

# The Washington State Board of Education

Governance | Achievement | High School and College Preparation | Math & Science | Effective Workforce

## DELTA HIGH SCHOOL VISIT

### BACKGROUND

Delta High School is a one-of-a-kind Washington public school that opened its doors in 2009 to provide a learning environment emphasizing Science, Technology, Engineering and Mathematics (STEM) education.

Admission to the school is available through a lottery held for students in the Tri-Cities districts of Kennewick, Pasco, and Richland. Nearly 300 students applied for enrollment in the inaugural freshman class; 110 students were accepted. Each district is allotted a certain number of student slots, based on its overall school population. Delta now has students in two grade levels: 9<sup>th</sup> and 10<sup>th</sup>.

Delta is the product of a unique partnership among community businesses, higher education institutions, K-12 school districts, and non-profit foundations. The Delta “story” is explained on the school [website](#).

<b>Partner</b>	<b>Role</b>
Paul G. Allen Family Foundation	\$700,000 in support, including the first gift of \$250,000 in 2008, to assist with the development of a program of study.
Battelle	\$1.2 million in corporate support.
U.S. Department of Energy's Pacific Northwest National Laboratory	Comprehensive support—mentors, materials, specialists, money.
Kennewick, Pasco, and Richland School Districts	\$365,000 per year in Basic Education Act (BEA) funds to support their students.
WSU-Cities	Consultation services on the curriculum; conducting a longitudinal study on the effectiveness of Delta.
Columbia Basin College	Provided the facility rent-free to serve as the initial school site; has also shared faculty as consultants.
Washington State	\$800,000 to renovate the school facility.
Local companies, organizations and individuals	\$1,000,000 in cash and in-kind contributions.
Washington State STEM Education Foundation	501C-3 established by partnership to initiate a capital campaign to build a campus and to work with community partners.
Educational Service District 123	Fiscal agent.

Delta emphasizes approaches to teaching and learning that are research-based, standards-based, and project-based. Principal Deidre Holmberg noted that students attracted to the school needed to be willing to “think differently” about what mattered most to them about their high school experience, as not all typical high school experiences will be available to them. See Attachment A for a snapshot of Delta’s STEM Program of Study and school-wide approaches to teaching and learning.

The State Board of Education (SBE) will participate in a student-led tour of the facility, and have an opportunity to talk with students in classes, as well as with the tour guides. A panel of partners, including the superintendents of the three school districts, will talk with SBE members about the partnership’s goals for students.

### **POLICY CONSIDERATION**

Washington State policy creates the possibility for innovative schools like Delta High School to exist and in this instance, for students interested in cultivating their interests in STEM-related fields to “go deep” with their learning in an environment uniquely suited to them.

Getting the school off the ground required an unprecedented outlay of private and public resources. What can be learned from this model that may be transferrable to other, more typical, school settings?

### **EXPECTED ACTION**

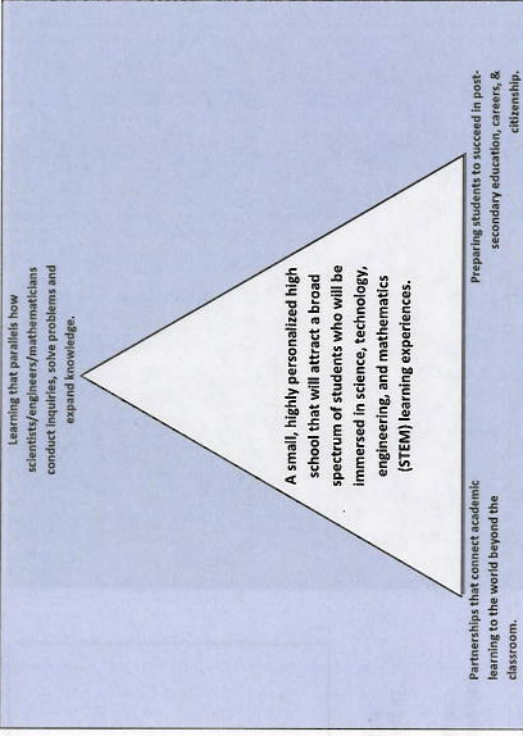
For information only; no action required.

# ASK ME ABOUT ATTACHMENT

## Portrait of a STEM School Graduate

- Graduates have the confidence to strive for success, effectively manage challenges, and persist in the face of unforeseen outcomes.
- Graduates possess and use the knowledge, skills and habits of mind necessary to pursue college, technical training, or immediately enter the work force..
- Graduates are well-informed and contributing members of society.
- Graduates acquire and assimilate information to develop knowledge.
- Graduates fully comprehend how their actions and decisions impact others and the world.
- Graduates understand and are comfortable with uncertainty in the context of academics and in circumstances in life outside the classroom
- Graduates successfully transfer skills and knowledge gained through internships, apprenticeships and similar experiences to future opportunities.
- Graduates have a passion for the STEM disciplines that translates to advocacy for continued STEM education and expanded participation in STEM careers.

## Vision for the Tri-Cities STEM School

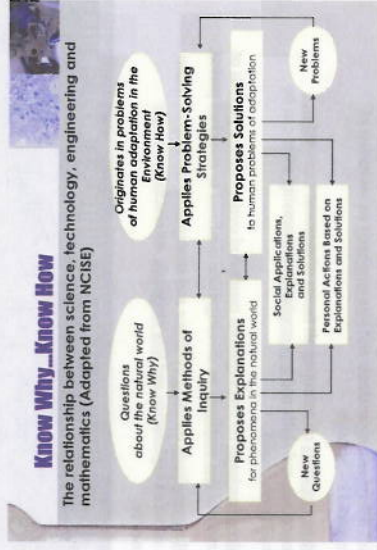


## Tri-Cities STEM Program of Study Overview – An Evolving Framework

Rooted in the research on *How People Learn*, the Tri-Cities STEM program of study aligns its goals with state, national, and college-ready standards. The Program of Study provides the framework for specific courses and sets expectations that will guide how students, teachers, and the community will interact, acquire knowledge and skills, gain deep understanding of the content, and apply that knowledge in real world situations.

The Tri-Cities STEM program of study is anchored by essential questions that invite thought-provoking inquiry into the nature of each content area. Not rooted in disconnected or dispassionate facts, the program of study reveals linkage and recurring themes between and among the disciplines.

The Tri-Cities STEM School Core Planning Team (CPT), comprised of teachers, scientists, university professors, and business leaders designed the program of study to instill a deep understanding, to extend beyond simple coverage of the knowledge and skills critical to global 21<sup>st</sup> century citizenship. The Tri-Cities STEM Program of Study is unique because over a six-month period, the CPT designed the framework for the program of study as they modeled the cross-disciplinary inquiry process that will be embodied in the day-to-day learning process at the STEM school.



## School-Wide Approaches to Teaching and Learning

The Tri-Cities STEM School will use state, national and college-ready standards as the launching point for rigorous, relevant learning experiences. The school will ground its work in the key research findings of an analysis of some 20 years of research, entitled *How People Learn*, which summarizes key findings in this way:

1. *Students come to the classroom with preconceptions about how the world works. If their initial understanding is not engaged, they may fail to grasp the new concepts and information that are being taught, or they may memorize them for purposes of a test but revert to their preconceptions when they are outside the classroom context. (p. 14)*
2. *To develop competence in a discipline, students must (a) have a deep foundation of usable knowledge, (b) understand facts and ideas in a conceptual framework, and (c) organize knowledge in ways that facilitate retrieval and application. (p. 16)*
3. *A “meta-cognitive” approach to instruction can help students to take control of their own learning by defining learning goals and monitoring their progress in achieving them. (p. 18)*

These over-arching research findings will guide the teaching and learning experience at the Tri-Cities STEM School.

The Tri-Cities STEM School will thrive with the support of the three founding school districts along with multiple community, higher education, and business/industry partners. Because they will be engaged in a planned and purposeful way in the design of the units of study, each partner will have a unique, highly interdependent role to play in the learning process. To that end, both collaboration within and collaboration outside of the school are essential to effective operations.

### Habits of mind

Our STEM Students are...

- **Curious** – Inquisitive, probing, gathering information, making connections
- **Persistent**- Sustaining a process and being committed to completing task
- **Problem solvers** – Thinking critically, applying knowledge, experiences, and resources to new situations
- **Flexible**. – Open to new ideas, perspectives, and approaches
- **Precise and accurate**. – Meeting the context and requirements of each STEM discipline
- **Continuous learners**. – Seeking to expand personal knowledge and understanding of a dynamic world
- **Socially aware**. – Demonstrating integrity and ethical behavior
- **Creative and innovative thinkers** –Possessing the knowledge and power to pursue independent and original investigation
- **Collaborative**. –Working effectively and flourishing in group settings.
- **Responsible** – Leveraging strengths to accomplish goals; acting responsibly with interests of a larger picture

The Tri-Cities STEM School will use time, materials and personnel resources in creative ways to provide unique opportunities that deepen and expand learning for students and teachers. The Tri-Cities STEM School will provide focused, rigorous, relevant, coherent, cross-curricular

learning experiences that emphasize a deep understanding of core concepts and provide continuous opportunities for students to apply knowledge as they attempt to solve real-world problems. These learning experiences will be characterized by:

- More emphasis on understanding material within a conceptual framework and less emphasis on disconnected facts and information.
- More emphasis on learning and understanding subject matter disciplines in the context of inquiry, technology, history from personal and social perspectives and less emphasis on studying isolated concepts.
- More emphasis on implementing inquiry as instructional strategies, abilities, and understandings to be learned and less emphasis on implementing inquiry as a set of processes.
- More emphasis on deepening students’ understanding and use of knowledge, ideas, and inquiry processes, and less emphasis on student acquisition of unrelated bits of information.

- More emphasis on providing opportunities for reasoning, discussion and debate among students and less emphasis on recitation of acquired knowledge.
- More emphasis on assessing all facets of essential knowledge, processes, and skills and less emphasis on assessing what can be readily measured.
- More emphasis on investigations conducted over extended periods of time and less emphasis on investigations confined to one class period.
- More emphasis on using evidence and strategies to develop or revise a nuanced explanation and less emphasis on reaching a single answer.

## 21<sup>st</sup> Century Workforce Qualities and Skills

Across their four-year experience, Tri-Cities STEM School students will acquire and hone the following qualities and skills identified by industry and post-secondary institutions as critical for success in the 21st century workplace:

### Fundamental Literacy

- Reading
- Writing
- Listening
- Speaking
- Mathematics Literacy
- Science Literacy
- Technology Literacy
- Civic Literacy

### Social and Personal Qualities

- Leadership
- Professionalism/Work Ethic
- Teamwork/Collaboration
- Ethics and Social Responsibility
- Social and Cross-cultural Skills
- Lifelong Learning/Self Direction

### Workplace Qualities

- Creativity/Innovation
- Oral/Written/Symbolic Communications
- Critical Thinking/Problem Solving
- Resource Management