



# K-12 STEM Whitepaper

Prepared for the  
District 11 Academic Master Plan Steering Team

Respectfully Submitted on Behalf of the AMP K-12 STEM Planning Team  
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# Executive Summary: D11 AMP K-12 STEM Planning Team Recommendations

## Exemplary K-12 STEM Development Framework

- [The STEM Immersion Guide](#), Science Foundation Arizona (SFAz), the Arizona STEM Network, and the Maricopa County Education Service Agency (MCESA).

## Elementary School Recommendations

- District 11 K-5 STEM Pathway schools should be designed as full immersion and transdisciplinary for all students.
- Instructional models should be problem- and project-based engaging students in open-ended inquiry to solve real-world problems.
- Curricular design should bring all components of the Graduate Profile to the forefront of learners' experiences.
- Evidence-based, K-5 STEM development framework
  - [eSTEM Critical Components for Inclusive STEM Elementary Schools](#), The eSTEM Project lead by SRI International and George Mason University
- K-5 STEM Pathway schools with exemplary components
  - [Vineyard Stem Magnet School; Ontario, CA](#)
  - [Walter Bracken STEAM Academy; Las Vegas, NV](#)
  - [Douglas L. Jamerson, Jr. Elementary; St. Petersburg, FL](#)
  - [Weaver Lake Elementary; Maple Grove, MN](#)
- K-5 implementation plan overview
  - Year 1 (planning prior to school opening)  
Comprehensive planning and development with school leadership team and identified K-5 staff.  
Further research of and site visits with exemplar STEM schools.  
Extensive, in-depth professional learning in STEM, learning models, culture development, and habits of mind.
  - Year 2 (1<sup>st</sup>-year implementation)  
K-5 launch with initial curriculum, instruction, and learning models; one major transdisciplinary STEM unit per grade; and initial community partnerships.  
Extensive job-embedded professional learning and coaching for all staff.
  - Years 3 & 4 (2<sup>nd</sup>- & 3<sup>rd</sup>-years implementation)  
Full implementation of curriculum and learning models with four major transdisciplinary STEM units per grade.  
Extended community partnerships.  
Extensive after-school enrichment opportunities for all learners.  
Full integration of Design Thinking and STEM Habits of Mind.  
Continued job-embedded professional learning and coaching for all staff.
  - Year 5 (4<sup>th</sup>-year implementation)  
Comprehensive review, reflection, and evaluation of school model for further improvement and for sustainability.

## Executive Summary: D11 AMP K-12 STEM Planning Team Recommendations

### Middle School Recommendations

- District 11 middle school STEM should be designed as school-within-school, partial immersion programming with STEM integrated into all content areas.
- Identify four middle school STEM-focus sites – two eastside and two westside.
- Leverage and further develop District 11 middle schools' experience and investment in *Project Lead The Way (PLTW)*.
- Exemplary, middle school STEM framework
  - [Project Lead The Way Gateway](#), Project Lead The Way, Inc.
- Middle schools with exemplary STEM components
  - [Clark County Magnet Middle Schools](#); Las Vegas, NV
  - [Trail Ridge Middle School](#); Longmont, CO
  - [Broward County Schools](#); Fort Lauderdale, FL
- Middle school implementation plan overview
  - Year 1 (planning prior to launch)  
Comprehensive planning and development with school leadership teams.  
Further research of exemplar sites and community partnerships.  
Evaluate and enhance current grade-level and advanced STEM-related courses.  
Extensive and in-depth *Project Lead The Way (PLTW)* professional learning for identified staff.
  - Year 2 (1<sup>st</sup>-year implementation)  
Launch Grade 6 introductory *PLTW Gateway* classes and STEM integration into all Grade 6 content areas.  
Launch community partnerships.  
Job-embedded professional learning and coaching for staff.
  - Years 3 (2<sup>nd</sup>-year implementation)  
Launch Grade 7 *PLTW Gateway* classes with identified student cohorts and STEM integration into all Grade 7 content areas.  
Extend community partnerships.  
Continue job-embedded professional learning and coaching for staff.
  - Year 4 (3<sup>rd</sup>-year implementation)  
Launch Grade 8 *PLTW Gateway* classes with identified student cohorts and STEM integration into all Grade 8 content areas.  
Refine community partnerships.  
Continue job-embedded professional learning and coaching for staff.
  - Year 5 (4<sup>th</sup>-year implementation)  
Comprehensive review, reflection, and evaluation of school model for further improvement and for sustainability.

# Executive Summary: D11 AMP K-12 STEM Planning Team Recommendations

## High School Recommendations

- District 11 high school's traditional comprehensive model should continue to utilize school-specific programs to provide STEM opportunities for ALL students at ALL high schools.
- D11 high school STEM programs should be strengthened through increased funding and professional development, and by increased effectiveness in recruiting and alignment.
- D11 STEM education should emphasize demonstrations of learning in which students present their work for community review and feedback.
- Leverage and further develop District 11 high schools' experience and investment in *Project Lead The Way (PLTW)* and expand *PLTW Gateway* offerings in D11 middle schools.
- Expand 3<sup>rd</sup>- and 4<sup>th</sup>-year computer science offerings in D11 high schools.
- Establish an ongoing D11 K-12 STEM Steering Committee with STEM educators from grades K-5, 6-8, and 9-12, students, district administration, and community members to collaborate and advise further development of K-12 STEM programming in District 11.
- Evidence-based, high school STEM framework
  - [\*The Opportunity Structures for Preparation and Inspiration in STEM \(OSPri\) Logic Model\*](#) and [\*The OSPri STEM Inventory\*](#), The OSPri Study of Inclusive STEM-Focused High Schools lead by SRI International and George Mason University
- High schools with exemplary STEM components
  - [\*High Tech High\*](#), multiple locations in southern CA
  - [\*STEM School Highlands Ranch\*](#), Highlands Ranch, CO
- High school implementation plan overview
  - Year 1 (collaboration)  
Collaborate to establish an on-going D11 K-12 STEM Steering Committee of STEM educators from grades K-5, 6-8, and 9-12.  
Collaborate to initiate D11 development of a comprehensive philosophy and vision for K-12 STEM education.  
Collaborate with grades K-5 and 6-8 STEM planning teams to support and to develop K-8 vertical articulation to high school STEM options.
  - Years 2 & 3 (study & planning)  
Continue collaboration efforts with K-8 teams in District-wide STEM development.  
Conduct comprehensive review and evaluation of strengths/opportunities in D11 high school STEM programming, practices, and inclusiveness having all stakeholders consider vertical alignment from K-8.  
Conduct further, in-depth research of exemplary and inclusive high school STEM practices and programming models.  
Conduct coordinated and site-based planning for further investment in and expansion of high school STEM programming.
  - Years 4 & 5 (launch expansion)  
Initial implementation of high school STEM expansion based upon study/planning in years 2 & 3 and on-going K-8 collaboration and vertical articulation.

## STEM Definitions

Over the last 20 years the term STEM, in the context of education, has taken on a variety of perspectives. These perspectives range from being an acronym for the four separate disciplines in isolation to the title of a course or elective, all the way to the transdisciplinary integration of science, technology, engineering, and mathematics with the other core subject areas [1]. An internet search of “definition STEM education” returns a wide variety of rich possibilities. Within D11 there are at least two definitions currently in use.

The definition of STEM on District 11’s website reads as follows:

*“STEM education involves the study of science and mathematics, and the meaningful integration of technology and engineering to provide opportunities for innovative problem solving. Using the engineering design process, students identify problems, develop and test possible solutions, and ultimately reach a solution. The integration of mathematics, science, and engineering practices used in conjunction with digital literacy will help students recognize and utilize the variety of perspectives that may be tapped into to help unravel complex inquiries.” [2]*

The definition of STEM used in the Academic Master Plan presentation to the D11 Board of Education on February 17, 2021, reads as follows:

*“STEM is an interdisciplinary approach to learning where rigorous academic concepts are coupled with real-world lessons as students apply science, technology, engineering, and mathematics in contexts that make connections between school, community, work, and the global enterprise enabling the development of STEM literacy and with it the ability to compete in the new economy.” [3]*

With such a range of possible definitions across reputable education systems (and with the current variation within D11), it is critical that the District develops visionary and empowering definitions of what will constitute STEM in the District’s new, innovative K-5 magnet schools, in its new definition of K-5 quality neighborhood schools, and in its continued development of STEM programming in concert with Career and Technical Education programming in secondary schools.

## Recommendation

A major recommendation of the K-12 STEM Planning Team is that a permanent D11 K-12 STEM Steering Committee be established (involving STEM administrators, educators, and students from grades K-5, 6-8, and 9-12, district administration, and community members) to collaborate and provide leadership in further development of K-12 STEM in District 11.

One significant, initial agenda item for such a STEM steering team should be the research, review, and development of STEM definitions that will accurately reflect and guide the District’s planning for and implementation of STEM programming.

## Colorado and National STEM Standards

The Colorado Department of Education presents the following regarding “STEM Standards and Instruction”:

*“STEM Education provides a venue for the transformation of teaching and learning by integrating content and the skills of science, technology, engineering and mathematics. Engaging students in 21st century practices through inquiry, critical thinking and reasoning, collaboration, invention, and information literacy through STEM education directly impacts their ability to succeed by mastering and transferring concepts within STEM disciplines and across all content areas.” [4]*

The CDE website then offers weblinks to Colorado’s Science Academic Standards, Mathematics Academic Standards, the Academic Standards for the other content areas, and the Career and Technical Education STEM Standards or Course Builder.

In similar fashion, searching national STEM organizations for standards either does not produce references to academic content standards or results in references to national science and math standards: Next Generation Science Standards and Common Core State Standards for Mathematics.

## Recommendation

Site-based, STEM pathway school planning teams and a permanent, D11 K-12 STEM Steering Committee should review national reports on and frameworks of “standards” for developing and implementing STEM education.

Examples of sources for national reports include The STEM Education Innovation & Research Institute at Indiana University [5] and the American Association for the Advancement of Science, (e.g., *Levers for Change: An Assessment of Progress on Changing STEM Instruction*, May 2018) [6].

Recommended, evidence-based, STEM implementation frameworks include the *STEM Immersion Guide* [7], the *Critical Components for Inclusive eSTEM Elementary Schools* [8], and the *OSPri Stem Inventory* [9].

## National K – 5 STEM Evidence-Based Frameworks and Exemplars

### K – 5 STEM evidence-based frameworks and logic models

The K-5 STEM sub-team recommends that site-based, STEM pathway school planning teams use two evidence-based frameworks and logic models as their foundation for program development.

The *STEM Immersion Guide* [stemguide.sfaz.org](http://stemguide.sfaz.org)

See Appendix 1. See Appendix 1A for the *Full Immersion Model Implementation Roadmap*.

The Arizona STEM Network and Maricopa County Education Services Agency (MCESA) collaborated on the research, design, and implementation model for embedding STEM in schools. The research was based on interviewing local school districts currently offering a variety of established STEM programs, as well as interviewing STEM school stakeholders from other states. A list of critical STEM school components emerged from these interviews, as well as the realization that there is not a singular model for STEM schools, but rather common elements of successful schools. As a result of this research, the STEM Immersion Guide was created and written as an over-arching framework to chart a course for STEM integration for schools and districts [7].

The *Critical Components for Inclusive eSTEM Elementary Schools* [inclusivestemschools.org](http://inclusivestemschools.org)

See Appendix 2

The eSTEM project, led by SRI International and George Mason University and supported by the National Science Foundation, the design of STEM elementary schools was studied using case studies of five well-established, inclusive, STEM-focused schools to identify components that are common across multiple settings. The work resulted in a synthesis logic model outlining the 17 components critical to elementary STEM school design [8].

### K-5 STEM schools with exemplary components

The K-5 STEM sub-team recommends that site-based, STEM pathway school planning teams study the STEM models implemented at the following notable magnet schools.

- [Walter Bracken STEAM Academy; Las Vegas, NV](#)  
See Appendix 2A for this school's eSTEM profile and logic model.
- [Douglas L. Jamerson, Jr. Elementary; St. Petersburg, FL](#)  
See Appendix 2B for this school's eSTEM blueprint and logic model.
- [Weaver Lake Elementary; Maple Grove, MN](#)  
See Appendix 2C for this school's eSTEM blueprint and logic model.
- [Brentwood Magnet Elementary School, School of Engineering, Raleigh, NC](#)  
See Appendix 2D for this school's eSTEM profile and logic model.
- [Summit Road STEM Elementary, Reynoldsburg, OH](#)  
See Appendix 2E for this school's eSTEM profile and logic model.
- [Charlotte-Mecklenburg School Choice: STEM and STEAM, Charlotte, NC](#)
- [Vineyard Stem Magnet School; Ontario, CA](#)



## **K – 5 STEM curriculum and instruction**

To support developing a community where our future leaders, neighbors, and workers understand and solve current and future complex challenges, School District 11 should create innovative learning environments designed to prepare our youth to make sense of information and know how to gather and evaluate evidence to make decisions and to problem-solve. These are the sort of skills students develop in science, technology, engineering, and math, collectively known as STEM. There is a need for STEM education within all our schools today as there is an “ever widening skills gap between what schools are teaching and what the economy actually needs” [10].

If D11 wishes to empower students to have a maximal, profound impact on our world then, based on current research and best practices, the definition of the instructional model for K – 5 STEM pathway schools in D11 should include the following components.

### **Transdisciplinary and Immersion Approach to Learning**

A transdisciplinary [1], [11] and full immersion [12] STEM model refers to a non-traditional learning environment where the organizing principles for curriculum are determined by addressing major, contemporary local, national, or world issues through STEM-related experiences. “Full Immersion schools look more like 21st Century work-place environments rather 20th century K12 school environments.” [12]

This approach is achieved through a problem-based and project-based learning (PBL) instructional approach and is developed around a Design Thinking model that requires students iterate the stages of Empathize, Define, Ideate, Prototype, Test, and Revise [13]. Learning is collaborative, engaging, relevant, and applied, with connections to the community and/or local industry. This approach creates opportunities for students to participate in collaborative groups that foster innovation, critical thinking, problem solving, in-depth learning and risk taking while creating solutions as part of the product/project development process[12], [14].

The transdisciplinary and full immersion model aligns with D11’s current development of Curricular Blueprints in each of the content areas. This model provides an ideal framework for the implementation of the Blueprints. Problem-based and project-based instruction requires students to participate in phase 5 and 6 activities that include practice, reflection, extension, and application as part of the design process. These phases foster transference of information from working memory to long-term memory.

### **Problem-Based and Project-Based Learning**

Learning through a problem-based and project-based instructional approach engages students in learning that is deep and long-lasting. Because it is hands-on, PBL engages students, inspires a love of learning, and gives students a personal connection to their academic experience [15]. In a problem-based and project-based approach a real-world scenario becomes the curriculum. Students engage in guided or open inquiry that results in learners demonstrating mastery of multiple content standards while creating a solution to the problem or the development of a product. The following gives an example of what such a student learning experience might be like in a transdisciplinary and full immersion STEM model.

### *Shrinking Our Footprints*

*In this project, students use measurement, data, and fraction concepts to develop, implement, and monitor an action plan for reducing their family's impact on the environment. Each student team focuses on one resource: water, garbage, food waste, electricity, or car gas use. Teams research information, such as the amount of water per minute of shower or the number of miles per gallon used by a family car, and then they conduct home inventories of their family's use of these resources for 1 week (e.g., timing the length of showers, the weight and volume of garbage, or the number of watt hours used by key household devices). Students graph their individual family data and collective team data online plots. After measuring their families' current use of resources, students set goals for reducing resource use by a given fraction and identify strategies to help their families achieve these goals (e.g., "We will reduce our use of water by one-quarter through taking shorter showers and making sure the dishwasher is full before running it.") Students communicate these strategies and goals to their families in the form of an informative/explanatory letter and then measure and graph changes in their families' resource use as they implement their action plans [16].*

### Individualized Choice Projects

While teacher-defined, team projects may encourage small groups of students to produce their own solutions to a problem, these sorts of projects are usually related to grade level topics of study. To give students more voice and choice in their learning, engaging students in individual projects where they can select their own topics and how to present their new learning is important. Opportunities should include STEM projects, passion and genius projects, as well as service and community outreach activities. The school schedule should ensure students get dedicated time each week for their individual project work, such as one hour every Friday.

### Developing Responsible Citizens

School culture and community is developed to support students' life readiness skills. The culture is one where students are engaged participants, display a growth mindset, and have responsibility and autonomy to travel independently and to work in appropriate locations throughout the building for the required learning task. Recommended program options include:

- Leader in Me provides a unique approach to integrating highly effective practices throughout a school's culture. Instead of focusing on academic measures alone, *Leader in Me* embodies a holistic approach to education, redefining how schools measure success. This approach empowers educators with effective practices and tools to:
  - teach leadership to every student,
  - create a culture of student empowerment,
  - and align systems to drive results in academics. [17]
- Responsive Classroom is a student-centered, social and emotional learning approach to teaching and discipline. It is comprised of a set of research, and evidence-based practices designed to create safe, joyful, and engaging classrooms and school communities for both students and teachers. [18]

## Goal Setting and Portfolio Review

Authentic self-assessment and relevant goal setting is critical to building independent learners. All students should develop quarterly learning and personal goals that are based on past goals and performance data. Another part of the process of goal setting and data review is the use of student portfolios to support deeper reflection when setting goals. Portfolios show the cumulative efforts and learning of a particular student over time and offer valuable data about student improvement and skill mastery. Along with student reflection, portfolio data provides valuable information about how each student learns and what is important to him or her in the learning process [19]. Additionally, portfolio reflection also shows students how the design cycle fits into their daily lives, not just as part of a project or classroom learning. These practices can be incorporated into the time set aside for individualized choice projects once or twice per quarter.

## Integration of Computer Science

Computing is used all around us and in virtually every field. It is foundational knowledge that all students need. Teaching students computer science provides them with necessary 21<sup>st</sup>-century skills needed to solve problems and innovate. Computer science also makes the curriculum that students are learning more relevant [20], while also boosting mathematical and literacy skills. Computer science careers are one of the fastest growing job markets and will make up two-thirds of all new STEM jobs. It is recommended that computer science be viewed as a core subject in any K – 5 STEM magnet school and be incorporated into transdisciplinary units for all students, in a manner no different than how math or English would be integrated. This could be accomplished by implementing a model based on the approach of Grand Mountain School, a K – 8 computer science integration school, in Widefield, CO [21]. (Note that this recommendation is repeated in the K – 12 Computer Science section of this paper, pp. 26 – 28.)

District 11 has had past initiatives to bring computer coding to the elementary level. The most recent was a grant that trained teachers in Scratch and Scratch Jr. in coordination with Boot-Up. It is recommended that Scratch Jr. be used with K-2 students and Scratch be used with grades 3-5. Script-based coding in languages like Python could also be offered as challenge activities for higher performing 4<sup>th</sup> and 5<sup>th</sup> grade students. Both Scratch and Python are supported in conjunction with the following exemplar programs:

- BootUp provides a unique professional development program for elementary school teachers to engage students through an award-winning computer science curriculum. [22]
- Code.org is a nonprofit dedicated to expanding access to computer science in schools and increasing participation by young women and students from other underrepresented groups. Our vision is that every student in every school can learn computer science as part of their core K-12 education. [23]

## Exemplar Vendor-Provided K – 5 STEM Programming

- Project Lead The Way (PLTW) Launch  
PLTW Launch's 43 interdisciplinary modules bring learning to life. The program empowers students to adopt a design-thinking mindset through compelling activities, projects, and problems that build upon each other and relate to the world around them. As the students engage in hands-on activities in computer science, engineering, and biomedical science, they become creative, collaborative problem solvers ready to take on any challenge. [24]

- Engineering is Elementary (EiE)

EiE, the award-winning curricula division of the Boston Museum of Science, develops research-based, classroom-tested programs that empower students to become lifelong STEM learners and passionate problem solvers. Since 2003, EiE has designed PreK-8 curricula to encourage all students, including those from underrepresented groups, to see themselves as engineers. EiE's flexible print, online, and blended hands-on programs bring engineering, science and computer science together to prepare students for a fast-paced, global, technology-savvy future. [25]

## K – 5 STEM staffing

Research reveals that while the pathway theme is important to the success and viability of a school, the more critical factor is having teachers and administrators, committed to the theme [26]. The staff must not only possess the skills of high-quality leaders and educators, but also need to have special skills and training in STEM, PBL, transdisciplinary instruction, etc. Equally important, the staff needs to be trained in and committed to the mission of the school.

The website STEM by Design outlines 13 traits of great STEM teachers which should be used to guide the hiring process and subsequent professional learning [27].

1. Be able to engage kids in selecting real world problems to work on. Kids should [pick a problem](#) that interests them. Use experts to help to define the problem clearly.
2. Work together with a teacher in either math or science (whatever you are not teaching) to integrate the subjects. Plan for digital technology where appropriate. Know that technology also involves anything created to meet a human need.
3. Be able to engage kids in meaningful research and knowledge acquisition about the problem. Doesn't have to be reading or watching a video.
4. Be able to [manage teams](#) effectively. The ultimate goal, of course, is to enable kids to manage themselves.
5. Be able to get kids to ask the right questions. That means you need to be able to ask the right questions as well – not questions with yes and no answers – but questions that stimulate curiosity.
6. Act as a learning facilitator, not a presenter of information. Don't tell kids what they need to discover – let them think for themselves. Discovery is a part of learning.
7. Be able to convince kids to accept failure as normal and a necessary part of the process of learning. Failure to succeed on solving a problem is an opportunity to try again with more information and an increased chance of success.
8. Be able to allow kids to muck through many possible solutions for their problem and teach them that problems have more than one possible solution, or right answer.
9. Use an engineering design process ([described here](#)).
10. Help kids understand and decide on criteria and constraints.
11. Allow teams to physically construct solutions for problems. Time and materials may be limited but don't leave out hands-on "learning by doing."
12. Test and analyze performance, and how well performance meets criteria. Be sure to involve math, graphics, computer programs, etc.
13. Lead teams to plan for redesign, and to understand that problem-solving is an ongoing process in which success is sometimes constructed over many "draft" efforts.

While it is desirable for D11 to establish a new school with new staffing, this may not be feasible, and the district may need to establish the STEM pathway school out of an existing, fully staffed neighborhood school. In the process, the district should reconstitute the neighborhood school and require the existing principal and staff to reapply if they would like the

opportunity to join the pathway school. The principal at a newly established pathway school must be given the freedom he or she needs to recruit and hire teachers, irrespective of seniority. The school's leadership team must be able to recruit and hire good matches to the school's theme and programmatic philosophy, including having the requisite motivation, commitment, and knowledge to fully implement the theme [26].

Essential to a strong transdisciplinary and full immersion approach to STEM instruction and learning is the role for specialized support staff. Overall, districts and schools agree that having a full-time in-school magnet or STEM coordinator is essential [26]. This coordinator can provide coaching, curriculum development and coordination, training, etc.

Additionally, the model should include an integrated team-teaching approach utilizing content specialists [26]. For students to go deeper in their learning and to support more complex problem solving, they need access to specialized support. Therefore, successful STEM magnet schools develop partnerships with local businesses and industries. Working with community partners invests in the future of students and the community. Building relationships with businesses and organizations enhance the school's learning environment and allows students to learn beyond the school walls and experience authentic learning [28].

This approach is also necessary for their daily instructional process. Instead of 25 students assigned to a self-contained classroom with a generalist teacher, an integrated team-teaching approach utilizes a group of content specialists in literacy, math, science, social studies, etc. to support a larger group of students. During the instructional day the students then meet with the different specialists who provide not only support of the project from their content specific focus, but also provide instruction in the standards to develop the foundation skills to complete the project. Ideally a four-teacher team would be grade level specific if enrollment supports that staffing. For lower enrollment a team could work with a two-grade cohort of students, or a two-teacher team with dual content specializations such as math / science and literacy / social studies.

## **K – 5 STEM professional learning**

Intensive, sustained, and job-embedded professional learning will be of the highest importance to the success of any STEM pathway school. Through professional learning opportunities, teachers and administrators can model for students what it looks like to be engaged, lifelong learners who strive to impact children and the larger community. Targeted professional learning to increase staff skills and capacity to implement integrated STEM units is essential for teachers to become confident and prepared to work with students in approaching problem-solving through a transdisciplinary method. Professional learning must include vendor-provided STEM programming (e.g., Engineering is Elementary, PLTW, etc.), Project-Based Learning, Personalized Learning, Student Agency, Differentiation, and other teacher identified needs.

## **K – 5 STEM partnerships**

With the attention being given for increasing K – 12 STEM education, there is a large number of possible opportunities to form STEM partnerships at the local, state, and national levels. All opportunities should be coordinated and explored in collaboration with District 11 Career and Technical Education initiatives.

## K – 5 STEM program evaluation metrics

Program evaluation is, in general, a tremendous growth opportunity in District 11. Just like “backwards design” in teacher planning of instructional units, development of program evaluation metrics must be a foundational and framing component of any K – 5 STEM pathway school planning. Development of these metrics should be based in the evidence-based frameworks and logic models recommended in this paper and upon the evaluation practices of well-established, highly-successful K – 5 STEM schools.

## K – 5 STEM site features

Due to the different instructional processes involved with transdisciplinary or immersion guided and open inquiry learning in STEM using a PBL approach, the physical learning space does not always fit a traditional classroom or school. Successful STEM and PBL magnet schools look more like 21<sup>st</sup> century work-place environments than 20<sup>th</sup> century K-12 school Environments [29]. To facilitate this unique learning many successful STEM and PBL magnet school organizations like High Tech High Charter Organization's 16 K-12 PBL schools in CA [29] or Harmony Public Schools' 58 K-12 STEM schools in TX [30], build new construction whenever possible. To help schools and school districts with the design of PBL schools, the Buck Institute of Education, the Nation's leading organization for PBL instruction, created a resource on their website to support this work [31]. A PBL-friendly school building is flexible, has room for student and teacher collaboration, and allows for public exhibitions of student work. Please see Appendix 4 for what David Stephen at New Vista, the design firm that did the High Tech High K-12 Village in San Diego, says an innovative 21st-century school building should include.

## K – 5 STEM budget

Currently, with so much of the contexts for possible District 11 K – 5 STEM pathway schools yet to be determined, informed and meaningful budget suggestions cannot be offered in this paper.

## K – 5 STEM Pathway School 5-year implementation plan: transdisciplinary, full immersion model

The following timeline is based on the Arizona STEM Network Implementation Roadmap [32]

Implementation Stage	Time Frame	Action Items
Plan Year 1  Implementation Planning & Development	1 year prior to school opening (July/August)	<ul style="list-style-type: none"><li>○ <b>Facility</b><ul style="list-style-type: none"><li>• Site visits of exemplary STEM facilities</li><li>• Use stakeholder team to generate potential names for the STEM magnet school</li><li>• Provide BOE with top name choices for review and approval</li></ul></li><li>○ <b>Staffing</b><ul style="list-style-type: none"><li>• Develop leadership necessary skillset requirements for quality leadership team (Principal, STEM Integration Specialist, TLC, LTE, Administrative Assistant, Primary Team Lead, Intermediate Team Lead)</li><li>• Create job posting for leadership positions</li></ul></li></ul>

		<ul style="list-style-type: none"> <li>• Hire leadership team (Principal, STEM Integration Specialist, TLC, LTE, Administrative Assistant, Primary Team Lead, Intermediate Team Lead)</li> <li>• <b>Instructional Programming</b></li> <li>• Site visits of exemplary STEM programs</li> <li>• Establish a team of stakeholders from businesses, Higher Education, district employees, parents and students.</li> <li>Goals: <ul style="list-style-type: none"> <li>• identify vision, mission for the STEM program.</li> <li>• Generate ideas for an educational STEM themes that will provide support and collaboration with the businesses, resources you have in your community, and vertical articulation in the district.</li> <li>• Identify instructional materials needed to facilitate instruction (technology, STEM, PBL, PLTW, etc.)</li> <li>• Develop a scope and sequence to outline and guide the progression from a school wide partial immersion approach to full immersion in the intermediate level.</li> </ul> </li> <li>○ <b>Professional Development</b></li> <li>• Begin identifying possible PD resources for developing effective STEM, PBL, PLTW practices</li> <li>○ <b>Enrollment / Marketing</b></li> <li>• Establish memberships and relationships with STEM, PBL, PLTW organizations</li> </ul>
	8- 9 months prior to school opening (November / December)	<ul style="list-style-type: none"> <li>○ <b>Facility</b></li> <li>○ Identify building to house K-5 STEM Magnet School</li> <li>○ Identify program learning spaces needs (classroom, STEM, PBL, PLTW labs, collaboration areas, exterior learning centers, etc.)</li> <li>○ Facility review and develop facility renovation plans and timeline for needed facility modifications or additions to meet new STEM, PBL, PLTW requirements</li> <li>• <b>Staffing</b></li> <li>• Develop job descriptions for staff unique to STEM Magnet school to identify “best practicing” staff</li> <li>• Post staff positions</li> <li>• <b>Instructional Programming</b></li> <li>• Develop preliminary daily instructional schedule for a partial immersion model</li> <li>• Develop STEM, PBL exploration units including summative assessments</li> <li>• Develop student choice STEM, PBL exploration activities</li> <li>• Provide opportunities for new staff to apply and practice STEM, PBL, PLTW, etc. instruction in classrooms</li> <li>• Develop unit and activity initial instruction evaluation criteria to support unit and activity revision work</li> <li>○ <b>Professional Development</b></li> <li>• Develop training sequence for staff</li> <li>• Identify training resources, materials, vendors etc.</li> <li>○ <b>Enrollment / Marketing</b></li> <li>• Develop marketing materials</li> <li>• Develop marketing plan</li> </ul>

		<ul style="list-style-type: none"> <li>• Create school web and social media sites</li> <li>• Begin marketing school to the public</li> </ul>
	6 months prior to school opening (February)	<ul style="list-style-type: none"> <li>○ <b>Facility</b> <ul style="list-style-type: none"> <li>• Monitor facility renovation</li> </ul> </li> <li>○ <b>Staffing</b> <ul style="list-style-type: none"> <li>• Hire staff</li> </ul> </li> <li>○ <b>Instructional Programming</b> <ul style="list-style-type: none"> <li>• Revise initial STEM, PBL exploration units based on practice implementation data</li> <li>• Revise initial student choice STEM, PBL exploration activities based on practice implementation data</li> </ul> </li> <li>○ <b>Professional Development</b> <ul style="list-style-type: none"> <li>• Identify</li> </ul> </li> <li>○ <b>Enrollment / Marketing</b> <ul style="list-style-type: none"> <li>• Begin choice enrollment</li> <li>• Develop plan for possible mid-year enrollment</li> </ul> </li> </ul>
	3 - 5 months prior to school opening (March - May)	<ul style="list-style-type: none"> <li>○ <b>Facility</b> <ul style="list-style-type: none"> <li>• Monitor facility renovation</li> </ul> </li> <li>○ <b>Staffing</b> <ul style="list-style-type: none"> <li>• Continue staff hiring if necessary</li> </ul> </li> <li>○ <b>Instructional Programming</b> <ul style="list-style-type: none"> <li>• Develop initial budget based on unique school needs</li> <li>• Work with district procurement to create materials, supplies, furniture, etc. orders</li> <li>• Develop learning evaluation parameters</li> <li>• Outline and create STEM immersion experiences</li> <li>• Create learning, project, etc. summative performance assessments</li> </ul> </li> <li>○ <b>Professional Development</b> <ul style="list-style-type: none"> <li>• Begin professional development of staff</li> </ul> </li> <li>○ <b>Enrollment / Marketing</b> <ul style="list-style-type: none"> <li>• Establish ties to community resources, business, etc.</li> <li>• Establish school / family partnership plan</li> </ul> </li> </ul>
	1 - 2 months prior to school opening (June / July)	<ul style="list-style-type: none"> <li>• <b>Facility</b> <ul style="list-style-type: none"> <li>• Final walk through and facility check off</li> <li>• Receive, inventory, and install furniture, materials, resources, etc.</li> <li>• Set up STEM, PBL, PLTW labs</li> <li>• Staff move into new learning spaces</li> </ul> </li> <li>○ <b>Staffing</b> <ul style="list-style-type: none"> <li>• Develop staff teams</li> </ul> </li> <li>○ <b>Instructional Programming</b> <ul style="list-style-type: none"> <li>• Procurement places orders for materials, supplies, furniture, etc.</li> </ul> </li> <li>○ <b>Professional Development</b> <ul style="list-style-type: none"> <li>• Continue professional development of staff</li> </ul> </li> <li>○ <b>Enrollment / Marketing</b> <ul style="list-style-type: none"> <li>• Plan STEM grand opening event for the community</li> <li>• Develop instructional groupings of students</li> </ul> </li> </ul>
<b>Plan Year 2</b>	First School Year	<ul style="list-style-type: none"> <li>• <b>Facility</b> <ul style="list-style-type: none"> <li>○ Conduct site implementation review to determine needed revisions to improve facilitation of learning</li> </ul> </li> </ul>



Initial Implementation		<ul style="list-style-type: none"> <li>○ <b>Staffing</b> <ul style="list-style-type: none"> <li>• Conduct staff evaluations</li> <li>• Revise job descriptions for staff unique to STEM Magnet school to identify “best practicing” staff</li> <li>• Post staff positions to meet any staff changes</li> <li>• Hire required staff</li> </ul> </li> <li>○ <b>Instructional Programming</b> <ul style="list-style-type: none"> <li>• Establish PLC and a process to review, reflect, and revise learning experiences for students</li> </ul> </li> <li>○ <b>Professional Development</b> <ul style="list-style-type: none"> <li>• Develop PLCs that provide ongoing PD in STEM, PBL, PLTW that includes opportunities for reflection and collaboration among staff</li> <li>• Develop systematic approach for training and mentoring of new staff</li> </ul> </li> <li>• <b>Enrollment / Marketing</b> <ul style="list-style-type: none"> <li>• One week prior to first day hold STEM grand opening event for the community</li> <li>• Review and revise marketing materials and plan</li> <li>• Implement new marketing plan to increase / sustain enrollment</li> <li>• Provide choice enrollment opportunities</li> </ul> </li> </ul>
<b>Plan Years 3 &amp; 4</b>  Program Expansion (Increased Enrollment)	Summer Between 1 <sup>st</sup> and 2 <sup>nd</sup> School Years	<ul style="list-style-type: none"> <li>○ <b>Facility</b> <ul style="list-style-type: none"> <li>• Make needed improvements to facility to support transitional immersion program and adjustments to correct challenges in primary immersion program</li> </ul> </li> <li>○ <b>Staffing</b> <ul style="list-style-type: none"> <li>• Continue hiring if needed</li> </ul> </li> <li>○ <b>Instructional Programming</b> <ul style="list-style-type: none"> <li>• Create Develop additional grade level interdisciplinary units</li> </ul> </li> <li>○ <b>Professional Development</b> <ul style="list-style-type: none"> <li>• Provide transitional immersion training for 2<sup>nd</sup>-5<sup>th</sup> teams</li> <li>• Revise and provide systematic approach for training and mentoring of new staff</li> </ul> </li> <li>○ <b>Enrollment / Marketing</b> <ul style="list-style-type: none"> <li>• Provide choice enrollment opportunities</li> </ul> </li> </ul>
	Second and Third School Years	<ul style="list-style-type: none"> <li>• <b>Facility</b> <ul style="list-style-type: none"> <li>• Conduct site implementation review to determine needed revisions to improve facilitation of learning</li> </ul> </li> <li>○ <b>Staffing</b> <ul style="list-style-type: none"> <li>• Conduct staff evaluations</li> <li>• Revise job descriptions for staff unique to STEM Magnet school to identify “best practicing” staff</li> <li>• Post staff positions to meet any staff changes</li> <li>• Hire required staff</li> </ul> </li> <li>• <b>Instructional Programming</b> <ul style="list-style-type: none"> <li>• Continue PLC and a process to review, reflect, and revise learning experiences for students</li> <li>• Develop additional grade level interdisciplinary units (Summer)</li> </ul> </li> </ul>

		<ul style="list-style-type: none"> <li>○ <b>Professional Development</b></li> <li>○ Continue PLCs that provide ongoing PD in STEM, PBL, PLTW that includes opportunities for reflection and collaboration among staff</li> <li>○ Develop systematic approach for training and mentoring of new staff</li> <li>○ <b>Enrollment / Marketing</b></li> <li>• Review and revise marketing materials and plan</li> <li>• Implement new marketing plan to increase / sustain enrollment</li> <li>• Provide choice enrollment opportunities</li> </ul>
<b>Plan Years 5 and beyond</b>  Sustainability	School Years 4 and beyond	<ul style="list-style-type: none"> <li>○ <b>Facility</b></li> <li>• Annually conduct site implementation review to determine needed revisions to improve facilitation of learning</li> <li>• Annually make needed improvements to facility to support full immersion program and adjustments to correct challenges in partial and transitional immersion program</li> <li>○ <b>Staffing</b></li> <li>○ Annually review staffing needs</li> <li>○ Implement retention plans for existing staff</li> <li>○ Provide systematic approach for training and mentoring of new staff</li> <li>○ Revise job descriptions for staff unique to STEM Magnet school to identify “best practicing” staff</li> <li>○ Post staff positions to meet any staff changes</li> <li>○ Hire required staff</li> <li>○ <b>Instructional Programming</b></li> <li>• Annually review, reflect, and revise learning experiences for students</li> <li>• Annually develop new STEM PBL learning units and activities</li> <li>○ <b>Professional Development</b></li> <li>○ Continue ongoing PD in STEM, PBL, PLTW that includes opportunities for reflection and collaboration among staff</li> <li>○ Provide systematic approach for training and mentoring of new staff</li> <li>• <b>Enrollment / Marketing</b></li> <li>• Review and revise marketing materials and plan</li> <li>• Implement new marketing plan to increase / sustain enrollment</li> <li>• Provide choice enrollment opportunities Implement new marketing plan to increase / sustain enrollment</li> <li>• Provide choice enrollment opportunities</li> </ul>

## Grades 6 – 8, STEM School-within-School

The Grades 6 - 8 STEM sub-team recommends that site-based, STEM-focused, middle school planning teams use the evidence-based frameworks and logic model *STEM Immersion Guide*, [stemguide.sfaz.org](http://stemguide.sfaz.org), as their foundation for program development. See Appendix 1. See Appendix 1B for the Partial Immersion Model Implementation Roadmap.

STEM-focused, middle school planning teams will also greatly benefit from studying the critical components that characterize exemplary inclusive grades K – 5 and 9 – 12 STEM schools. See Appendix 2 and Appendix 3A.

## Outline of Grades 6 – 8 STEM Recommendations

Vendor:

- Project Lead the Way (PLTW) Gateway for all Middle Schools
- Rationale/Support:
  - Have established partnership within the district
  - Flexibility in modules chosen
  - Would provide consistency in instructional practices
  - More than 12,200 schools and 15,000 programs in all 50 states and U.S. Territories
    - <https://www.pltw.org/about-us/pltw-state-presence>
  - Available in English and Spanish (equity)

Instructional Models:

- Recommendation: Partial Immersion Model
  - STEM themes available on both east and west side MS sites
    - 2 Middle Schools with STEM Program for each side (4 total)
      - Ideally one in each quadrant of the district
    - Pre-engineering
    - Biomedical
  - Project/Inquiry-based learning
    - PLTW
  - School within a school model
    - Access for all 6<sup>th</sup> grade (equity)
    - Application process to continue pathway in 7<sup>th</sup> and 8<sup>th</sup> grade
  - Interdisciplinary approach
    - Support of general education in STEM
    - STEM supports general education
  - Some curriculum embedded in general education
    - Science Fair
    - Engineering process: prototypes
  - Industry partners
    - Lockheed Martin
    - Colleges
    - Air Force Academy
    - Verizon
    - Samsung
    - Automotive
    - 3M
    - Healthcare partners

- Family integration
  - Community nights monthly or quarterly
  - Science/Engineering Fair
  - Awards/Celebrations
  - TALLO
    - Students can build a STEM profile and be noticed by national companies (not a social network) and empowers students to make connections to real-world and careers
  - Apprenticeships
  - Career Fair
  - Student Organizations
    - Can participate in competitions or scholarship programs
    - Can provide feedback for continuous improvement of the STEM program
    - Student input for curriculum and club offerings
- Rationale/Support (National/Exemplar Models)
  - With the creation of elementary STEM magnet schools, programming in feeder middle schools should be aligned to support equity in our model.
  - In order to make the current programming more robust, D11 should consider a school within a school model to allow a STEM pathway that will feed into high school programs
  - <https://magnet.ccsd.net/site356.php> Clark County Middle Schools
  - <http://trms.svvsd.org/STEM> Longmont, CO School Program
  - <https://www.browardschools.com/site/Default.aspx?PageID=50699> Broward County Schools

#### Programming Details:

- General:
  - Introductory STEM class for all 6<sup>th</sup> grade students
  - Part of the electives rotation to last a quarter or semester
  - Students then apply at the end of their 6<sup>th</sup> grade year to enter into the STEM pathway
  - In 7<sup>th</sup> and 8<sup>th</sup> grade, they would be able to participate in either semester or year-long courses
  - Advanced/accelerated courses in the areas of math and science available for STEM students
  - Application criteria to consider
    - GPA of 2.5 or higher
    - Inclusive/diverse selection processes for a diverse enrollment population
      - Break stereotype that STEM is for “smart kids”
      - Do not dismiss students with behavior issues immediately (student may be bored and STEM will get them re-engaged in school)
    - Written response/letter of interest
    - Teacher recommendations for a student to enter the program
      - Recommendations should not prevent a student from entering the program
    - Student interview
    - Transcripts/previous grades
    - Assessment scores
    - Wait list or lottery system if needed
    - Student Choice for some portions of application

- Ex: Interview or written response
- Rationale: Equity: Strength based application process
- Programming/course offerings should be the same for east and west side middle schools
  - Pre-Engineering
  - Biomedical
  - Students can expand their PLTW participation in high school with additional course offerings
- Extra-curricular
  - Robotics
  - STEM club
  - Drones
  - Rubik's Cube

#### 5 year implementation plan:

- Can introduce Intro to STEM elective class for 6<sup>th</sup> grade students beginning August 2022
- Application process in spring of 2023
- Partial immersion STEM program for 7<sup>th</sup> only beginning August 2023
- Partial immersion STEM program for 7<sup>th</sup> and 8<sup>th</sup> grade beginning August 2024

#### Professional Development:

- Train the trainer model is already established in D11 for PLTW
- Gen Ed:
  - STEM overview (What is it? What does it look like?)
  - How to integrate STEM into general education
  - Interdisciplinary approach to STEM
  - Standards alignment
  - PLTW exploratory model overview
- STEM Teachers:
  - Full PLTW training
    - 2-day training
    - D11 has established trainers available
    - How to order modules and consumables
    - Standards alignment
  - Community engagement (How to host community nights, present the programming to families and how to involve families into the program)

#### Staffing:

- 2.0 FTE for schools with > 500 students
  - Add an extra 1.0 FTE for every additional 250 students
- 1.0 FTE at each MS is given an extra plan period or stipend to be the STEM Coordinator
  - Planning will be used for:
    - Programming oversight
    - Supporting General Education Teachers
    - Planning community engagement
    - Oversight of application process for students

#### Program Evaluation Metrics:

- Enrollment in STEM pathway
- Attendance
- Standardized Assessment Scores

- Graduation Rates (longitudinal studies)
- Entering into STEM career (longitudinal studies)
- Community involvement
- DAC oversight
- Program Evaluation at year 5 of implementation
  - PLTW has an established protocol for this process

Budget:

- First year/Start up:
  - \$10,000 Equipment and Supplies Startup for first 500 students
    - Add \$2,000 for every additional 250 students over 500
  - \$7,000 Professional Development
    - Core teachers (Science, Math, ELA, SS)
    - Administrator
    - SPED teacher
- Second year and beyond:
  - \$5,000 – replacement of consumables
  - \$1,000 – PD for new staff/turnover
- Fundraising Toolkits are available through PLTW to offset costs
- Grants from local and national agencies can offset costs

## Grades 9 – 12, Inclusive STEM High Schools

The Grades 9 - 12 STEM sub-team recommends that site-based, STEM-focused, high school planning teams use two evidence-based frameworks and logic models as their foundation for program development. See Appendix 1 for the *STEM Immersion Guide*, [stemguide.sfaz.org](http://stemguide.sfaz.org). See Appendix 3A and Appendix 3B for the *The Opportunity Structures for Preparation and Inspiration in STEM (OSPrl) Logic Model* and *The OSPrl STEM Inventory*.

STEM-focused, high school planning teams will also greatly benefit from studying the critical components that characterize exemplary inclusive grades K – 5 schools. See Appendix 2.

## Outline of Grades 9 – 12 STEM Recommendations

- Evidence-based, high school STEM framework
  - *The Opportunity Structures for Preparation and Inspiration in STEM (OSPrl) Logic Model* and *The OSPrl STEM Inventory*, The OSPrl Study of Inclusive STEM-Focused High Schools lead by SRI International and George Mason University
- High schools with exemplary STEM components
  - [High Tech High](#), multiple locations in southern CA
  - [STEM School Highlands Ranch](#), Highlands Ranch, CO
- The Grades 9 – 12 sub-team recommends District 11 develop a comprehensive philosophy and vision of STEM education for students K-12.
- There should be an ongoing K-12 STEM Steering Committee with representatives from elementary, middle, and high school STEM educators, students, district administration, and community members. Their role will be to collaborate and advise the development of K-12 STEM programming in District 11.
- The traditional comprehensive high school model should continue to utilize school-specific programs to provide STEM opportunities for ALL students at ALL high schools in D11.
  - At this time, we do not recommend a magnet STEM high school.
  - We believe a specialized school would negatively impact strong neighborhood schools.
  - Would potentially deplete resources and programs at comprehensive high schools.
  - Would perpetuate inequities and opportunities to STEM education within the district.
- D11 should strengthen existing STEM programs through funding, professional development, and effective recruiting/alignment at the 9-12 level.
- STEM programs should not be universal or one-size fits all and be personalized to the schools and communities they serve allowing schools to individually determine program design, curriculum, and pedagogy aligned to the district's philosophy and vision for STEM education.

- D11 has a long history with Project Lead the Way. This includes experienced staff, a significant investment in hardware and equipment, and pathway alignment through concurrent enrollment.
  - D11 should look for opportunities to expand course offerings and pathways.
  - D11 should expand PLTW Gateway offerings in feeder middle schools and expand 3<sup>rd</sup>/4<sup>th</sup> year computer science offerings at the high school level.
- STEM education in District 11 should emphasize demonstrations of learning that allows students to present their work for community review and feedback.
- High school implementation plan overview
  - Year 1 (collaboration)
 

Collaborate to establish an on-going D11 K-12 STEM Steering Committee of STEM educators from grades K-5, 6-8, and 9-12.

Collaborate to initiate D11 development of a comprehensive philosophy and vision for K-12 STEM education.

Collaborate with grades K-5 and 6-8 STEM planning teams to support and to develop K-8 vertical articulation to high school STEM options.
  - Years 2 & 3 (study & planning)
 

Continue collaboration efforts with K-8 teams in District-wide STEM development.

Conduct comprehensive review and evaluation of strengths/opportunities in D11 high school STEM programming, practices, and inclusiveness having all stakeholders consider vertical alignment from K-8.

Conduct further, in-depth research of exemplary and inclusive high school STEM practices and programming models.

Conduct coordinated and site-based planning for further investment in and expansion of high school STEM programming.
  - Years 4 & 5 (launch expansion)
 

Initial implementation of high school STEM expansion based upon study/planning in years 2 & 3 and on-going K-8 collaboration and vertical articulation.



## **K – 12 Computer Science**

There is plenty of existing research that make a solid argument for computer science to be treated as a core subject and integrated more heavily into the traditional comprehensive education model:

- Computer Science is essential in our 21<sup>st</sup> century world.
- Computer Science is one of the fastest growing job markets in the world.
- Computer Science boosts Mathematic ability and English literacy.
- As a school district in Colorado Springs, which is a hub for military and Department of Defense careers, an education in computer science offers our students a unique opportunity for technical careers in the Pikes Peak region.

### **Current State of Computer Science in D11**

District 11 has a growing, though largely disjointed, computer science pathway. Currently, four elementary schools offer PLTW Launch courses, while 11 elementary schools participated in a grant-funded computer science curriculum during the 2020-2021 school year. At the middle school level, 8/9 of our middle schools offer PLTW Gateway curriculum and our CS offerings have been growing in recent years. Within our high schools, computer science programs exist at Wasson, Coronado, Palmer, Doherty, and Mitchell. The curriculums at these sites vary, which may be considered a positive or a negative depending on one's point of view. To summarize, D11 has a growing computer science pathway that needs augmenting, bolstering, and alignment to strengthen the CS skills of its students.

### **Specific K-5 STEM Magnet Recommendations:**

- Integrated Computer Science Curriculum (Use Grand Mountain as a model)
  - Grand Mountain is a magnet K-8 STEM school with an integrated CS curriculum
- Consider using PLTW Launch as an integrated curriculum
  - PLTW launch offers 46 units that could be layered into a K-5 school
- VEX Robotics, Lego League, or other STEM student organizations

### **General K-5 Recommendations**

- Expanding the use of PLTW launch wherever fiscally possible
  - In cases where PLTW is not fiscally possible or appropriate, utilize Code.org

### **General 6-8 Recommendations**

- Coordinating with K-5 and 9-12 stakeholders to ensure incoming and outgoing alignment
- Expansion of course offerings through PLTW and/or other vendors
  - This will require PD and potential material costs

## Specific 9-12 Recommendations

- Consider expanding PLTW course offerings where appropriate
- Expanding 3<sup>rd</sup> and 4<sup>th</sup> year course offerings where needed (Every high school should have a 4-year Computer Science Program by Fall 2023)
- Develop alignment committee for each high school that monitors and assesses alignment of feeder middle schools

## 5- Year computer science implementation plan:

### Year 1 (2021-22)

- Development of pathway K-5 STEM School with integrated CS curriculum.
- Audit K-5 CS course offerings and assess areas for growth.
- Audit 6-8 course offerings and assess areas for growth.
- Develop high school CS alignment teams at all high schools.
- Develop/plan 4-year CS course offerings at all high schools.

### Year 2 (2022-2023)

- Implementation of magnet K-5 STEM School.
  - Recursively assess computer science curriculum.
- Recursively assess CS alignment on a broader K-5, 6-8, 9-12 level.
- PD to ensure expansion of CS curriculum at elementary schools.
- PD to augment CS offerings at middle schools.
- PD to ensure 4-year CS course offerings at all high schools.

### Year 3 (2023-2024)

- 4-year course offerings at all high schools should be implemented and running.
- Goal of 75% of Elementary Schools offering computer science specials.
- Goal of 100% of middle schools offering computer science electives.
  - Must be aligned to high school.
- Recursively assess CS alignment on a K-5, 6-8, 9-12 level

### Year 4-5 (2024-2025)

- Continued professional development to ensure sustainability.
- Goal of 100% CS saturation across the district.
  - Every school in D11 offers computer science courses
- Recursively assess CS alignment on a K-5, 6-8, 9-12 level.

- Recursively assess CS course offerings/outcomes.
  - Develop new 5-year plan/goals.

Exemplary Site:

- [Grand Mountain STEM School](#)

**Colorado Springs School District 11  
Elementary School Offerings**

Offerings	Overview Categories	Adams	Audubon	Bristol	Buena Vista	Carver	Chipeta	Columbia	Edison	Freedom	Fremont	Grant	Henry	Howbert	Jackson	Keller	King	Madison	Martinez	McAuliffe	Midland	Monroe	Penrose	Queen Palmer	Rogers	Rudy	Scott	Steele	Stratton	Taylor	Trailblazer	Twain	West	Wilson	
Accredited with Distinction- Academic Achievement	Award			X	x		x	x	x																		x								
Achieving Competitive Excellence (3-5)	?	x																																	
Acting Club	Clubs/Activities																											x							
Animal Discovery Club	Clubs/Activities																											x							
After School Activity Bus	Services	x				x																													
After School Enrichment Program	Services				x		x									x						x	x			x						x			
After School Tutoring	Services/SS							x	x			x									x	x		x					x			x	x		
Amateur Radio Station	Clubs/Activities					x																													
Archery	Clubs/Activities													x																					
Art Instruction	Academic Offering	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
Arts Integration	Academic Offering							x																						x					
AVID	Academic Offering														x																			X	
Badminton	Clubs/Activities																											x			x				
Basketball	Clubs/Activities	x		x	x	x	x	x	x			x	x		x	x	x	x		x	x			x	x	x	x	x	x	x		x	x		
Battle of the Books	Clubs/Activities				x		x	x	x	x				x	x					x	x			x	x	x			x	x					
Before/After School Care	Services	w	x	*	*	x	x	*	*	x	*	x	*	x	x	*	*	*	*	*	*	x	*	x	*	*	x	x	w	x	x	x	*	*	*
Before School Enrichment	Services			x			x																	x		x						x			
Beyond the School Bell	Services	x																																	
Bike Club	Clubs/Activities			x																		x									x				
Breakfast: Free	Services	x		x	-	x	-	x	x	-	x	x	x	-	x						x	x		x	x							x	x	x	
Breakfast: Fee based	Services		x		-		-			-				-		x	x	x		x			x			x			x	x					
Broadcast	Clubs/Activities									x																									
Buddy Bunch	Clubs/Activities																																x		
Capturing Kids Hearts	Student Support	x								x		x	x			x	x			x	x	x		x		x	x		x			x		x	
Cartooning	Clubs/Activities						x																												
Center of Excellence	Award					x			x																										
Challenger Learning Program	Clubs/Activities	x														x																			
Chess Club	Clubs/Activities						x				x	x		x															x				x		
Classroom Champions	?																																	x	
Climbing Club	Clubs/Activities													x																					

**Colorado Springs School District 11  
Elementary School Offerings**

Offerings	Overview Categories	Adams	Audubon	Bristol	Buena Vista	Carver	Chipeta	Columbia	Edison	Freedom	Fremont	Grant	Henry	Howbert	Jackson	Keller	King	Madison	Martinez	McAuliffe	Midland	Monroe	Penrose	Queen Palmer	Rogers	Rudy	Scott	Steele	Stratton	Taylor	Trailblazer	Twain	West	Wilson
Co-ed Basketball	Sport	x																																
Computer Coding	Academic Offering	x			x		x		x	x	x	x	x	x	x	x						x			x	x	x							
Computer Science Focus	Academic Offering	x																																
Cooking	Clubs/Activities						x				x																							
Crazy 8's Math Club	Clubs/Activities								x					x																				
Creative Writing	Academic Offering	x																																
Crocheting/Knitting Club	Clubs/Activities																		x				x											
Cross Country	Sport		x	x			x	x	x	x		x		x	x	x	x	x		x		x	x									x	x	x
CSSM Counselor	?	x			X			X			x												x		x			X						
Cup Stacking	Clubs/Activities																							x			x						x	
Cursive Writing	Academic Offering															x																		
Dance	Clubs/Activities			x					x					x		x										x								x
Deaf/Hard of Hearing Program	Student Support																											x		PK				
Discovery Hour (STEAM / Weather work)	Academic Offering		x																															
Drama	Clubs/Activities		x		x																									x				
Dungeons and Dragons Club	Clubs/Activities																			x														
ELL	Student Support	x	x	x	x	x	x	x	x	x	x	x	x	x	X	X	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Extended School Day	Services																	x																
Fitness Challenge	Clubs/Activities	x																																
Flag Football	Clubs/Activities																																	x
Floor Hockey	Clubs/Activities											x											x				x				x			
Game Club	Clubs/Activities			x			x		x		x		x			x	x	x			x				x		x	x						
Gardening Club	Clubs/Activities																						x											
Genius Hour	Clubs/Activities																																	x
Geology	Academic Offering													x																				
Gifted & Talented Services	Student Support	x	x	x	x	x	x	x	x	x	x	x	x	x	x	X	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Girls on the Run	Clubs/Activities	x	x				x						x		x										x							x	x	
Governor's Distinguished Improvement Award- 2019	Award			x	X			x															X											
Gymnastics	Clubs/Activities			x			x																				x							
Guitar Club	Clubs/Activities															x								x										

**Colorado Springs School District 11  
Elementary School Offerings**

Offerings	Overview Categories	Adams	Audubon	Bristol	Buena Vista	Carver	Chipeta	Columbia	Edison	Freedom	Fremont	Grant	Henry	Howbert	Jackson	Keller	King	Madison	Martinez	McAuliffe	Midland	Monroe	Penrose	Queen Palmer	Rogers	Rudy	Scott	Steele	Stratton	Taylor	Trailblazer	Twain	West	Wilson
Handball	Clubs/Activities						x																											
Hiking	Clubs/Activities	x																																
Homework Club	Clubs/Activities																				x			x										
Home Economics	Academic Offering																									x								
IB (International Baccalaureate)	Academic Offering																				x													
iPad 1:1	?	x																				x												
John Irwin School of Excellence	Award						x																					x						
Kids Hope Mentoring	Student Support																								x									
Kids on Bikes	Clubs/Activities	x		x								x		x											x									x
KidStage Theater	Clubs/Activities						x																											
Kindness Club/ Random Acts of Kindness Club	Clubs/Activities				x				x	x		x													x				x				x	x
Kindness Homework	?	x																																
Land Sharks Track	Clubs/Activities									x																								
Leader In Me	Clubs/Activities																		x															
Leadership and Learning Academy w/ USAFA Cadets	Academic Offering																								x									
Lego Jr Club	Clubs/Activities	x					x		x							x				x		x								x				
Lighthouse Status	?																		x															
Magnet: Gifted & Talented	Academic Offering										x			x																x				
Magnet: Montessori Education	Academic Offering				x																													
Maker Space	?						x			x																								
Mandarin Chinese Club	Clubs/Activities				x																													
Math Expressions/ Math Club	Clubs/Activities							x																										
Mindful Mondays	?							x																										
Minecraft/ Minecraft Club	Clubs/Activities																															x		x
Montessori	Academic Offering				x																													
Music: Choir/Vocal	Academic Offering	x	x	x	x		x			x	x		x	x		x	x	x	x		x				x	x	x	x	x	x	x	x	x	x
Music: Instrumental/Band	Academic Offering	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Music: Orchestra	Academic Offering	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Music: Recorder	Academic Offering									x															x									
Music: Suzuki Violin	Academic Offering			x																														

**Colorado Springs School District 11  
Elementary School Offerings**

Offerings	Overview Categories	Adams	Audubon	Bristol	Buena Vista	Carver	Chipeta	Columbia	Edison	Freedom	Fremont	Grant	Henry	Howbert	Jackson	Keller	King	Madison	Martinez	McAuliffe	Midland	Monroe	Penrose	Queen Palmer	Rogers	Rudy	Scott	Steele	Stratton	Taylor	Trailblazer	Twain	West	Wilson
Music: Ukulele	Award									x								x																
National Blue Ribbon School of Excellence	Award						x					x																						
National Elementary Honor Society	Award											x			x																			
Nationally Recognized PLC Model School	Clubs/Activities												x																					
Nature Club	Clubs/Activities																								x									
Next Generation/ Personalized Learning	Academic Offering						x			x						x	x		x	x											x			
Outdoor School with Catamount Institute	Academic Offering	x												x																				
Patriot Pride (Patience, Respect, Integrity, Determination, Excellence)	?												x																					
PBIS Program	Clubs/Activities																			x														
Preschool Program	Academic Offering	D	D		x	C	D	D	D	D	D	C	D	D	D	D	D	D	D	D		D/C	D	C	D	D	D		D	D	D	D/C	D	C
Project Based Learning	Academic Offering			x			x			x										x			x											
Project Lead The Way	Academic Offering																				x		x											
Readers Theater	Clubs/Activities				x																													
Reading Buddies	Clubs/Activities																								x									
Reading Intervention and Enrichment	Student Support						x																										x	
Rising Stars	Clubs/Activities																											x						
ROAR Club	Clubs/Activities																																x	
Robotics	Clubs/Activities		x	x	x				x	x								x					x											x
Running Club	Clubs/Activities				x									x														x					x	x
Safety Patrol	Clubs/Activities																		x	x														
Scouts (Boy/Girl)	Clubs/Activities	x																	x															
School Garden	Clubs/Activities	x																																
School of Academic Performance	Award		x	x	x	x	x	x	x	x		x			x	x	x	x	x			x	x		x	x	x	x	x	x				
Science Club/ Fair	Clubs/Activities		x				x	x																	x									
SEL (Social-Emotional Learning) Curriculum	Academic Offering									x																	x	x			x		x	
Sign Language	Academic Offering						x																						x		x			
SiMR Structured Phonics	Academic Offering								x																									
Soccer	Clubs/Activities																				x						x						x	
Spanish	Clubs/Activities				x					x						x				x	x								x					
Spartan Spotlight	?					x																												

Colorado Springs School District 11  
Elementary School Offerings

Offerings	Overview Categories	Adams	Audubon	Bristol	Buena Vista	Carver	Chipeta	Columbia	Edison	Freedom	Fremont	Grant	Henry	Howbert	Jackson	Keller	King	Madison	Martinez	McAuliffe	Midland	Monroe	Penrose	Queen Palmer	Rogers	Rudy	Scott	Steele	Stratton	Taylor	Trailblazer	Twain	West	Wilson
Sports Challenge	Clubs/Activities	x	x										x				x	x		x	x								x	x				
ST Math	Academic Offering						x														x												x	
Starbase	?	x																																
STEM Focus/Lab	Clubs/Activities								x						x				x					x					x		X			
STEAM Focus	Academic Offering	x	x	x			x						x			x		x									x	x						
Storybook STEM/ Storytime	Clubs/Activities				x																													
Student Council	Clubs/Activities						x				x	x					x	x		x		x			x	x	x		x	x				
Student Newspaper	Clubs/Activities							x																										
Taekwondo	Clubs/Activities						x					x																						
Talent Show	Clubs/Activities					x																												
Technology 1:1 iPad	Services	x																																
Television Production	Clubs/Activities																											x						
Tier Time	?											x																						
Track and Field	Clubs/Activities			x						x	x		x									x			x		x	x	x			x		
Volleyball	Clubs/Activities						x					x															x							
Walking Club	Clubs/Activities							x																										
Weather Station	Clubs/Activities		x																															
World Language (during the school day): Spanish	Academic Offering									x											x													
Yearbook	Clubs/Activities						x							x															x					
Yoga	Clubs/Activities				x								x															x						
Young Environmental Stewards (YES) Club	Clubs/Activities				x											x								x	x	x								

**Before and After Care:**  
x - onsite before and after care;  
w - onsite after school care only;  
\* - offsite care with transprotation provided

**Preschool:**  
D - D11 run preschool;  
C - CPCD (Head Start) preschool;  
EC - Early Connections preschool

Red = new addition from Principal Survey Results  
Listed on both spreadsheets

GREEN = ADDITIONS

RED SOLID = DELETE



Colorado Springs School District 11

Middle School Offerings

Offerings	Overview Categories	Galileo	Holmes	Jenkins	Mann	North	Russell	Sabin	Swigert	West	Achieve 6-8	Tesla MS
Achieve Online Hybrid Program	Academic Offering					x						
Advanced Placement Offerings	Academic Offering			x	x				x			
Adventure League	Clubs/Activities			x								
Anime	Clubs/Activities		x			x		x	x			
Archery	C/A/Sport								x	x		
Art Focus: School-wide	Academic Offering					x	x					
Art Instruction/ Club	Academic Offering	x	x	x	x	x	x	x	x	x	x	x
Astronomy	AO/C/A											
AVID	AO/SS	x				x				x		
Band after School Help	?				x				x			
Basketball	Sport	x	x	x	x	x	x	x	x	x		
Battle of the Books	Clubs/Activities	x		x	x			x	x	x		
Bike Club	Clubs/Activities		x			x						
Biomedical Sciences*	Academic Offering				x	x	x	x	x			
BIONIC CLUB	Clubs/Activities				x							
Book Club	Clubs/Activities				x	x	x					
Books and Games	Clubs/Activities	x			x							
Breakfast: Free	Services	x			x	x			x	x	x	x
Breakfast: Fee based	Services		x	x			x	x				
Broadcasting Studio/Video Production	AO/C/A	x			x	x		x	x			
Campus Connections College Partnerships w/ UCCS	AO/C/A					x				x		
Capturing Kids Hearts	Student Support			x								
Cheerleading	C/A/Sport				x							
Chess Club	Clubs/Activities		x		x			x	x			
Chinese	Academic Offering					x						
Climbing Club	Clubs/Activities					x				x		
Comic Book Club	Clubs/Activities							x				
Computer Coding	AO/C/A		x		x					x		
CREATE	?				x							
CREW	?			x								
Crocheting Club	Clubs/Activities				x			x				

**Colorado Springs School District 11**

**Middle School Offerings**

Offerings	Overview Categories	Galileo	Holmes	Jenkins	Mann	North	Russell	Sabin	Swigert	West	Achieve 6-8	Tesla MS
Cross Country	Sport		x			x						
Deaf/Hard of Hearing Program	Student Support				x							
Digital Art	AO/C/A			x								
Digital Media	AO/C/A					x		x	x	x	x	
Disney Trivia and Animation	Clubs/Activities			x								
Diversity Club	Clubs/Activities				X				x			
Dodgeball	Sport		X			x						
Drama Club	Clubs/Activities	x	X	x	x	x		x		x		
Dungeons and Dragons Club	Clubs/Activities									x		
ELL	Student Support	x	x	x	x	x	x	x	x	x	x	x
Encore	?	x										
Engineering	Academic Offering		X						x	x		
Extended School Day	Services								x			
Family and Consumer	Academic Offering		x						x			
Fitness Center	AO/C/A		x		X				x			
Flight/ Rocket/ Space	AO/C/A				x				x			
Football	Sport		x	x	x	x	x					
Forensics	AO/C/A			x		x						
French	Academic Offering					x						
Friend First Club	Clubs/Activities								x			
Future Problem Solvers	Clubs/Activities									x		
Gamers Club	Clubs/Activities				x							
Gateway to Technology	Academic Offering	x	X	X	X							
Geeks of the Roundish Table	Clubs/Activities								x			
Gifted & Talented	AO/SS	x	x	x	x	x	x	x	x	x	x	x
Golf	Sport		x		X	x						
GSA Club (Gay/Straight Alliance)	Clubs/Activities				x		X	X	X			
High Impact Partnership w/ Colorado College	AO/C/A					x	x			x		
Hiking Club	Clubs/Activities								x			
IB: Middle Years Programme	AO/SS					x						
Industrial Arts/ Technology	AO/C/A	x	x		x	x					x	

Colorado Springs School District 11

Middle School Offerings

Offerings	Overview Categories	Galileo	Holmes	Jenkins	Mann	North	Russell	Sabin	Swigert	West	Achieve 6-8	Tesla MS
LeadWorthy	?			x								
Lego League	Clubs/Activities			x			X					
Magnet: Gifted & Talented	AO/SS							x		x		
Makerspace Technology	AO/C/A		X		X			x				
Making It Club	Clubs/Activities					x						
MathCounts Club	Clubs/Activities									x		
Mental Health Service On-Site (THRIVE)	Services					x	x					
MESA (Math, Engineering, Science and Arts)	Academic Offering							x				
Minecraft Club	Clubs/Activities							x				
Music: Choir/Glee/Vocal	Academic Offering	x	x	x	x	x	x	x	x	x		
Music: Guitar	AO/C/A			x								
Music: Instrumental	Academic Offering	x	x	x	x	x	x	x	x	x	x	
Music: Jazz	Academic Offering		x	x	x	x	x	x		x		
Music: Orchestra	Academic Offering	x	x	x	x	x	x	x	x	x		
Next Generation/ Personalized Learning	AO/SS		x	x				x			x	
Newspaper Club	Clubs/Activities		x									
NJHS (National Junior Honor Society)	AO/C/A	x	X	x	x	x	x	x	X	x		
Outdoor Adventure Club	Clubs/Activities		x							X		
Photography	AO/C/A			x				x				
Pokemon Club	Clubs/Activities		x									
Pre-Engineering Program	Academic Offering											
Pride Club	Clubs/Activities					x				X		
Project Based Learning	AO/SS		x									
Project Lead the Way	Academic Offering	x	X	x	x		x	x	x	x		
Public Achievement	?					x						
REACH Assemblies for Excellence	Student Support						x					
Recording Studio	AO/C/A							x				
Robotics	AO/C/A	x	X	X	X		X	X	x	x		
Running	C/A/Sport		x									
School of Academic Performance	Award		x	x	x	x	x		x	x	x	
Scrabble Club	Clubs/Activities	x										

Colorado Springs School District 11

Middle School Offerings

Offerings	Overview Categories	Galileo	Holmes	Jenkins	Mann	North	Russell	Sabin	Swigert	West	Achieve 6-8	Tesla MS
Science Olympiad Club	Clubs/Activities							X		x		
Ski and Snowboard	C/A/Sport		x									
Soccer	Sport	x	x	x	x	x		x	x	x		
Softball	Sport		x	x	x	x		x	x	x		
Sources of Strength Club	Clubs/Activities									x		
Spanish	Academic Offering		X	X		x		x				
STEM Focus/Lab	Academic Offering		X	X	x							
STEAM Focus	Academic Offering				X							
STEP Team	AO/C/A				x							
Student Council	AO/C/A		X	x				X		x		
Student Government	Academic Offering							x				
Technology Assistance Association	AO/C/A/SS			x								
Technology 1:1 Laptop/Computer	AO/SS											
Technology 1:1 iPad	AO/SS				x			x				
Teen Court	AO/C/A	x							X			
Tennis	Sport		x									
Track and Field	Sport	x	x	x	x	x	x	x	x	x		
Tutoring/Homework (Before and After School)	Student Services		X		x	x	x	X	X	X		
Volleyball	Sport	x	x	x	x	X	X	x	x	x		
WEB (Where Everyone Belongs) Mentoring Program	AO/C/A/SS	X	X	X	X	x	X	x	X	x		
Weight Lifting	Sport								x			
Wood Class	Academic Offering		X					x				
Wrestling	Sport	x	x	x	x	x	x	x	x	x		
World Language (during the school day): Chinese	Academic Offering					x						
World Language (during the school day): French	Academic Offering							x				
World Language (during the school day): Spanish	Academic Offering		x	x	x	x	x	X				
Yearbook	AO/C/A		X	X	X	x	X	X		X		

\*Biomedical Sciences refers to a one semester course called "Medical Detectives"

Red = new addition from Principal Survey Results

GREEN = ADDITIONS

Listed on both spreadsheets

RED SOLID = DELETE

**Colorado Springs School District 11  
High School Offerings**

Offerings	Overview Categories	Coronado	Doherty	Mitchell	Palmer	Odyssey Early College	Achieve Online	Bijou	Digital	Tesla	Springs Comm Night	Career Pathways	Adult/Family Ed
Advanced Placement Offerings	Academic Offering	x	x	x	x		x						
Aerospace Club	Clubs/Activities		x										
Anime Club	Clubs/Activities		x			x							
AP Capstone	Academic Offering		x										
Archery	C/A/Sport						x						
Architecture	Academic Offering		x										
Art Instruction/ Club	Academic Offering	x	x	x	x	x	x		x	x		x	
Automotive Technology	Academic Offering		x	x								x	
AVID	AO/SS	x	x		x	x							
Baseball	Sport		x										
Basketball	Sport		x	x									
Battle of the Books	Clubs/Activities									x			
Beyond Mind Capacity Club	Clubs/Activities					x							
Biomedical Sciences	Academic Offering			x		P							
Bowling	Sport		x				x						
Breakfast: Free	Services									x			
Breakfast: Fee based	Services	x	x	x	x	x	x	x	x				x
Broadcasting Studio/Video Production	AO/C/A	x	x	x	x								
Business Marketing Focus	Academic Offering	x	x			P				x		x	
Capturing Kids Hearts	Student Support									x			
Career and Technical	AO/C/A	x											
Career Pathways	AO/C/A		x			x		x					
Career Start Program w/ PPCC	AO/C/A							x					
Ceramics	Academic Offering		x										
Cheerleading/ Poms	Clubs/Activities		x										
Chess Club	Clubs/Activities		x										
Christian Athletes Club	Clubs/Activities			x									
Cisco	AO/C/A											x	
Climbing Club	Clubs/Activities	x											
Computer Science Focus	Academic Offering	x	x	x	x	P			x	x		x	
Concurrent Enrollment	Academic Offering	x	x	x	x	x	x	x	x	x	x		
Construction Trades	Academic Offering	x		x									
Creative Writing	Academic Offering		x										

Odyssey ECCO programs marked with a "P" are available as Associates programs at PPCC

Adult and Family Education offers: Family Literacy, Refugee Programming, ESL, and access to select Career Pathways courses

**Colorado Springs School District 11  
High School Offerings**

Offerings	Overview Categories	Coronado	Doherty	Mitchell	Palmer	Odyssey Early College	Achieve Online	Bijou	Digital	Tesla	Springs Comm Night	Career Pathways	Adult/Family Ed
Cross Country	Sport	x	x	x									
Culinary Arts	Academic Offering		x										
CU Succeed	AO/C/A	x											
Cyber Security Education	Academic Offering					x							
Dance	AO/C/A			x	x								
Deaf/Hard of Hearing Program	Student Support				x								
Digital Media	AO/C/A	x	x	x	x		x		x			x	
Diversity Council	Clubs/Activities		x										
Drawing	AO/C/A		x										
Dual Enrollment	Academic Offering	x	x	x	x			x	x	x	x	x	
Dungeons and Dragons Club	Clubs/Activities			x									
E-Sports	Clubs/Activities				x								
ELL	Student Support	x	x	x	x				x				x
Engineering/ Pre-Engineering	Academic Offering	x	x										
Environmental Club	Clubs/Activities		x										
Family and Consumer	Academic Offering	x	x		x							x	
FBLA (Future Business Leaders of America)	AO/C/A	x	x										
FCCLA (Family, Career and Community Leaders)	AO/C/A	x	x			x							
Flight/ Rocket/ Space	AO/C/A	x											
Food Science Nutrition	Academic Offering	x	x		x							x	
Football	Sport	x	x	x									
Foreign Language Clubs	AO/C/A				x								
Forensics	AO/C/A		x		x								
Future Farmers of America	Clubs/Activities					x							
Future Problem Solvers Club	Clubs/Activities	x											
Game Club (Spectrum Magic Card Game/ Board Game)	Clubs/Activities			x									
Game Design	AO/C/A				x								
GSTA (Gay, Straight, Trans Alliance)	Clubs/Activities		x			x							
Gifted & Talented	AO/SS	x	x	x	x	x	x	x	x	x			
Golf	Sport	x	x	x									
Graphic Arts and Communications	AO/C/A					x							
Hockey	Sport		x										
Horseback Riding	C/A/Sport						x						

Odyssey ECCO programs marked with a "P" are available as Associates programs at PPCC

Adult and Family Education offers: Family Literacy, Refugee Programming, ESL, and access to select Career Pathways courses

**Colorado Springs School District 11  
High School Offerings**

Offerings	Overview Categories	Coronado	Doherty	Mitchell	Palmer	Odyssey Early College	Achieve Online	Bijou	Digital	Tesla	Springs Comm Night	Career Pathways	Adult/Family Ed
Hotel and Restaurant Management	Academic Offering					x							
IB: Diploma Years Programme	AO/SS				x								
ICAP	AO/SS			x									
Ice Hockey	Sport	x											
Industrial Arts/ Technology	Academic Offering	x		x									
Information/Technology Academy	Academic Offering			x						x		x	
Interior Design	Academic Offering	x											
Japanese Club	AO/C/A			x									
Jewelry	Clubs/Activities		x										
Journalism	AO/C/A					x							
JROTC Program	Academic Offering		x	x									
Knowledge Bowl	?				x								
Korean Club	AO/C/A			x									
Link Crew	?				x	x							
Manufacturing	Academic Offering		x										
Marketing	Academic Offering		x										
Mathletes	AO/C/A		x										
Microsoft Office Specialist Program	Academic Offering									x			
Mock Trial	AO/C/A		x		x								
Music: Choir/Vocal	Academic Offering	x	x	x	x								
Music: Guitar	AO/C/A					x							
Music: Instrumental	Academic Offering	x	x	x	x					x			
Music: Jazz	Academic Offering	x	x	x	x								
Music: Marching Band	Academic Offering		x	x	x								
Music: Orchestra	Academic Offering	x	x	x	x								
National Honor Society	Academic Offering		x	x	x	x							
Next Generation/ Personalized Learning	AO/SS		x			x						x	
Origami Club	Clubs/Activities		x										
Outdoor Club	Clubs/Activities		x										
Outdoor Leadership	Clubs/Activities									x			
Painting	AO/C/A		x										
Pay it Forward Club	Clubs/Activities	x											
Performing Arts/ Theatre	AO/C/A	x	x		x								

Odyssey ECCO programs marked with a "P" are available as Associates programs at PPCC

Adult and Family Education offers: Family Literacy, Refugee Programming, ESL, and access to select Career Pathways courses

**Colorado Springs School District 11  
High School Offerings**

Offerings	Overview Categories	Coronado	Doherty	Mitchell	Palmer	Odyssey Early College	Achieve Online	Bijou	Digital	Tesla	Springs Comm Night	Career Pathways	Adult/Family Ed
Photography (and Digital)	AO/C/A		x										
Post Secondary Workforce Readiness	Academic Offering							x					
Pre-Engineering Program	Academic Offering	x	x			P							
Project Based Learning	AO/SS									x			
Project Lead the Way	Academic Offering	x	x	x									
ProStart Program	Academic Offering	x	x									x	
Rhyme Scene	Clubs/Activities		x										
Robotics	AO/C/A	x	x										
School of Academic Performance	Award	x	x		x	x	x	x					
Science Club/ Olympiad	Clubs/Activities		x		x								
Sculpture	AO/C/A		x										
Sign Language (American) Club	AO/C/A			x									
Skiing	C/A/Sport						x						
Small Class Sizes	Student Support							x		x			
Soccer	Sport		x	x									
Softball	Sport		x										
Sources of Strength Club	Clubs/Activities					x							
STEM Focus/Lab	Academic Offering	x				P						x	
Successful Career Students of Colorado	AO/C/A/SS			x									
Student Council/ Government	AO/C/A				x	x							
SWAT (Students Working Against Tobacco)	Clubs/Activities		x										
Swim	Sport		x	x									
Teacher Cadet Program	?		x									x	
Technology 1:1 Laptop/Computer	AO/SS	x	x			x			x	x			
Tennis	Sport		x	x									
Thespians	AO/C/A		x	x									
TSA (Technology Student Associates)	AO/C/A		x	x									
Track and Field	Sport		x	x									
Ultimate Frisbee	C/A/Sport	x											
Visual Arts	AO/C/A		x										
Vocational Auto Program	Academic Offering		x	x								x	
Vocational Alternative Cooperative Education Program	AO/SS									x			
Volleyball	Sport	x	x	x	x								

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**Colorado Springs School District 11  
High School Offerings**

Offerings	Overview Categories	Coronado	Doherty	Mitchell	Palmer	Odyssey Early College	Achieve Online	Bijou	Digital	Tesla	Springs Comm Night	Career Pathways	Adult/Family Ed
World Language (during the school day): Chinese	Academic Offering				x								
World Language (during the school day): French	Academic Offering	x	x		x								
World Language (during the school day): German	Academic Offering		x										
World Language (during the school day): Spanish	Academic Offering	x	x	x	x	x				x			
Wrestling	Sport	x	x	x	x								
YMCA	Services						x						
Young Life	Clubs/Activities		x										
Credit Acceleration	AO/SS									x			
Credit Recovery	AO/SS	x	x	x	x			x	x	x	x		
Associate's Degree	Academic Offering					x							
Night Hours (1:30 pm - 9:50 pm)	Services/SS												

Red = new addition from Principal Survey Results

Listed on both spreadsheets

Odyssey ECCO programs marked with a "P" are available as Associates programs at PPCC

Adult and Family Education offers: Family Literacy, Refugee Programming, ESL, and access to select Career Pathways courses

**Other Districts STEM Offerings**

**January 2020**

<b><u>District</u></b>	<b><u>School</u></b>	<b><u>Offering</u></b>
D20	Antelope Trails ES	IBPY
	Challenger MS	School of Innovative Learning and Technology
	Chinook Trail ES	Offers Mandarin Chinese
	Foothills ES	Organized STEAM Program w/ curriculum; also GT and SIP
	Village HS	Our program is a hybrid learning experience called The Village. This program provides a flexible schedule for students who are involved in athletics, music, theater, or other community activities.
D38	Lewis-Palmer HS	Engineering/Technology (PLTW) Pathway
	Prairie Winds ES	Smart Lab:
		"In an elementary Smart Lab program, young learners discover a wide range of applied technologies. They engage in authentic first-hand experiences in STEM, building interest and inspiring many to pursue these fields in more depth in the years to come."
	Palmer Ridge HS	Engineering/Technology (PLTW) Pathway
D49	Sand Creek HS	Pathways in Business, Computer Science, engineering, Graphic Design, Health & Wellness, Manufacturing
	Odyssey ES	Part of what they call "Power Zone STEM System"
	Skyview MS	Part of what they call "Power Zone STEM System"
	Vista Ridge HS	Part of what they call "Power Zone STEM System"
D12		Not readily identified
D2		Not readily identified
D3	Mesa Ridge HS	District wide program Supported by DoDEA School Partnership
	Widefield HS	District wide program Supported by DoDEA School Partnership
	Discovery HS	District wide program Supported by DoDEA School Partnership
	Watson JHS	District wide program Supported by DoDEA School Partnership

**Other Districts STEM Offerings****January 2020**

<b><u>District</u></b>	<b><u>School</u></b>	<b><u>Offering</u></b>
	Janitell JHS	District wide program Supported by DoDEA School Partnership
	Sproul JHS	District wide program Supported by DoDEA School Partnership
D14		Not readily identified
D8	Abrams ES	STEM Programming
	Mountainside ES	STEM Programming
	Patriot ES	STEM Programming
	Carson MS	STEM Programming
		Pre-Engineering
	FFC HS	STEM Programming
		Intro to Engineering
		Principles of Engineering
		Computer Science Principles
		Principles of Biomedical Science
		Human Body Systems
		Medical Interventions

**Q1 Public AMP Responses:**

**Questions 1-3 (N=485)**

What programs could we introduce or expand that would be attractive to ELEMENTARY students?	Q1	What programs could we introduce or expand that would be attractive to MIDDLE SCHOOL students?	Q2	What programs could we introduce or expand that would be attractive to HIGH SCHOOL students?	Q3
<b><u>FINE ARTS IN SOME FASHION</u></b>		<b><u>FINE ARTS IN SOME FASHION</u></b>		<b><u>PERSONAL/LIFE SKILLS</u></b>	
Band, Art, Music, PE, Orchestra, Theatre	67	Band, Art, Music, PE, Orchestra, Theatre	52	Cooking Classes/Home Ec/Life Skills	68
Band/Orchestra during school day	4	Gymnastics/Dance	4	Personal Finance	34
Video Productions	1	Video Productions	2	<b>TOTAL</b>	<b>102</b>
<b>TOTAL</b>	<b>72</b>	Visual Arts	2		
		Marching Band	1	<b>Trades/Crafts/CTE</b>	<b>64</b>
<b><u>LANGUAGE IN SOME FASHION</u></b>		<b>TOTAL</b>	<b>61</b>		
Foreign Language/Immersion/Spanish	<b>54</b>			<b><u>FINE ARTS IN SOME FASHION</u></b>	
		<b><u>STEM</u></b>		Band, Art, Music, PE, Orchestra, Theatre	37
<b><u>STEM</u></b>		Computer Coding/Game Design	20	Gymnastics/Dance	4
More Science/Science Fairs	18	STEM	10	Video Productions	1
Computer Coding	16	Robotics/Engineering	8	<b>TOTAL</b>	<b>42</b>
STEM	15	More Science/Science Fairs	7		
STEAM	6	STEAM	4	<b><u>STEM</u></b>	
Robotics	6	More Math	1	Computer Coding/Game Design	15
Pre-engineering	3	Pre-engineering	1	Robotics/Engineering	7
<b>TOTAL</b>	<b>64</b>	<b>TOTAL</b>	<b>51</b>	More Science/Science Fairs	6
				STEM/Advanced STEM	5
<b>OTHER PROGRAMS/SUGGESTIONS</b>				STEAM	2
Outdoor Learning/Gardening	23	<b>Cooking Classes/Home Ec/Life Skills</b>	<b>49</b>	Ethical Hacking	1
Hands-on Activities	22			<b>TOTAL</b>	<b>36</b>
Cooking Classes/Home Ec	16	<b>OTHER PROGRAMS/SUGGESTIONS</b>			
After school clubs	14	Foreign Language/Immersion/Spanish/Sign	34	<b>OTHER PROGRAMS/SUGGESTIONS</b>	
More Sports	13	Trades/Crafts	32	Foreign Language/Immersion/Spanish/Sign	19
Project Based Learning	11	After school clubs/activities	23	Leadership/Communication Skills	17
Environmental Education	10	Outdoor Learning/Gardening	14	Dual Enrollment/College Prep	14
Yoga, fitness, nutrition	9	More Sports Options	13	Trade Apprenticeships/Mentor Programs	14
Computer & Keyboarding Basics/Technology	9	Hands-on Activities	13	Debate/Public Speaking	11
Gymnastics/Dance	7	Yoga, fitness, nutrition, meditation	8	Community Service/Volunteer	8
More district-wide athletic opportunities	7	Environmental Education	8	Outdoor Learning/Gardening	7
Trades/Crafts	6	Computer & Keyboarding Basics/Technology	7	More Sports Options	6
Community Service/Outreach	6	More fun electives	6	Health/Wellness Education	6
Volleyball/Soccer	5	Advanced/IB Classes/HS Prep Classes	6	Driver's Education	6
Transportation for B/A school activities	4	Transportation for B/A school activities	6	Photography	6

**11 Public AMP Responses:**

**Questions 1-3 (N=485)**

What programs could we introduce or expand that would be attractive to ELEMENTARY students?	Q1	What programs could we introduce or expand that would be attractive to MIDDLE SCHOOL students?	Q2	What programs could we introduce or expand that would be attractive to HIGH SCHOOL students?	Q3
Expand GMP Locations 1 more	4	Community Service/Outreach	6	Work Release/DECA	6
GT at every school	1	Technology	4	Technology	5
Montessori	1	On-line Interactive activities w/ teachers	4	After school clubs/activities	5
Smaller Class Sizes	1	Project Based Learning	3	Project Based Learning	4
Playground Beautification	1	Social/Emotional Intelligences	3	Social/Emotional Classes	4
Social/Emotional Intelligences	1	Smaller Class Sizes	2	Environmental Education	4
Anti-bias/Anti-bullying training	1	Anti-bias/Anti-bullying training	2	Hands-on Activities	3
Laptops for each student	1	Interdisciplinary Projects	1	On-line Interactive activities w/ teachers	3
Dyslexia	1	Field Trips	1	Smaller Class Sizes	3
Capturing Kids Hearts	1	Uniforms	1	AP/College Course Offerings all HS	3
IB Programs	1	Montessori	1	More Electives	2
		Basketball Courts Beautification	1	Blended Learning	1
		Debate	1	Anti-bias/Anti-bullying training	1
		Cheerleading	1	GSA/LGBTQ Support Clubs	1
		Career/Job Shadowing	1	IB Programs	1
		IB Programs	1	AVID	1
		Communication Skills	1	Animal/Pet/Horse Therapy	1
		Inquiry-based learning	1	1st Generation College Students	1

**D1 Public AMP Responses:**  
**Questions 4-6 (N=485)**

What programs can we introduce or expand that a student could follow from KINDERGARTEN to HIGH SCHOOL?	Q5*	What programs can we introduce or expand that a student could follow from KINDERGARTEN to MIDDLE SCHOOL?	Q4*	What programs can we introduce or expand that a student could follow from MIDDLE SCHOOL to HIGH SCHOOL?	Q6
<b>PERSONAL/LIFE SKILLS</b>		<b>Band, Art, Music, Orchestra, Theatre</b>	<b>75</b>	<b>PERSONAL/LIFE SKILLS</b>	
Teen Mentor Program	10			<b>TOTAL PE/Fitness</b>	<b>26</b>
Environmental Education	6	<b>OTHER PROGRAMS/SUGGESTIONS</b>			
GT/IB/GMP	5	GT/IB/GMP	6	<b>Foreign Language/Immersion/Spanish/Sign</b>	<b>22</b>
Anti-bias/Anti-bullying training	3	Hands-on Activities	4		
After school clubs/sports	3	Astronomy	3	<b>OTHER PROGRAMS/SUGGESTIONS</b>	
Project Based Learning	3	Montessori	3	HS to MS Mentor Program	9
Capturing Kids Hearts	3	Project Based Learning	2	Hands-on Activities	3
Hands-on Activities	2	Environmental Education	2	AVID	3
AVID	2	AVID	2	GT/IB/GMP	3
K-12 GT	2	Evolutionary Biology	2	US History	2
Shadow/Mentoring Opportunities	1	Capturing Kids Hearts	1	Capturing Kids Hearts	2
Free breakfast	1	Dyslexia	1	Transportation for After School Activities	2
Astronomy	1	K-12 GT	1	College Prep/Vocational Prep	2
Montessori	1			Project Based Learning	1
High School Prep classes	1			Small class sizes	1
Ethics/Philosophy	1			Montessori	1
				Animal Science	1
				K-12 GT	1
				Military	1
* on public survey, Q4 and Q5 were reversed, so responses are noted above.					

Questions 1-3	Parents/Community Responses	Staff Responses	TOTALS
<b>DEVELOPING PROGRAMS THAT MEET STUDENTS' NEEDS</b>	<b>N=485</b>	<b>N=247</b>	
<b>Elementary</b>			
Music, Theater, Dance, Drama, Orchestra, Band, Piano, Voice, Guitar, Visual Art	72	88	<b>160</b>
STEM	64	37	<b>101</b>
Hands-on activities	22	0	22
More Sports	13	6	19
Project-Based Learning	11	6	17
Magnet schools w/ special focus	14	2	16
After school clubs	14	0	14
Montessori	1	10	11
<b>Middle</b>			
Band, Art, Music, PE, Orchestra, Theatre, Performing and Fine Arts	61	85	<b>146</b>
STEM	51	43	<b>94</b>
After school clubs/activities	23	29	52
Magnet schools w/special focus (art, athletic, military, digital)	5	35	40
More sports options	13	4	17
Hands-on Activities	13	0	13
<b>High</b>			
Band, Art, Music, PE, Orchestra, Theatre, Performing/Fine Arts/Visual Arts	42	51	<b>93</b>
STEM	36	30	<b>66</b>
Magnet Schools w/ special focus (arts, athletics, military, digital, engineering, pre-med, veterinarian)		42	42
<b>REAL WORLD LIFE SKILLS</b>	<b>N=485</b>	<b>N=247</b>	
<b>Elementary</b>			
Foreign Language/Immersion/Spanish	54	38	<b>92</b>
Outdoor Learning/Gardening	23	8	<b>31</b>
Cooking Classes/Home Economics/Life Skills	16	5	<b>21</b>
Environmental Education	10	0	10
<b>Middle</b>			
Cooking Classes/Home Economics/Life Skills	49	14	<b>63</b>
Trades/Crafts/More Elective Offerings	32	29	<b>61</b>
Foreign Language/Immersion/Spanish/Sign	34	27	<b>61</b>
Outdoor Learning/Gardening	14	6	20
<b>High</b>			
Trades/Crafts/CTE	64	61	<b>125</b>
Cooking Classes/Home Economics/Life Skills/Personal Finance	102	8	<b>110</b>
Foreign Language/Immersion/Spanish/Sign	19	13	<b>32</b>
Trade Apprenticeships/Mentor Programs	14	15	29
Leadership/Communication Skills	17	0	17
Dual Enrollment/College Prep	14	0	14
Debate/Public Speaking	11	0	11

HIGH AREAS OF INTEREST		Parents/Community Responses			Staff Responses		TOTALS
		<i>N=485</i>			<i>N=247</i>		
	K-8	K-12	8th-12th	K-8	K-12	8th-12th	
Personal/Life Skills	73	61	101	48	17	44	344
Performing/Fine/Visual Arts	75	46	51	72	45	39	328
STEM	51	53	48	49	25	31	257
World Language/Immersion/Sign	51	44	22	31	20	15	183
PE/Fitness	67	55	26	4	6	8	166
<b>Specific Gifted, IB Programs Referenced</b>							
GT K-12	7	7	5		5		24
IB K-12					15		15
GT K-8				2			2
IB K-8				1			1
IB 8-12						4	4
GT 8-12						1	1
IB Honors					11		11
<b>TOTAL GT, IB Programs Referenced</b>	7	7	0	3	26	5	34



## **Post-secondary Alignment: Local, Colorado, and National**

Post-secondary alignment to K – 12 STEM programming is now pervasive at the local, state, and national level. Well before 2001, when the STEM acronym was introduced by the National Science Foundation (NSF), there have been only steadily growing calls for increasing the “pipeline” or “flow” of STEM-trained and workforce ready students from both K – 12 and post-secondary education systems. There is a wealth of post-secondary education options for District 11 students to enter upon graduating from high school.

## **Policies and Procedures**

Here is offered preliminary list of the sorts of policies and procedures that may need to come under consideration for review/revision or development:

- Staffing of innovative STEM programs – all employee groups
- Professional learning and performance evaluation of personnel – all employee groups
- Differential employee contract and incentive models – all employee groups
- Evaluation and accountability for program implementation inputs and meeting metrics
- Repurposing and reconstituting school sites
- Steering and planning structures for magnet programming
- Student enrollment
- Supports for student success and retaining students
- Transportation of students
- Differential program/school site funding models
- Steering and planning structures for coordinated, District-wide growth of STEM

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