas County Board of Education,

I wish to sign this Letter of Support for the new charter high school project called, South Metro High Tech High. We encourage you to approve this charter school.

Sincerely,

Name: Inez Hockom

Address: 8251 Wetherill Cir.

City: Castle Rock  State: Co  Zip: 80108

Email Address: inez.hockom@gmail.com

Phone Number: 720.935.7335

Business (Optional)
South Metro High Tech High
Letter of Support

Douglas County Board of Education,

I wish to sign this Letter of Support for the new charter high school project called, South Metro High Tech High. We encourage you to approve this charter school.

Sincerely,

Name: Stephanie Schannuth

Address: 6540 N. Windfield Ave.

City: Parker

State: CO

Zip: 80134

Email Address: Schannfam@juno.com

Phone Number: (303) 805-1592

Business (Optional)
SOUTH METRO HIGH TECH HIGH
LETTER OF SUPPORT

Douglas County Board of Education,

I wish to sign this Letter of Support for the new charter high school project called, South Metro High Tech High. We encourage you to approve this charter school.

Sincerely,

Name: Karmen Davis
Address: 14367 E. Layton Dr.
City: Aurora State: CO Zip: 80015
Email Address: Karmenjoy@aol.com
Phone Number: 303-693-9918

Business (Optional)

P.O. BOX 261086 HIGHLANDS RANCH COLORADO 80163 303.522.2158
South Metro High Tech High
Letter of Support

Douglas County Board of Education,

I wish to sign this Letter of Support for the new charter high school project called, South Metro High Tech High. We encourage you to approve this charter school.

Sincerely,

Name: Kimberly Fort

Address: 10545 N Windfield Ave

City: Parker State: CO Zip: 80134

Email Address: AKFORT4@MSN.COM

Phone Number: 303-805-0419

Business (Optional)
South Metro High Tech High
Letter of Support

Douglas County Board of Education,

I wish to sign this Letter of Support for the new charter high school project called, South Metro High Tech High. We encourage you to approve this charter school.

Sincerely,

Name: Lori Martin

Address: 8714 Wildrye Circle

City: Parker  State: Colorado Zip: 80134

Email Address: lmartin@chubb.com

Phone Number: 303-680-1247

Business (Optional)

P.O. Box 261086  Highlands Ranch  Colorado  80163  303.522.2158
South Metro High Tech High
Letter of Support

Douglas County Board of Education,

I wish to sign this Letter of Support for the new charter high school project called, South
Metro High Tech High. We encourage you to approve this charter school.

Sincerely,

Name: NAVA & BEHROOZ FAR

Address: 12430 Ventana Mesa Ct

City: Castle Rock State: CO. Zip: 80108

Email Address: BEHROOZRTL@yahoo.com & NAVALABET@yahoo.com

Phone Number: (303) 790-4212 cell: (303) 667-4777

Business (Optional) CDOT (303) 757-9193
South Metro High Tech High
Letter of Support

Douglas County Board of Education,

I wish to sign this Letter of Support for the new charter high school project called, South Metro High Tech High. We encourage you to approve this charter school.

Sincerely,

Name: Molin & Fred Jalilifar

Address: 10574 Jaguar Point

City: Littleton State: CO Zip: 80124

Email Address: mbjalilifar@yahoo.com

Phone Number: 303-799-9985

Business (Optional)

P.O. Box 261086 Highlands Ranch Colorado 80163 303.522.2158
South Metro High Tech High
Letter of Support

Douglas County Board of Education,

I wish to sign this Letter of Support for the new charter high school project called, South Metro High Tech High. We encourage you to approve this charter school.

Sincerely,

Name: Tracie Scott

Address: 7976 W. Deer Creek Pl.

City: Highlands Ranch State: CO Zip: 80129

Email Address: trasuresays@comcast.net

Phone Number: 720-344-2707

Business (Optional)
Douglas County Board of Education,

I wish to sign this Letter of Support for the new charter high school project called, South Metro High Tech High. We encourage you to approve this charter school.

Sincerely,

Name: Henry Winkler
Address: 2373 So. Tabor Way
City: Lakewood State: CO Zip: 80228
Email Address: Janet and Henry@Winklers.net
Phone Number: 303 984-5337
Business (Optional) Microsoft
South Metro High Tech High
Letter of Support

Douglas County Board of Education,

I wish to sign this Letter of Support for the new charter high school project called, South Metro High Tech High. We encourage you to approve this charter school.

Sincerely,

Fiona Breslin

Name: Fiona Breslin

Address: 6136 Stormy Mt. Ct.

City: Parker State: CO Zip: 80134

Email Address: cobreslin5@yahoo.com

Phone Number: 303-891-7791

Business (Optional)

P.O. Box 261086 Highlands Ranch Colorado 80163 303.522.2158
Douglas County Board of Education,

I wish to sign this Letter of Support for the new charter high school project called, South Metro High Tech High. We encourage you to approve this charter school.

Sincerely,

Name: Deborah + Dan Montelli
Address: 9896 S Miners St
City: Highlands Ranch  State: CO  Zip: 80126
Email Address: Dmontelli@excite.com
Phone Number: 303 846-2501
Business (Optional)  303 807-5741
Douglas County Board of Education,

I wish to sign this Letter of Support for the new charter high school project called, South Metro High Tech High. We encourage you to approve this charter school.

Sincerely,

Name: Jen Knighton

Address: 10906 Marcroft Dr

City: Parker State: CO Zip: 80134

Email Address: jensjays4@yahoo.com

Phone Number: 303-840-3400

Business (Optional)
South Metro High Tech High
Letter of Support

Douglas County Board of Education,

I wish to sign this Letter of Support for the new charter high school project called, South Metro High Tech High. We encourage you to approve this charter school.

Sincerely,  

David Diller

Name:  

David Diller

Address:  

11611 Masonville Drive

City:  

Parker

State:  

CO

Zip:  

80134

Email Address:  

ddiller@lgc.com

Phone Number:  

720-320-3525

Business (Optional)
South Metro High Tech High
Letter of Support

Douglas County Board of Education,

I wish to sign this Letter of Support for the new charter high school project called, South Metro High Tech High. We encourage you to approve this charter school.

Sincerely,

Name: Peter and Kulín Strimbu

Address: 10151 Alexa Lane

City: Highlands Ranch State: CO Zip: 80130

Email Address: Kulín@Strimbu.com

Phone Number: 303-470-6147

Business (Optional) 303-881-8178
South Metro High Tech High
Letter of Support

Douglas County Board of Education,

I wish to sign this Letter of Support for the new charter high school project called, South Metro High Tech High. We encourage you to approve this charter school.

Sincerely,  

[Signature]

Name:  

Jane Motler (Alex Motler)

Address:  

4053 Arroyo Run

City:  

Littleton  
State:  

CO  
Zip:  

80123

Email Address:  

janemotler@hotmail.com

Phone Number:  

303-973-9433

Business (Optional)
Douglas County Board of Education,

I wish to sign this Letter of Support for the new charter high school project called, South Metro High Tech High. We encourage you to approve this charter school.

Sincerely,

[Signature]

Name: JANE MOTLER (AIDEN MOTLER)

Address: 7053 ARROYO RUN

City: LITTLETON State: CO Zip: 80125

Email Address: janemotler@hotmail.com

Phone Number: 303-973-9433

Business (Optional)

P.O. Box 261086  Highlands Ranch  Colorado  80163  303.522.2158
South Metro High Tech High
Letter of Support

Douglas County Board of Education,

I wish to sign this Letter of Support for the new charter high school project called, South Metro High Tech High. We encourage you to approve this charter school.

Sincerely,

[Signature]
Name: Lorie Grothe

Address: 9108 S. Fox Fire Wy

City: Highlands Ranch State: CO Zip: 80129

Email Address: J.grothe@comcast.net

Phone Number: 303 346-1411

Business (Optional)

P.O. Box 261086 Highlands Ranch Colorado 80163 303.522.2158
South Metro High Tech High
Letter of Support

Douglas County Board of Education,

I wish to sign this Letter of Support for the new charter high school project called, South Metro High Tech High. We encourage you to approve this charter school.

Sincerely,

Name: Kelly & Kevin Milliman

Address: 2282 W. Briar Wood Ave.

City: Whiteman  State: CO  Zip: 80120

Email Address: kmilliman@aol.com

Phone Number: 720-283-6553

Business (Optional)
Douglas County Board of Education,

I wish to sign this Letter of Support for the new charter high school project called, South Metro High Tech High. We encourage you to approve this charter school.

Sincerely,

Name: Dean Kuhloie

Address: 5116 Tuscany Ct

City: Highlands Ranch  State: CO  Zip: 80130

Email Address: Kuhloie @ aol.com

Phone Number: 3) 470 - 0744

Business (Optional)
Douglas County Board of Education,

I wish to sign this Letter of Support for the new charter high school project called, South Metro High Tech High. We encourage you to approve this charter school.

Sincerely,

[Signature]

Name: Shirley Kuhloie

Address: 5116 Tuscany Ct

City: Highlands Ranch State: CO Zip: 80130

Email Address: Kuhloie @ aol.com

Phone Number: 3) 470 - 0744

Business (Optional)
Dear Mr. Baisley,

Thank you for the opportunity to work to help STEM High and Academy obtain a location.

As we have discussed, I have had the experience of helping Pinnacle Chapter School obtain a high school location and investigated its growth into a preschool location. Additionally I have worked with a private party to sell their property to the city of Aurora, as well as the sale of a large tract of land to a church for a school and church at the corner of Airport and Colfax.

In addition to STEM, I am working with another group to put a large land assemblage together for a school and athletic training facility.

I believe that these experiences will be of great value in bringing the negotiations with the City of Englewood and Shea Development for project area 81 and the adjacent 10 acres near the Highlands Ranch Town Center to a successful conclusion.

We are now in the process of finalizing a Letter of Intent with Englewood and working toward a Letter of Intent with Shea Development.

Additionally, under the Boards’ direction I have located 20 locations for a short term location in the area during the construction period. Thus providing the ability for STEM to open September 2010, if you choose. I am including 5 samples with this letter for your information.

Obviously the decision to open in September 2010 and acquire a space is dependent upon considerations of funding, obtaining your charter approval, etc. I will be at your service to provide any help and construct agreements that provide for these contingencies.

I have done that for Pinnacle and others, so we should be ready to move ahead quickly when you are ready.

As I have indicated, the City of Englewood has a draft proposal for our prime location. This Letter of Intent/Proposal should be completed by September 8, 2009.

Again, thank you for this opportunity to represent you and the Board.

Respectfully,

[Signature]

R. David Drahm
Managing Broker
Century 21 Advantage Plus
9800 S Meridian Blvd

Office For Lease in Englewood

Property ID: 375622

**Location**

9800 S Meridian Blvd
Englewood, CO 80112
Park/Complex: Meridian Int'l Bus Center
Market: DEN-SE
Submarket: Meridian
Cross Streets: SE of S Meridian Blvd and S Havana St

<table>
<thead>
<tr>
<th>Available SF</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>77,564 SF</td>
<td>$0.00 - $21.00 FSG</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Min Div</th>
<th>Max Contig</th>
<th>Sublease</th>
</tr>
</thead>
<tbody>
<tr>
<td>3,297 SF</td>
<td>42,032 SF</td>
<td>No</td>
</tr>
</tbody>
</table>

**Listing Summary**

**Property Description**

- **Building Size**: 142,967 SF
- **Class**: A
- **Common Area Factor**: 12.00%
- **Parking Spaces**: 580
- **Parking Ratio**: 4.09/1000

- **Floors**: 4
- **Status**: Existing
- **Year Built**: 1994
- **Min Floor Size**: 24,186 SF
- **Max Floor**: 35,550 SF

**Available Suites**

<table>
<thead>
<tr>
<th>Floor</th>
<th>Unit</th>
<th>SF Avail</th>
<th>Min Div</th>
<th>Max Contig</th>
<th>Rate</th>
<th>Available</th>
<th>Suite ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>200</td>
<td>42,632</td>
<td>20,000</td>
<td>42,632</td>
<td>$19.00 - $21.00 FSG</td>
<td>New</td>
<td>729796</td>
</tr>
</tbody>
</table>

Comments: Open plan, build to suit. Divisible to 20,000 SF.

Colliers Bennett & Kahnweiler

Ech Wattlesey  (303) 283-4581
John Hutto      (303) 283-4592

This information has been obtained from sources believed reliable. While we do not doubt its accuracy, we have not verified it and make no guarantees, warranty or representation about it. It is your responsibility to independently confirm its accuracy.
### Available Suites

<table>
<thead>
<tr>
<th>Floor</th>
<th>Unit</th>
<th>SF Avail</th>
<th>Min Div</th>
<th>Max Contig</th>
<th>Rate</th>
<th>Available</th>
<th>Suite ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>400</td>
<td>25,458</td>
<td>5,000</td>
<td>25,458</td>
<td>$0.00 FSG</td>
<td>Now</td>
<td>870034</td>
</tr>
</tbody>
</table>

Comments: Open plan, build to suit.
Exercise room complete with locker rooms with showers. Common conference room and onsite storage area. Overlooks the nearby Jack Nicklaus-designed golf course. Features executive covered parking, Qwest fiber optics, 24-hour HVAC. Close to executive housing in Castle Pines, Parker, Lone Tree & Highlands Ranch, as well as to Park Meadows Mall and Centennial Airport.

### Location
- **Address:** 9785 S Maroon Cir  
  Englewood, CO 80112
- **Park/Complex:** Meridian International Business Center
- **Market:** DEN-SE
- **Submarket:** Meridian
- **Cross Streets:** NE of S Meridian Blvd and Maroon Cir

### Listing Summary
<table>
<thead>
<tr>
<th>Available SF</th>
<th>Rate</th>
<th>47,768 SF</th>
<th>$21.00 NNN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min Div</td>
<td>Taxes/SF</td>
<td>999 SF</td>
<td></td>
</tr>
<tr>
<td>Max Contig</td>
<td>Operating Exp/SF</td>
<td>13,410 SF</td>
<td></td>
</tr>
<tr>
<td>Sublease</td>
<td></td>
<td>No</td>
<td></td>
</tr>
</tbody>
</table>

### Property Description
- **Building Size:** 139,269 SF
- **Floors:** 4
- **Status:** Existing 1994
- **Common Area Factor:** 34,817 SF
- **Parking Spaces:** 487
- **Parking Ratio:** 3.50/1000

### Available Suites

<table>
<thead>
<tr>
<th>Floor</th>
<th>Unit</th>
<th>SF Avail</th>
<th>Min Div</th>
<th>Max Contig</th>
<th>Rate</th>
<th>Available</th>
<th>Suite ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>200/210</td>
<td>11,719</td>
<td>11,719</td>
<td>11,719</td>
<td>$21.00 NNN</td>
<td></td>
<td>863231</td>
</tr>
<tr>
<td>4</td>
<td>410</td>
<td>13,410</td>
<td>13,410</td>
<td>13,410</td>
<td>$21.00 NNN</td>
<td></td>
<td>863235</td>
</tr>
</tbody>
</table>

### Cushman & Wakefield
- **Nick Pavlyevich**  (303) 815-6493
- **Matthew Gaulrea**  (303) 813-6400

This information has been obtained from sources believed reliable. While we do not doubt its accuracy, we have not verified it and make no guarantee, warranty or representation about it. It is your responsibility to independently confirm its accuracy.
Located in the heart of the Meridian International Business Center. Developed by Shea Properties, this state-of-the-art 88,584 square foot project provides a superior working environment which facilitates employee productivity while enhancing employee recruitment and retention.

**Location**

<table>
<thead>
<tr>
<th>Property ID: 961304</th>
</tr>
</thead>
</table>

- **9540 S Maroon Cir**
- **Englewood, CO 80112**
- **Park/Complex**: Meridian Business Center
- **Market**: DEN-SE
- **Submarket**: Meridian
- **Cross Streets**: NE of S Meridian Blvd and Maroon Cir

**Listing Summary**

- **Available SF**: 88,584 SF
- **Min Div**: 5,028 SF
- **Max Contig**: 75,776 SF
- **Sublease**: No
- **Rate**: $22.00 - $27.00 FSG
- **Taxes/SF**: Operating Exp/SF

**Property Description**

- **Building Size**: 88,594 SF
- **Class**: A
- **Status**: Existing
- **Year Built**: 2008
- **Common Area Factor**: 332
- **Parking Spaces**: 332
- **Parking Ratio**: 3.75/1000

**Available Suites**

<table>
<thead>
<tr>
<th>Floor</th>
<th>Unit</th>
<th>SF Avail</th>
<th>Min Div</th>
<th>Max Contig</th>
<th>Rate</th>
<th>Available</th>
<th>Suite ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>100</td>
<td>5,028</td>
<td>5,028</td>
<td>29,778</td>
<td>$22.00 - $27.00 FSG</td>
<td>728580</td>
<td></td>
</tr>
</tbody>
</table>

**Comments**: Raw space ready for build-out.

**Fuller Real Estate**

- Dan Miller: (303) 312-4272
- Joe Siglsted: (303) 312-4245
- C. Douglas Wulf: (303) 312-4218

*This information has been obtained from sources believed reliable. While we do not doubt its accuracy, we have not verified it, and make no guarantee, warranty or representation about it. It is your responsibility to independently confirm its accuracy.*
<table>
<thead>
<tr>
<th>Floor</th>
<th>Unit</th>
<th>SF Avail</th>
<th>Min Div.</th>
<th>Max Contig</th>
<th>Rate</th>
<th>Available</th>
<th>Suite ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 &amp; 2</td>
<td>100/200</td>
<td>29,778</td>
<td>5,026</td>
<td>55,719</td>
<td>$22.00 - $27.00 FSG</td>
<td>Available</td>
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<tr>
<td>2</td>
<td>200</td>
<td>24,750</td>
<td>10,000</td>
<td>55,719</td>
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<td>726581</td>
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Comments: Raw space ready for build-out.

<table>
<thead>
<tr>
<th>Floor</th>
<th>Unit</th>
<th>SF Avail</th>
<th>Min Div.</th>
<th>Max Contig</th>
<th>Rate</th>
<th>Available</th>
<th>Suite ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 &amp; 3</td>
<td>200/300</td>
<td>50,691</td>
<td>10,000</td>
<td>75,775</td>
<td>$24.00 - $27.00 FSG</td>
<td>Available</td>
<td>-237764</td>
</tr>
<tr>
<td>2 &amp; 1 &amp; 3</td>
<td>200/100</td>
<td>55,719</td>
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<td>75,775</td>
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<table>
<thead>
<tr>
<th>Floor</th>
<th>Unit</th>
<th>SF Avail</th>
<th>Min Div.</th>
<th>Max Contig</th>
<th>Rate</th>
<th>Available</th>
<th>Suite ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
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<td>25,941</td>
<td>10,000</td>
<td>75,775</td>
<td>$24.00 - $27.00 FSG</td>
<td>Available</td>
<td>726582</td>
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Comments: Raw space ready for build-out.

<table>
<thead>
<tr>
<th>Floor</th>
<th>Unit</th>
<th>SF Avail</th>
<th>Min Div.</th>
<th>Max Contig</th>
<th>Rate</th>
<th>Available</th>
<th>Suite ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 &amp; 4</td>
<td>300/400</td>
<td>51,025</td>
<td>10,000</td>
<td>75,775</td>
<td>$24.00 - $27.00 FSG</td>
<td>Available</td>
<td>-237766</td>
</tr>
<tr>
<td>3 &amp; 2 &amp; 4</td>
<td>300/200</td>
<td>75,775</td>
<td>10,000</td>
<td>75,775</td>
<td>$24.00 - $27.00 FSG</td>
<td>Available</td>
<td>-237765</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Floor</th>
<th>Unit</th>
<th>SF Avail</th>
<th>Min Div.</th>
<th>Max Contig</th>
<th>Rate</th>
<th>Available</th>
<th>Suite ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>400</td>
<td>25,084</td>
<td>10,000</td>
<td>51,025</td>
<td>$24.00 - $27.00 FSG</td>
<td>Available</td>
<td>726583</td>
</tr>
</tbody>
</table>

Comments: Raw space ready for build-out.

Fuller Real Estate
Dan Miller (303) 312-4272
Joe Sigmastad (303) 312-4245
C. Douglas Weiss (303) 312-4248

Please note, this information has been obtained from sources believed reliable. While we do not doubt its accuracy, we have not verified it and make no guarantee, warranty or representation about it. It is your responsibility to independently confirm its accuracy.
8740 Lucent Blvd

Office For Sublease in Littleton

Property ID: 402581

Layout: Mostly open area with 6x8 and 8x8 workstations; some private 10x10 offices. Workstations are on UPS; each Steelcase workstation has 2 voice and 2 data ports.

<table>
<thead>
<tr>
<th>Location</th>
<th>Listing Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>8740 Lucent Blvd</td>
<td>Available SF: 35,000 SF</td>
</tr>
<tr>
<td>Littleton, CO 80129</td>
<td>Min Div: 17,500 SF</td>
</tr>
<tr>
<td>Park/Complex</td>
<td>Max Contig: 35,000 SF</td>
</tr>
<tr>
<td>Market: DEN-SW</td>
<td>Sublease: Yes</td>
</tr>
<tr>
<td>Submarket:</td>
<td>Term: 10/31/2020</td>
</tr>
<tr>
<td>Cross Streets: NE of Plaza Dr and Lucent Blvd</td>
<td>Rate: $18.00 FSG</td>
</tr>
<tr>
<td></td>
<td>Taxes/SF:</td>
</tr>
<tr>
<td></td>
<td>Operating Exp/SF</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Property Description</th>
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</thead>
<tbody>
<tr>
<td>Building Size</td>
<td>210,000 SF</td>
</tr>
<tr>
<td>Floors</td>
<td>5</td>
</tr>
<tr>
<td>Status</td>
<td>Existing</td>
</tr>
<tr>
<td>Year Built</td>
<td>2000</td>
</tr>
<tr>
<td>Common Area Factor</td>
<td>Min Floor Size: 35,000 SF</td>
</tr>
<tr>
<td></td>
<td>Max Floor: 35,000 SF</td>
</tr>
<tr>
<td>Parking Spaces</td>
<td>1,050</td>
</tr>
<tr>
<td>Parking Ratio</td>
<td>5.00/1000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Available Suites</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Floor</td>
<td>Unit</td>
</tr>
<tr>
<td>6</td>
<td>600</td>
</tr>
</tbody>
</table>

Jones Lang LaSalle

Eric Bynested (303) 572-1900
Kenneth Gooden (303) 390-6202
T.J. Tankerg (303) 390-8223

This information has been obtained from sources believed reliable. While we do not doubt its accuracy, we have not verified it and make no guarantee or representation about it. It is your responsibility to independently confirm its accuracy.
400 Inverness Pkwy
Office For Lease In Englewood

One block to light rail. One block to Inverness Athletic Club. Close proximity to Park Meadows Mall & Inverness Hotel. Showers and Lockers. Executive covered parking. Western views.

| Property ID: | 375826 |

Location
400 Inverness Pkwy
Englewood, CO 80112
Park/Complex: Dry Creek Corporate Center
Market: DEN-SE
Submarket: Inverness
Cross Streets: NW of S Valley Hwy and Inverness Pkwy

<table>
<thead>
<tr>
<th>Listing Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Available SF</td>
</tr>
<tr>
<td>Min Div</td>
</tr>
<tr>
<td>Max Contig</td>
</tr>
<tr>
<td>Sublease</td>
</tr>
<tr>
<td>Rate</td>
</tr>
<tr>
<td>Taxes/SF</td>
</tr>
<tr>
<td>Operating Exp/SF</td>
</tr>
</tbody>
</table>

Property Description

<table>
<thead>
<tr>
<th>Building Size</th>
<th>111,605 SF</th>
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<tbody>
<tr>
<td>Class</td>
<td>A</td>
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<tr>
<td>Status</td>
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<tr>
<td>Year Built</td>
<td>1997</td>
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<tr>
<td>Min Floor Size</td>
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<tr>
<td>Max Floor</td>
<td>27,902 SF</td>
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<td>Parking Spaces</td>
<td>468</td>
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<tr>
<td>Parking Ratio</td>
<td>4.20/1000</td>
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</table>

Available Suites

<table>
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<tr>
<th>Floor</th>
<th>Unit</th>
<th>SF Avail</th>
<th>Min Div</th>
<th>Max Contig</th>
<th>Rate</th>
<th>Available</th>
<th>Suite ID</th>
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</thead>
<tbody>
<tr>
<td>4</td>
<td>400</td>
<td>28,475</td>
<td>28,475</td>
<td>28,475</td>
<td>$23.50 - $24.50 Gross</td>
<td>30 Days</td>
<td>544866</td>
</tr>
</tbody>
</table>

CB Richard Ellis (USA)
John Marolei
(730) 525-4155

This information has been obtained from sources believed reliable. While we do not doubt its accuracy, we have not verified it and make no guarantee, warranty or representation about it. It is your responsibility to independently confirm its accuracy.
Dear [Name],

This letter is to confirm the interest of Englewood McLellan Reservoir Foundation, hereinafter known as “EMERF,” to negotiate a long term lease of approximately 38.1 acres of ground at the known as PA 81 located at the Northeast corner of Lucent Boulevard and Town Center Drive in Highlands Ranch, unincorporated Douglas County, Colorado. We understand the land would be developed for use by the proposed Charter School referred to as the STEM Academy (“Tenant”).

We are prepared to negotiate a lease that includes the following:

1. Rent will be based on value of the unimproved land, and will be triple net. Rent will commence upon mutual execution of a lease.
2. The lease will not be subordinated to construction or other financing.
3. Tenant would have a 125 day due diligence period to satisfy and contingencies, including financing, Charter approval, other governmental approvals and acceptability of the condition of the land (which will be lease in its “as is” condition). Said due diligence shall commence upon receipt by tenant of its chapter school approval or December 2, 2009, whichever is earlier.
4. Landlord will agree to negotiate exclusively with the Tenant during the due diligence period.
5. The due diligence period will terminate in the event, Tenant fails to deliver by December 2, 2009. Landlord reasonable evidence of adequate financing for the project, or fails to obtain approval of its application for a Charter School by December 2, 2009.
6. Tenant shall guarantee landlord up to $10,000 to cover costs of landlord’s legal fees in the event that the tenant fails to execute a lease on the subject property, due to lack of funding for the project. If the tenant, for any other reason than funding, fails to execute a lease with the landlord on the above described property, then the tenant shall not be liable to the landlord for any legal fee reimbursement.

This letter is intended to confirm our interest in pursuing good faith negotiations to agree upon the terms and conditions of a long term ground lease, including the above terms. However, neither party shall have any obligation to the other until such time as the parties have executed a definitive agreement.

We look forward to working with you and wish you success in your application for a Charter School.

Sincerely,
<table>
<thead>
<tr>
<th>FACTORS</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
<th>Year 5</th>
</tr>
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<tbody>
<tr>
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<td>342</td>
<td>499</td>
<td>648</td>
<td>648</td>
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<td>Number of Administrators</td>
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<td>2</td>
<td>2</td>
<td>2</td>
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<tr>
<td>Number of Teachers</td>
<td>6.5</td>
<td>14</td>
<td>19</td>
<td>27</td>
<td>27</td>
</tr>
<tr>
<td>Number of Instructional Aides</td>
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<td>4</td>
<td>5</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Student Services Department Representative</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Number of Secretary/Attendance</td>
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<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Number of Other Staff (Tech Consultants, etc)</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Square Footage per Student</td>
<td>135</td>
<td>135</td>
<td>135</td>
<td>120</td>
<td>120</td>
</tr>
<tr>
<td>Facility Square Footage</td>
<td>23,625</td>
<td>46,170</td>
<td>67,365</td>
<td>77,760</td>
<td>77,760</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>REVENUES</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PPR</td>
<td>$1,216,775</td>
<td>$2,484,932</td>
<td>$3,788,832</td>
<td>$5,141,574</td>
<td>$5,372,945</td>
</tr>
<tr>
<td>Extended Learning Revenue</td>
<td>$72,000</td>
<td>$72,000</td>
<td>$72,000</td>
<td>$72,000</td>
<td>$72,000</td>
</tr>
<tr>
<td>Donations and Fundraising</td>
<td>$75,000</td>
<td>$75,000</td>
<td>$75,000</td>
<td>$75,000</td>
<td>$75,000</td>
</tr>
<tr>
<td><strong>Total Revenue</strong></td>
<td>$1,363,775</td>
<td>$2,631,932</td>
<td>$3,935,832</td>
<td>$5,288,574</td>
<td>$5,519,945</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>EXPENSES</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>District Operation of Special Programs</td>
<td>$85,174.25</td>
<td>$173,945.29</td>
<td>$265,218.24</td>
<td>$359,910.19</td>
<td>$376,106.15</td>
</tr>
<tr>
<td>Salaries</td>
<td>$90,000</td>
<td>$99,000</td>
<td>$108,900</td>
<td>$119,790</td>
<td>$125,779</td>
</tr>
<tr>
<td>Dean of Students</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teachers</td>
<td>$390,000</td>
<td>$882,000</td>
<td>$1,256,850</td>
<td>$1,875,352</td>
<td>$1,960,120</td>
</tr>
<tr>
<td>Instructional Aides</td>
<td>$50,000</td>
<td>$105,000</td>
<td>$137,812.50</td>
<td>$202,384.38</td>
<td>$212,713.59</td>
</tr>
<tr>
<td>Student Services Department Representative</td>
<td>$6,615</td>
<td>$16,000</td>
<td>$24,000</td>
<td>$29,000</td>
<td>$32,000</td>
</tr>
<tr>
<td>Substitute Teachers</td>
<td>$31,200</td>
<td>$70,560</td>
<td>$100,548</td>
<td>$150,028.20</td>
<td>$157,529.61</td>
</tr>
<tr>
<td>Technology Consultant</td>
<td>$20,000</td>
<td>$21,000</td>
<td>$70,000</td>
<td>$73,500</td>
<td>$77,175</td>
</tr>
<tr>
<td>Secretary / Attendance</td>
<td>$40,000</td>
<td>$84,000</td>
<td>$88,200</td>
<td>$138,915</td>
<td>$145,865.75</td>
</tr>
<tr>
<td>Salaries Total</td>
<td>$621,200</td>
<td>$1,261,560</td>
<td>$1,898,460.50</td>
<td>$2,703,127.58</td>
<td>$2,837,353.58</td>
</tr>
<tr>
<td>Benefits</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Retirement</td>
<td>$62,120</td>
<td>$126,156</td>
<td>$189,846.05</td>
<td>$270,312.76</td>
<td>$283,735.36</td>
</tr>
<tr>
<td>Health</td>
<td>$55,200</td>
<td>$105,600</td>
<td>$144,000</td>
<td>$196,800</td>
<td>$196,800</td>
</tr>
<tr>
<td>Medicare</td>
<td>$9,007</td>
<td>$18,292.62</td>
<td>$27,527.68</td>
<td>$39,195.35</td>
<td>$41,141.63</td>
</tr>
<tr>
<td>Benefits Total</td>
<td>$126,327.60</td>
<td>$250,048.62</td>
<td>$361,373.73</td>
<td>$506,308.11</td>
<td>$521,676.98</td>
</tr>
<tr>
<td>Materials and Supplies</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Textbooks and Instructional Material</td>
<td>$21,875</td>
<td>$42,750</td>
<td>$62,375</td>
<td>$81,000</td>
<td>$81,000</td>
</tr>
<tr>
<td>Other Books</td>
<td>$13,125</td>
<td>$25,650</td>
<td>$37,425</td>
<td>$48,600</td>
<td>$48,600</td>
</tr>
<tr>
<td>Software</td>
<td>$13,125</td>
<td>$25,650</td>
<td>$37,425</td>
<td>$48,600</td>
<td>$48,600</td>
</tr>
<tr>
<td>Classroom Paper and Supplies</td>
<td>$17,500</td>
<td>$34,200</td>
<td>$49,900</td>
<td>$64,800</td>
<td>$64,800</td>
</tr>
<tr>
<td>Materials and Supplies Total</td>
<td>$65,625</td>
<td>$128,250</td>
<td>$187,125</td>
<td>$243,000</td>
<td>$243,000</td>
</tr>
<tr>
<td>Services and Contracts</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Custodial</td>
<td>$28,350</td>
<td>$56,404</td>
<td>$80,888</td>
<td>$93,312</td>
<td>$93,312</td>
</tr>
<tr>
<td>Bookkeeping and Auditing</td>
<td>$13,637.75</td>
<td>$26,193.33</td>
<td>$39,158.32</td>
<td>$52,885.74</td>
<td>$55,199.45</td>
</tr>
<tr>
<td>Legal Services</td>
<td>$8,000</td>
<td>$10,000</td>
<td>$12,500</td>
<td>$15,625</td>
<td>$19,531.25</td>
</tr>
<tr>
<td>Liability and Property Insurance</td>
<td>$17,500</td>
<td>$34,200</td>
<td>$49,900</td>
<td>$64,800</td>
<td>$64,800</td>
</tr>
<tr>
<td>Waste Disposal</td>
<td>$2,000</td>
<td>$2,510</td>
<td>$3,150.05</td>
<td>$3,953.31</td>
<td>$4,961.41</td>
</tr>
<tr>
<td>Student Testing and Assessment</td>
<td>$4,375</td>
<td>$8,550</td>
<td>$12,475</td>
<td>$16,200</td>
<td>$16,200</td>
</tr>
<tr>
<td>Staff Development</td>
<td>$21,375</td>
<td>$42,750</td>
<td>$58,500</td>
<td>$81,000</td>
<td>$81,000</td>
</tr>
<tr>
<td>Board Operations</td>
<td>$2,500</td>
<td>$3,125</td>
<td>$3,906.25</td>
<td>$4,882.81</td>
<td>$5,126.95</td>
</tr>
<tr>
<td>Internet/Telephone/Cable</td>
<td>$7,000</td>
<td>$10,944</td>
<td>$15,968</td>
<td>$20,736</td>
<td>$20,736</td>
</tr>
<tr>
<td>Postage</td>
<td>$875</td>
<td>$1,710</td>
<td>$2,495</td>
<td>$3,240</td>
<td>$3,240</td>
</tr>
<tr>
<td>Copier Lease</td>
<td>$4,800</td>
<td>$5,040</td>
<td>$5,292</td>
<td>$5,556.60</td>
<td>$5,834.43</td>
</tr>
<tr>
<td>Services and Contracts Total</td>
<td>$110,412.75</td>
<td>$200,552.33</td>
<td>$284,382.62</td>
<td>$362,191.47</td>
<td>$369,941.49</td>
</tr>
<tr>
<td>Facilities and Capital</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rent/Lease/Mortgage</td>
<td>$259,875</td>
<td>$507,870</td>
<td>$741,015</td>
<td>$855,360</td>
<td>$855,360</td>
</tr>
<tr>
<td>Replacement Furnishings and Equipment</td>
<td>$28,000</td>
<td>$50,000</td>
<td>$90,000</td>
<td>$138,000</td>
<td>$138,000</td>
</tr>
<tr>
<td>Gas/Electric</td>
<td>$42,525</td>
<td>$83,106</td>
<td>$121,257</td>
<td>$139,968</td>
<td>$139,968</td>
</tr>
<tr>
<td>Security Alarm</td>
<td>$2,400</td>
<td>$2,520</td>
<td>$2,646</td>
<td>$2,778.30</td>
<td>$2,917.22</td>
</tr>
<tr>
<td>Tenant Finish</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Facilities and Capital Total</td>
<td>$332,800</td>
<td>$593,466</td>
<td>$894,916</td>
<td>$998,106.50</td>
<td>$998,245.22</td>
</tr>
<tr>
<td><strong>TOTAL EXPENSES</strong></td>
<td>$1,341,523</td>
<td>$2,607,852.12</td>
<td>$3,891,478.09</td>
<td>$5,172,543.64</td>
<td>$5,346,323.42</td>
</tr>
<tr>
<td>Surplus (Deficit)</td>
<td>$22,235.60</td>
<td>$24,080.84</td>
<td>$44,353.97</td>
<td>$115,930.54</td>
<td>$173,641.60</td>
</tr>
</tbody>
</table>
a assuming 5% attrition rate per class per year
b assuming on instructional aide per four teachers
c assuming square footage per high school student adjusted for student capacity
   (Charter School Report; CO League of Charter Schools)
d assuming 5% wage increase year-on-year
e assuming 4.5% growth based on FY2009-2010 growth from FY2008-2009
f based on $6,000 per month from industry partners
g special services provided by district based on 7% of PPR
h based on 10% wage increase year-on-year during school’s growth period; 5% following
i assuming 10% of teachers at 80% of average teacher salary
j based on part-time tech consultant for first two years followed by full time employee with 5% wage increase
k based on one administrative assistant per 300 students at 40,000 per year with 3% wage increase
l assumes 10% contribution per salaried employee
m assumes all salaried employees receive benefits equal to $400/month
n assumes 1.45% of earnings; Colorado does not participate in social security benefits for its educators
o assumes $125.00 per student per year
p assumes $75.00 per student per year
q assumes $100.00 per student per year
r assumes $.10 / sq ft per month
s based on 1% of gross revenue
t 8,000 initial cost plus 25% growth per year
u 2,000 initial cost plus 25% growth per year
v assumes $25 per student per year
w assumes $1,500 per year for each administrator, teacher, and teacher's aide; this figure includes conferences
x $2,500 initial expenses plus 25% growth during school expansion followed by 1.5% increase after year 4 for infla
y assumes $20.00 per student per year with 20% reduction in cost year-on-year for economies of scale adjustmen
z assumes 10 mailings per student per year at current postal rates
aa assumes $400 per month with 5% increase in expense per year
bb assumes $100 per student per year
cc assumes $11 NNN rate
dd assumes $1.80 / square foot per year
ee assumes $200 per month and increase of 5% of expense per year
APPENDIX H – PARENT LETTER OF INTENT

STEM High/ Middle School

Letter of Intent

Student’s Name: ____________________________________________

Parent’s Name: ____________________________________________

Address: _________________________________________________

City: __________________________ Zip: __________

Telephone: ______________________________________________

Email Address: ____________________________________________

Present School Attending: __________________________________

School District which you live in: _____________________________

Year entering ninth grade: _________________________________

Thank you for signing this letter of intent to enroll at South Metro High Tech High. We appreciate your interest in our school. This letter of intent is exactly what it says – a letter that you intend to attend STEM High / Middle.

Contact Information:
STEM High / Middle School
P.O. Box 631086
Highlands Ranch, CO  80163
303.522.2158

For Office Use Only

Date and Time Received:
APPENDIX I - INTERN PERFORMANCE REVIEW

High Tech High
Academic Internship Program

MENTOR: This form will help our interns learn more about their strengths and weaknesses with regard to work skills.
Please read the descriptions for each category and check the performance that best applies to your intern. Click "Submit" when finished.

1) Today's Date
2) Date of Internship (Months, Year)
3) Organization
4) Mentor Name
5) Intern Name

6) Project Design And Completion
Exceptional: Actively discusses, defines, and designs project with mentor, showing mentor several drafts for review, and successfully completes project.
Meets Expectations: Discusses, defines, and designs project with mentor, showing mentor one draft for review, and successfully completes project.
Satisfactory: After prompting, discusses, defines, and designs project with mentor, showing one draft for review, but final project lacks a desired element.
Needs Improvement: After initial discussion of project with mentor, fails to show mentor drafts for review and project does not meet expectations.

7) Mentor-Intern Communication
Exceptional: Talks with mentor about ideas and problems. Asks questions and actively listens.
Meets Expectations: Usually talks with mentor about ideas or problems. Often asks questions and actively listens.
Satisfactory: Sometimes talks with mentor about ideas or problems. Reluctant to ask questions or listen.
Needs Improvement: Rarely talks with mentor about ideas or problems. Prone to mistakes due to not understanding.

8) Attention To School Rules
Exceptional: Works 8 or more hours each week. Always notifies mentor (and HTH) about absences or lateness.
Meets Expectations: Works at least 8 hours each week. Always notifies mentor (and HTH) about absences or lateness.
Satisfactory: Usually works at least 8 hours each week. Fails to notify mentor (and HTH) about one absence or lateness.

Needs Improvement: Usually works at least 8 hours each week. Fails to notify mentor (and HTH) about two or more absences or lateness.

9) Professionalism
Exceptional: Always dresses appropriately, avoids distracting behavior, and avoids excessive
personal use of client equipment.  
**Meets Expectations:** Usually dresses appropriately, avoids distractive behavior, and avoids excessive personal use of client equipment.  
**Satisfactory:** Tends to dress inappropriately, distract others, and/or excessively use client equipment for personal reasons.  
**Needs improvement:** Often dresses inappropriately, distracts others, and/or excessively uses client equipment for personal reasons.

10) Time Management  
**Exceptional:** Routinely uses time well. Limited procrastination.  
**Meets Expectations:** Usually uses time well, but may have procrastinated on one or two things.  
**Satisfactory:** Tends to procrastinate, but usually meets deadlines.  
**Needs improvement:** Rarely meets deadlines; inadequate time management skills.

11) Quality Of Work  
**Exceptional:** Provides work of the highest quality that meets or exceeds mentor expectations. Work is error-free and typo-free.  
**Meets Expectations:** Provides high-quality work that generally meets mentor expectations. Work is error-free and typo-free.  
**Satisfactory:** Provides good-quality work that generally meets mentor expectations and may have some errors or typos.  
**Needs improvement:** Provides poor-quality work that fails to meet mentor expectations and was not checked for errors or typos.

12) Ethics/Integrity  
**Exceptional:** Always can be trusted to choose an ethical course of action. Admits any mistakes as soon as possible.  
**Meets Expectations:** Most of the time can be trusted to choose an ethical course of action. Admits mistakes fairly quickly.  
**Satisfactory:** Much of the time can be trusted to choose an ethical course of action. Somewhat slow to admit mistakes.  
**Needs improvement:** Cannot be trusted to choose an ethical course of action. Does not admit mistakes, or blames others.

13) Critical Thinking Skills  
**Exceptional:** Uses critical thinking skills to routinely provide useful ideas.  
**Meets Expectations:** Usually uses critical thinking skills to provide useful ideas.  
**Satisfactory:** Sometimes uses critical thinking skills to provide useful ideas.  
**Needs improvement:** Rarely uses critical thinking skills or provides useful ideas.

14) Preparedness  
**Exceptional:** Brings needed materials to the internship and is always ready to work.  
**Meets Expectations:** Almost always brings needed materials to the internship and is ready to work.  
**Satisfactory:** Almost always brings needed materials but sometimes needs to settle down and get to work.  
**Needs improvement:** Often forgets needed materials or is rarely ready to get to work.
15) Selection Of Tools/Technology

**Exceptional:** Always chooses the right tools, equipment, or procedures that will effectively help complete the task.

**Meets Expectations:** Usually chooses the right tools, equipment, or procedures that will effectively help complete the task.

**Satisfactory:** Sometimes chooses the right tools, equipment, or procedures that will effectively help complete the task.

**Needs improvement:** Must be regularly reminded which tools, equipment, or procedures will effectively help complete the task.

16) Problem-Solving

**Exceptional:** Actively looks for and suggests solutions to problems.

**Meets Expectations:** Refines solutions suggested by others.

**Satisfactory:** Does not suggest or refine solutions, but is willing to try others’ ideas.

**Needs improvement:** Does not try to solve problems or help others solve problems.

17) Attitude

**Exceptional:** Always supportive of project and organization, especially during tough times.

**Meets Expectations:** Usually supportive of project and organization, especially during tough times.

**Satisfactory:** Somewhat supportive of project and organization, especially during tough times.

**Needs improvement:** Generally unsupportive of project and organization, especially during tough times.

18) Focus On The Task

**Exceptional:** Consistently stays focused on the task and what needs to be done. Very self-directed.

**Meets Expectations:** Focuses on the task and what needs to be done most of the time. Mentor can count on this person.

**Satisfactory:** Focuses on the task and what needs to be done some of the time. Mentor must sometimes remind this person to be on-task.

**Needs improvement:** Rarely focuses on the task and what needs to be done. Lets others do the work.

19) Working With Others

**Exceptional:** Consistently listens to, shares with and supports the efforts of others. Works well with everyone.

**Meets Expectations:** Usually listens to, shares with, and supports the efforts of others. Works well with most others.

**Satisfactory:** Often listens to, shares with, and supports the efforts of others. Tries to work well with most.

**Needs improvement:** Rarely listens to, shares with, or supports the efforts of others. Does not attempt to work well with others.

20) Please write any comments you may have about your intern’s overall performance.

21) Please write any suggestions you may have about improving the Academic Internship Program at High Tech High.
NEW MILLENNIUM SCHOOLS

delivering six-figure teacher salaries in return for outstanding student learning gains

$100,000 +

by

MATTHEW LADNER, Ph.D.
Vice President for Research, Goldwater Institute

MARK S. FRANCIS, D.M.A.
Charter Liaison, Arizona Charter School Association
Founder, Arizona School for the Arts

GREGORY E. STONE, Ph.D.
Associate Professor, Research & Measurement
The Judith Herb College of Education, University of Toledo

GOLDWATER INSTITUTE
NEW MILLENNIUM SCHOOLS

delivering *six-figure teacher salaries* in return for outstanding student learning gains

**Executive Summary**

Despite the fact that American students enjoy higher average family incomes and per-pupil funding, they consistently rank near the bottom in international examinations of high school achievement. Many researchers point to the United States’ poor practices of recruiting, training, compensating, and retaining teachers. The highest-achieving countries tend to recruit their teachers from the top 5 percent of university graduates; however, on average, American K-12 schools recruit from the bottom third.

A growing body of research in the United States demonstrates that teacher quality makes a profound difference in student learning. Judging schools on a value-added basis, by measuring academic growth over time, reveals a profound need to attract high-quality teachers into American classrooms in large numbers. Students learning from three highly effective instructors in three successive grades learn 50 percent more than students who have three consecutive ineffective instructors. These results are consistent across subjects and occur after controlling for student factors. Teacher quality is 10 to 20 times more important than variation in average class sizes, within the observable range. Unfortunately, though, poor human resource practices lead high-quality teachers to cluster in leafy suburbs, far from the children most in need.

In this paper, we propose a charter school model based on providing value-added merit pay, identifying “master teachers” through value-added assessment, and adding more students to classes taught by master teachers. By giving these high-performing teachers two-thirds of the revenue for additional students, we find that a six-figure salary may well be within reach for master teachers with average class sizes in the low 30s (based on the current and recent historical practice in the United States). With high salaries as incentive, administrators can access new pools of talent and recruit more high-ability graduates into the classroom.
“‘You have teachers who are very diligent,’ said a middle-aged teacher from the Bronx. ‘They work very hard, and even come up with money out of their own pockets to pay for supplies, or even to help these children when they are in trouble. But there are many, many others who are not remotely interested in these kids. They tell the kids to their faces: ‘I don’t care what you do. I’m still going to get paid.’”


**Measuring Teacher Quality: The Coming Revolution**

For decades, many education policymakers have argued that teachers should be rewarded or sanctioned based on the academic achievement of their students. Teachers unions and others have argued that administrators cannot hold teachers accountable for results because they cannot “control the quality of their raw materials.”¹ In essence, they claim that because students have varying levels of academic capacity, it would be impossible to have a system of merit pay that would be fair to teachers. The National Education Association, in fact, passed a resolution in 2006 opposing “federal initiatives that mandate or promote traditionally defined merit pay schemes or other pay-for-performance systems that link teacher compensation to student achievement.”²

The status quo, however, is unfair to high-performing teachers, and profoundly unfair to disadvantaged students. Teacher salary schedules reward longevity, not performance. Those routinely staying long hours after school receive the same pay as their contemporaries who tear out of the building shortly after the bell sounds. Sadly, many of these dedicated, high-quality teachers leave the profession, justifiably frustrated by a system that does next to nothing to reward merit. Others seek higher-paying administrative jobs. Too few remain in the classroom.

With little control over compensation, many high-performing teachers gravitate toward more amiable working conditions in suburban school systems. All else being equal, for example, teachers with negotiating power often prefer to teach in Ann Arbor rather than Detroit; North Scottsdale rather than South Phoenix. This fact raises a profound equity issue, since the distribution of high-ability teachers reinforces preexisting educational disparities. The children most in need of high-quality instructors tend to be the least likely to have access to them.

The overall supply of high-quality teachers also represents a critical issue. Studies have documented a significantly lower-than-average academic ability among prospective teachers in colleges of education. By failing to recognize effort, ambition, or merit, teaching as a profession is simply not an attractive career option for most academically talented students.
For example, in 1998, Massachusetts required an academic skills exam for prospective teachers near the completion of their college careers. Fifty-nine percent failed the exam. The Seattle Times reported:

In Massachusetts, more than half of 1,800 would-be teachers flunked a literacy test—a test rated as “about the eighth-grade level” by state Board of Education Chairman, John Silber. It was not just the number of failures as much as it was how they failed. There were misspellings worthy of 9-year-olds, an inability to describe nouns and verbs, and failure to define words such as “imminent.” Most of the blaming fingers point to teachers’ colleges, which often fail to attract the brightest students or assure they master the basics of subjects they are to teach.3

The current system does not attract enough of the high-ability people needed in the teaching profession, does not keep in the classroom all those it does attract, and does not equitably distribute those who remain. We need to attract a greater number of academically talented individuals into the classroom, keep them there, and give more students the opportunity to learn from them.

The near-quadrupling of inflation-adjusted spending per pupil since 1960 has failed to address this problem in any meaningful way. We have tried to spend our way out of this problem and failed. Today, the average spending per pupil in the United States is near $10,000 per year, but 38 percent of American public-school fourth-graders, for example, still score “below basic” in reading.

Research on Teacher Quality: A Road Map for Reform

Fortunately, recent research demonstrates that we can greatly improve this situation with existing resources. Focusing on value-added assessment, the research has established that teachers vary widely in effectiveness, which greatly matters in student learning. William Sanders, currently of the SAS Institute, pioneered a method of teacher assessment known as “value-added assessment.” Using a vast amount of testing data from the Tennessee public schools, Sanders focused on achievement gains rather than levels.

Sanders’ ongoing research agenda focused on what students learned throughout the year, rather than on how much they knew at the end of the year. Using state examinations, Sanders measured gains by following the year-to-year progress of students from the end of year X to the end of school year X+1 and then to year X+2. Therefore, the research focused on growth in student achievement rather than proficiency.

By measuring student progress, Sanders established that teachers vary widely in terms of effectiveness—some teachers add tremendous value to student learning; many are in the middle; and some add very little. The differences in effectiveness were largely irrespective of student profiles and did not vary significantly with average class size.
Sanders summarized the breathtaking findings of his research as follows: “Research conducted utilizing data from the Tennessee Value-Added Assessment System (TVAAS) database has shown that race, socioeconomic level, class size, and classroom heterogeneity are poor predictors of student academic growth. Rather, the effectiveness of the teacher is the major determinant of student academic progress.”

Effective teachers produce greater gains regardless of student demographics, which raises an appalling equity issue in the distribution of quality teachers. Sanders writes:

African American students and white students with the same level of prior achievement make comparable academic progress when they are assigned to teachers of comparable effectiveness. However, at least in the system studied, black students were disproportionately assigned to the least effective teachers. Regardless of race, students who are assigned disproportionately to ineffective teachers will be severely academically handicapped relative to students with other teacher assignment patterns.

The difference between highly ineffective teachers and highly effective teachers proved to be profound. For example, Sanders found that the impact of teacher effectiveness is 10 to 20 times larger than that of variations in average class size, within the observable range. Sanders found that having an instructor in the bottom 20 percent of effectiveness for three years in a row results in a student learning 50 percent less than those with top 20 percent instructors.

These findings have profound implications. In early-childhood reading instruction, for example, the effectiveness of instructors literally makes the difference between literacy and illiteracy. Students subjected to a series of poor instructors early on often get so far behind that they benefit little from high-quality instructors later in their academic careers. Intuitively, this squares with much of what we know about high school dropouts, since they often lack the ability to read their textbooks and have given up on any aspiration they may have once had to go to college.

Looking at the current distribution of quality instructors reveals a staggering equity issue, but when considering the ratio of highly effective teachers to teachers overall, the challenge of attracting more effective teachers becomes even more daunting.

Based on Dr. Sanders’ research, the state of Tennessee adopted a system of value-added teacher quality assessment. The state produces reports on the value-added gains for each teacher and shares those reports with principals and with the individual teachers. Having this critical feedback is a step in the right direction; however, it does not go far enough.

Tennessee specifically designated these reports as falling outside the realm of a public record, which means that the public cannot access them. In addition, teacher compensation in Tennessee remains completely unrelated to teacher effectiveness. It is obvious that teacher union opposition played a key role in these decisions. In fact, the National Education Association delegates took a hard-line position that
maintains a declared steadfast opposition to “any system of compensation based on an evaluation of an education employee’s performance.”

If, however, we follow this research to its natural conclusions, we will embrace a system of teacher compensation that rewards the best teachers. First, schools should adopt value-added teacher assessment. Second, they should make the results of these evaluations public and as transparent as possible. Finally, they should compensate teachers according to the number of students a teacher effectively educates.

The aggregate test score data now available because of the testing and accountability movement provides a crucial first step toward transparency. But it is even more important for parents to know about the quality of instruction their children receive.

The next step would be to bring transparency down to the level of the individual teacher. Currently, there are huge disparities in teacher quality between school districts, between different schools in a school district, and even within individual schools. Sophisticated parents anecdotally identify the “good” teachers and discreetly lobby to have their children placed in those classes.

This proposal would also create the potential for high-quality instructors to receive much higher compensation. Education researcher Eric Hanushek stated that he could envision high-quality instructors routinely earning six-figure salaries. With the relative scarcity of teachers adding high amounts of value, a great need exists to attract higher numbers of highly capable teachers into the classroom. Like any well-functioning system, teachers should be rewarded based on success, and remediated or punished based on failure.

**The South Korean Model of Teacher Recruitment**

High salaries for high-achieving teachers could transform the teaching profession. For decades, education unions have sought smaller class sizes and across-the-board pay increases. From the students’ perspective, the results have not been positive. Figure 1 shows international comparisons of average class size. The figure clearly shows that the average South Korean student sat in a class more than twice as large as the average American class.
Far from harmed, however, South Korean students score much higher than American students do on international examinations of mathematics and science. Figure 2 presents average scores of seventh-graders from the Third International Mathematics and Science Study.

“The quality of an education system cannot exceed the quality of its teachers.”
The average South Korean seventh-grader scores 21 percent higher than the average American on seventh-grade mathematics, despite having much larger average class sizes. While a variety of factors contribute to the relative deficiency of American public schools, many scholars are beginning to suspect the main factor is the relatively inferior average quality of American teachers.

In *How the World’s Best Performing Schools Come Out on Top*, the international management consulting firm McKinsey & Company point squarely at teacher quality as a key variable in explaining variation in international academic achievement. In its findings, McKinsey quoted a South Korean policymaker who noted, “The quality of an education system cannot exceed the quality of its teachers.”

McKinsey found that the top-performing school systems around the world recruit their teachers from the top third of each graduating cohort. Moreover, South Korean schools draw from the top 5 percent of college graduates. Larger class sizes create the resources to pay South Korean instructors much higher salaries. The Organisation of Economic Co-operation and Development measures relative teacher pay by comparing the average salaries of teachers who have 15 years of experience with a nation’s gross domestic product (GDP) per capita. A high salary compared with per capita GDP suggests that a country invests more of its financial resources in teachers, and suggests a relative prestige of the profession. By definition, the average person in each of these countries will earn a ratio of 1. Figure 3 compares teacher salary to per capita GDP for the United States and South Korea.

*In South Korea, teaching is an honored profession—not just rhetorically but in compensation as well.*

Average Salaries for Experienced Teacher to Average National Gross Domestic Product per Person | 2000
(Source: OECD)
An experienced South Korean schoolteacher makes a relatively impressive wage. In South Korea, teaching is an honored profession—not just rhetorically but in compensation as well. In the United States, meanwhile, a teacher with a college degree and 15 years of experience makes a salary relatively close to the average GDP per person. Not surprisingly, there are many qualified applicants for each open teaching position in South Korea.

McKinsey quotes the New Commission on the Skills of the American Workforce to contrast the United States with those countries having more successful education systems: “We are now recruiting our teachers from the bottom third of high-school students going to college…. [I]t is simply not possible for students to graduate [with the skills they will need] unless their teachers have the knowledge and skills we want our children to have.”

To put matters even more succinctly, McKinsey quoted the Arab expression faakid ashay la yu’atee, meaning, “One cannot give what one does not have.” Teachers who were not themselves good students, and who lack advanced literacy skills, cannot be expected to be high-quality instructors.

**Literacy Among College Education Majors**

The National Council on Teacher Quality found that there were “numerous robust studies spanning many decades that looked at the impact of literacy on student achievement, all finding that a teacher’s level of literacy is a strong predictor of student achievement. A number of other factors, such as having certification or even a master’s degree, hold only a weak or no relationship with student outcomes.” The Council cites the finding of a major study on predicting teacher quality that found: “A teacher’s level of literacy, as measured by vocabulary and other standardized tests, affects student achievement more than any other measurable teacher attribute, including certification status, experience, and the amount of professional development that a teacher receives.”

The news gets worse. The United States has a general literacy problem with college students. The American Institutes for Research (AIR) recently assessed the literacy of 1,800 graduating seniors from 80 randomly selected two- and four-year colleges and universities. It found that 20 percent of U.S. college students completing four-year degrees have only what the researchers describe as “basic quantitative literacy skills,” meaning that they are unable to estimate whether their car has enough gas to get to the next gas station or calculate the total cost of ordering office supplies. The study also found that more than 50 percent of students at four-year colleges have only the most basic literacy skills, meaning that they cannot perform a basic task such as summarizing arguments in a newspaper editorial.

Furthermore, the AIR study found that education majors had the lowest average literacy scores among the major fields of study. These findings are remarkably disturbing, especially in light of recent research establishing a strong relationship between a teacher’s literacy scores and his or her students’ outcomes.
Some observers want to explain these differences in outcomes between Korean and American schools as a function of culture. Doubtlessly, there are cultural differences, but the most vital point to the success of a school is staff control over the school culture. The South Korean observation quoted in the McKinsey report is quite accurate: A school system cannot exceed the quality of its teachers. A school certainly can underperform the quality of its teachers and will certainly do so in instances of poor leadership. An effective school, whether operating as a district or private school, has a staff-led culture focused on academic achievement.

**Successful Models at Home**

There is a domestic example of schools that also outperform American public schools. Like South Korean schools, they have managed to create a higher level of academic achievement with lower spending per pupil with much larger average class sizes. Economically disadvantaged inner-city children going through this school system have much higher graduation rates from both high school and college.

Not surprisingly, this model is the Catholic school system. The ability of Catholic schools to rely on priests and nuns as staff members in previous decades doubtlessly has boosted average teacher quality, given the relatively modest level of spending. Catholic schools have succeeded in maintaining a successful academic culture in inner-city schools, even when the overwhelming majority of students are not Catholic.\(^\text{16}\)

Highly successful charter schools have also demonstrated that the combination of a determined leader, focused mission, and high-quality teachers can overcome even the most difficult educational challenges. Other schools with similar characteristics succeed in beating the odds of educating low-income children, regardless of the challenges they face.

**Recognizing and Changing the Status Quo**

In an education editorial, Louis V. Gerstner, Jr., former chairman and chief executive officer of IBM, summarized the problem with the current teacher pay system well:

> The heart of the problem is the arcane way we recruit and prepare teachers, along with the lockstep single salary schedule—which says a teacher equals a teacher equals a teacher, no matter how desperately society may need a certain skill set and no matter how well a teacher performs in the classroom. That’s senseless, yet it’s still the norm in the teaching profession.\(^\text{17}\)

American education policy has indeed taken a wrong turn. Teaching is an enormously important job, and the best research available strongly indicates that we have completely mismanaged the profession. American school districts have prized
quantity over quality and have not attracted a high enough number of academically
talented teachers. The system fails to reward high-quality results or to address
failure. Moreover, the system does not keep many of the high-quality teachers it
does manage to attract in the classroom, and school districts inequitably distribute
those high-quality teachers remaining in the system.

This project aims to create a workable school model to address these problems.
We aspire to pay high-quality teachers higher salaries and to treat teachers as
professionals. Professionals earn their compensation through results, and those with
better results achieve higher levels of compensation. Using value-added assessment
can overcome the critical obstacle to such success.

Much discussion centers on whether or not different models of value-added
assessment are completely fair to individual teachers. Any system of assessment, of
course, should aim to be as fair as possible. Recognition of the profound inequity—
for students and teachers—of the status quo, however, must underlie any and all
such discussions.

The model developed here would create a mechanism to achieve a substantial
increase in the aggregate effectiveness of teachers, attract a higher number of
quality candidates into the field, provide proper incentives for performance, and
either remediate or remove those who are miseducating children. Parents and
policymakers must recognize ineffective teachers as people who are damaging the
education of children.

The typical education union proposal—across-the-board pay increases—is
unworkable, ineffective, and inherently unjust. Such proposals literally keep
resources away from those who deserve them in order to reward those who
do not—and will not attract ambitious students into the teaching profession.
Columnist William Raspberry addressed the issue directly in the Washington Post:

The awkward secret is that too many young people who go into
education are among the least academically gifted of their college
classes. It seems to be the case that many of them choose to become
education majors precisely because it is among the easiest paths to a
professional career.18

We simply cannot attract more academically talented people into teaching without
addressing the elephant in the room: Teaching, as currently practiced, is an
unattractive career, largely because it does not reward merit. Although there have been
some sporadic small moves toward merit pay, these experiments have been modest in
comparison to the enormous shortage of high-quality instructors. School leaders need
to provide a vision for what the ultimate system of merit pay would look like.

Lawmakers should reform the training, recruitment, and compensation of teachers
at a systemic level. Waiting for broad and successful systemic reform in American
education, however, requires a time horizon of decades and the patience of Job.
Alternative delivery systems, such as charter-school and private-school vouchers, provide the opportunity to develop an Americanized version of the South Korean model straightaway.

The model put forward here involves the following elements:

- value-added assessment used both as a diagnostic teaching tool and as the foundation of merit pay for teachers
- two merit pay pools—one determined by value-added gains for teachers and principal evaluation, and another by meeting an overall growth goal for the school as a whole
- transparency in teacher performance—making value assessment aggregated at the teacher level available to parents
- identification of “master teachers” through multiyear tracking of value-added gains
- giving a greater number of students the opportunity to learn from master teachers, which allows class sizes to increase for teachers with a proven record of accomplishment
- paying master teachers a per-pupil bonus for additional students taught above the normal limit.

In short, this school model hopes to reverse the mistakes of the previous five decades of American public schools. Under this model, school districts will recruit from the top 5 percent of college students, not the bottom third. School districts typically compensate their teachers according to union-negotiated pay scales that reward longevity and advanced education degrees, neither of which are correlated to student academic achievement. The school model developed here would compensate teachers according to the learning gains of their students and the number of students taught.

School districts emphasize quantity over quality, hiring more teachers from the bottom third of college graduates. Instead, the model developed here allows more children the opportunity to learn from high-quality teachers. In the following section, we outline both a method for merit pay based on value-added assessment and a method for radically increasing the pay of master teachers through larger class sizes.

Below we develop a plan for value-added merit bonuses for teachers based on student gains. As will be demonstrated afterward, however, the prospect for recruiting high-ability teachers would be enhanced to an even larger degree by allowing high-quality teachers to instruct larger numbers of students.
AN ILLUSTRATIVE EXAMPLE OF VALUE-ADDED MERIT PAY

The following examples assume a 10 percent merit pool of funds set aside by the school administration for teaching staff, and base salaries and merit ratings as presented in Table 1. We use the examples to demonstrate the practical application of the merit calculation. First, we present models based on the academic literature. Next, we present two simplified models that arrive at similar results and are easier to comprehend and calculate.

We recommend that an explanation of the merit pay system be included in the standard teacher contract, regardless of the method chosen. We further recommend that the teacher affirmatively agree to the model when signing a contract.

**Table 1**

<table>
<thead>
<tr>
<th>Teacher Rating</th>
<th>Annual Salary</th>
<th>Merit Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Superior</td>
<td>$40,000</td>
<td>100</td>
</tr>
<tr>
<td>2. Great</td>
<td>$40,000</td>
<td>90</td>
</tr>
<tr>
<td>3. Good</td>
<td>$40,000</td>
<td>80</td>
</tr>
<tr>
<td>4. Average</td>
<td>$40,000</td>
<td>70</td>
</tr>
<tr>
<td>5. Poor</td>
<td>$40,000</td>
<td>60</td>
</tr>
</tbody>
</table>

The proposed final calculation model:

\[
T_i = \frac{\alpha S}{\sum_j M_j S_j - CS}
\]

where

- \(\alpha\) = available percentage merit pool allotted,
- \(d_i\) = fraction contributed to the merit pool by the instructor,
- \(S_i\) = base salary of instructor \(i\), and
- \(S\) = the total of all instructor salaries.
- \(M_i\) = merit rating for instructor \(i\), and
- \(C\) = a constant to be determined based on the budgetary restrictions.

Entering the first figures into the equation:

\[
T_i = \frac{(M_i - C) \cdot \frac{1(200,000)}{16,000,000 - C200,000}}
\]


Simplifying the equation:

\[ T_i = \left( M_i - C \right) \frac{20,000}{16,000,000 - C200,000} \]

The constant \( C \) plays an important role. We can either allow the merit distribution to fluctuate (where the evaluator uses average merit rating arbitrarily as a midpoint such that even poor performers get sizable increases) or fix one end at some point (such that merit increases are on a ratio scale, proportional to their merit rating). If we allow for fluctuation, we set \( C \) equal to zero, but if we wish to set a lower boundary, \( C \) would equal some defined percentage that represents that lower boundary.

First, let us present an example of \( C = 0 \) such that there are no fixed boundaries. Using salaries and ratings of teachers presented in Table 1, we arrive at Table 2.

<table>
<thead>
<tr>
<th>Teacher Rating</th>
<th>Annual Salary</th>
<th>Merit Rating</th>
<th>Merit</th>
<th>Merit Bonus</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Superior</td>
<td>$40,000</td>
<td>100</td>
<td>12.5%</td>
<td>$5,000</td>
</tr>
<tr>
<td>2. Great</td>
<td>$40,000</td>
<td>90</td>
<td>11.3%</td>
<td>$4,500</td>
</tr>
<tr>
<td>3. Good</td>
<td>$40,000</td>
<td>80</td>
<td>10%</td>
<td>$4,000</td>
</tr>
<tr>
<td>4. Average</td>
<td>$40,000</td>
<td>70</td>
<td>8.8%</td>
<td>$3,500</td>
</tr>
<tr>
<td>5. Poor</td>
<td>$40,000</td>
<td>60</td>
<td>7.5%</td>
<td>$3,000</td>
</tr>
</tbody>
</table>

The advantage of no fixed boundaries is a normal distribution around the fixed midpoint. However, as indicated, increases are more a function not of merit but of averages, which can disproportionately reward poorly performing teachers simply because their base salary is greater. We therefore recommend against this model in favor of those presented below. On the other hand, we can specify a minimum merit and associate that minimum with the lowest-performance rating.

If we assume then that our “poor” teacher, with the lowest merit rating of 60, should receive no more than a 1 percent merit increase, we can calculate the constant \( C \) necessary to achieve this goal:

\[ .01 = (60 - C) \frac{20,000}{16,000,000 - C} \]
Solving the equation, we find that $C = 52$, and

$$T_i = (M_i - 68).00125$$

Using the new constant, Table 3 reflects the bounded merit increases.

**table 3**

<table>
<thead>
<tr>
<th>Teacher Rating</th>
<th>Annual Salary</th>
<th>Merit Rating</th>
<th>Merit</th>
<th>Merit Bonus</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Superior</td>
<td>$40,000</td>
<td>100</td>
<td>6%</td>
<td>$2,400</td>
</tr>
<tr>
<td>2. Great</td>
<td>$40,000</td>
<td>90</td>
<td>4.75%</td>
<td>$1,900</td>
</tr>
<tr>
<td>3. Good</td>
<td>$40,000</td>
<td>80</td>
<td>3.5%</td>
<td>$1,400</td>
</tr>
<tr>
<td>4. Average</td>
<td>$40,000</td>
<td>70</td>
<td>2.24%</td>
<td>$900</td>
</tr>
<tr>
<td>5. Poor</td>
<td>$40,000</td>
<td>60</td>
<td>1.00%</td>
<td>$400</td>
</tr>
</tbody>
</table>

Merit increases are now clearly a function of merit rating and have less to do with base salary, although they remain connected.

In this example, however, the total merit increases awarded were lower than those from the unbounded example, and there remained a connection to base salary. One could handle this differently if the merit percentage increases were not considered as a percentage of the base salary but rather as a percentage of the merit dollars available. Merit dollars in the next example were factored as 10 percent of the total salaries paid, or $20,000. Table 4 presents merit increases when making this assumption.

**table 4**

<table>
<thead>
<tr>
<th>Teacher Rating</th>
<th>Annual Salary</th>
<th>Merit Rating</th>
<th>Merit</th>
<th>Pool</th>
<th>Merit Bonus</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Superior</td>
<td>$40,000</td>
<td>100</td>
<td>6%</td>
<td>34.28%</td>
<td>$6,857.14</td>
</tr>
<tr>
<td>2. Great</td>
<td>$40,000</td>
<td>90</td>
<td>4.75%</td>
<td>27.14%</td>
<td>$5,428.57</td>
</tr>
<tr>
<td>3. Good</td>
<td>$40,000</td>
<td>80</td>
<td>3.5%</td>
<td>20%</td>
<td>$4,000.00</td>
</tr>
<tr>
<td>4. Average</td>
<td>$40,000</td>
<td>70</td>
<td>2.35%</td>
<td>12.85%</td>
<td>$2,571.42</td>
</tr>
<tr>
<td>5. Poor</td>
<td>$40,000</td>
<td>60</td>
<td>1.00%</td>
<td>5.7%</td>
<td>$1,142.85</td>
</tr>
</tbody>
</table>

The model developed here allows more children the opportunity to learn from high-quality teachers.
The final example presented in Table 4 best accounts for merit (alloting significantly more money for better teaching), disconnecting merit from base salary altogether. In other words, it calculates merit bonuses as a percentage of the merit pool that each teacher deserves based on his or her merit score, not on base salary. This last model makes best use of the available merit funds, and we therefore recommend it.

**A Simplified Merit Calculation**

The above calculation is complex. The advantage of the final formula is that it allows precise control over the merit bonus process with the constant, which the evaluator can use to distribute funds away from the lowest performer and to the higher-performing teachers.

A result very similar to the final merit model presented in Table 4 can be calculated by simply squaring or cubing the merit scores, summing the squares or cubes, and dividing each score by the total. Table 5 demonstrates this process.

<table>
<thead>
<tr>
<th>Teacher Rating</th>
<th>Merit Rating</th>
<th>Merit Rating Squared</th>
<th>Pool</th>
<th>Merit Bonus</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Superior</td>
<td>100</td>
<td>10,000</td>
<td>30.30%</td>
<td>$6,060.61</td>
</tr>
<tr>
<td>2. Great</td>
<td>90</td>
<td>8,100</td>
<td>24.55%</td>
<td>$4,909.09</td>
</tr>
<tr>
<td>3. Good</td>
<td>80</td>
<td>6,400</td>
<td>19%</td>
<td>$3,879.00</td>
</tr>
<tr>
<td>4. Average</td>
<td>70</td>
<td>4,900</td>
<td>14.85%</td>
<td>$2,969.70</td>
</tr>
<tr>
<td>5. Poor</td>
<td>60</td>
<td>3,600</td>
<td>10.91%</td>
<td>$2,181.82</td>
</tr>
</tbody>
</table>

**Sum of Squares** 33,000

The result between a sum of squares approach and the final merit model presented in Table 4 are somewhat different, but the calculation is much simpler. To accentuate differences in merit scores somewhat more, one could use a sum of cubes, as presented in Table 6 below.
table 6

Sum of Cubes Method for Determining Merit Bonuses

<table>
<thead>
<tr>
<th>Teacher Rating</th>
<th>Merit Rating</th>
<th>Merit Rating Cubed</th>
<th>Pool</th>
<th>Merit Bonus</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Superior</td>
<td>100</td>
<td>1,000,000</td>
<td>35.71%</td>
<td>$7,142.86</td>
</tr>
<tr>
<td>2. Great</td>
<td>90</td>
<td>729,000</td>
<td>26.04%</td>
<td>$5,207.14</td>
</tr>
<tr>
<td>3. Good</td>
<td>80</td>
<td>512,000</td>
<td>18.29%</td>
<td>$3,657.14</td>
</tr>
<tr>
<td>4. Average</td>
<td>70</td>
<td>343,000</td>
<td>12.25%</td>
<td>$2,450.00</td>
</tr>
<tr>
<td>5. Poor</td>
<td>60</td>
<td>216,000</td>
<td>7.71%</td>
<td>$1,542.86</td>
</tr>
</tbody>
</table>

Sum of Cubes 2,800,000

The sum of cubes strategy numbers are even closer to those presented in the final merit model of Figure 4.

**Determining Merit Ratings**

We recommend a multifaceted approach to determining merit rating in which student gain scores play a primary role. We believe that the value-added methodology—using multiple assessments over the course of a year with external verification through an outside national norm-referenced exam—should serve as the basis for merit bonuses.

Gain scores should not be the sole determining factor of merit bonuses, however. Teaching is an inherently social enterprise, and the school leader should enjoy some discretion over bonuses to maintain a productive operating culture. Teachers contribute to the operation of a school in ways not necessarily reflected in test scores but that nevertheless are needed and valuable. They maintain discipline, sponsor outside activities, tutor students, and mentor newer teachers. We therefore recommend that the principal evaluate all teachers by factoring in both gains on test scores and other factors contributing to a successful school.

Additionally, the merit pay plan should recognize the social nature of teaching by incorporating an aggregate, communal goal that the staff strives for collectively. The principal and board of directors should develop and approve a plan annually. We suggest that the school set an overall goal of an average national percentile ranking for both reading and mathematics. This goal should start relatively low but slowly increase over time. Alternatively, the school can focus on gains on a national norm-referenced test and judge whether the school has failed or succeeded as a whole.

The principal will determine merit bonuses based on the average of the gain score, the teacher’s evaluation, and whether the teacher met the school-wide goal.
We recommend that schools spend two years identifying their high-quality, “rock-star” teachers through value-added analysis; certify them as such; assign them additional students; and then give the teacher the bulk of the additional revenue.

A school operator can determine the relative weight of each of these factors (we recommend that gain scores represent at least 50 percent of this average).

Further, we recommend maintaining a separate bonus pool of funds based on the social test score goal developed by the principal and adopted by the board. This could be accomplished by dividing the merit pool described above, but ideally it would be a separate pool. For example, a school could have a 10 percent pool based on gain and evaluation scores and another 5 percent pool based on the school’s social goal.

Some merit schemes around the country have tied extra money to continuing education. Operators should encourage teachers to seek out continuing education that they believe will help improve the student gain scores, but the formula should reward actual improvement rather than rewarding the taking of classes per se. Teachers would then be more selective in continuing education, not taking classes simply to check off a requirement but as a method of seeking to improve student learning.

We believe that merit pay is an important element of aligning the interests of students with those of teachers. Merit pay alone, however, does not constitute a game-changer in terms of improving the attractiveness of the teaching profession to highly capable and ambitious college graduates. To do that, we must also create additional resources to compensate teachers with larger-than-average class sizes.

**Master Teachers and Six-Figure Teacher Salaries**

Students desperately need high-quality teachers, but the profession attracts too few of them, keeps too few of the ones it gets in the classroom, and then distributes the limited remaining pool in an inequitable fashion. Schools can remedy this situation not only by paying merit bonuses but also by identifying master teachers and giving them additional students to teach. The additional students make possible much higher teacher pay.

The pay model given previously uses a start-up charter model as a baseline, with $40,000 teacher salaries. Our budget assumes teacher salaries constitute 26 percent of the overall budget, with a ratio of just under 20 students for each teacher and a school total of 136 students. The school would begin with seven teachers who have an average starting salary of $40,000 and have a total revenue of about $1,069,000 in the first year (revenue per pupil in the first year equals $7,860, the funds available per student for an Arizona charter school in 2007).

The value-added research shows us that teacher quality trumps the impact of class size. Therefore, we recommend that schools spend two years identifying their high-quality, “rock star” teachers through value-added analysis; certify them as such; assign them additional students; and then give the teacher the bulk of the additional revenue.
Such a plan begs the question: What would be the marginal increase in cost to the school for adding a 21st child to the class of a master teacher? There would be additional costs for more books, tables, and chairs, for example; utility costs would higher. Strictly speaking, though, these marginal costs would be very limited, given the right kind of facility. Facility concerns do introduce significant constraints (as we discuss later), but for now we assume a flexible facility that can accommodate relatively large class sizes.

We propose to split the additional revenue with the master teacher on a 2/3-to-1/3 basis, with the teacher receiving the larger share. In our example, this would allow the school operator to pay a $5,235 bonus to master teachers for each child educated beyond the normal minimum. Taking on five additional children would net the master teacher a $26,176 bonus; ten additional children would amount to a $52,353 bonus.

A master teacher would cross the six-figure threshold in total compensation (base salary and class size bonus, not including the merit bonus) by taking 12 additional students and having a class size of 32, which is hardly outside the realm of experience for American public schools. Schools successfully developing this model would clearly become the employer of choice for bright, talented, and self-confident potential teachers.

Only experimentation with this model will reveal the location of the point of diminishing returns for class size. We know that teacher quality is significantly more important than class size within the observable range. Having 32 students in a class seems likely to be within the observable range of American schools and provides more than enough funding to attract the right person to produce the right results.

Market-Testing a South Korean-Style School in the United States

Would American parents be willing to enroll their children in a South Korean-style school with value-added merit pay, higher teacher pay, and larger classroom sizes? Market research indicates no—at least not in a cold-turkey fashion.

Americans have an unhealthy if unrecognized obsession with small classes. For purposes of this project, we market-tested the concept of a school emphasizing teacher quality over class size. Knooodle Shop, a Phoenix-based market research firm, recruited both public-school parents and private/charter-school parents from the Phoenix area. Public- and private/charter-school parents sat in two separate groups and had a moderator progressively introduce the notion underlying such a school.

The moderator first described the findings of value-added research, showing parents that teacher quality is far more important to student learning than average class size within the observable range. The moderator also told the parents the reasons why schools have difficulty recruiting high-quality teachers, and the frustrations they face in keeping such teachers.
The parents received information about new data management software products and how teachers and administrators could use these systems to monitor academic progress on an ongoing basis. The parents also heard about how such information could be made available to them, as well, through a password-protected website, which would allow them to monitor the progress of their child.

Both groups of parents were strongly favorable to all of these concepts. They were open to the idea that teacher quality was crucial, and they liked the idea of value-added assessment and paying good teachers more money.

Awareness of data management systems in schools was moderate to low across the board, although general interest in learning more about them was high. One parent in the charter school group believed that her school was already using such a system, since she received phone calls from her child’s teacher every two weeks and used a website to look at learning progress in detail. A few other parents wondered whether the tracking system presented was comparable to testing done by the Sylvan Learning Centers.

When asked if the use of a data management tracking system was positive, a strong majority said it was “common sense” to use it. It would make principals better managers and would help to ensure that students learn and grow academically, since teachers can more easily correct learning problems with early detection.

When asked whether they would be willing to enroll their child in a school using value-added assessment for the purpose of giving merit pay for teachers—with larger class sizes and much higher teacher pay—most parents balked at the idea, even after having been told that teacher quality trumps class size. The session moderator made the statement: “A growing body of academic research shows that teacher effectiveness is the biggest factor in driving academic success. In short, all else being equal, some teachers are much more effective than others. Research has shown that, when tracking student academic progress over a three-year period, students learning from the top 20 percent most highly effective instructors learned 50 percent more than those taught by the bottom 20 percent of teachers.”

Parents strongly agreed with the statement that highly effective instructors can help students to learn more. Effective teachers can have a positive lifetime impact on students by engaging and encouraging them to study and learn—even those children who do seem not to want to learn can. Administrators need to be able to evaluate teachers well so that they hire and keep the best teachers possible.

Next, the moderator asked the parents whether they would be interested in sending their students to a school that tracked teacher effectiveness over time and then made those results available to parents. Tracking teacher effectiveness interested nearly all of the parents, but some seemed skeptical, citing the time it would take for teachers to update or enter data and the amount of exams that would be required to feed the system. Ultimately, participants mostly agreed that the tracking

Education research has consistently found that the talent of the teacher is very important in driving learning, but that average class size is not.
system would help parents when deciding which school was best for their children. Participants noted that the use of teacher tracking reports would force school administrators to be more accountable to parents for the quality of the teaching staff employed. Less-effective teachers would either be let go or retrained, ensuring that only highly effective instructors teach students; teachers would be more motivated to improve their performance.

The moderator then introduced information regarding the relative efficacy of teacher quality with the statement: “Education research has consistently found that the talent of the teacher is very important in driving learning, but that average class size is not. The research indicates students are much better off in a larger class with a talented teacher than they are in a smaller class with an ineffective instructor.”

At this point, the parents began to become skeptical. Although the focus group participants in both discussion groups agreed strongly with the correlation of teacher effectiveness to student learning, many had difficulty believing the notion that class size is not a factor. They maintained that small class sizes are needed especially for younger students and difficult subject matters. Some parents based their rejection of larger class sizes, even at higher school levels, on the belief that there are too many disciplinary problems with these age groups and that students are less likely to participate.

Many parents expressed compassion for the difficult situations teachers often experience (i.e., large class sizes with no assistants, disobedient and rowdy students, lack of time, difficulty working with students who have fallen behind). In fact, compassion for the teachers seemed more of a priority to the parents than was the quality of education children are receiving.

The moderator posed the final question: “Some reformers have begun to think about designing a high school based on this type of measurement that may resemble a university model with lecture style classes, teaching aids, and very high-quality instructors. It would be different than universities in that there would be tracking measurements of student progress biweekly to help communicate learning progress better with parents, track teacher effectiveness, and reward teachers for measurable results.” Many parents reacted negatively to this concept, insisting that their child requires far more individual attention than could be given in such a model.

Ultimately, when asked whether they would consider enrolling their child in a charter school with higher-quality teachers and larger class sizes, the tally came down as presented in Figure 4.
The Koodle Shop marketing team concluded that success for this school model would rely on a specific type of academically enthusiastic student. Parents often pointed out that only those children who were well behaved and highly motivated would likely do well in the proposed school’s type of atmosphere. Even still, measures would have to be put in place to help ensure student-teacher interaction and class participation.

The 11 parents who said they were not likely (“somewhat unlikely” and “not at all likely”) gave the reasons that either (1) their children would not likely do well in this type of school, or (2) they themselves survived and succeeded in the public school system and therefore did not feel the need to have such an option. A few of the parents in the private/charter-school group also indicated that they were currently happy with their children’s school.

The Koodle Shop team reached the following five conclusions based on its research:

1. Parents need detailed knowledge of the data management system needs. This description needs to reassure parents that such a system would not be taking away teaching time to update or enter data and that students would not be required to take too many exams to feed the system.

2. Larger class sizes would be a barrier to a large proportion of parents who consider this model for their children. Parents are most likely to accept the larger class sizes if done only for junior- and senior-level students, since there is a need to transition students to this style of learning.

3. Those most likely to be attracted to this school model are in a very specific target market, namely families with educationally ambitious, personally motivated teens. Parents were very clear that the school would have to be a good fit for their child.
School operators would require proof of teacher effectiveness upfront to entice parents to consider this model, especially data confirmed by reliable third-party entities. Until the new school has built a reputation for having the highest-quality teachers, parents would have to rely on information disseminated by the school or by third-party evaluations. The information provided would need to include, for example, facts about how the school prevents teachers from cheating.

There was a general proclivity toward protecting teachers from scrutiny or other added difficulties in the classroom. Parents want reports about effectiveness of teachers, but they do not want to embarrass the teachers or have the reports published.

Implications of the Market Research

Simply put, the myth of the curative powers of the small-sized class has a deep hold in our society. Our focus groups revealed that parents generally liked the idea of value-added assessment, were somewhat apprehensive about merit pay, and liked the idea of paying teachers more money. Many balked, however, at putting their child into a classroom with a documented master teacher at a high rate if there were going to be many other children in the classroom—even after learning that the research showed teacher quality to be far more important than average class size. Many parents simply did not believe it.

Our recommended implementation model therefore involves incremental adoption. Schools would implement value-added assessment and merit pay elements, establish and market both high test scores and value-added gains, and build a waiting list of parents. Based on their value-added scores, and over the course of a couple of years of practice, those earning the master teacher title would emerge. Those master teachers could then take on additional students using the 2/3-to-1/3 teacher-to-school split of revenue.

The school would give children from the waiting list the opportunity to learn from master teachers. Since teacher quality trumps class size, this will be a winning proposition for the student. Finally, schools would create a revenue stream with which to reward and retain their master teachers.

The goal should be to have all teachers at the master teacher level over time. Introduced incrementally, parents can get comfortable with the school and the model of education, and the results will speak for themselves. In a charter school situation, parents are free to transfer their children elsewhere. Those parents who remain wedded to their preference of small classes can seek such an education for their children at other schools.

The huge advantage of this model is that teacher quality will be far above average. By measuring value-added gains, this model will remediate or remove failure quickly. Average teacher quality will improve considerably simply by removing low performers efficiently.
The merit pay and higher salaries, however, create the proper incentives for excellence and would draw from a much broader pool of talent. What teacher would want to be an administrator when she could enjoy the pay and prestige of being a master teacher?

School operators, however, must recognize that parents are very hesitant to enroll their children in larger classes. This obstacle can be overcome, however, when early adopters enjoy the substantial reward of having their children educated at a higher level than their peers.

MASTER-APPRENTICE MODEL VARIATION

Another model could involve putting two teachers into a single classroom. Imagine a classroom with 40 students and two teachers—a master teacher and an apprentice. If we assume $7,800 per pupil in revenue, and a classroom of 40 students that generates $312,000 in revenue, then a total teacher compensation of $150,000 keeps the cost below 50 percent of the total revenue. Such compensation likely would attract serious ability into the classroom, with the possibility of having the master teacher’s compensation in the low six figures.

With two instructors in the classroom, one teacher’s set of eyes can be on the students even when the other teacher has her back to the class. The dual-instructor model also can provide more individual attention to students.

Dual instructors also provide flexibility for filling in gaps when one of the teachers misses class because of an illness or family emergency, or for absences related to professional development. Unlike a substitute teacher “parachuting” into a class with little context, an apprentice teacher can readily fill the gap because she knows the students personally, understands the lesson plan and subject, and has a much better chance of productively leading the class.

The Benchmark charter school in North Central Phoenix uses two teachers in its classroom model. Greatschools.net ranks Benchmark as 10 out of 10 in its analysis of school test scores, and the school routinely scores above the 80th percentile on national norm-referenced exams.

Benchmark has 30 children in a classroom, with two teachers in each class and two classes for each grade. Barbara Darroch, president of Benchmark, stressed that one of the main benefits of this model is the opportunity to perform ability subgrouping within the classroom. This method allows the teachers to aim instructional techniques at children who are behind, as well as more advanced instruction to students who are ahead of the class average. The ability to do such personalized learning has been crucial to the success of the school.
Benchmark’s model significantly differs from the proposal here, because it does not employ a web-based data management system performing value-added analysis on an ongoing basis. Also, its dual-teacher approach is not a master-apprentice model; it involves coequals in the classroom. Most important, at a 15-to-1 student-to-teacher ratio, the finances are simply not in the system to provide a game-changing level of compensation to a master teacher.

Benchmark’s model is a proven one that has worked wonderfully for its students. We, by contrast, have not proven this model by actual practice. The key goals of this project, however, are to develop a scalable school model that will attract a greater number of extremely capable people into the teaching profession. In our view, this will require experimentation.

Nevertheless, modifications of Benchmark practices might allow a school to provide high levels of compensation to master teachers. With 40 students in a classroom and two instructors (master-apprentice), the pupil-to-teacher ratio would be 20 to 1.

**The Facility: Key to the Model**

Facility needs will be the main constraint to implementing either a South Korean or a master-apprentice model of schooling. States typically require charter schools to finance or rent a facility out of their own operational funds. Therefore, many charter schools rent space from churches, which have a great deal of classroom space that sits underutilized between Monday and Friday. This type of arrangement can be mutually beneficial for both the school and church.

As a practical matter, however, church classrooms tend to be small, often designed to accommodate very young children for a limited amount of time. The number of churches with an abundance of readily available large classroom spaces is likely to be limited. Using the model we have described would approximately double the class size, which would require double the amount of classroom space—somewhere in the range of 800 to 1,000 square feet per classroom. The model would simply not work in small-sized classrooms.

Even though a limited number of church facilities might possess the needed space—or would be willing to combine rooms to produce it—the school and facilitator would still have to consider access to private capital financing and expandable building capacity that can grow along with the student body. In addition, public-private partnership arrangements, whereby a private investor builds a facility with a long-term lease arrangement with the school, may be possible.

One can only describe the need for such schools as desperate. Alternatively, this model could be applied to a Knowledge is Power Program (KIPP)-type of remedial approach.
Readiness for Rigor

Potential school operators must recognize the deficiencies in the education of many American students. The National Assessment of Educational Progress, for example, indicates that 44 percent of Arizona fourth-graders scored below a basic level of reading proficiency. In 2007, 35 percent of Arizona eighth-graders scored below basic on reading. Many of these students will be unprepared to do the rigorous work required of them in the future; as well, they will be unaccustomed to a disciplined school environment with high expectations set for them.

Providing substantial pay for incredibly effective teachers will hopefully improve this situation. Again, however, we call for an incremental approach. The best strategy in introducing such schools would begin at the elementary level and move toward a system of feeder schools into the middle and high school levels.

Alternatively, this model could be applied to a Knowledge Is Power Program (KIPP)–type of remedial approach. One can only describe the need for such schools as desperate. There are only so many Teach for America students to put into KIPP classrooms. A KIPP teacher who turns around the academic life of a child who has fallen far behind in early middle school is worth their weight in gold. Merit pay and larger class sizes can at least give them a very competitive professional salary without compromising quality.

Conclusion

In the United States, human resource policy regarding the recruitment, compensation, and retention of teachers is both ineffective and inherently unjust. As a result, some of the least academically gifted students are choosing education as their career.

Teaching is simply too important of a profession to leave up to such a dysfunctional system. The existing system of teacher recruitment, training, compensation, and retention produces a huge percentage of children without basic academic skills.

We simply cannot expect to have the needed amount of academically talented people in the teaching profession without addressing the elephant in the room: Teaching, as currently practiced, is an unattractive career, ending with a brick ceiling for the highly successful. Even though there have been some interesting and small moves toward merit pay, these experiments will never realize their full potential unless we are willing to follow the research where it leads.

Rather than attempt to impose these methods on an unwilling system, we call for the creation of new schools to experiment with these techniques. Without a doubt, a practitioner would need to sort many things out, and will learn much through experience. The experience will doubtlessly inform adjustments to the broad model presented here. We are confident, however, that teacher quality can be greatly increased and rewarded, and that practitioners can open new pools of talented graduates for the teaching profession. Students and high-performing teachers will both benefit.
ENDNOTES

1. For a typical example of the rhetorical use of this argument, see Peter Berger, “Widgets and Other Misunderstandings,” *The Irascible Professor: Irreverent Commentary on the State of Education in America Today* (weblog), May 9, 2003, http://irascibleprofessor.com/comments-05-09-03.htm.


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Best High Schools


School for Science and Technology (Top 100, #1)
Fairfax County Public Schools School District
Fairfax County

6560 Braddock Rd
Alexandria, VA 22312
Telephone: (703) 750-8300

College Readiness Index 100.0
Poverty-Adjusted Performance Index 4.04
Disadvantaged Students Performance Gap Not Available

For more information, visit this school on the SchoolMatters website.

Detailed Information (methodology) School Data

Grades Served 9-12
Magnet School No
Charter School No
Admissions Type Application - Merit-Based Selection
NCES Locale Type Suburb, Large Territory

Receive Title I Funding

Demographic Data

Enrollment 1,802
Minority Enrollment (% of total) 3.9%
Disadvantaged Student Enrollment (% of total) 1.4%

Overall Student Performance

State Test Performance Index 144.3
Poverty-Adjusted Performance Index 4.04

Disadvantaged Student Performance

Disadvantaged Students' State Test Proficiency Rate Not Available
Disadvantaged Students Performance Gap Not Available
Non-disadvantaged Students' State Test Proficiency Rate 100.0
Current State Test Achievement Gap Not Available

College-Ready Student Performance

College Readiness Index 100.0
Quality-Adjusted Exams Per Test Taker 6.8
Participation Rate 100.0%
Quality-Adjusted Participation Rate 100.0%
Participant Passing Rate 100.0%
Exams Per Test Taker 6.9
Exam Passing Rate 97.9%

Advanced Placement Student Performance

Quality-Adjusted AP Exams Per Test Taker 6.8
AP Participation Rate 100.0%
Quality-Adjusted AP Participation Rate 100.0%
AP Participant Passing Rate 100.0%
AP Exams Per Test Taker 6.9
AP Exam Pass Rate 97.9%
International Baccalaureate Student Performance

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Criteria for Medals

Gold Medal: Top 100 schools nationally based on the College Readiness Index

Silver Medal: all other schools with a college readiness index of at least 20 but that are not ranked in the top 100 nationally

Bronze Medal: either do not offer AP or IB or do not achieve a college readiness index of at least 20 but successfully meet the other two key performance indicator criteria

Honorable Mention: schools that achieved very high levels of college readiness but only partially met state test performance criteria

College-ready student performance data derived from data provided by the College Board and/or International Baccalaureate of North America.

Advanced Placement student performance data derived from data provided by the College Board. Copyright © 2009. Data provided by the College Board. All rights reserved. www.collegeboard.com


In association with SchoolMatters.
Articles of Incorporation for a Nonprofit Corporation
filed pursuant to and of the Colorado Revised Statutes (C.R.S.)

1. The domestic entity name for the nonprofit corporation is
   Science Technology Engineering and Math (STEM) High School
   (Caution: The use of certain terms or abbreviations are restricted by law. Read instructions for more information.)

2. The principal office address of the nonprofit corporation’s initial principal office is
   Street address
   7595 Louviers Blvd
   (Street number and name)
   Louviers CO 80131
   (City) (State) (ZIP/Postal Code) United States
   (Province – if applicable) (Country)
   Mailing address
   (leave blank if same as street address)

3. The registered agent name and registered agent address of the nonprofit corporation’s initial registered agent are
   Name
   (if an individual)
   Brannberg Barry K.
   (Last) (First) (Middle) (Suffix)
   OR
   (if an entity)
   (Caution: Do not provide both an individual and an entity name.)
   Street address
   7595 Louviers Blvd
   (Street number and name)
   Louviers CO 80131
   (City) (State) (ZIP/Postal Code)
Mailing address
(leave blank if same as street address)

(Street number and name or Post Office Box information)

(City) CO (State) (ZIP Code)

(The following statement is adopted by marking the box.)
✓ The person appointed as registered agent above has consented to being so appointed.

4. The true name and mailing address of the incorporator are

Name
(if an individual)
Arrington Barry
(Last) (First) (Middle) (Suffix)

OR

(if an entity)
(Caution: Do not provide both an individual and an entity name.)

Mailing address
7664 East Phillips Circle

(Street number and name or Post Office Box information)

Centennial CO 80112

(City) (State) (ZIP Code)

(Province – if applicable) United States (Country)

(The following statement applies, adopt the statement by marking the box and include an attachment.)
☐ The corporation has one or more additional incorporators and the name and mailing address of each additional incorporator are stated in an attachment.

5. (If the following statement applies, adopt the statement by marking the box.)
✓ The nonprofit corporation will have voting members.

6. (The following statement is adopted by marking the box.)
✓ Provisions regarding the distribution of assets on dissolution are included in an attachment.

7. (If the following statement applies, adopt the statement by marking the box and include an attachment.)
✓ This document contains additional information as provided by law.

8. (Caution: Leave blank if the document does not have a delayed effective date. Stating a delayed effective date has significant legal consequences. Read instructions before entering a date.)

(if the following statement applies, adopt the statement by entering a date and, if applicable, time using the required format.)
The delayed effective date and, if applicable, time of this document is/are (mm/dd/yyyy hour:minute am/pm)

Notice:

Causing this document to be delivered to the Secretary of State for filing shall constitute the affirmation or acknowledgment of each individual causing such delivery, under penalties of perjury, that the document is the individual's act and deed, or that the individual in good faith believes the document is the act and deed of the person on whose behalf the individual is causing the document to be delivered for filing, taken in conformity with the requirements of part 3 of article 90 of title 7, C.R.S., the constituent documents, and the organic statutes, and that the individual in good faith believes the facts stated in the document are true and the document complies with the requirements of that Part, the constituent documents, and the organic statutes.

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APPENDIX M – BYLAWS

BYLAWS OF STEM SCHOOL

ARTICLE I.

Offices

Section 1.1. Principal office. The principal office of the corporation shall be located in Douglas County, Colorado. The corporation may have such other offices within Colorado as the board of directors may designate or as the business of the corporation may require from time to time.

Section 1.2. Registered Office. The registered office of the corporation required by the laws of the State of Colorado to be maintained in Colorado may be, but need not be, identical with the principal office and the address of the registered office may be changed from time to time by the board of directors.

ARTICLE II.

Members

Section 2.1. Members. Each parent or legal guardian of a child enrolled at the school shall be a voting member of the corporation. Such membership will terminate when the child is no longer enrolled at the school.

Section 2.2. Member Meetings. The timing and conduct of regular and special meetings of the members shall be determined from time to time by resolution of the board of directors.

ARTICLE III.

Board of Directors

Section 3.1. General Powers. The business and affairs of the corporation shall be managed by its board of directors, except as otherwise provided in the Colorado Revised Nonprofit Corporation Act, the articles of incorporation, or these bylaws.

Section 3.2. Number, Tenure and Qualifications.

(a) The corporation shall have five directors, consisting of two classes, Class A and Class B. There shall be two Class A members and three Class B members.

(b) Class A Members of the board of directors shall be elected at the annual meeting of members. One Class B members shall be elected annually by majority vote of the Class B members then in office.

(c) Each director shall hold office for a term as designated by the board of directors.
(d) A director having three (3) or more consecutive unexcused absences from the meetings of the board of directors shall be deemed to have resigned as a director.

(e) Directors shall be removed following the procedure provided by the Colorado Revised Nonprofit Corporation Act.

Section 3.3. Chair. The board of directors shall elect a Chair of the board of directors from among the directors. The term of such Chair shall be for a period of one (1) year or until such time as their respective successors are duly elected and qualified. The Chair of the board of directors shall preside over all meetings of the board of directors.

Section 3.4. Vacancies. Any director may resign at any time by giving written notice to the president or to the secretary of the corporation. Such resignation shall take effect at the time specified therein; and unless otherwise specified therein, the acceptance of such resignation shall not be necessary to make it effective. Any vacancy occurring in the board of directors shall be filled by the board of directors at a special meeting called for such purpose. A director appointed to fill a vacancy shall serve for the unexpired term of his predecessor in office.

Section 3.5. Regular Meetings. The Board of Directors shall provide by resolution the time and place of the holding of regular meetings.

Section 3.6. Special Meetings. Special meetings of the board of directors may be called by or at the request of the president or any two directors. The person or persons authorized to call special meetings of the board of directors may fix any place as the place for holding any special meeting of the board of directors called by them.

Section 3.7. Notice to Directors. Notice to Directors of any special meeting shall be given at least five (5) days prior to the meeting by written notice delivered personally or mailed to each director at his business address, or by notice given at least two (2) days prior to the meeting by telegraph, telex, telecopier or other similar device. If mailed, such notice shall be deemed to be delivered three (3) days after such notice is deposited in the United States mail so addressed, with postage thereon prepaid. If notice is given by telegram, such notice shall be deemed to be delivered when the telegram is delivered to the telegraph company. A director waives notice of a regular or special meeting by attending or participating in the meeting unless, at the beginning of the meeting, he objects to the holding of the meeting or the transaction of business at the meeting.

Section 3.8. Quorum. A majority of the directors shall constitute a quorum for the transaction of business at any meeting of the board of directors. If fewer than a majority of the directors are present at a meeting, a majority of the directors present may adjourn the meeting from time to time without further notice for a period not to exceed sixty (60) days at any one adjournment.

Section 3.9. Manner of Acting. The act of a majority of the members of the board of directors shall be the act of the board of directors, unless a greater number is required by law or the articles of incorporation.
Section 3.10. Compensation. By resolution of the board of directors, any director may be paid his expenses, if any, of attendance at meetings. No such payment shall preclude any director from serving the corporation in any other capacity and receiving compensation therefore.

Section 3.11. Presumption of Assent. A director of the corporation who is present at a meeting of the board of directors or committee of the board at which action on any corporate matter is taken shall be presumed to have assented to the action taken unless (i) he objects at the beginning of the meeting to the holding of the meeting or the transaction of business at the meeting; (ii) he contemporaneously requests that his dissent be entered in the minutes of the meeting; or (iii) he gives written notice of his dissent to the presiding officer of the meeting before its adjournment or delivers such dissent by registered mail to the secretary of the corporation immediately after the adjournment of the meeting. Such right to dissent as to a specific action taken at a meeting of the board of directors or a committee of the board shall not be available to a director who voted in favor of such action.

Section 3.12. Committees. The board of directors, by resolution adopted by a majority of the full board of directors, may designate from among its members an executive committee and one or more other committees.

Section 3.13. Advisory Committees. The board of directors, by resolution adopted by a majority of the full board of directors, may appoint advisory committees to the board of directors who, by such appointment, shall not be deemed to be directors, officers or employees of the corporation and whose functions shall not include participation in the operating management of the corporation. Members of the board of directors shall be entitled to serve on advisory committees. The advisory committees shall meet at such times as the board of directors shall determine. If so determined by the board of directors, the members of the advisory committees may be entitled to a fee for attendance at each regular or special meeting of such committees, which fee shall be fixed by resolution of the board of directors. The advisory committee shall consider, advise upon and make recommendations to the board of directors and to the chairman of the board with respect to matters of policy relating to the general conduct of the business of the corporation and with respect to such questions relating to the conduct of the business of the corporation as may be submitted to it by the board of directors or the executive committee. By way of example and not of limitation, the board of directors may appoint a policy and planning committee to advise on fund raising and an investment management committee to advise the corporation on its investment portfolio. The members of the advisory committee shall hold office at the pleasure of the board of directors. Additional members or members to fill vacancies may be appointed at any regular or special meeting of the board of directors.

Section 3.14. Telephonic Meetings. One or more members of the board of directors or any committee designated by the board may participate in a meeting of the board of directors or a committee thereof by means of conference telephone or similar communications equipment by which all persons participating in the meeting can hear one another at the same time. Such participation shall constitute presence in person at the meeting.
Section 3.15. Standard of Care. A director shall perform his duties as a director, including his duties as a member of any committee of the board upon which he may serve, in good faith in a manner he reasonably believes to be in the best interests of the corporation, and with such care as an ordinarily prudent person in a like position would use under similar circumstances. In performing his duties, a director shall be entitled to rely on information, opinions, reports or statements, including financial statements and other financial data, in each case prepared or presented by the persons herein designated; but he shall not be considered to be acting in good faith if he has knowledge concerning the matter in question that would cause such reliance to be unwarranted. No member of the board of directors shall permit his position on the board of directors to create a conflict between his personal business activities unrelated to the school and the actions of the corporation.

The designated persons on whom a director is entitled to rely are: (i) one or more officers or employees of the corporation whom the director reasonably believes to be reliable and competent in the matters presented; (ii) counsel, public accountants, or other persons as to matters which the director reasonably believes to be within such persons' professional or expert competence; or (iii) a committee of the board or an advisory committee upon which the director does not serve, duly designated in accordance with Sections 3.12 or 3.13 of these bylaws, as to matters within its designated authority, which committee the director reasonably believes to merit confidence.

No member of the board of directors shall permit his position on the board of directors to create a conflict between his personal business activities unrelated to the school and the actions of the corporation.

ARTICLE IV.

Officers and Agents

Section 4.1. General. The officers of the corporation shall be a president, one or more vice presidents, a secretary, and a treasurer. The board of directors may appoint such other offices, assistant officers, committees and agents, including a chairman of the board, assistant secretaries and assistant treasurers, as they may consider necessary, who shall be chosen in such manner and hold their offices for such terms and have such authority and duties as from time to time may be determined by the board of directors. One person may not simultaneously hold the office of president and secretary. In all cases where the duties of any officer, agent or employee are not prescribed by the bylaws or by the board of directors, such officer, agent or employee shall follow the orders and instructions of the president.

Section 4.2. Election and Term of Office. The officers of the corporation shall be appointed annually by the board of directors. Each officer shall hold office until the first of the following occurs: until his successor shall have been duly elected or appointed and shall have qualified; or until his death; or until he shall resign; or until he shall have been removed in the manner hereinafter provided.

Section 4.3. Removal. Any officer or agent may be removed by the board of directors whenever in its judgment the best interest of the corporation would be served thereby, but such
removal shall be without prejudice to the contract rights, if any, of the person so removed. Election or appointment of an officer or agent shall not itself create contract rights.

Section 4.4. Vacancies. A vacancy in any office, however occurring, may be filled by the board of directors for the unexpired portion of the term.

Section 4.5. President. Subject to the direction and supervision of the board of directors, the president shall be the chief executive officer of the corporation and shall have general and active control of its affairs and business and general supervision of its officers, agents, and employees. The president shall have custody of the treasurer's bond, if any.

Section 4.6. Vice President(s). The vice president(s) (if the corporation so desires to have more than one) shall assist the president and shall perform such duties as may be assigned to them by the president or by the board of directors. In the absence of the president, the vice president, or, if there be more than one, the vice presidents in the order designated by the board of directors, or if the board makes no such designation, then the vice president designated by the president, or if neither the board nor the president makes any such designation, the senior vice president as determined by first election to that office, shall have the power and perform the duties of the president.

Section 4.7. Secretary. The secretary shall (i) keep the minutes of the proceedings of the executive committees, advisory committees, and the board of directors; (ii) see that all notices are duly given in accordance with the provisions of these bylaws or as required by law; (iii) be custodian of the corporate records; (iv) keep at the corporation's registered office or principal place of business within or outside Colorado a record containing the names and addresses of all directors; and (v) in general, perform all duties incident to the office of secretary and such other duties as from time to time may be assigned to him by the president or by the board of directors. Assistant secretaries, if any, shall have the same duties and powers, subject to supervision by the secretary. The directors may, however, respectively, designate a person other than the secretary or assistant secretary to keep the minutes of their respective meetings.

Section 4.8. Treasurer. The treasurer shall be the principal financial officer of the corporation, shall have the care and custody of all funds, securities, evidences of indebtedness and other personal property of the corporation and shall deposit the same in accordance with the instructions of the board of directors. He shall receive and give receipts and acceptances for money paid in on account of the corporation, and shall pay out of the funds on hand all bills, payrolls, and other just debts of the corporation of whatever nature upon maturity. He shall perform all other duties incident to the office of the treasurer and, upon request of the board, shall make such reports to it as may be required at any time. He shall, if required by the board, give the corporation a bond in such sums and with such sureties as shall be satisfactory to the board, conditioned upon the faithful performance of his duties and for the restoration to the corporation of all books, papers, vouched money and other property of whatever kind in his possession or under his control belonging to the corporation. He shall have such other powers and perform such other duties as may from time to time be prescribed by the board of directors or the president. The assistant treasurers, if any, shall have the same powers and duties, subject to the supervision of the treasurer.
The treasurer shall also be the principal accounting officer of the corporation. He shall prescribe and maintain the methods and systems of accounting to be followed, keep complete books and records of account, prepare and file all local, state, and federal tax returns, prescribe and maintain an adequate system of internal audit, and prepare and furnish to the president and the board of directors statements of account showing the financial position of the corporation and the results of its operations.

ARTICLE V.

Indemnification of Certain Persons

Section 5.1. Authority for Indemnification. Any person who was or is a party or is threatened to be made a party to any threatened, pending, or completed action, suit, or proceeding, whether civil, criminal, administrative, or investigative, and whether formal or informal, by reason of the fact that he is or was a director, officer, employee, fiduciary or agent of the corporation or is or was serving at the request of the corporation as a director, officer, partner, trustee, employee, or agent of any foreign or domestic corporation or of any partnership, joint venture, trust, other enterprise or employee benefit plan ("Any Proper Person" or "Proper Person"), shall be indemnified by the corporation against expenses (including attorneys' fees), judgments, penalties, fines, (including any excise tax assessed with respect to an employee benefit plan) and amounts paid in settlement reasonably incurred by him in connection with such action, suit or proceeding if it is determined by the groups set forth in Section 5.4 of these bylaws that he conducted himself in good faith and that he (i) reasonably believed, in the case of conduct in his official capacity with the corporation, that his conduct was in the corporation's best interest, or (ii) in all other cases (except criminal cases) believed that his conduct was at least not opposed to the corporation's best interests, or (iii) with respect to criminal proceedings had no reasonable cause to believe his conduct was unlawful. A person will be deemed to be acting in his official capacity while acting as a director, officer, employee or agent of this corporation and not when he is acting on this corporation's behalf for some other entity.

No indemnification shall be made under this Section 5.1 to a director with respect to any claim, issue or matter in connection with a proceeding by or in the right of a corporation in which the director was adjudged liable to the corporation or in connection with any proceeding charging improper personal benefit to the director, whether or not involving action in his official capacity, in which he was adjudged liable on the basis that personal benefit was improperly received by him. Further, indemnification under this Section 5.1 in connection with a proceeding brought by or in the right of the corporation shall be limited to reasonable expenses, including attorneys' fees, incurred in connection with the proceeding. These limitations shall apply to directors only and not to officers, employees, fiduciaries or agents of the corporation.

Section 5.2. Right to Indemnification. The corporation shall indemnify Any Proper Person who has been wholly successful on the merits or otherwise, in defense of any action, suit, or proceeding referred to in Section 5.1 of these bylaws, against expenses (including attorneys' fees) reasonably incurred by him in connection with the proceeding without the necessity of any action by the corporation other than the determination in good faith that the defense has been wholly successful.
Section 5.3. Effect of Termination of Action. The termination of any action, suit or proceeding by judgment, order, settlement or conviction, or upon a plea of nolo contendere or its equivalent shall not of itself create a presumption that the person seeking indemnification did not meet the standards of conduct described in Section 5.1 of these bylaws. Entry of a judgment by consent as part of a settlement shall not be deemed an adjudication of liability.

Section 5.4. Groups Authorized to Make Indemnification Determination. In all cases, except where there is a right to indemnification as set forth in Section 5.2 of these bylaws or where indemnification is ordered by a court, any indemnification shall be made by the corporation only as authorized in the specific case upon a determination by a proper group that indemnification of the Proper Person is permissible under the circumstances because he has met the applicable standards of conduct set forth in Section 5.1 of these bylaws. This determination shall be made by the board of directors by a majority vote of a quorum, which quorum shall consist of directors not parties to the proceeding ("Quorum"). If a Quorum cannot be obtained, the determination shall be made by a majority vote of a committee of the board of directors designated by the board, which committee shall consist of two or more directors not parties to the proceeding, except that directors who are parties to the proceeding may participate in the designation of directors for the committee. If a Quorum of the board of directors cannot be obtained or the committee cannot be established, or even if a Quorum can be obtained or the committee can be established but such Quorum or committee so directs, the determination shall be made by independent legal counsel selected by a vote of a Quorum of the board of directors or a committee in the manner specified in this Section 5.4 or, if a Quorum of the full board of directors cannot be obtained and a committee cannot be established, by independent legal counsel selected by a majority vote of the full board (including directors who are parties to the action).

Section 5.5. Court Ordered Indemnification. Any Proper Person may apply for indemnification to the court conducting the proceeding or to another court of competent jurisdiction for mandatory indemnification under Section 5.2 of these bylaws, including indemnification for reasonable expenses incurred to obtain court-ordered indemnification. If the court determines that the director is fairly and reasonably entitled to indemnification in view of all the relevant circumstances, whether or not he met the standards of conduct set forth in Section 5.1 of these bylaws or was adjudged liable in the proceeding, the court may order such indemnification as the court deems proper, except that if the individual has been adjudged liable, indemnification shall be limited to reasonable expenses incurred.

Section 5.6. Advance of Expenses. Expenses (including attorneys' fees) incurred in defending a civil or criminal action, suit or proceeding may be paid by the corporation to Any Proper Person in advance of the final disposition of such action, suit or proceeding upon receipt of (i) a written affirmation of such Proper Person's good faith belief that he has met the standards of conduct prescribed in Section 5.1 of these bylaws; (ii) a written undertaking, executed personally or on his behalf, to repay such advances if it is ultimately determined that he did not meet the prescribed standards of conduct (the undertaking shall be an unlimited general obligation of the Proper Person but need not be secured and may be accepted without reference to financial ability to make repayment); and (iii) a determination is made by the proper group (as described in
Section 5.4 of these bylaws), that the facts as then known to the group would not preclude indemnification.

Section 5.7. Limitation. Any provision of this article V to the contrary not withstanding, the corporation shall not have authority to indemnify any person or entity if to do so would be contrary to Colorado law.

ARTICLE VI.
Provision of Insurance

By action of the board of directors, notwithstanding any interest of the directors in the action, the corporation may purchase and maintain insurance, in such scope and amounts as the board of director deems appropriate, on behalf of any person who is or was a director, officer, employee, fiduciary, or agent of the corporation, or who, while a director, officer, employee, fiduciary or agent of the corporation, is or was serving at the request of the corporation as a director, officer, partner, trustee, employee, fiduciary or agent of any other foreign or domestic corporation or of any partnership, joint venture, trust, other enterprise, or employee benefit plan, against any liability asserted against, or incurred by, him in any such capacity or arising out of his status as such, whether or not the corporation would have the power to indemnify him against such liability under the provisions of Article V of these bylaws or applicable law.

ARTICLE VII
Conflicts of Interest Policy

Section 7.1. Purpose. The purpose of the conflict of interest policy is to protect the interest of the Corporation when it is contemplating entering into a transaction or arrangement that might benefit the private interest of an officer or director of the Corporation or might result in a possible excess benefit transaction. This policy is intended to supplement but not replace any applicable state and federal laws governing conflict of interest applicable to nonprofit or governmental organizations.

Section 7.2. Definitions.

(a) Interested Person: Any director, principal officer, or member of a committee with governing board delegated powers, who has a direct or indirect financial interest, as defined below, is an interested person.

(b) Financial Interest: A person has a financial interest if the person has, directly or indirectly, through business, investment, or family:

(i) An ownership or investment interest in any entity with which the Corporation has a transaction or arrangement,
(ii) A compensation arrangement with the Corporation or with any entity or individual with which the Corporation has a transaction or arrangement, or

(iii) A potential ownership or investment interest in, or compensation arrangement with, any entity or individual with which the Corporation is negotiating a transaction or arrangement.

(c) Compensation includes direct and indirect remuneration as well as gifts or favors that are not insubstantial.

(d) A financial interest is not necessarily a conflict of interest. Under Section 7.3(b), a person who has a financial interest may have a conflict of interest only if the appropriate board or committee decides that a conflict of interest exists.

Section 7.3. Procedures.

(a) Duty to Disclose: In connection with any actual or possible conflict of interest, an interested person must disclose the existence of the financial interest and be given the opportunity to disclose all material facts to the directors and members of committees with governing board delegated powers considering the proposed transaction or arrangement.

(b) Determining Whether a Conflict of Interest Exists: After disclosure of the financial interest and all material facts, and after any discussion with the interested person, he shall leave the board of directors or committee meeting while the determination of a conflict of interest is discussed and voted upon. The remaining board or committee members shall decide if a conflict of interest exists.

(c) Procedures for Addressing the Conflict of Interest:

(i) An interested person may make a presentation at the board or committee meeting, but after the presentation, he shall leave the meeting during the discussion of, and the vote on, the transaction or arrangement involving the possible conflict of interest.

(ii) The chairman of the board or committee shall, if appropriate, appoint a disinterested person or committee to investigate alternatives to the proposed transaction or arrangement.

(iii) After exercising due diligence, the board or committee shall determine whether the Corporation can obtain with reasonable efforts a more advantageous transaction or arrangement from a person or entity that would not give rise to a conflict of interest.

(iv) If a more advantageous transaction or arrangement is not reasonably possible under circumstances not producing a conflict of interest, the board or committee shall determine by a majority vote of the disinterested directors whether the transaction or arrangement is in the Corporation's best interest, for its own
benefit, and whether it is fair and reasonable. In conformity with the above
determination it shall make its decision as to whether to enter into the transaction
or arrangement.

(d) Violations of the Conflicts of Interest Policy:

(i) If the board or committee has reasonable cause to believe a member has failed
to disclose actual or possible conflicts of interest, it shall inform the member of
the basis for such belief and afford the member an opportunity to explain the
alleged failure to disclose.

(ii) If, after hearing the member’s response and after making further investigation
as warranted by the circumstances, the board or committee determines the
member has failed to disclose an actual or possible conflict of interest, it shall
take appropriate disciplinary and corrective action.

Section 7.4. Records of Proceedings. The minutes of the board of directors and all committees
with board delegated powers shall contain:

(a) The names of the persons who disclosed or otherwise were found to have a financial
interest in connection with an actual or possible conflict of interest, the nature of the
financial interest, any action taken to determine whether a conflict of interest was present,
and the board’s or committee’s decision as to whether a conflict of interest in fact existed.

(b) The names of the persons who were present for discussions and votes relating to the
transaction or arrangement, the content of the discussion, including any alternatives to the
proposed transaction or arrangement, and a record of any votes taken in connection with
the proceedings.

Section 7.5. Compensation.

(a) A voting member of the board of directors who receives compensation, directly or
indirectly, from the Corporation for services is precluded from voting on matters
pertaining to that member’s compensation.

(b) A voting member of any committee whose jurisdiction includes compensation
matters and who receives compensation, directly or indirectly, from the Corporation for
services is precluded from voting on matters pertaining to that member’s compensation.

(c) No voting member of the board or any committee whose jurisdiction includes
compensation matters and who receives compensation, directly or indirectly, from the
Corporation, either individually or collectively, is prohibited from providing
information to any committee regarding compensation.
Section 7.6. Annual Statements. Each director, principal officer and member of a committee with governing board delegated powers shall annually sign a statement which affirms such person:
(a) Has received a copy of the conflicts of interest policy,
(b) Has read and understands the policy,
(c) Has agreed to comply with the policy, and
(d) Understands the Corporation is educational and/or charitable and in order to maintain its federal tax exemption it must engage primarily in activities which accomplish one or more of its tax-exempt purposes.

Section 7.7. Periodic Reviews. To ensure the Corporation operates in a manner consistent with charitable purposes and does not engage in activities that could jeopardize its tax-exempt status, periodic reviews shall be conducted. The periodic reviews shall, at a minimum, include the following subjects:

(a) Whether compensation arrangements and benefits are reasonable, based on competent survey information and the result of arm’s length bargaining.

(b) Whether partnerships, joint ventures, and arrangements with management organizations conform to the Corporation’s written policies, are properly recorded, reflect reasonable investment or payments for goods and services, further charitable purposes and do not result in inurement, impermissible private benefit or in an excess benefit transaction.

Section 7.8. Use of Outside Experts. When conducting the periodic reviews as provided for in Article VII, the Corporation may, but need not, use outside advisors. If outside experts are used, their use shall not relieve the governing board of its responsibility for ensuring periodic reviews are conducted.

ARTICLE VIII.

Miscellaneous

Section 8.1. Waiver of Notice. Whenever notice is required by law, by the articles of incorporation or by these bylaws, a waiver thereof in writing signed by the director or other person entitled to said notice, whether before, at or after the time stated therein, shall be equivalent to such notice.

Section 8.2. Fiscal year. The fiscal year of the corporation shall be July 1 through June 30.

Section 8.3. Amendments. The board of directors shall have power to make, amend and repeal the bylaws of the corporation at any regular or special meeting of the board. The bylaws shall be reviewed by the board for any useful or necessary amendments at least biennially at the regular meeting of the board.
Section 8.4. Gender. The masculine gender is used in these bylaws as a matter of convenience only and shall be interpreted to include the female and neuter genders as the circumstances indicate.

Section 8.5. Conflicts. In the event of any irreconcilable conflict between these bylaws and either the corporation's articles of incorporation or applicable law, the latter shall control.

Section 8.6. Definitions. Except as otherwise specifically provided in these bylaws, all terms used in these bylaws shall have the same definitions as in the Colorado Revised Nonprofit Corporation Act.

THE END
APPENDIX N – STUDENT GRIEVANCE POLICY

A grievable action is an action that:

- Is in violation of written campus policies or procedures, or
- Constitutes arbitrary, capricious, or unequal application of written campus policies or procedures.

Note: This Procedure does not apply to sexual harassment or discrimination complaints. Such complaints should be directed to the Principal or President of the Board of Directors. Proper procedures and options shall then be discussed with the student.

Informal Procedures
STEM High’s Student Grievance Procedure relies on the good faith of all involved to achieve a reasonable resolution of grievable actions. Any student who believes that s/he has grounds for a grievance shall first make an attempt to resolve the problem through early informal discussion of the matter with the faculty, staff or administrator directly involved. If after ten (10) working days from the date of such informal discussion, the student is not satisfied, the student shall then attempt to resolve the grievance through the following channel.

Grievance Against a Faculty or Staff Member
If an informal resolution is not reached, the student must then attempt resolution by submitting a written statement of his/her allegations to the Dean of Students. The Dean shall investigate the allegations and reach a conclusion as to whether the student’s allegations have merit and propose a resolution. If the student is not satisfied with the results of the investigation, the student may proceed with the initiation of a formal grievance.

Should any particular allegation lay charges against the Dean of Students, then the Principal (or his/her designee) will become the primary point of contact. Should any particular allegation lay charges against the Principal, then the President of the STEM High Board of Directors (or his/her designee) will become the primary point of contact.

Standing to File a Grievance
Any person who at the time of filing a grievance is a student enrolled in a course or was such a student during the academic term prior to the time of filing, has standing to file a grievance under this Procedure, provided that person has attempted to resolve his/her complaint informally through those procedures discussed above.

Time Limit on Filing a Formal Grievance
To be timely, a formal grievance must be filed with the Dean within forty (40) calendar days after the student learned or reasonably should have learned of the occurrence of the action on which his/her grievance is based.
Formal Procedures
Students can file a formal grievance should they not find resolution through informal procedures described above. Students without an informal resolution can file a grievance with the Dean of Students. In order to file a formal grievance, the student must make a written statement that includes a narrative of the complaint, a description of the means taken to informally resolve the grievance, a requested remedy, and the signature of all involved parties attesting to the fact that informal means were taken to resolve the grievance but were unsuccessful. The only exception to this requirement shall be a showing by the student that good cause exists for not engaging in the signature stage.

The Dean of Students shall determine grievability by ascertaining whether:
- the grievant has standing to file a grievance;
- the grievance has been filed within the timeline specified in this Procedure;
- a grievable act, as defined by STEM High, has been alleged;
- informal efforts as stated in this procedure have been made to attempt to resolve the issue; and

The complaint is one for which this procedure applies:
- The Principal shall notify the student of his/her findings on the issue of grievability within ten (10) working days of having received the grievance in writing.
- A finding that the student lacks standing, that the grievance was not filed within the specified timeline, that no grievable action has been alleged, or that the complaint is one for which this procedure does not apply shall conclude the proceedings.
- If it is found that the student failed to engage in the informal stage of this procedure, the student shall be given five (5) working days to either engage in such informal measures or to show good cause for not engaging in those measures. Failure to do either within that time period shall conclude the proceedings.
- Determinations/findings made by the Dean of Students under this section shall be final.

Student Grievance Panel
A. Composition. There shall be a standing Student Grievance Panel that shall be composed of the following seven members: three members of the teaching faculty selected by the Faculty Committee; the Principal; and three students selected by the student body.

B. Purpose of Student Grievance Panel. The purpose of the Student Grievance Panel is to serve as the pool of individuals from which a Student Grievance Committee is selected to hear a grievance that proceeds to the hearing phase of this procedure.

C. Term of Service – Faculty. Faculty members of the Student Grievance Panel shall serve for two (2) years. The two-year terms of these members of the Student
Grievance Panel shall begin and end in the same timeframe established for Faculty committee subcommittees.

D. Term of Service – Students. Student members of the Student Grievance Panel shall serve for one (1) year. The one-year term shall begin on July 1st and end on June 30th, or upon completion of any hearing in progress as of that date.

E. Vacancy in Student Grievance Panel. In the event that a member of the Student Grievance Panel is unable to complete his/her term of office, a replacement shall be appointed to complete the unexpired term, following the original appointment procedures stated above.

The Hearing Procedures

Hearing by a Student Grievance Committee
Each grievance that proceeds to the hearing phase shall be heard by a Student

Grievance Committee selected from the Student Grievance Panel. Within ten (10) working days of determining grievability, the Dean of Students shall select from the Student Grievance Panel one faculty member and one student member to serve as the Student Grievance Committee, along with the Principal, for that grievance. Should the Principal happen to be the respondent, the Dean will select an alternate from the members of the Student Grievance Panel. The Dean shall provide a copy of the Student Grievance Form to each member of the Student Grievance Committee as well as to the grievant and the party against whom the grievance is filed.

Selection of Chair of the Student Grievance Committee
Each Student Grievance Committee shall select its own chair.

Notification of Composition of Student Grievance Committee
Once a Chair of the Student Grievance Committee had been selected, the Dean shall notify both the grievant and the party against whom the grievance is filed of the names of the committee members as well as the chair of the Student Grievance Committee.

Duties of the Chair of the Student Grievance Committee
The duties of the Chair of the Student Grievance Committee include the following:

- The Chair of the Student Grievance Committee shall notify the grievant and the individual against whom the grievance is filed of the date, time and place of the hearing.
- The Chair of the Student Grievance Committee shall ensure that the conduct of the hearing conforms to the procedures prescribed herein.
- The Chair of the Student Grievance Committee is responsible for maintaining order, and may establish such rules as are necessary or appropriate to conduct a fair hearing. The Chair shall not permit any person to be subjected to abusive treatment. The Chair may eject or exclude anyone who refuses to be orderly.
The Chair of the Student Grievance Committee shall arrange for and maintain custody of the records of the proceedings until the Student Grievance Committee has rendered its recommendation to the Director, or his/her designee, after which the records of the proceedings shall be placed in the custody of the Administrative Assistant/Records. Records of the grievance proceedings shall be maintained for a period of four (4) years.

- The Chair of the Student Grievance Committee shall see that copies of all statements and documents to be considered by the Student Grievance Committee are accessible to all members of the Student Grievance Committee and to each party of the grievance.
- The Chair shall also ensure that each party of the grievance shall have the opportunity to be present when testimony is given.
- The Chair of the Student Grievance Committee shall ensure that the hearing is audio recorded.
- The Chair of the Student Grievance Committee shall decide all procedural issues that arise during the hearing with the concurrence of at least one member of the Student Grievance Committee.
- The Chair of the Student Grievance Committee, on behalf of the Student Grievance Committee, may seek legal advice from the STEM High's legal counsel.

**The Hearing**

All hearings held under this Procedure shall be conducted according to the following:

- The full three-member Student Grievance Committee must be present for the hearing to proceed.
- The hearing shall be informal in nature, and conducted in a spirit of mediation and conciliation. The hearing shall be closed. In a closed hearing, only the principals in the action, the advisors (if any), and members of the Student Grievance Committee may be present. Witnesses are to be present only during the time in which they give their statement and shall remain outside the hearing room until called. The principals in the action shall be provided with the dates and times of all meetings and given the opportunity to hear any evidence presented.
- Either party to the dispute may be accompanied by one advisor of his/her choice, provided that person does not function as an attorney and provided that prior notification of the intent to have an advisor is given to the Chair of the Student Grievance Committee and the other party. An advisor may act on the behalf of the party he/she represents.
- The exclusion of attorneys as advisors does not prohibit either party to the dispute from consulting an attorney.
- Either party to the grievance may bring witnesses to a hearing. The names of the witnesses shall be provided to all parties prior to their appearance. Written statements may be permitted from witnesses
unable to attend the hearing if the Chair of the Student Grievance Committee so rules with the concurrence of at least one other member of the Student Grievance Committee. Each witness shall be questioned first by the party presenting the witness, then by the other party, and finally by the members of the Student Grievance Committee.

- Prior to the hearing, both parties shall have the right to examine and copy documentation pertinent to the grievance. Questions of pertinence shall be decided by the Chair of the Student Grievance Committee with the concurrence of at least one member of the Student Grievance Committee.

- The hearing shall be conducted according to the order set forth above in this procedure. The hearing shall not be conducted according to technical rules of evidence and witnesses. The Chair of the Student Grievance Committee shall admit the sort of evidence on which reasonable persons are accustomed to rely in the conduct of serious affairs and shall exclude evidence that is irrelevant, unduly repetitious or cumulative. Evidence relating to past actions may be admitted if shown to be relevant. No evidence other than that received at the hearing shall be considered by the Student Grievance Committee.

- The hearing shall be conducted in the following order subject to recognition by the Chair of the Student Grievance Committee, with the Chair of the Student Grievance Committee ensuring that each party be allowed a maximum of thirty (30) minutes for all aspects of his/her presentation.

Opening Statements
Both parties may make opening statements. The grievant goes first. The respondent may reserve the opening statement until the evidence of the grievant has been presented.

Presentation of Evidence
The case of the grievant shall be presented first and then that of the respondent. Documents submitted as evidence shall be numbered by the Chair of the Student Grievance Committee. At the hearing, each side shall have sufficient copies of each document that s/he wishes to enter into evidence to ensure that each member of the Student Grievance Committee and each side have a copy of the document presented.

Presentation of Rebuttal Evidence.
Both parties may present rebuttal evidence. The grievant goes first.

Closing Arguments
After all the evidence has been presented, both parties may make closing arguments. The grievant goes first and shall have a final opportunity to rebut the closing argument of the respondent.

- The hearing shall be audio recorded. The Chair of the Student Grievance Committee shall record the date, time and place of the
hearing and shall require all participants to identify themselves for the audio recording at the beginning of the hearing and when speaking during the hearing. The audio recording shall become part of the official record maintained by the Administrative Assistant/Records. Camera and video recorders shall not be permitted at the hearing. The grievant as well as the individual against whom the grievance is filed may, at his/her own expense, request a copy of such recording. No recording by the grievant or other persons at the hearing shall be permitted.

- If the grievant does not appear within one half-hour of the time agreed upon for the hearing, the hearing shall be canceled and the charges dismissed, unless a valid excuse (as judged by the Student Grievance Committee) is presented within 48 hours. If the person grieved against does not appear, the hearing shall proceed without her/him. Failure of an advisor to appear for either party shall not constitute grounds for postponing or delaying the hearing.

Recommendation of the Student Grievance Committee

- Members of the Student Grievance Committee shall meet in executive session (with all other persons excluded) following the conclusion of the hearing. In this session, the Student Grievance Committee shall consider the evidence and reach its recommendation, basing that recommendation only on the evidence and exhibits received at the hearing, arguments made in accordance with this procedure, and any opinions received from STEM High’s legal counsel.

- The Student Grievance Committee shall determine by majority vote whether a preponderance of the evidence presented demonstrated that a grievable action was committed, and if so, shall recommend remedies. The Student Grievance Committee shall then prepare its written report which shall consist of the Student Grievance Committee's detailed findings of fact, any conclusions resulting from those findings, a finding for or against the grievant, and its recommendations for resolving or terminating the matter. A minority position may be expressed either as a section in the Student Grievance Committee's Report or as a separate Report.

- Within ten (10) working days of the conclusion of the hearing, the Chair of the Student Grievance Committee shall ensure that the Student Grievance Committee’s Report is completed, and shall send copies to the parties involved in the grievance, the Director of School, and the President of the Board of Directors.

- After the Student Grievance Committee report is sent to the Principal and President of the Board of Directors, the Chair of the Student Grievance Committee shall submit the audio recording of the hearings and all written documentation provided to the Student Grievance Committee to the Administrative Assistant/Records.
Principal Action

- After reviewing the Student Grievance Committee’s Report, the Principal, or his/her designee, may accept, reject or modify the recommendations of the Student Grievance Committee for reasons based on the record of the hearing, system policy or state or federal law.

- A decision by the Principal, or his/her designee, on whether the grievance has merit is final.

- If the decision by the Principal, or his/her designee, finds that the grievance has merit and the Principal decides that corrective action or disciplinary action is appropriate, the matter shall be referred for such corrective action or discipline.

- The decision of the Principal, or his/her designee, shall be in writing and normally rendered within five (5) working days of receipt of the Student Grievance Committee’s report. Copies of the decision of the Principal, or his/her designee, shall be delivered to the grievant, the person against whom the grievance was filed and the President of the Board of Directors. Unresolved complaints may be directed to the STEM High’s charter authorizer.

Based on HTH’s Student Grievance Policy, 2007
APPENDIX O – DR. DARLENE YANEZ’ RESUME

DARLENE A. YANEZ
5904 Cary Drive, Austin, Texas 78757
Home: (512) 799-2650 Office: (512) 475-9716
Email: dyanez@mail.utexas.edu
dyanez5904@gmail.com

EDUCATION

University of Texas at Austin May 2001
- Ph.D., Education Administration with specialization in:
  - Program evaluation
  - Education reform/systemic reform
  - Curriculum and instruction (mathematics and science)

Texas A&M University at Corpus Christi, Texas Summer 1982 – Summer 1983
- Superintendent’s Certification

University of Texas at Pan American at Edinburg, Texas Summer 1975 – Summer 1981
- ME.D. – Emphasis Research and Program Evaluation, Mid-Management Certificate
- Research Assistant, Language and Linguistics Research Center, Emphasis on language acquisition among bilingual Spanish speakers
- B.A. in English, History, Government; Minor in Secondary Education

Also attended:
Iowa State University, Ames, Iowa, Winter Quarter 1972
Indiana State University, Terre Haute, Indiana, Fall 1968 to Summer 1970

Professional Background

Principal Investigator
Texas Teachers Empowered for Achievement in Mathematics and Science (TEXTEAMS) Mentoring Academies for High School Science 2004 – 2005

Senior Evaluator
Evaluation of the Literacy Intervention of AmeriCorps for Community Engagement and Education (ACEE) 2003 - 2004

Adjunct Professor
Department of Education Administration
The University of Texas at Austin 2005

Project Management Professional Training
Project Management Institute (August 2007)
Certification – in progress 2007

Project Director
Texas Center for Science, Technology, Engineering, Mathematics Education 2006-Present
Charles A. Dana Center, The University of Texas at Austin
2901 North IH-35, Suite 2.200, Austin, Texas 78722-2348
Supervisor: P. Uri Treisman, Director (512-471-1148)

Provide project management duties with a cross-functional team at the Charles A. Dana Center. The duties include strategic planning, budgetary management, and coordination with external entities including the Texas Education Agency, seven T-STEM Centers, thirty-eight T-STEM Academies and their community college partners, other university partners, community and stakeholder groups. Primary objectives include supporting the Texas High School Project’s T-STEM initiative, populating the T-STEM portal with current research on successful high performing STEM-focused campuses, conducting research and disseminating findings of the research throughout the state and nation.

Director of Research and Evaluation Team 2003 - 2006

- Direct staff in implementation of research and evaluation activities for the Charles A. Dana Center. As lead evaluator:
  - Usage and Effectiveness of Agile Mind Services (On-line teacher and student support services in mathematics and AP Programs
  - PHA: Partnership for High Achievement (Professional development and technical assistance to improve student achievement with a focus in science and mathematics for teachers and leaders)
- Direct internal evaluation of programs and manage external evaluation initiatives with other universities and evaluators. Provide written reports of findings of initiatives using both quantitative and qualitative data. Disseminate findings at the state and national levels to add to the body of research regarding school improvement, leadership development, building capacity of teachers and leaders, and increasing student performance.
- Contribute and lead development activities for continued support of internal evaluation for Dana Center
Director of STAR Center (Support for Texas Academic Renewal) 2001 - 2003

Charles A. Dana Center, The University of Texas at Austin
2901 North IH-35, Suite 2.200, Austin, Texas 78722-2348

- Oversee and manage STAR Center funds (approximately $800,000 per year)
- Direct staff to meet goals and objectives of the STAR Center that include the following:
  --on-site technical assistance for curriculum and instruction for low performing campuses and districts in the state of Texas to improve student achievement;
  --parental and community involvement efforts, and assistance in the creation or refinement of policies and products that develop and sustain increased parental participation in schools and encourage community partnerships;
  --dissemination of information on effective practices in high poverty, high achieving schools, and training designed to support schools in learning from research;
  --support for local districts in identifying or replicating successful models that schools can use to improve student achievement through the coordination of funds and programs;
  --regional training and technical assistance to federal and state ESL and bilingual program staff and technical assistance to selected local education agencies related to state performance standards and student assessment to ensure compliance with federal IASA legislative requirements under No Child Left Behind (NCLB) and the attainment of state achievement standards.

Program Coordinator 1996 – 2002

Charles A. Dana Center, The University of Texas at Austin
2901 North IH-35, Suite 2.200, Austin, Texas 78722-2348

- Developed the Advanced Placement® Capacity Assessment Tool (APCAT) for reviewing the current status of campuses/districts’ AP® programs and develop capacity to expand the AP program to those students historically underrepresented in AP classes.
- Project director for the Texas Education Agency’s Commissioner’s Access Initiative for Data-Driven Decision Making
- Co-direct Evidence Team for the Texas Statewide Systemic Initiative (SSI)
- Coordinate and support research and evaluation of the Charles A. Dana Center projects: Texas Center for Accelerated Schools, Texas HeadStart Collaborative, Texas Office for the Education of Homeless Children and Youth
- Senior researcher for Improving Algebra I End-of-Course-Exam Scores: Evidence from the Field.
- Senior researcher for Case Study: Comprehensive School Reform Initiatives – How Does Reform Work?
- Supervise graduate research assistants

Director of Instructional Services, Division of Accelerated Instruction Fall 1991 - 1996

Texas Education Agency (State Department of Education)
1701 North Congress Avenue, Austin, Texas 78701
Supervisors: Dr. Joseph Johnson, Senior Director of Accelerated Instruction (202) 260-0826

- Supervised eight professional staff
- Managed the following programs:
  - State Compensatory Education Programs and Funding including Dropout Reduction and Learn and Serve program for the state of Texas
  - Reviewed and developed legislative policy for Texas state legislature
  - Developed policy and rules for statewide implementation of state laws for the Texas Education Code
- Supervised the design, implementation and evaluation of the state’s Retention Reduction Program (Currently the Optional Extended Year)
- Supervised the implementation of Results Based Monitoring System (RBM)
  --Chaired Results Based Monitoring (RBM) to Ector County
  Austin, and Brownsville Independent School Districts
- Developed a guide for assisting schools to plan for effective schoolwide programs
- Supervised the provision of technical assistance to various school districts throughout the state engaged in school improvement efforts
- Supervised state and federal program implementation of Learn and Serve America Grants - $1,500,000
- Co-Chaired Carnegie Middle School Initiative
  - Developed the State Plan for implementation of statewide middle school
  - Assisted in the development of the proposal to the Carnegie
- Co-Chaired America 2000 Committee for the city of Austin, Texas
- -Represented the Texas Education Agency in the development of the application for funds for the America 2000 partnership between state education agency, Austin Independent School District, and the University of Texas at Austin
- Managed state School Community Guidance Centers Programs and Funding
- Chair Annual State Conference for Students in At-Risk Situations
- Dropout Reduction Coordinator for Texas
- Task Force Member for the Texas Information and Referral Project Liaison to the Governor’s Office for Texas Juvenile Justice
- Co-chaired Taskforce on Social Policy and Assessment Vocational Education State Plan
- Co-chaired Committee on Behavior Management Guidelines for Special Education Students

School Administrative and Teaching Experiences:

Program Director, Corpus Christi, Texas Summer 1991
Supervisor: Jaime Arredondo, Assistant Superintendent (512) 844-0213
Don Shephard, Texas Department of Commerce, Austin, Texas (512) 343-0939

- Designed, directed, and implemented state model, STEP Program, JTPA co-sponsored program for summer training and employment

Grade Level Principal 1989-1991
Baker Middle School, Corpus Christi Independent School District
P. O. Box 110, Corpus Christi, Texas 78403-0110
Supervisors: Jaime Arrendondo, Assistant Superintendent (512) 844-0213  
Raymond Davis, Building Principal (512) 886-9002
- Supervised 6th and 7th grade levels; responsible for evaluation, instructional leadership, student performance, and physical plant maintenance
- Implemented a monthly teacher reflection group for staff development
- Data analysis and student performance reporting

**Assistant Principal**  
Baker Middle School, Corpus Christi Independent School District  
P. O. Box 110, Corpus Christi, Texas 78403-0110  
Supervisor: Raymond Davis, Principal (512) 878-1426
- Summer school principal
- Responsible for teacher evaluation and instructional leadership
- Responsible for TAAS testing and monitoring
- Responsible for discipline management

**Assistant Principal**  
Baker Middle School, Corpus Christi Independent School District  
P. O. Box 110, Corpus Christi, Texas 78403-0110  
Fall 1987 to Summer 1988  
Supervisor: Richard Harbin, Principal (Retired)
- Responsible for oversight of middle school implementation policy
- Responsible for teacher evaluation and instructional leadership
- Responsible for discipline management

**Assistant Principal**  
Hamlin Middle School, Corpus Christi Independent School District  
P. O. Box 110, Corpus Christi, Texas 78403-0110  
Fall 1986 to Summer 1987  
Supervisor: Sherry Blackett, Principal (512) 268-2911
- Responsible for teacher evaluation and instructional leadership
- Responsible for discipline management
- Responsible for facilities and maintenance

**Classroom Teaching experiences:**  
Corpus Christi Independent School District  
Point Isabel Independent School District  
Brownsville Independent School District  
Pharr-San Juan-Alamo Independent School District  
(Grades 6-12, English, Government, History, Journalism, & Yearbook)

**PUBLICATIONS**


RESEARCH DEVELOPED AND PUBLISHED OR PRESENTED:


The University of Texas, The Charles A. Dana Center.


BOARDS AND OTHER ASSOCIATIONS

P-16 Council sponsored by Education Equal Economics (E3 Alliance), Austin, Texas 2009

Texas Business and Education Coalition (TBEC) STEM Action Team, Austin, Texas 2008-Present

West Houston Center for Science and Engineering Advisory Board (HCASE), Houston, Texas 2008-Present

The Academy of Medicine, Engineering, and Science of Texas (TAMEST), contributing member to The Academy’s Education Steering Committee in the development of the final report, The Next Frontier: World Class Mathematics and Science Education for Texas, The University of Texas at Austin 2008

Teaching the Hard Stuff to Diverse Groups of Students. A national conference on issues of equity, access, and rigor for administrators, teachers, counselors, policymakers, school board members, and higher education faculty and researchers. Dallas, Texas 2005
STEM Academy Research Laboratories Sponsored by Business and Industry

STEM High and Middle School is patterned after a successful East Coast STEM Magnet School called Thomas Jefferson High School for Science and Technology (TJHSST) in Virginia. A unique feature in the school is the specialized science and technology research laboratories. They are designed to enhance the academic curriculum as well as provide students with unique learning experiences in technological environments, opportunities for independent research, experimentation, and interaction with professionals from the scientific, engineering, technological, and industrial communities. Through a mentorship coordinator, (financed through STEM Academy), each laboratory maintains contact with local government, private research laboratories, and technical facilities for information exchange and off-campus student mentorship opportunities.

STEM Academy will design and open Research Laboratories similar to TJHSST, modifying each Research Laboratory to meet the unique needs of Colorado’s business and industry providers. Business and Industry leaders at STEM Academy are being invited to have a permanent presence at STEM High through the STEM Academy Research Laboratory. Juniors and seniors from other high schools will be allowed to do mentorships and research at the STEM Academy Research Laboratories through an application basis. Once funding has been secured for the building project, Mark Baisley, STEM High / Middle School Board President, will begin inviting business and industry for their participation in the STEM Academy Research Labs.

Research Laboratories Overview
The technology program at Thomas Jefferson High School for Science and Technology is designed to develop in our students substantial experience and proficiency in laboratory-based research, project planning, experimentation, problem solving, design, modeling, fabrication, testing, evaluation, documentation, and presentation related to engineering, scientific and other technical areas.

The structure of the technology curriculum is different from Fairfax County and Virginia state technology curricula in order to support our unique student population. By initiating curriculum exploration and development in high technology fields, and by integrating elements from science and computer science as well as from the technical curriculum, the technology program derives strength from its links with businesses, industry, scientific and academic institutions. Structurally, it is comprised of both a technology electives curriculum and a science and technology laboratory research program.

Ninth grade students begin their technology education by taking a required full-year technology survey course which is integrated with Biology and English courses. Through an active, project-oriented approach to learning, the technology survey course introduces students to the engineering design process and provides a uniform foundation in knowledge of content and basic skills upon which students may draw for later work in science and technology.
During the tenth and eleventh grades, all students are expected to explore their science and technology interests through elective courses. A broad range of technology courses are currently offered throughout the Science and Technology research laboratories. Through these electives, students learn the specific formal content and skills required for their senior research project.

During the twelfth grade, all students are expected to complete a major science or engineering research project, either by working in one of the science and technology laboratories, or by working in a commercial, government or university research lab or technical facility through our mentorship program.

Twelfth grade students conduct the majority of their work in a specific laboratory, but are encouraged to make use of the facilities, equipment and resources of all of the laboratories. The mentorship program offers the students an opportunity to pursue a research project under the guidance of professionals from the scientific and technological community in a professional laboratory or worksite. Students are matched with a mentor based on mutual scientific and technological interests, as well as the goals of the senior research program. An in-house mentorship program is also offered to enable the investment and participation of the scientific and technological community in our school-based program. This provides students electing to remain at the school an enhanced research experience.

Numerous student projects developed in the research laboratories and through the mentorship program have been honored with top awards from the Intel Science Talent Search, Regional, Virginia and International Science and Engineering Fair, the Virginia Junior Academy of Science, the Austin T. Brown Technical Writing Competition, the Siemens Westinghouse Science and Technology Competition.

Below is a description of the type of Research Laboratories offered by TJHSST.
http://www.tjhsst.edu/discovery/labs/index.php

Astronomy
Students in the Astronomy Laboratory are involved in projects related to planetary geology, deep space image processing, and telescopic observations. Students are able to investigate astronomical images on CD ROM for their planetary projects. The Astronomy Laboratory participates in the Telescopes in Education program based on Mount Wilson in California. Students are permitted to remotely control Mt. Wilson's 24-inch telescope. Students access the telescope by modern and download the images in real time. Using "The Sky" software enables the students to do image processing. Other projects center on analyzing data provided by astronomers who are doing fundamental research on topics such as: light curves of variable stars, spectroscopic analysis, and investigating planetary features.

Automation and Robotics
In the Automation and Robotics Laboratory students apply engineering concepts to the design and fabrication of automated and robotic systems. They investigate the building blocks of those systems including sensors, analyzers, actuators, drivers, controllers, and power supplies. Students identify and solve problems aimed at integrating the concepts of automation and robotic systems,
with a view to electronics, computer programming, and manufacturing. Applications are viewed with consideration of their social, cultural and ethical impacts.

**Biotechnology**

The Biotechnology Laboratory provides a unique technology experience for a large portion of the Jefferson student body. The program offers a biotechnology training and research program designed to transform traditional secondary molecular biology studies into an applications program that helps students experience the power of newly discovered research tools associated with recombinant DNA technologies. The laboratory's primary mission is to supply a laboratory research-based program that allows its students to experience topics from bacterial transformation to DNA mapping. In addition, the program provides students with the experience of new, leading-edge technologies including bioinformatics, western blotting, rtPCR and DNA sequencing.

**Chemical Analysis**

In the Chemical Analysis Laboratory students take three years of chemistry from basic chemistry to more advanced topics which allow them to pursue independent research. For some students their chemistry experience culminates in an introductory organic chemistry with instrumental analysis course. For others, an independent research project rounds out their chemistry study.

**Communications**

Students in the Videotechnology and Communications Laboratory are involved in the technical side of developing video projects which inform or entertain the viewer. They adapt video technology to convert ideas into a finished visual product, including videos for Fairfax County Public Schools, promotional videos for community agencies and programs that cable-cast throughout the school. Serving as a resource facility, the Television Studio is used in a variety of interdisciplinary activities throughout the school. Students are given instruction on equipment operation and ongoing guidance as the projects progress. A study of the fundamentals of audio and video telecommunications equipment is incorporated.

**Computer Aided Design**

The Computer Assisted Design Laboratory allows students to interact with the computer to produce various three dimensional designs. Seniors conducting research projects in CAD are free to pursue their interests through independent studies in a variety of technical fields. Students have access to various AutoDesk software packages, from CAD 2000i to 3D Studio Max and 3D Studio VIZ to turn their ideas into reality.

**Computer Systems**

The Computer Systems Laboratory supports studies in theoretical and applied computational science, computer architecture, artificial intelligence, and supercomputing. Working in a UNIX environment, students are able to investigate a wide range of pure and applied research topics utilizing a variety of computer languages and styles. Projects fall within a broad spectrum of computer science areas spanning computer graphics, artificial intelligence, computer vision, high performance computing, grid/distributed computing, computational science applications such as computational linguistics, agent based modeling of complex systems including social complexity, software design, and theoretical algorithmic development of ideas as varied as tree
data structures to ant colony search optimization. The Computer Systems Laboratory emphasizes a multilingual computer language community, featuring C/C++, Java, Python, Ruby, XML, PHP, Perl, MySQL, JavaScript, Tk, OpenGL, Fortran, Lisp, and MASON (Multi-Agent Simulator of Neighborhoods).

**Energy Systems**
In the Energy Systems Laboratory, students apply the knowledge, problem-solving skills and project management skills acquired during their previous three years. Students may pursue projects of interest in a wide range of engineering disciplines, such as heat transfer, fluid dynamics, direct and indirect energy conversion, and mechanical systems. The laboratory accommodates both individual and team projects requiring specific knowledge in such diversified subjects as design, materials, testing, computer interfacing and planning.

**Microelectronics**
The Microelectronics Laboratory provides the opportunity for students to develop research and engineering projects involving the design of electronic circuitry. Areas of focus include digital signal processing, digital control, instrumentation, analog and digital audio, and communications. The various elective courses offered through this laboratory provide a technological foundation which prepares students for senior research both in this and in other technology laboratories.

**Neuroscience**
The Neuroscience Laboratory is an interdisciplinary lab, incorporating skills from the areas of biology, electronics, robotics, computer science, mathematics, chemistry, and physics. Research projects can involve brainwave analysis, conversion of brainwaves into electronic signals that would perform various physical or computer tasks, the biochemistry and physiology of axon action potential propagation and of synaptic transmission, nerve regeneration, computational neurobiology, and other exciting endeavors.

**Oceanography and Geophysics**
The Oceanography and Geophysics Research Laboratory focuses on the biological and physical aspects of oceanography and the geophysical systems. Biological oceanography students work on projects in taxonomy, morphology, ecology, biogeography and evolutionary biology. Physical Oceanography students work on projects in tidal dynamics, ocean currents, and ocean acoustics. Geophysical students work on projects in hydrology, geographical mapping, sedimentation and geophysical fluid dynamics. Students are expected to collect their own data from the marine environment on research vessels. Assistance in the form of ship-time and technical advice has come from the Oceanography Department of the United States Naval Academy, the Smithsonian Environmental Research Center, the Department of Systemic Biology of the National Museum of Natural History, and the Center for Coastal Physical Oceanography of Old Dominion University.

**Optics and Modern Physics**
The Optics and Modern Physics Laboratory provides exciting opportunities for students to develop research and engineering projects in the areas of pure and applied physics that include lens systems, fiber optics, human vision, interferometry, photography, color science, holography,
optical computing, or other laser and optical systems. Research projects in modern physics explore areas of nuclear, atomic, electromagnetic, solid state, wave and quantum physics. Other students regularly make use of the laboratory's specialized technologies to develop projects with applications in a variety of other scientific and engineering areas. In addition to research, the laboratory supports elective courses in optics and quantum physics.

**Prototyping and Engineering Materials**
The Prototyping and Engineering Materials Laboratory allows students, through research, to increase their understanding of the nature of a wide range of engineering materials. Students can also explore processes that are used to fabricate these materials. In addition to the research classes, two elective classes are taught through this laboratory. One, the Nature of Materials, is designed to introduce students to the families of engineering materials and to expose them to the physical properties of each. The second elective is Materials Processing. As Nature of Materials is designed to introduce students to the characteristics of materials, Materials Processing is designed to allow students to explore the various ways engineering materials can be fabricated. These electives are designed to lay a foundation for students who will be conducting research in the Prototyping and Engineering Materials Laboratory.

**TJHSST Research Laboratories Original Sponsors**
- Atlantic Research Corporation
- AT&T
- BDM Corporation (now Northrop Grumman)
- A.J. Dwoskin & Associates
- FMC Corporation
- Hazelton Laboratories
- IBM Corporation
- Martin Marietta
- Sony Corporation
- TRW (now Northrop Grumman)
- Versar, Inc.
- Virginia Power
- Honeywell, Inc.
- Meloy Laboratories
- Dynalectron
Student

- Based on the Denver Public Schools new school performance framework released in Spring of 2008, DSST was the highest performing high school in Denver on both the student learning growth section of this framework and the absolute student performance section of this framework – an unusual combination of excellence. Most importantly, this framework demonstrates that DSST is not successful because we get “better prepared kids,” rather, we are successful because they achieve measurable learning growth while they are here.

- From 2005-2007, DSST is the only high school in Colorado to earn an “Excellent” performance rating and “Significant Improvement” growth rating on state report cards based on state testing results.

- DSST is the only high school in the state ever to earn a “significant improvement rating” three consecutives years on the State Report Card.

- DSST’s 11th grade students over the last two years have averaged 3.75 point gain on a pre-post ACT tests in the junior year over an 8 month period – a remarkable increase.

- DSST’s first 11th graders had the fifth highest composite score in the state behind four schools with FRL count of 6%. (DSST’s 11th grade -38% FRL )

- In 2006-07 DSST’s 10th grade FRL students outperformed district and state averages for all students.

- In 2006-07, 10th grade FRL low income students outperformed DSST non-FRL students in reading and writing on the state tests – completely closing the achievement gaps in those subjects.

College

- 100% of its first class of seniors has been accepted into a four-year college or university this spring. The 100% acceptance rating is particularly inspiring considering the diversity of the Senior Class, which includes 62% minority and 40% low income students. Additionally, 50% of this first graduating class will be first generation college students.

- More than half of the class was accepted to the University of Colorado-Boulder, which is the most selective public institution in the state. A representative list of the other colleges and universities where DSST’s students have received admissions includes: Bowdoin College, Cal Tech, Cal Berkeley, Carleton College, Carnegie Mellon, Colorado College, Cornell University, University of Denver, Howard, Middlebury College, MIT, Pomona College, Northwestern, University of Northern
Colorado, Metropolitan State College of Denver, Stanford, Rensselaer Polytechnic Institute, Tufts, Wesleyan, and Worcester Polytechnic Institute.

- Our 2008 college acceptance list is unique nationwide as it includes both 100% four year acceptance for the class of 2008 (universal access) and has a list of selective colleges unparalleled for a charter school serving our population.

School Performance Framework 2008 Stoplight Scorecard Network: Charter Denver School of Science and Technology

Earned Points Possible Points % of Points Earned Stoplight

<table>
<thead>
<tr>
<th>Enrollment</th>
<th>431</th>
</tr>
</thead>
<tbody>
<tr>
<td>% FRL</td>
<td>34.1%</td>
</tr>
<tr>
<td>% ELL</td>
<td>3.5%</td>
</tr>
<tr>
<td>% SPED</td>
<td>6.5%</td>
</tr>
<tr>
<td>% Minority</td>
<td>56.4%</td>
</tr>
</tbody>
</table>

Distinguished

High Educational Level

1. Student Progress Over Time--Growth 66 78 85% Exceeds
2. Student Achievement Level--Status 41 42 98% Exceeds
3. Post-Secondary Readiness 10 11 91% Exceeds
4. Student Engagement 5 6 83% Exceeds
5. School Demand 4 4 100% Exceeds

Overall School Performance 126 141 89% Distinguished

Cut-Off Points 0% --

School Performance Framework 2008 Stoplight Scorecard Denver School of Science and Technology

Earned Points Possible Points % of Points Earned Stoplight

High Educational Level

1. Student Progress Over Time--Growth 66 78 85% Exceeds
1.1 SAR Growth Year 1 6 6 Exceeds
1.2a Growth Percentile Reading 6 6 Exceeds
1.2b Growth Percentile Math 6 6 Exceeds
1.2c Growth Percentile Writing 6 6 Exceeds
1.3a Growth Percentile Similar School Reading 6 6 Exceeds
1.3b Growth Percentile Similar School Math 6 6 Exceeds
1.3c Growth Percentile Similar School Writing 6 6 Exceeds
1.4a Catch Up Growth Reading 4 4 Meets
1.4b Catch Up Growth Math 4 4 Meets
1.4c Catch Up Growth Writing 4 4 Meets
1.5a Keep Up Growth Reading 4 4 Meets
1.5b Keep Up Growth Math 4 4 Meets
1.5c Keep Up Growth Writing 4 4 Meets
1.6 AYP Growth 0
1.7a Continuously Enrolled Growth Reading 0 4 Does not meet
1.7b Continuously Enrolled Growth Math 0 4 Does not meet
1.7c Continuously Enrolled Growth Writing 0 4 Does not meet
2. Student Achievement Level--Status 41 42 98% Exceeds
2.1a SAR Rating Year 2 3 3 Exceeds
2.1b SAR Rating Year 1 3 3 Exceeds
2.2a AYP Year 2 Reading 2 2 Meets
2.2b AYP Year 2 Math 2 2 Meets
2.2c AYP Year 1 Reading 2 2 Meets
2.2d AYP Year 1 Math 2 2 Meets
2.3a CSAP Proficient+ Reading 2 2 Meets
2.3b CSAP Proficient+ Math 2 2 Meets
2.3c CSAP Proficient+ Writing 2 2 Meets
2.3d CSAP Proficient+ Science 2 2 Meets
2.4a CSAP Proficient+ Similar School Reading 2 2 Meets
2.4b CSAP Proficient+ Similar School Math 2 2 Meets
2.4c CSAP Proficient+ Similar School Writing 2 2 Meets
2.4d CSAP Proficient+ Similar School Science 2 2 Meets
2.5a Gaps Reading 2 2 Meets
2.5b Gaps Math 2 2 Meets
2.5c Gaps Writing 1 2 Approaching
2.5d Gaps Science 2 2 Meets
2.7 CSAP Advanced 2 2 Meets
2.8 CELA 2 2 Meets
3. Post-Secondary Readiness 10 11 91% Exceeds
3.1 COACT 3 3 Exceeds
3.2 Graduation Rate 0
3.3 On Track to Graduation 2 2 Meets
3.4 AP PSEO Enrollment 1 2 Approaching
3.5 AP Test Taking Rate 2 2 Meets
3.6 AP Test Passing Rate 2 2 Meets
3.7 PSEO Passing Rate 0
4. Student Engagement 5 6 83% Exceeds
4.1 Attendance Rate 3 3 Exceeds
4.2 Student Satisfaction Survey 2 3 Meets
5. School Demand 4 4 100% Exceeds
5.1 Re-Enrollment Rate 2 2 Meets
5.2 Enrollment Change 2 2 Meets
9/22/2008
This book list was contributed from Dr. Darlene Yaney, based on her expertise with STEM curriculum and her partnership with TJSST.

The book lists are difficult because they change each year. However, when speaking to several English/humanities teachers in STEM schools, they use the Norton Anthology along with the Great Books summer program reading lists from Amherst and Stanford [http://www.greatbookssummer.com/about/index.asp] and using the National Great Books Curriculum [http://www.nationalgreatbooks.com/whoweare/statement.asp]

I like TJ's idea of one book for the entire school reading program...and you will see the summer reading program for each of the areas listed below. The teachers work together to find the appropriate reading materials to support their projects...

- This is the summer reading program for TJSST for IBET [http://www.tjhsst.edu/curriculum/summer/docs/ibet.pdf]
- Humanities I [http://www.tjhsst.edu/curriculum/summer/docs/hum1.pdf]
- Humanities II [http://www.tjhsst.edu/curriculum/summer/docs/hum2.pdf]
- Topics In Globalization [http://www.tjhsst.edu/5%7EJlamb/tgsummerreading.html] (AP Lang: 119662/AP Gov: 244561)
- AP Language & Comp [http://www.tjhsst.edu/curriculum/summer/docs/aplang.pdf] (Only singleton classes) (119604)
- AP Literature [http://www.tjhsst.edu/curriculum/summer/docs/aplit.pdf] (Only singleton classes) (119504)
- [http://www.tjhsst.edu/curriculum/summer/sumread.php]

One Book for One Question

[http://www.tjhsst.edu/studentlife/oneq/index.php]

The One Book selection for 2009 summer reading is Three Cups of Tea by Greg Mortenson and David Oliver Relin. This non-fiction work lends itself well to the 2009-2010 One Question, "What are the social responsibilities of educated people?" [http://www.tjhsst.edu/studentlife/oneq/index.php]. All students and faculty will read Three Cups of Tea during the summer, and will have the opportunity to react to it through class discussions and activities when the school year begins. It is not necessary to write about the book before returning to school. Three Cups of Tea is easily available through public libraries, bookstores and online purchasing.
STEMming the Tide: 
A Colorado Response to the National Crisis in 
STEM Education

A White Paper by 
The Colorado Association for Gifted and Talented 
and 
Center for the Education and Study of the Gifted, Talented, 
Creative 
University of Northern Colorado

Stuart N. Omdal, Ph.D., Mary-Anne Richards, Ed.D., 
Deborah Brennan, M.A. & Julie Gonzales, M.A.
The Colorado Association for Gifted and Talented and the Center for the Education and Study of the Gifted, Talented, Creative at the University of Northern Colorado present this “White Paper” to inform Colorado decision makers in industry, government, and public education how to resolve the current crisis in Science, Technology, Engineering, and Mathematics (STEM) education in Colorado. We propose solutions that “raise the bar” for all students and “raise the ceiling” for Colorado’s most able learners. We conclude that research-based gifted education practices can effectively address and must be applied to the STEM problem. The result will be the continued leadership of Colorado and the United States in innovation, research, and development – STEMMing the Tide and solving the crisis in the areas of Science, Technology, Engineering and Mathematics.
INTRODUCTION

The role of Science, Technology, Engineering, and Mathematics (STEM) education in the United States is currently receiving a great deal of attention. Recently published national studies, President Bush’s 2006 State of the Union address, and even a recent edition of *Time* magazine, highlight the importance of strong educational programs in these areas starting at elementary grade level throughout college to ensure the vitality of the United States economy, to sustain our national security, as well as to maintain our global leadership in innovation and research.

Asian countries, in particular, have made great advances in education during the last 50 years, in some instances surpassing the United States in student achievement in math and science. Whereas in the past many of the Asian countries specialized in manufacturing American goods, their leaders are showing great interest in learning about American methods of inventive thinking, innovation, and creativity.

The potential economic and social impact of the downward trend of fewer American university students majoring and choosing careers in the STEM areas is enormous. Introducing students to these fields through curriculum that is engaging, meaningful, and challenging, creates the opportunity for the United States to maintain and exceed its current place as the leader in science, technology, engineering and mathematical innovation throughout the world. In the United States, gifted education principles and practices hold much promise for increasing student interest and achievement in Science, Technology, Engineering and Mathematics (STEM).

Education reform in the United States focuses on raising the “academic bar” for lower performing students by increasing math and science graduation requirements and math achievement scores. Federal and state legislation around academic accountability displaces any efforts to support education of the gifted learner. State mandated testing of public school students focuses questions and measured outcomes squarely on the “proficient” scorers. This undermines the value of "advanced" level scores, reporting to
the public that successful achievers are those falling under the combined "proficient or advanced" categories.

The future of the United States’ economy depends on a well-educated workforce. However, the impetus for economic growth comes from the creation of ideas and innovation -- new ways of doing things. American innovation and creativity have kept the United States at the technological forefront for a century-and-a-half and have made the United States the envy of other countries.

Last fall the Colorado Association for Gifted and Talented (CAGT) hosted a public forum entitled: **Tapping Colorado's Potential: An Initiative for Achieving Innovative Excellence in a Global Economy.** The association invited representatives from area high tech and defense industries including Northrop Grumman, IBM, Raytheon, and Ball Aerospace. Former Wyoming Governor Jim Geringer, Director of Policy and Public Sector Strategies for Environmental Systems Research Institute; Dr. Judi Diaz Bonacquisti, Director of Minority Engineering Programs at the Colorado School of Mines; and Dr. Susan Assouline, co-author of the Templeton National Report on Acceleration were also invited. The focus of the discussion was to respond to recent reports concerning the declining pool of a competitively educated and trained workforce in the areas of science, technology, engineering and mathematics (STEM). The decision to publicize issues surrounding the STEM problem and offer solutions from a gifted education perspective resulted from this forum.

The Colorado Association for Gifted and Talented and the Center for the Education and Study of the Gifted, Talented, and Creative at the University of Northern Colorado present this “White Paper” to inform decision makers in Colorado of solutions to address the current state of STEM education in Colorado. These solutions “raise the bar” for all students and “raise the ceiling” for Colorado’s most able learners. **Principals of gifted education present a research-based foundation that can reverse the current STEM crisis in Colorado and the nation.**

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THE PROBLEMS

❖ Shifting Intellectual Capital

“We go where the smart people are. Now our business operations are two-thirds in the U.S. and one-third overseas. But that ratio will flip over the next 10 years.”
— Intel spokesman Howard High

The percentage of United States students majoring in the STEM disciplines and thus choosing STEM careers is decreasing. The percentage of students from foreign countries majoring in the STEM disciplines in the U.S. and the percentage of foreign students who stay in their own countries majoring in STEM disciplines are increasing.

The numbers are familiar:

❖ In 2000- The number of science and engineering undergraduate degrees awarded:
  ▪ Asian universities: 12 million
  ▪ European universities (including Russia): 850,000
  ▪ North American universities: 500,000
❖ In 2003- percentage of graduates who were foreign nationals earning Ph.D.s in the United States
  ▪ 59 percent - Engineering
  ▪ 56 percent - Computer Science
  ▪ 54 percent - Math
  ▪ 48 percent – Physics
In 2004- U.S. graduated 70,000 engineers
  ▪ India graduated 350,000 engineers
  ▪ China graduated 600,000 engineers

Current- percentage of undergraduates majoring in Engineering
  ▪ U.S. - 6 percent of university students (about one-third of U.S. students intending to major in engineering switch majors before graduating)
  ▪ European Countries - 12 percent of university students
  ▪ Singapore - 20 percent of university students
  ▪ China - 40 percent of university students

U.S. universities report a drop in the number of foreign students coming to the United States for undergraduate and graduate study due to changes in immigration laws that resulted from the 9-11 incident. Also reported is an increase in the number of universities in Asian countries offering advanced degrees in the STEM disciplines. The increase of graduates in STEM in other countries is considered to be reflective and predictive of growing technological and scientific economic strength in those countries.

**Losing the Competitive Edge**

The development of scientific talent in foreign countries may produce long-term educational and economical implications. The United States leads the world in innovations and inventions that have greatly affected many aspects of life on a global scale. This proclivity for creativity and originality has long been a hallmark in American industry and technology. Leaders in business and industry in foreign countries are now looking to the United States for strategies to increase their country’s creative thinking, innovation, and problem solving abilities.

**Losing National Security Capabilities**

National security depends on an abundance of graduates in the STEM disciplines. When over 50% of the graduates earning Ph.D.s in the United States are foreign
nationals, there will not be an adequate number of United States citizens capable of filling these crucial positions.

❖ The Status of Education at the National Level

Nat°ve Standards Eyed Anew
By Lynn Olson (as first appeared in Education Week, December 7, 2005)

"Besides the effects of the nearly 4-year-old federal law (No Child Left Behind), advocates are pointing to the kind of growing international competition that is analyzed in Thomas L. Friedman’s current best-selling book, The World Is Flat: A Brief History of the Twenty-First Century. I’ve been watching very, very closely the educational progress in Asia — China, India, Vietnam, Singapore, and several others,” said Robert L. Wehling, a retired global-marketing officer for the Cincinnati-based Procter & Gamble Co., "and I’m telling you, they’re making rapid progress, whereas we’re making minuscule progress. And I don’t think the average American understands the impact of this for our future, because they’re going to have the bulk of the intellectual and creative talent in the world, and that has devastating consequences for us."

Student Performance in Mathematics and Science

- The National Assessment of Educational Progress (NAEP) reports that student performance in mathematics and science has improved to some extent over the past 30 years, but the improvement has not been consistent. Achievement gaps between racial/ethnic groups have not changed.

- The Program for International Student Assessment (PISA) states that students in the United States are performing at or below the levels of students in other industrialized countries.

- The Third International Mathematics and Science Study (TIMSS) reports that when compared internationally the performance of American students declines at higher grade levels. Those United States students who took classes in science and mathematics at an advanced level performed poorly compared with students in other countries who had taken comparable courses.
Limitations of Standardized Tests

Standardized tests provide adequate data relating to midrange students; however, they fail to effectively measure students at the high end of the ability spectrum. These tests fail to recognize students who perform above the Advanced level or those who move to superior or innovative performance. If collected data reflects values, then our society values minimum proficiency. There is no formal recognition of students who move beyond the knowledge and comprehension levels of understanding concepts and information and move to the highest levels of thinking – the synthesis or creation of new information.

NASA Space Settlement Contest

As an example of true American ingenuity, the NASA Space Settlement contest was started in 1993, with the first awards given in the Spring of 1994. Table 1 is a comparison of the winners from 2000 and 2005. It is clear that the participation of students from other countries has increased. It may be due to increased publicity through the Internet, or other reasons, such as the drive of other governments to compete in engineering and technology. Whatever the reason, this is a dramatic representation of the growing creative thinking, innovation, and problem-solving ability of students in other parts of the world.

Table 1: NASA Space Settlement Contest Winners Country of Origin

<table>
<thead>
<tr>
<th></th>
<th>2000</th>
<th>2005</th>
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<tbody>
<tr>
<td><strong>Grand Prize</strong></td>
<td>Ireland: 1</td>
<td>Romania: 1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>India: 1</td>
</tr>
<tr>
<td><strong>1st place winners</strong></td>
<td>Austria: 1</td>
<td>Iran: 1</td>
</tr>
<tr>
<td></td>
<td>Macedonia: 1</td>
<td>Romania: 1</td>
</tr>
<tr>
<td></td>
<td>U.S.: 7</td>
<td>India: 1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>U.S.: 4</td>
</tr>
<tr>
<td><strong>2nd place winners</strong></td>
<td>Canada: 1</td>
<td>India: 4</td>
</tr>
<tr>
<td></td>
<td>U.S.: 8</td>
<td>Turkey: 1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>U.S.: 2</td>
</tr>
<tr>
<td><strong>3rd place winners</strong></td>
<td>U.S.: 10</td>
<td>India: 2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>U.S.: 5</td>
</tr>
<tr>
<td><strong>Honorable Mention</strong></td>
<td>U.S.: 26</td>
<td>India: 4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>U.S.: 13</td>
</tr>
</tbody>
</table>
Status of Education in Colorado

Colorado Student Assessment Program

Student data for the last five years show a decline in the percentage of students scoring at the proficient (p) and advanced (a) levels. (Appendix 1, Page 20) This decline may reflect that the math foundation developed in the early grades primarily focuses on arithmetic computation at the expense of general number sense and conceptual mathematical thinking. Instructional strategies that develop a strong foundation in conceptual mathematics supports the application of skills and knowledge needed for success in algebra, geometry and calculus.

Advanced Placement

Advanced Placement (AP) exam results (Appendix 2, page 21) indicate that more students are taking the AP exams, in part due to the Colorado ESCAPE Grant (Eliminating Student Cost for Advanced Placement Exams). The score range on the AP exam scores is 1 (low) - 5 (high), with scores of three and above indicating subject-competency. From 2001 to 2005 in the sciences and mathematics exams, 29 - 48 percent of the students scored below the competency level. This may indicate that these students were neither ready academically for the rigor of the courses nor ready for college level coursework.

Colorado’s Post-Secondary Outlook

Colorado ranks 29th in the country for graduating high school students and 19th for the percentage of high school graduates who go on to college. The Colorado Department of Education reports that about 25 percent of high school graduates require remedial classes in college and that the majority of these students do not earn a bachelor’s degree. With this critical need to focus on the students who are not ready for post-secondary options, Colorado’s most able learners are left out of the call for high school reform. While it is important to “raise the bar” of academic rigor and preparation for all students, it is critical to Colorado’s economic future that we “raise the ceiling” for our most able learners.
Assessments Used to Estimate College and Entry Job Readiness

The CSAP and AP exam scores can tell us how our students and schools perform within Colorado on a year-to-year basis; they can also be used to compare schools. But how college-ready and entry-job-ready are our students when compared to the rest of the high school students in the country? The answer necessitates a look at the American College Testing Program (ACT) scores of Colorado’s high school students.

Since 2002, all Colorado high school juniors have taken the ACT as part of the State Assessment Program for Education Accountability (Colorado Senate Bill 186, 2000). The ACT scores allow parents and schools to compare the academic success of high school students in Colorado and across the nation. With all juniors now taking the ACT, Colorado’s average ACT score fell, on a 36-point scale, from 21.4 in 1995 to 20.2 for 2005 (See Table 2, page 11). The ACT assesses student performance in Mathematics, Science, English and Reading, with an optional Writing section. This allows the state policymakers, business leaders, parents, and educators to evaluate how prepared the high school upperclassmen are for work and secondary educational opportunities.

Only 15 percent of American jobs are open to the unskilled high school graduate or drop-out – this is the basis of the call for high school reform and Colorado’s initiative to “raise the bar” of post-secondary preparation. “College Prep” coursework is not just for college-bound students in the 21st century. Eighty-five percent of the possible jobs require more than basic skills. All high school graduates need the pre-requisite content, skill, and thinking ability requirements of post-secondary options in order to qualify for introductory level jobs in the United States.

However, it is Colorado’s most able learners that will create these job opportunities for our educated population. Innovation provides the key to employing a highly-trained and educated workforce. As America loses its technological and innovative edge to other countries, the skilled jobs, like the unskilled jobs of the 20th century, will be lost to overseas competitors. We must “raise the ceiling” for our most able learners, allowing them to develop their creative thinking and problem solving abilities in order to continue to create new industries for our workforce.
Table 2: ACT National and Colorado Scores 1995-2005

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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>ACT Average Score</td>
<td>20.8</td>
<td>20.9</td>
<td>21.0</td>
<td>21.0</td>
<td>21.0</td>
<td>21.0</td>
<td>20.8</td>
<td>20.8</td>
<td>20.9</td>
<td>20.9</td>
<td></td>
</tr>
<tr>
<td>Colorado Average Score</td>
<td>21.4</td>
<td>21.4</td>
<td>21.5</td>
<td>21.5</td>
<td>21.5</td>
<td>21.5</td>
<td>20.1</td>
<td>20.1</td>
<td>20.3</td>
<td>20.2</td>
<td></td>
</tr>
<tr>
<td>Percent Graduating Seniors Taking Test</td>
<td>63</td>
<td>60</td>
<td>60</td>
<td>63</td>
<td>62</td>
<td>64</td>
<td>62</td>
<td>99</td>
<td>100</td>
<td>100</td>
<td>100</td>
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<tr>
<td>National Math</td>
<td>20.2</td>
<td>20.2</td>
<td>20.6</td>
<td>20.8</td>
<td>20.7</td>
<td>20.7</td>
<td>20.7</td>
<td>20.6</td>
<td>20.6</td>
<td>20.7</td>
<td>20.7</td>
</tr>
<tr>
<td>Colorado Math</td>
<td>20.5</td>
<td>20.5</td>
<td>20.9</td>
<td>21.2</td>
<td>21.1</td>
<td>21.1</td>
<td>21.1</td>
<td>19.8</td>
<td>19.7</td>
<td>20.0</td>
<td>20.0</td>
</tr>
<tr>
<td>National Science</td>
<td>21.0</td>
<td>21.1</td>
<td>21.1</td>
<td>21.1</td>
<td>21.0</td>
<td>20.0</td>
<td>20.1</td>
<td>20.8</td>
<td>20.8</td>
<td>20.9</td>
<td>20.9</td>
</tr>
<tr>
<td>Colorado Science</td>
<td>21.8</td>
<td>21.8</td>
<td>21.8</td>
<td>21.8</td>
<td>21.7</td>
<td>21.7</td>
<td>21.7</td>
<td>20.2</td>
<td>20.5</td>
<td>20.4</td>
<td>20.2</td>
</tr>
</tbody>
</table>

Note: Colorado’s scores in 2005 ranked Colorado 39th in math and 40th in science on the ACT.

“Only 22 percent of the 1.2 million high school graduates who took the ACT Assessment in 2004 achieved scores that would deem them ready for college in all their basic academic areas — English, Math and Science.” (ACT report (2004)

**PROPOSED SOLUTIONS**

The chain of STEM instruction begins in elementary school and continues through middle and high school to undergraduate and graduate schools. This “pipeline” feeds the research and development departments of business and industry. Weak links in the chain can cause the breakdown of the system and leave our country with a dearth of specialists in the STEM disciplines, creating a threat to Colorado’s and America’s economic vitality and leadership, as well as our national security. The
following proposals to reverse this crisis in STEM areas are grounded in research-based Gifted and Talented Education principles and practices.

❖ Research-Based Solutions from Gifted Education for ALL STUDENTS:

• Raising the Ceiling

 PROVIDE ADVANCED LEARNING OPTIONS AT ALL LEVELS (K-12) IN COLORADO SCHOOLS

“No Child Left Behind” places a high priority on increasing the test scores of students who are at the Unsatisfactory and Partially Proficient levels to the Proficient level. While this “raising the bar” is necessary for those who are too often left behind, an unintended side effect of this emphasis is the lowering of curricular expectations for students who are capable of advanced performance. Too often educators feel they must choose between providing for the academic needs of students working below grade level and those performing above grade level. It is possible to address the needs of all learners by raising both the “bar” and the “ceiling”.

“By denying our most intelligent students an education appropriate to their abilities, we may also be denying civilization a giant leap forward.”


• Curriculum Differentiation

 APPLY CURRICULUM AND INSTRUCTION DIFFERENTIATION IN ALL K-12 CLASSROOMS.

Curriculum differentiation is a research-based approach to instruction that uses student ability, readiness, and interest to shape instruction. Colorado teachers face classrooms filled with a wide-range of learning abilities and readiness. Many teachers try to “teach to the middle” and leave both the struggling learner and the advanced learner out of the lesson planning. Often the struggling learner gives up and the advanced learner tunes out. Rather than assuming that all students in the same grade have the same level of knowledge, understanding, and skills in a particular content area, curriculum differentiation allows teachers to pre-assess students to determine
each student’s appropriate level for instruction. In a major 2005 study conducted in the Denver metropolitan area by Mary-Anne Richards from the University of Northern Colorado, 300 high school freshmen in heterogeneous general science classes made substantial academic gains through the implementation of curriculum differentiation. Training all classroom teachers in curriculum differentiation will allow them to address the diverse abilities found in Colorado’s classrooms. This will allow more time for the struggling learner to grasp the content, as well as allow the advanced learner to gain the opportunity to develop higher levels of skills and knowledge.

- **Active Learning**

  **INCREASE S.T.E.M. ACTIVE LEARNING EXPERIENCES.**

  Provide STEM active learning experiences for students which utilize inquiry methods, primary sources, and technology in an exciting and sophisticated way to increase student motivation. As students master the skills of practicing professionals, they learn to solve real problems. Real-world problem solving with direct application, opportunities for research, and creative productivity are achievable at any grade level for all students. More students will pursue math and science education into post-secondary options because they associate science and math with practical applications to life rather than the tedium of textbook learning. It is critical that students who exhibit high ability in STEM areas have the opportunity to meet and collaborate with career STEM professionals. These connections will allow students to develop a knowledge of and an interest in the possibility of pursuing a career in a STEM profession. Connecting high potential students during their early school years to STEM professionals will create America’s next generation of innovative leaders.

- **Creativity and Innovation**

  **EMPHASIZE CREATIVITY AND INNOVATION IN S.T.E.M. INSTRUCTION.**

  Creative thinking is the essential factor in innovation, invention, and research. When schools emphasize memorization of facts without an opportunity to use those facts by posing questions and solving real world problems, students associate the STEM
fields as a disengaging process of cataloging and computing information. Curiosity and creativity lead to innovation and invention, as well as the ability to solve critical problems. Gifted education includes many research-based activities that enhance creativity in students. High ability learners need an opportunity to develop their creative thinking abilities so innovation, invention, and research will continue in STEM areas.

- **Reduce Alienation**

  REDUCE THE ALIENATION OF CREATIVE AND INNOVATIVE STUDENTS BY REQUIRING ALL PRE-SERVICE TEACHERS TO COMPLETE A FULL COURSE ON THE NATURE & NEEDS OF GIFTED LEARNERS.

  The social and emotional needs of creative, innovative, and gifted students are not supported in many public and private school settings. These students often feel separated from their peers and devalued in school and society, leading them to under-achieve and drop-out of school. In reality, it is the thinking of creative and innovative people that allows original approaches to old problems that leads to new ideas and innovative solutions. Innovative professionals make the discoveries that lead to breakthroughs, inventions, and new ways of thinking. Gifted education includes many research-based methods aimed at decreasing the alienation of creative and innovative learners. These practices need to be embedded in Colorado’s education system. Teachers, administrators, parents, and students must be given the opportunity to understand and value the creativity of these students in order to support them.

  “We must learn to value nonconformists. ...Just as we are learning to value racial diversity, we must learn to treasure the different abilities and interests of our students.” Margaret Wallace (Jefferson County Schools, Colorado) Ed Leadership Dec 1999/Jan 2000, Nurturing Nonconformists p.44

- **Explorations, Internships, and Mentorships**

  DEVELOP EXPLORATIONS, INTERNSHIPS, AND COORDINATED MENTORSHIP PROGRAMS.

  Explorations allow high ability students to begin the process of active inquiry into
a field of study. By using the research-based gifted education method of curriculum compacting, high ability students gain the class time necessary to make these explorations, nurturing their personal identity as a practitioner of the discipline. Providing internships and mentorships will allow students to experience the excitement of real-world application in the STEM fields. Linking middle and high school students with professionals working in the field will stimulate interest and provide opportunities for collaboration. Research shows that many successful scientists attribute a critical degree of their success to interested professionals and mentors that supported them during their development.

**Teacher Support Solutions**

- **Qualified Teachers**

  **INCREASE THE NUMBER OF HIGHLY QUALIFIED TEACHERS.**

  This is a key component of both the No Child Left Behind act and President Bush’s “American Competitiveness Initiative” (2006). Because elementary teachers must take courses in all content areas, it is sometimes difficult for them to attain adequate levels of knowledge and skills in all the content areas they teach. Elementary teachers lay the content area foundations critical for success at the secondary level so it is essential that they attain the knowledge, skills, and dispositions necessary to successfully ground their students in the STEM content areas. State universities are mandated to plan teacher education programs that can be completed in eight semesters with a cap of 120 credits. Giving universities the option to increase the science and math requirements is a key step in developing more highly qualified teachers.

- **Colorado Association for Gifted and Talented (CAGT)**

  **DEVELOP A STATEWIDE NETWORK OF RESOURCES, TRAININGS, AND ENRICHMENT OPPORTUNITIES FOR TEACHERS, PARENTS, AND STUDENTS.**

  CAGT will develop a clearinghouse for professional education opportunities for teachers: summer institutes, internships, collaborative projects, workshops, and
courses, as well as teaching resources. CAGT will continue to develop workshops and conferences that give educators, parents, and students an opportunity to experience research-based ideas for the classroom and school. CAGT will publish best teaching practices in STEM areas that highlight curriculum ideas for parents, teachers, and students. CAGT will gather opportunities for students to explore and expand their interests, talents, and abilities in STEM through summer programs, academic competitions, and research opportunities. CAGT will actively pursue partnerships with Colorado businesses to provide opportunities and scholarships for students to engage in mentor experiences and internships in STEM areas.

**CONCLUSION**

Gifted education solutions can effectively address and must be applied to the STEM problem. Although Colorado is requiring higher levels of math – “raising the bar” for all students – and many students are accepting the challenge of higher levels of math, Colorado and the United States have failed to “raise the ceiling” for our most able-learners. They have ignored the research-based components of gifted education that cultivate creativity, problem solving, and innovation through independent study, explorations, enrichment, and mentorships. Teacher training in research-based gifted education practices can benefit all students. With the full support of policymakers, the business community, parents, and our Colorado community, all students can make the transformation into active, inquiring learners. School partnerships with industry to provide internships, mentorships, and other real-world experiences can motivate highly-able students to pursue further education and careers in STEM. The result will be the continued leadership of Colorado and the United States in innovation, research, and development – STEMming the Tide and solving the crisis in the areas of Science, Technology, Engineering and Mathematics.

“True education makes for inequality; the inequality of individuality, the inequality of success; the glorious inequality of talent, of genius; for inequality, not mediocrity, individual superiority, not standardization is the measure of the progress of the world.”
— Felix Emmanuel Schelling, American Educator and Scholar (1858 - 1945)
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