

**West Seattle STEM Elementary School**

**Five-Year Strategic Plan**

**April 23, 2013**

West Seattle STEM Elementary School (originally K-5 STEM at Boren) was established in September of 2012 in response to community input regarding the need for STEM education at the Elementary level in Seattle Public Schools. West Seattle STEM has drafted a Mission Statement that expresses the aspirations of our community:

STEM is Science, Technology, Engineering and Mathematics education. With an emphasis on establishing a highly diverse student and staff population, we at West Seattle STEM Elementary seek to draw from the wide range of academic and life experiences brought here by all participants. We strive to craft a learning community that addresses the needs of all students as they engage in Project-based Learning activities driven by the Common Core Standards, real-world scientific challenges, and the economic demands of the 21<sup>st</sup> Century. Our goal is to inspire students to develop an appreciation of the STEM disciplines, while fostering innovative thinking, and to provide them with the Core-knowledge and skill-sets necessary to explore potential professional opportunities in STEM related fields.

### **Five-Year Goals**

With a strong focus on project-based learning, staff and support-community members will promote two strategies to facilitate the delivery of a rigorous STEM program: Curriculum Integration and Cross-grade Curricular Articulation.

Curriculum integration is a teaching strategy whereby the boundaries between individual subject areas are taken down and most activities make connections to other subject areas. For example, a study of North America's industrial history is also an opportunity to research or perhaps even design a steam engine.

Curriculum articulation is the logical progression of learning objectives from grade level to grade level, from course to course, within each curricula area. Articulation requires close collaboration by staff across all grades. For a student to successfully progress from Grade 3 to Grade 4, he or she will experience all the necessary prerequisites in 3<sup>rd</sup> Grade to be successful in 4<sup>th</sup> Grade without the need for remediation.

Depending on the availability of financial, material and facilities-related resources, the goals below may be expanded or scaled-back based on current fiscal realities. Therefore, this is a living document.

#### **Goal 1.- – Full Integration of STEM Across All Elementary Curricular Areas**

- a. STEM provides the platform to integrate Social Studies, Art, Physical Education, Music, Literacy (Reading and Writing), and Social Development while serving as the primary focus of learning at West Seattle STEM

Elementary School (WSS). Special emphasis will be given to the integration of literacy across all STEM domains.

## **Goal 2. – – Articulate Science Curriculum Across Grade Levels**

a. Seattle Public Schools provides basic science curriculum through NSF kits. Utilizing allotted hours for Professional Development and our Professional Learning Communities, WSS staff will develop a curriculum customized to integrate STEM across all learning areas (1a. above) over five years, with full implementation of this goal in the fifth year of this strategic plan.

## **Goal 3.- – Articulation of Technology Curriculum Across Grade Levels**

a. Technology learning experiences at WSS will be embedded into all facets of student learning. There are three areas within which students will familiarize themselves with common and specialized technologies. Utilizing Professional Development and Professional Learning Community opportunities, WSS staff will develop a curriculum customized to integrate:

1. Computer-based software learning (including hand-held devices).
2. Digital, electro-mechanical, and pneumatic robotics (also see Engineering).
3. Simple machine building and design.

Technology learning at WSS will focus on both practical skills and those experiences that provide students opportunities to develop life-long interests in technology-based careers.

## **Goal 4.- – Articulation of Engineering Curriculum Across Grade Levels**

a. WSS will implement the Engineering is Elementary curriculum to provide introductory engineering experiences to students. Utilizing Professional Development and Professional Learning Community time, WSS staff will develop a curriculum customized to integrate fundamental engineering experiences across all grade levels over five years, with full implementation of this goal in the fifth year of this strategic plan.

## **Goal 5.- – Articulation of Mathematics Curriculum Across Grade Levels**

a. WSS has adopted the Singapore Math Program. This curriculum is closely aligned with the Common Core Standards and fully articulated from grade-to-grade. Where schedule adjustments must be made to prepare students for State and District exams, WSS Professional Learning Communities will adapt the curriculum to accommodate

testing requirements. However, Singapore Math is a rigorous curriculum that accelerates students in some areas of mathematics beyond the Common Core Grade-level Standards. Teaching staff will utilize the Singapore Math curriculum planning schedules year-to-year with the goal of preparing as many students as possible to enter Advanced Mathematics classes when they leave 5<sup>th</sup> Grade.

### **Goal 6.- – Articulation and integration of Literacy Across All Grade Levels**

a. Given the STEM emphasis across all curricular areas at WSS, and the need to integrate Literacy into all student-learning experiences, WSS staff will customize a literacy program to support student work in all curricular areas. Four strategies will be employed to meet the Common Core goals established for each grade level.

1. Employ the Seattle Public Schools strategies utilized in Readers and Writers Workshop to support students in their development of Narrative Reading and Writing skills.
2. Continue to use (while available) Reading Wonders to support students in the development of sentence structure, grammar, syntax, and paragraphing.
3. Design and implement a customized expository reading and writing curriculum to support student work specific to the STEM domains.
4. Implement Read Naturally (or similar) computer-based intervention program to support struggling readers at all grade levels.

### **Five-Year Strategic Plan – Timeline**

The purpose of this timeline is to introduce the process design, development and implementation by which WSS Community will integrate the above-mentioned goals over the course of five years. Each year, from 2013 to 2018, the WSS Community will build upon the framework introduced in previous years towards the realization of this plan.

<b>Science</b>	<b>Engineering/Art</b>	<b>Math</b>	<b>Technology</b>
<b>Explore additional/ alternative science curricula (e.g., Finding Urban Nature)</b>		<b>Complete alignment of CCSS &amp; Singapore Math.</b>	<b>Fall 2hours PD for tech collaboration- open format and protocols for modeling appropriate use of technology resources, and protocols for rotating hand held devices amongst classes.</b>
<b>Initiate/complete full articulation of K5STEM science curriculum</b>	<b>Initiate integration of drafting/drawing with art curriculum</b>	<b>Begin articulation of vertical alignment (K-2, 3-5)</b>	<b>Establish guidelines for appropriate student accessible resources online</b>
<b>Initiate content integration across STEM and non-STEM domains</b>	<b>Establish and implement scope and sequence for Engineering is Elementary</b>	<b>Fall PD on giving/ recording CCSS assessments. Teachers will conduct at least 3 CC assessments per quarter.</b>	<b>Establish pipeline to grants to fund professional development and new/more devices for more student access at one time.</b>
<b>Identify field research trips; establish “bank” of trips</b>		<b>SM fully implemented with fidelity, following pacing guide. Finish A, at least half of B.</b>	<b>Ergonomics will be introduced, modeled and guided</b>
<b>Establish list of strategic community contacts and partnerships</b>		<b>After school tutoring provided for struggling math students.</b>	<b>Implement tech goals and benchmarks for each grade level-to be addressed within classroom and in computer lab.</b>
<b>Initiate procurement of Science Lab equipment</b>		<b>Fall curriculum night; Spring Math night organized by math lead.</b>	<b>Type to learn program implemented for every student.</b>
<b>Establish Science content library</b>		<b>Establish partnership with community organizations (i.e. (Zeno).</b>	<b>Establish new device goals for 2014-15: e.g. hamm radio, solar powered devices.</b>

## 2014

<b>Science</b>	<b>Engineering/Art</b>	<b>Math</b>	<b>Technology</b>
<b>Initiate Science curriculum bank for new and continuing staff</b>	<b>Continue development of drafting and technical drawing K-5</b>	<b>Math lead will meet monthly with GLT on data, assessment, and or lesson planning. Math lead is available to model lessons.</b>	<b>Fall 2hours PD for tech collaboration-open format and protocols for modeling appropriate use of technology resources, and protocols for rotating hand held devices amongst classes.</b>
<b>Develop and introduce Alternative Energy curriculum/projects</b>	<b>Continue integration of drawing/drafting into art program</b>	<b>Teachers will conduct at least 5 CC assessments per quarter.</b>	<b>Teaching staff will participate in 3 tech related PDs per year. These will preferably be geared toward program/device usage and integration.</b>
<b>Continued articulation of science curriculum in bands K-1, 2-3, 3-5; also K-2, 3-5 transitions</b>	<b>Introduce Technical Writing program (3-5)</b>	<b>SM fully implemented with fidelity, following pacing guide. Finish A and B.</b>	<b>Type to learn program continued for every student.</b>

<b>Continue procurement of Science Lab equipment</b>	<b>Initiate procurement of safety equipment and development of Tool Library</b>	<b>Math aide to work with struggling students, and after school enrichment program for advanced students.</b>	<b>Increase tablets from 32 to 64+ Incorporate software for robotics and engineering in grades 3 to 5.</b>
<b>**MSP 5<sup>th</sup> Grade Level 3-4 pass rate 60%</b>	<b>Initiate establishment of Simple Machine lab</b>	<b>Purchase software for intervention and enrichment; ST Math, Math Whizz, Dreambox, etc.</b>	<b>Evaluate devices/ programs needed. Apply for grants and look for funding to accommodate those specific needs.</b>
<b>Continue to build Science content resource library</b>			<b>Create partnerships with local businesses to build tech accessibility and educational programs on site.</b>
<b>Develop comprehensive physics/simple machines study</b>			<b>Establish pipeline to grants to fund professional development and new/more devices for more student access at one time.</b>
			<b>Broaden technology uses within arts and creative outlets. For example, creating music video, dramatic piece to share to audience within school community.</b>

## 2015

<b>Science</b>	<b>Engineering/Art</b>	<b>Math</b>	<b>Technology</b>
<b>Continue development of Science curriculum bank for new and continuing staff; implement and expand</b>	<b>Full implementation of drafting and technical drawing K-5</b>	<b>All 5<sup>th</sup> grade students will meet 5<sup>th</sup> grade CCSS</b>	<b>Teaching staff will participate in 3 tech related PDs per year. These will preferably be geared toward program/device usage and integration.</b>
<b>Continue/expand Alternative Energy curriculum/projects</b>	<b>Introduce CAD (3-5)</b>	<b>**MSP 3<sup>rd</sup>, 4<sup>th</sup>, 5<sup>th</sup> Grade Level 4 pass rate 70%</b>	<b>Laptops for teaching staff. Increase tablets to 128+</b>
<b>Develop comprehensive Earth Sciences study</b>	<b>Continue development and implementation of Technical Writing program (3-5)</b>		<b>Summer technology PD for a small staff group with the intent for that group to train the rest of staff.</b>
<b>Fully implemented physics/simple machines curriculum (4-5)</b>	<b>Fully established Tool Library and Simple Machines lab</b>		<b>Establish new device goals for 2015-16: e.g. ham radio, solar powered devices.</b>



<b>**MSP 5<sup>th</sup> Grade Level 3-4 pass rate 70%</b>	<b>Continued development and integration of art curriculum</b>		<b>85% of 1st through 3rd grade students will meet benchmark “checklist” goals. 80% of 4th and 5th graders will meet benchmark goals through project-based learning.</b>
<b>**Prepare 5<sup>th</sup> grade students to enter Honors Science track, 50%</b>			

## 2016

<b>Science</b>	<b>Engineering/Art</b>	<b>Math</b>	<b>Technology</b>
<b>Fully articulated framework for custom science curriculum designed by and for highly-qualified staff</b>	<b>Continue implementation of CAD for drafting and engineering (3-5)</b>	<b>**MSP 3<sup>rd</sup>, 4<sup>th</sup>, 5<sup>th</sup> Grade Level 4 pass rate 85%</b>	<b>Establish “Tech Fair” to showcase tech related projects for school and local community.</b>
<b>Significant content integration across STEM and non-STEM domains</b>	<b>Full integration of Art curriculum within STEM domains</b>		<b>Establish new device goals for 2017-18: e.g. ham radio, solar powered devices.</b>
<b>Expand physics/simple machines curriculum (2-5)</b>	<b>Fully functional Simple Machine lab</b>		<b>Review/Revise/Expand partnerships with tech related entities and grant opportunities.</b>
<b>**MSP 5<sup>th</sup> Grade Level 3-4 pass rate 80%</b>			<b>90% of 1st through 3rd grade students will meet benchmark “checklist” goals. 95% of 4th and 5th graders will meet benchmark goals through project-based learning.</b>
<b>**Prepare 5<sup>th</sup> grade students to enter Honors Science track, 70%</b>			

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## 2017

Science	Engineering/Art	Math	Technology
<b>Initiate marketing of STEM curriculum bank</b>	<b>Full implementation of CAD for drafting and engineering (3-5)</b>	<b>**MSP 3<sup>rd</sup>, 4<sup>th</sup>, 5<sup>th</sup> Grade Level 4 pass rate 90%</b>	<b>90% of 1st through 3rd grade students will meet benchmark “checklist” goals. All 4<sup>th</sup> and 5<sup>th</sup> grade students will be able to demonstrate skills on checklist through project based learning.</b>
<b>Full content integration across STEM and non-STEM domains</b>	<b>Introduce robotics (digital/analog/pneumatic) training, begin establishment of permanent robotics lab</b>		<b>Continue/Revise if needed “Tech Fair” to showcase tech related projects for school and local community.</b>
<b>**MSP 5<sup>th</sup> Grade Level 3-4 pass rate 90%</b>			<b>Review/Revise/Expand partnerships with tech related entities and grant opportunities.</b>
<b>**Prepare 5<sup>th</sup> grade students to enter Honors Science track, 90%</b>			<b>All students will have their own tablet device to use at school.</b>

# 2018

Science	Engineering/Art	Math	Technology
Continue marketing of STEM curriculum bank	Continue development of robotics (digital/ analog/ pneumatic) program, permanent robotics lab	80% 5 <sup>th</sup> grade students will exceed 6 <sup>th</sup> grade CCSS	
**MSP 5 <sup>th</sup> Grade Level 3-4 pass rate 100%		**MSP 3 <sup>rd</sup> , 4 <sup>th</sup> , 5 <sup>th</sup> Grade Level 4 pass rate 95%	
**Prepare 5 <sup>th</sup> grade students to enter Honors Science track, 100%			

**Staff and parents in the WSS Community recognize that this strategic plan, which expresses a general outline for planning, fundraising and professional development, is not a static document. Changes in current technologies, the economy, WSS staffing, PTA funding and community diversity are all factors in the strategic planning of West Seattle STEM Elementary School. This five-year plan addresses the broad goals expressed by parents, teachers and administrators involved in our school. It intentionally does not detail the specifics of curriculum planning and design since writing curriculum is the most labor intensive and impactful decision we, as a community, must make in the years to come. The WSS Community recognize that the investments we make in the next five years in terms of capital and labor are precious commodities to be thoughtfully discussed and implemented based on the needs of our are most important constituency...our children.**

**Respectfully Submitted:**

**Lily Pierson – PTA/BLT**

**Nancy Maher – PTA/ Parent Volunteer**

**Craig Parsley - 5th Grade Teacher – Engineering Committee**

**Ro Gluck – 2/3 Teacher – Science Committee**

**Katie Bilanko – K/1 Teacher – Math Committee**

**Ashley Toney – Technology Committee**

## **Strategic Plan Glossary and Notes**

4/24/13 notes by Lily Pierson (BLT/Strategic Plan Committee)

### **Other Science Curriculum Options:**

We currently have the district–provided Foss Science Kits, some of which are great and some of which are less so. Our staff wants to supplement these kits as needed, as well as to explore other science curricula (which they are already investigating). New Common Core Standards for Science have been published, which will to some extent guide how the science curriculum is implemented in our school, with a plan to have a full adoption of the standards by 2018. The rollout for full implementation of whatever complementary/alternative curricula that the staff decides upon will happen over the course of several years.

### **STEM Curriculum Bank**

Because there is no ready–made project–based STEM program for K–5, our staff will be documenting their projects and sharing their curricula as they go along. The goal is a database that will be available to all of our staff that will have project–based curricula for all grade levels and subject areas. Ideally this bank will include lists of resources (possibly including community members who are able to help in some way), and materials. If, for example, a teacher does a lesson on pulleys for 4th grade, there will be a kit that other staff members can grab that will have the necessary supplies, and other teachers can add notes or modifications as they use this curriculum (such as how to make the lesson work for 1st graders). Although it is called the STEM Curriculum Bank, it will by default include the content integration mentioned above. It is not clear how this database will be administered, but the staff seems to have some ideas. By 2017, the staff hopes to have such a comprehensive and tested bank of projects for all grade levels that it can be marketed and sold to other schools who are interested in adopting our curriculum.

### **Field Research Trips**

Field trips that integrate STEM concepts.

### **Drafting and Engineering**

Technical drawing for all grade levels, beginning with drafting by hand/ blueprint making (which our 4th/5th graders are doing now). The delay of CAD introduction is due to cost and training required to implement.

### **Engineering is Elementary**

The engineering curriculum that we already have but that not all teachers have begun to use yet. This will begin before the end of this year, however, and by next fall all teachers will be using it.

### **Building Tool Library**

This will be supplementary to the science labs and will include the many tools that students will become familiar with by the time they graduate. The younger grades will begin to use these tools in guided projects so that by the time they reach the upper grades they will be able to safely and independently understand how to use them to undertake projects of their own design.

Teachers will begin making a wish list ASAP to share with our parent community so that we can begin to create a full set of tools as soon as possible.

### **Simple Machine Laboratory**

Similar to the Tool Library, this will contain simple machines (wedges, levers, pulleys, jacks, etc.) that students will become familiar with as they progress through our school so that they can engineer their own solutions and projects by the time they graduate.

### **Digital/Analog/Pneumatic Robotics Devices and Training**

This is essentially a robotics library/curriculum, which students will use to design and program tools to perform tasks (such as move a widget three inches every six seconds).