

BOISE-ELIOT/HUMBOLDT SCHOOL
STEM Investment Plan

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BOISE-ELIOT/HUMBOLDT SCHOOL

STEM Investment Plan

WHO WE ARE:

Boise-Eliot/Humboldt School is a Portland Public PreK through 8th grade neighborhood school in North Portland. We are a very diverse community in an ever-changing part of Portland. In 2012, Boise-Eliot School merged its campus with Humboldt School creating a new unified school that offers a comprehensive program including music, PE, enrichments for middle school students, and now a focus on Science, Technology, Engineering and Math (STEM).

Boise-Eliot/Humboldt School is known for its work around equity. Over the last several years we have grown our PreK-8th grade programs by focusing on culturally competent teaching pedagogy in line with our role as a Beacon Equity School in the Portland Public Schools. Our teaching practice is centered on a framework of rigor, relevance, and relationship. We are now excited and motivated to merge our equity work with our focus as a STEM school.

STEM education creates an integrated learning environment that encourages problem solving and persistence, critical thinking, and team work across the subjects. At Boise-Eliot/Humboldt we are focused on building a program that uses STEM to inspire and excite students as they prepare for college and 21st century careers. Our students will apply rigorous STEM content while engaging in learning activities that investigate the natural world and demonstrate a connection between themselves and the environment. We want our students to see themselves as capable problem solvers that can adapt and strategize in the face of challenges, both academic and personal. Our vision for Boise-Eliot/Humboldt students is to have a passion for learning and activism that extends beyond the classroom and to believe that they have the capacity to make change in their community.

Through our participation in the Portland Metro STEM Partnership we hope to build a STEM program that will dramatically transform student engagement, teacher practice, and Boise-Eliot/Humboldt callhe subje475 ingn8 0 Tehnt our students to e 7.02/w[(exoeT tismml in)5.1(No

WHERE WE WANT TO GO:

Vision Statement:

To understand and foster the development of human communities and the environment, through the lens of Place, Race and Justice.

Mission Statement:

Our mission is to educate all children to their highest potential to be productive, respectful, self-reliant, and responsible citizens who value the richness of diversity. In partnership with families and the community, we are committed to creating an environment where students engage in rigorous learning opportunities that challenge them to think critically about their place in the world.

STEM education is active and has student-centered learning at its core. Through a focus on inquiry based instruction we seek to build a STEM program that focuses on integrated units of study that are place-based and relevant to our students and community. We will use experiential learning opportunities to ignite curiosity and provide an opportunity for reflection, challenging students' initial beliefs and guiding them in the formation of deeper questions from multiple perspectives. And through this work, we hope to build a program that connects the classroom to stewardship empowering Boise-Eliot/Humboldt students to take action and educate others as they move along the path toward college and 21st century careers.

OUTCOMES:

Teachers will use frequent formative and summative assessments to facilitate diagnostic teaching and learning

4. Effective Instructional Practice:

Teachers implement learning activities that students find to be relevant, important, worthwhile, and connected to their cultural and personal lives outside the classroom

5. Supportive Teacher-Student Relationships:

Teachers foster caring relationships with students, provide challenging learning activities with high expectations and clear feedback, and explain the relevance of learning activities

HOW WE WILL GET THERE:

The transformation of Boise-Eliot/Humboldt is process that will be carried out over the next four years. In year 1 we have built our investment plan by carefully analyzing the current state of our school while comparing it to the outcomes we want to achieve in the future. We focused our efforts on identifying current assets and strengths in our school community while also analyzing current areas of underperformance or lack of support

Asset Mapping:

The Portland Metro STEM Partnership has adopted an assets-based approach to school transformation based on the rationale that, contrary to a needs-based approach,

Implementation Plan:

Appendix 3 outlines how Boise-Eliot/Humboldt plans to address each of our student and teacher outcomes. We see the transformation of our learning environment as an adaptive process that will evolve over the course of the Portland Metro STEM Partnership as we build new partnerships, teachers experience professional development opportunities, and we adopt the Common Core and Next Generation Science Standards. We want to design our program with an intentional focus on flexibility that allows teachers to adapt curriculum to the interests and needs of their students, maximizes on the field experiences and opportunities that new partnerships may provide, and is driven by the place-based equity discussions our community is continually engaged in. With an understanding that our process will be continually evolving, we have prioritized several strategies that will have an impact on all of our outcomes and incorporate that flexibility.

With the release of the Next Generation Science Standards (NGSS), and adoption of the Common Core State Standards (CCSS), grade level teams have started to generate new curriculum maps and design units that integrate STEM disciplines with CCSS. Teachers are analyzing district curriculum adoptions including Scott Foresman reading and Bridges math curriculum guides to align units as much as possible. Both the Inquiry Team, and staff at large, are also analyzing the scope and sequence of units across grade-levels to maximize connections and build partnerships that multiple grade levels can benefit from.

Expository writing will be a focus for teachers as students develop their content knowledge through writing instruction. In year 1 we started using Science Notebooks in PreK-8th grade as a place to document STEM content, inquiry projects, and integrated units. Teachers explored what types of notebook organization worked for their students as well as how to best integrate writing instruction with notebooks. In year 2 teachers will intentionally build Science Notebook documentation in to their integrated units. Grade levels will also analyze the district provided writing curriculum notebooks to realign units and/or substitute lessons with more STEM specific instruction.

During the summer of 2013 staff will participate in a STEM Curriculum Camp where teachers will engage in professional development in the areas of project-based work, inquiry, and content integration. They will also have curriculum planning time to create a STEM focused integrated unit of study that is place-based and includes elements of integrated learning, experiential learning, and stewardship. The explicit connections between STEM disciplines, CCSS, and supporting organizations and partners will all be addressed through the unwrapping of each standard during the Curriculum Camp.

To support the implementation and teaching of units created during the Curriculum Camp, one staff meeting a month will be dedicated to STEM professional development throughout the school year. During these meetings teachers will receive professional development for the first half of the meeting by the TOSA on a selection of inquiry and STEM topics. Grade level teams will then have the other half of the meeting to plan or reflect on units. By having time to debrief with teams and problem solve throughout the course of the year we feel teachers will have the time to deepen their own understanding of STEM content and have an opportunity to discuss the best practice for instructional delivery at our specific school. Teachers will also have time to contact community partnerships and build in experiential learning opportunities for their students.

Networked Improvement Community/Inquiry Team:

Networked Improvement Communities (NIC) are a cornerstone of the Portland Metro STEM Partnership's collective impact structure and approach. NICs have been identified by the Carnegie Foundation for the Advancement of Teaching as an effective means of bringing multiple practitioners together to engage simultaneously in local problem solving. A NIC uses a problem-centered approach to join academic research, education delivery, and business/community expertise and resources in sustained programs. The NIC is developed as a design community in which individuals from multiple sectors and backgrounds participate according to their interests and expertise, while sustaining collective attention on progress toward common goals. [1]

At Boise-Elito/Humboldt we have designed our NIC to have two components—the teacher-focused Inquiry Team, and the larger NIC comprised of the Inquiry Team and outside community members. The Inquiry Team is facilitated by the building STEM TOSA and consists of the principal, Literacy Instructional Specialist, and eight teachers from PreK-8th grade. The team meets between one and two times a month to work on the implementation of the STEM Investment Plan, plan building level STEM professional development, and brainstorm STEM related activities at the building level. The larger NIC includes members of the Boise-Eliot/Humboldt PTA, representatives from Self Enhancement Inc, the Oregon Writing Projects, and the Department of Fish and Wildlife. Other outside community members are invited as needed. The larger NIC meets as needed to work on SIP implementation and brainstorming.

[1] Bryk, A.S., Gomez, L.M., & Grunow, A.. (In press.) Getting ideas into action: Building networked improvement communities in education. In M. Hallinan. (Ed.), *Frontiers in Sociology of Education*, Dordrecht, the Netherlands, Verlag.

Investment Opportunities:

Our teachers, students, and school community have the motivation and drive to build a STEM program that will transform teaching and learning opportunities for Boise-Eliot/Humboldt students but we cannot do it alone. Resources and support are needed to put into place our implementation plan over the next four years.

They include:

- Funding to support teachers in the continued development of inquiry-based units that are grounded in the standards and also address issues that are relevant to our community
 - We need funds to pay teachers extended contract hours for summer curriculum camps and meeting for feedback throughout the year
 - We need funds to pay Inquiry Team members to meet monthly outside of the contract day

- Partnerships and funding that enable our students to engage in field experiences that spark their curiosity, anchor their learning, and provide numerous opportunities for reflection
 - It costs about \$700 to fund the transportation for a grade level of students to attend an all day field experience
 -

**APPENDIX 1-
Driver Diagram**



<p><u>Outcome:</u></p>

**APPENDIX 1-
Driver Diagram**

**Outcome:
Students will engage in hands-on inquiry lessons throughout the year in addition to one in-depth unit of integration across the subjects.**

S- Student difficulty coping with change in structure/curriculum

S/T- Clear and consistent behavior expectations and student follow-through to allow for more open-ended learning

T- Time to fit in an in-depth unit with a tight timeline of curriculum already established

T- Having an entire grade level in agreement and on board so all students receive the same opportunities

T- Time to create unit and plan with grade level team members

T- Time to discuss scope and sequence with PK-8 teams and develop appropriate sequence of instruction

T- Access to materials and curriculum beyond the PPS Science Kits

T- Access to exciting and grade level appropriate texts for integration

Dedicated STEM PD Time and Staff Meetings to gather with grade levels

- One staff meeting a month divided with PD on a topic and time to meet/implement with grade level teams

Summer 2013 Curriculum Camp

- \$ to pay teachers
 - remaining Target grant \$
- Attendance by most teachers
- Materials available during planning time

Observation opportunities at other schools

- Knowing what schools to observe
- Release time and \$ for teachers

PD on integration of STEM with literacy and social studies

- Summer 2013 STEM Classes including: K-2 Literacy Class, Math/Science Integration Class
- Similar class for 3-8 teachers
- More teachers trained in various curriculums
 - Engineering is Elementary
 - Project Wild
 - ???

APPENDIX 2

Asset Maps
Compiled by Inquiry Team November 2012

Professional Development/Teacher-Based	
Current	Potential
Teachers who have taken STEM classes	

Stuff (computers, materials, books, etc.)	
Current	Potential
Tech bundle in every classroom	Science apps for iPads
iPad in every classroom	Student-friendly informational texts
Picture Perfect Science Curriculum	
2 teachers have incubators for hatching chickens	
4 teachers have classroom sets of Private Eye loupes	
1 teacher has a microscope that can project on a computer	
PPS science kits	
Picture Perfect science curriculum	
Scott Foresman units with science focus	
School library building informational text collection	

Student Outcomes 1, 2, & 5:

Students will demonstrate proficiency in adaptive strategizing skills and persistence in the face of academic challenges, obstacles, and setbacks (Affective: Constructive Coping)

Students demonstrate high quality participation in academic work, including effort and enthusiasm. (Affective: Academic Engagement)

Students will feel a sense of belonging, competency, autonomy and purpose as they view themselves and their potential to enjoy and succeed in STEM classes and careers. (Affective: Academic Identity)

	Description	Purpose/Articulation of Connection to Outcome	Timeline	Resources	Partners
Strategy #1: Teachers will intentionally build challenging inquiry activities in their units.	Teachers will create, and students will engage in hands-on inquiry lessons throughout the year plus one grade-level consistent integrated unit per year	High quality academic engagement will be achieved through student centered instruction (IP#1), activities of relevance to students lives (IP#5), and supportive teacher-student relationships.	Summer 2013 Curriculum Camp Begin implementing units in 2013-14	Existing: Funding from Target Grant Curriculum Resources and materials STEM Center courses	Existing: Dept. of Fish and Wildlife Kaiser Permanente City of Portland Clean Rivers Schnitzer Steel Industries

Student Outcomes 3 & 4:

Students will know a variety of problem solving strategies and tools and be able to choose and strategically use these tools. (Cognitive Skill: Metacognitive Skill)

Students will be able to identify, frame, and solve complex problems and apply knowledge and skills to novel problems and/or situations across STEM subjects. (Cognitive Skill: Problem Solving)

	Description	Purpose/Articulation of Connection to Outcome	Timeline	Resources	Partner
Strategy #1: Integrated Inquiry Units	Teachers will create, and students will				

Teacher Outcomes:

Teachers will facilitate active engagement of students in their learning. (Instructional Practice #1)

Teachers will emphasize deep content knowledge and higher-order cognitive skills by addressing learning goals in both areas. (Instructional Practice #2)

Teachers will use frequent formative and summative assessments to facilitate diagnostic teaching and learning. (Instructional Practice #4)

Teachers implement learning activities that students find to be relevant, important, worthwhile, and connected to their cultural lives. (Instructional Practice #5)

	Description	Purpose/Articulation of Connection to Outcome	Timeline	Resources	Partner
Strategy #1: Curriculum Camp	Teachers will create this integrated unit during a summer curriculum camp led by the TOSA. Understanding and designing inquiry instruction around the CCSS will be the focus.	These units will be designed to be student-centered and focused on both content and cognitive skill learning goals. The activities will be designed to be relevant and connected to student lives. Teachers will implement frequent formative assessments that monitor student progress toward learning goals.	Summer 2013 curriculum camp. Begin implementing units in 2013-14	Existing: Funding from Target Grant Curriculum Resources and materials Needed: Funding to continue Curriculum Camp the following years	
Strategy #2: Science Notebooking/ Expository Writing Professional Development	School led PD on notebooking ideas, scoring rubrics and reflections. Lessons modeled by STEM TOSA, integration of notebooks during unit creation. TOSA provides on-demand prompts	Science notebooks will be used by teachers as a tool to implement frequent formative assessments that monitor student progress toward learning goals.	Ongoing	TOSA	

Strategy: #3

STEM Teacher