



**Reaching for Success
Grant Application
2015-2016**

Grant Title (8 words or less): Growing Young Scientists with Intermediate STEM Kits

1. Summary:

S.T.E.M. (Science-Technology-Engineering-Mathematics) Kits will provide ready-to-go Engineering and Design challenges with the necessary materials so that teachers can effectively link integrated problem-solving tasks to the current science curriculum.

Estimated number of students participating/affected 300+ students Grade level(s) 3-5th grades

2. Continuous Improvement Process (CIP) Goal

Describe how this project helps your school accomplish the targeted CIP goal(s); including specific student outcomes you expect will result from the project. Summarize the specific goal(s) from your school's most recent CIP plan to which the project applies.

This proposed STEM Kits project supports our school's CIP goals in both science and mathematics. Grades 3-5th are seeking to increase the number of students at or above grade level in mathematics. In addition, improving the Numbers and Operations strand is the focus of our CIP's Subgroup Goal. The problem solving challenges in each of the STEM kits has a component of math embedded. The authentic practice of mathematics will be highly engaging and support the development of critical thinking skills including estimation and strategic planning. Student achievements will be measured with grade level eVisions topic tests and end of the year skill testing. Our CIP goal states third grade will move 85%, fourth grade 80%, and fifth grade will move 93% of students to at or above grade level standards in Numbers and Operations.

The STEM Kits also support our school's CIP goals for 5th grade science and our yearly Challenge Goal of moving at grade level students (level 3's) to above grade level (4's). Together these goals will increase our percent of students at or above grade level to 90%. Working on this goal across the 3-5th grade band will promote continuous growth and high levels of achievement in science. Our lowest area of achievement based on the Science MSP(Measurement of Student Progress) assessment is with the strand of Application of Scientific Reasoning. The kits we create will be specifically selected for each grade level to provide content-specific problem solving challenges. Students will practice direct application of newly learned science content and thereby improve their reasoning and application skills. Evidence of success will be measured with problem solving tasks on unit test and also by monitoring yearly MSP scores. Anecdotal evidence and student reflections will provide additional evidences to evaluate the effectiveness of these kits.

3. Project Description

Provide a description of the project and its purpose. Briefly describe how the project will be implemented, who will participate, and what activities and tasks will be completed. (300-word maximum)

Each intermediate grade will have 5-9 prepared STEM Kits to share. Each kit will contain an engaging design challenge, materials, student response sheets, and teaching information. The kits are STEM based design challenges so that success depends on an integrated use of science, technology, engineering, and math skills. Each grade level will have a mixture of short introductory challenges (called Energizers) and regular challenges to meet time considerations and students' readiness. Design challenge questions may ask the students to use the available resources to build a bridge, create a paddleboat, or design a water filtration system. Student then work collaboratively in teams using science and mathematical knowledge to drive the design and manage costs of their resources and measure outcomes. The purpose of these challenges is to provide an application experiences with real-world connections.

Students will also learn to be **problem solvers and critical thinkers**. They will blend their creative ideas with scientific understandings to select testable solutions. Working with cost factors of the materials and a limited budget will model real world engineering practices and require students to use their estimation and computation skills. Math facts skills of fluency and accuracy will be validated for many students. In addition to practicing these skills during the challenge, students will be motivated to keep practicing in math class and at home knowing these skills have value and purpose.

Students will learn to **communicate and work in teams**. They will share ideas, justify choices, collaborate in designs, evaluate outcomes, and rework original plans to increase the performance of their projects. Student response sheets will guide thinking, provide scaffolding and support for new learners, and allow for reflection as students analyze their results. The emphasis is on the process and the product.

4. Project Significance

Explain why this project is important for the students at your school. (200-word maximum)

The learning climate we strive to model and promote at our school is one of curiosity and improvement. Working together, focusing on learning targets, and putting in the hard work produces growth, both personal and academic. The learning in these projects is highly engaging for all types of students. It taps into creativity and provides an opportunity to take classroom skills and apply them to a novel task. Students will see that making a plan and working cooperatively is just as important as revising their first attempt, learning from the results, and improving their designs. During the debriefing, students will realize that it is equally important to learn from projects that did work and from those that fell short of their goals.

5. Project Resources

Describe the resources (e.g. staff, equipment, transportation, software or subscriptions) necessary for implementation of the project and explain how these are necessary to meet the project goals. Clearly justify the need for all elements for which funding is requested. (300-word maximum)

To make the Design Challenge kits portable and efficient we are requesting funds for a plastic tub for each kit. Each tub will contain one STEM kit with student response sheets, materials, and teaching notes. The teaching packets are purchased online through the website, Get Caught Engineering and The Teachers Pay Teachers store. These materials are grade level appropriate, have ready-made student response sheets, and give the teacher all the necessary background information to easily use these kits. An additional supplies budget is needed to stock kits with supplies that are not standard in the classroom. Supplies in the kits include materials such as fabric, craft sticks, magnets, and twine. Kits will also be stocked with recycled and reusable materials such as paper towel tubes and lunchroom milk cartons. Kits at the 3rd and 5th grade level contain a joint project with Bristle-bots. Attaching a pager motor to the head of a toothbrush creates a bristle bots robot. In 3rd grade students will create and explore these in terms of their science lessons surrounding form and function. The experienced 5th grade student will take on the role of peer-teachers for this lab. In 5th grade students will use basic materials and knowledge from their 4th grade unit on electricity to create homemade Bristle-bots and then test two variables to support their 5th grade learning goals.

* A sample pages from a teaching packet is attached to this grant along with photos from a prototype lesson we purchased and tried with 5th grade students to evaluate the effectiveness.

6. Project Evaluation

Describe how you will measure the results of your project to determine its success at achieving your targeted CIP goal(s). Identify what methods of evaluation will be used; data and quantitative analysis provide the best program measurements.

To measure program outcomes, we will collect and analyze pre and post student and teacher surveys and reflections. We will also track math progress at grade levels with skill checks and curriculum unit tests in our math curriculum, enVisions. Science scores will be tracked with end of unit topic tests. We will look at growth in these areas as they are tracked for our school's CIP.

7. Community Awareness of the Lake Washington Schools Foundation

Recognition of the grant in the community outside the school building helps the Foundation obtain support from donors and assures continued operation of the grant program. Describe how you and the students benefiting from the project will acknowledge the Foundation for its support.

To acknowledge the Foundation's support, we will share information about our program with the PTSA and our parents using both our community website and newsletters. To reach the wider community, we will also submit an article to the local newspaper. The students will also be encouraged to write thank you notes to the Foundation to express their gratitude for your generous support.

8. Instructional Materials and Technology Requests

*If you are requesting curriculum materials, have these materials already received Instructional Materials Committee (IMC) approval? (if repeat grant, prior approval?) Yes ☐ No ☒ N/A ☐ Pending ☒

If you are requesting software with curriculum content, has this software already received IMC approval?

Yes ☐ No ☐ N/A ☒ Pending ☐

If you are requesting software for production purposes only, has this software been approved by LWSD Technology Support?

Yes ☐ No ☐ N/A ☒ Pending ☐

If you are requesting hardware such as a digital or video camera for use with a specific project, have you confirmed that the hardware has been approved for use with the LWSD computer system and that technical support is available for that item?

Yes ☐ No ☐ N/A ☒ Pending ☐

If you answered "No" to any of the above questions, please explain what you plan to do to acquire the necessary approvals. Build these approval processes into your timeline.

***The teaching materials and student response sheets for our Engineering and Design challenges have been submitted to the March 2015 Instructional Materials Committee for approval.**

9. Project Personnel-N/A

If outside resource personnel (non-LWSD employees) will be involved in the project, submit their resumes with your application. Please do not include resumes or qualifications for LWSD staff or teachers.

TIMELINE

List specific steps and the expected dates to mark your progress, including start and completion dates. Include time for IMC review of books, curriculum, software, or online subscriptions, if necessary.

Grants awarded are intended to be used by June 3, 2016. All grant reimbursement requests **MUST** be submitted to the Foundation office by noon on June 3, 2016.

Evaluations are due to the Foundation office within one month of the completion of the grant, but no later than Noon on June 10, 2016.

STEP	DATE
Materials submitted to the IMC review process	3/2015
Purchase materials	6/2015
Build kits	6/2015
Train staff	8/2015
Conduct surveys	9/2015
Use of kits	2015-16
Share project with parents, PTSA and community	Spring 2016
Monitoring of math and science results and conduct final surveys	2015-16
Submit Disbursement of Funds Request	October 2015
Complete and submit project evaluation to the Lake Washington Schools Foundation office.	May 2016

BUDGET REQUIREMENTS

An explicit budget is mandatory in order for the grant to be eligible for funding. Identify books, videos, CDs, etc., by title and quantities. Attach multiple pages if necessary. Indicate funding sources for each item; collaboration, partnerships, and leveraging of funds are strongly encouraged.

Include budget information for ALL items needed for the project, including, but not limited to, materials, supplies, equipment, entry fees, professional/consulting services, sales tax, shipping, or transportation. If you are requesting funding for a teacher stipend, use \$2,089.00 as the cost of a full stipend and \$1044.50 as the cost of a half stipend. Per diems are not permitted.

The final dollar amount awarded to a grant applicant is a not-to-exceed amount. If the program costs more than the not-to-exceed awarded amount from the Foundation, the school will need to seek funding from other sources for the additional costs.

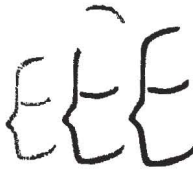
ITEM	COST	FUNDING SOURCES Lake Washington Schools Foundation, LWSD, PTSA, Building, etc.
Teaching Guide: Fifty Nifty STEM Connections (see list for titles)	\$50.00	Lake Washington Schools Foundation
Additional teaching guide: STEM-Engineering Energizer: Water, Water Everywhere -Engineer a Water Filter	\$3.00	Lake Washington Schools Foundation
Additional teaching guide: STEM the Spill: An Engineering Exploration of an Oil Spill	\$4.00	Lake Washington Schools Foundation
Additional teaching guide: STEM the Beak: An Engineering Energizer	\$3.00	Lake Washington Schools Foundation
Additional teaching guide: STEM Your Nest: An Engineering Energizer	\$3.00	Lake Washington Schools Foundation
(20)Plastic storage tubs	\$150.00	Lake Washington Schools Foundation
Copies and sheet protectors for resources	\$50.00	Building
Yearly replenishment/replacement of supplies in kits	\$75.00	Building/PTSA



ENRICH ENGAGE EMPOWER		
tape (20 rolls masking)	\$40.00	Lake Washington Schools Foundation
Bristlebot kit-40 units (3 rd grade)	\$225.00	Lake Washington Schools Foundation
40 toothbrushes	\$80.00	Lake Washington Schools Foundation
40 button batteries	\$15.00	Lake Washington Schools Foundation
30 pager motors	\$45.00	Lake Washington Schools Foundation
Smart Weigh Calibration Weight Kit, Includes 50g, 2x20g, 10g, 5g, 2x2g, 1g and 8 Different Sizes Milligram	\$12.00	Lake Washington Schools Foundation
Ajax Scientific Steel 9 Piece Deluxe Hook Weight Set, 10g - 1kg	\$40.00	Lake Washington Schools Foundation
Smart Weigh Digital Pro Pocket Scale with Back-Lit LCD Display, Tare, Hold and PCS Features 500 x 0.01g (2 Lids Included)	\$24.00	Lake Washington Schools Foundation
20 rolls tape (masking)	\$40.00	Lake Washington Schools Foundation
8-electronics boards (with wires/switches/bulbs)	\$80.00	Lake Washington Schools Foundation
24 AA batteries	\$20.00	Lake Washington Schools Foundation
2 boxes of 500-craft sticks	\$25.00	Lake Washington Schools Foundation
20 petri dishes 60mm x15mm	\$10.00	Lake Washington Schools Foundation
4-North/South bar magnets	\$16.00	Lake Washington Schools Foundation
15 sewing needles	\$8.00	Lake Washington Schools Foundation
20-foam sheets	\$10.00	Lake Washington Schools Foundation
10 boxes-straws (100 count)	\$40.00	Lake Washington Schools Foundation
1 box-plastic sheet-transparencies	\$9.00	Lake Washington Schools Foundation
2 boxes-coffee straws	\$6.00	Lake Washington Schools Foundation
3 rolls twine	\$9.00	Lake Washington Schools Foundation
4 boxes-clips (binder)-small and medium	\$15.00	Lake Washington Schools Foundation



ENRICH ENGAGE EMPOWER 4oz. and 8oz. paper and plastic cups	\$20.00	Lake Washington Schools Foundation
8 buckets	\$8.00	Lake Washington Schools Foundation
10 ping pong balls	\$4.00	Lake Washington Schools Foundation
1 spool fishing line	\$3.00	Lake Washington Schools Foundation
200 count-pipe cleaners	\$16.00	Lake Washington Schools Foundation
100-paper plates	\$15.00	Lake Washington Schools Foundation
5 bags-cotton balls	\$10.00	Lake Washington Schools Foundation
20-sponges	\$25.00	Lake Washington Schools Foundation
10-foil pans- 9x12	\$10.00	Lake Washington Schools Foundation
3 bags-small water balloons	\$3.00	Lake Washington Schools Foundation
4 spools-wire	\$8.00	Lake Washington Schools Foundation
4 sets-measuring cup	\$10.00	Lake Washington Schools Foundation
8 funnels	\$18.00	Lake Washington Schools Foundation
1 bag-gravel and sand (craft grade)	\$10.00	Lake Washington Schools Foundation
8-spoons	\$8.00	Lake Washington Schools Foundation
1- liquid dish soap (Dawn)	\$2.00	Lake Washington Schools Foundation
1 small bag-feathers	\$3.00	Lake Washington Schools Foundation
2 bottles-vegetable oil	\$5.00	Lake Washington Schools Foundation
3 rolls foil	\$12.00	Lake Washington Schools Foundation
16-litter bottles	\$10.00	Lake Washington Schools Foundation
3 boxes tooth picks	\$6.00	Lake Washington Schools Foundation
10 packages-index cards	\$6.00	Lake Washington Schools Foundation
8-small cardboard boxes (stiff gift style)	\$8.00	Lake Washington Schools Foundation
3 boxes-coffee filters	\$9.00	Lake Washington Schools Foundation



ENRICH ENGAGE EMPOWER		
1-roll wax paper	\$3.00	Lake Washington Schools Foundation
1 roll-plastic wrap	\$3.00	Lake Washington Schools Foundation
3 packages confetti	\$7.00	Lake Washington Schools Foundation
1-plastic tablecloth	\$4.00	Lake Washington Schools Foundation
1 roll duct tape	\$5.00	Lake Washington Schools Foundation
10-wooden spools	\$6.00	Lake Washington Schools Foundation
Sales Tax, if applicable	\$119.00	
Shipping Costs, if applicable	0	
Total Cost of Project:	\$1,483.00	
Total Amount Requested From The Foundation:	\$1358.00	

Please check your numbers and make sure all totals are correct.

Elementary 2014-2015

Part 2:

Goals for 2014-2015:

School Performance Goals for 2014-15				
"Class of"	English Language Arts SBA SMART Goal		Math SBA SMART Goal	Science MSP SMART Goal
2022- 5 th	From 92% to 94%		From 89% to 93%	From: 85% To: 90%
2023 - 4 th	From 79% to 82%		From 70% to 80%	
2024 - 3 rd	From 92% to 94%		From 79% to 85%	
"Class of"	DIBELS			
2025 - 2 nd	From: 91%	To: 100%		
2026 - 1 st	From: 82%	To: 95%		
2027 - K	From 72% to 90 %			

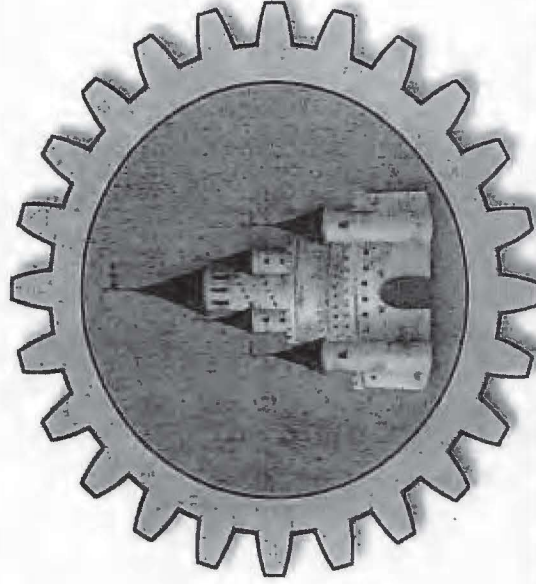
Closing the Achievement Gap - Sub-Group Goal(s):

Based on various data sources you are using within your school which school-wide sub-group/s have you identified to close the achievement gap? (e.g. American Indian, African American, Hispanic, low income, sped)? Choose **no more than 1-2 subgroups**.

Subgroup and Goal: Our focus is to improve math performance in numbers and operations for all students. This standard is critical as solid skills are a prerequisite for current and future math success. **historically** has underperformed on the state assessment in this skill when compared to schools with similar demographics. We will track progress in numbers and operations across grade levels using enVision topic tests and the end of year numbers and operations assessment.

By May 2015, students will move from 20% or fewer students at end of the year standard in numbers and operation to 83% of students at standard or above in numbers and operations as

Sample Design Challenge



The Gingerbread Man and a Paddleboat
Using Engineering to Get Away from a Fox

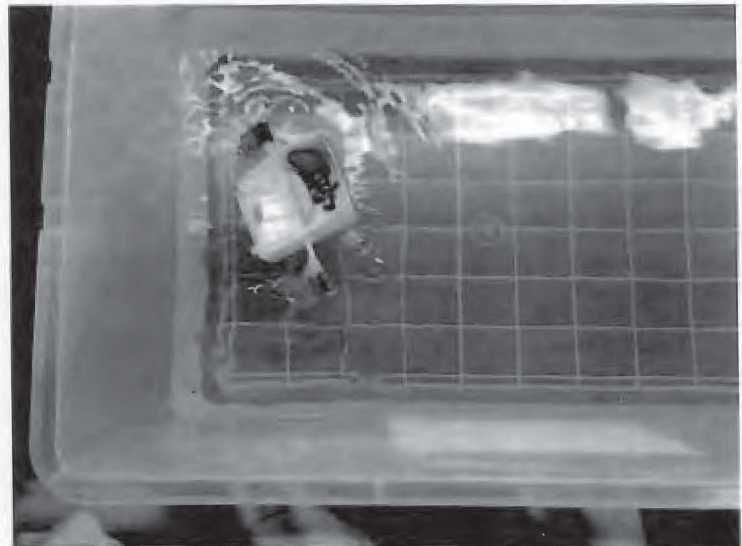


Group A (above) used a foam base and created a propeller with a twisted rubber band.

Design Challenge: Save the Gingerbread Girl and Boy

Must: Use no more than \$15 of materials and your knowledge of elastic energy to create a paddleboat that will hold 2 passengers and their supplies.

Success Criteria: Your boat must travel 20 centimeters in water without dropping the passengers or sinking.



Group B (above) created a folded paper box with side paddles powered by a twisted rubber band.

Both groups used one re-design series to improve the stability of their systems. Group B's boat was successful in traveling the 20 centimeters. Group A realized that their propeller didn't spin fast enough to push water or have a curve in the blade. Without pushing water in the opposite direction, their boat only turned in one place.

FIFTY FIFTY STEM CONNECTIONS

Get Caught Engineering with over 50 STEM lessons! We have used these lessons in the regular classroom, in a STEM lab, for a STEM Family Nights, and during school Engineering Days – they are kid tested and teacher approved.

Fifty Nifty STEM Connections from **Get Caught Engineering™**



The file includes the following STEM lessons:

Get Caught Engineering All Year Long
Bridging the Gap
Air Stream Autos
Tower Power
STEM Flower Show
Veggie Car Race
Goldilocks and the New Chair
Cinderella and the New Castle
Bundle of Energizers – 5 Quick Engineering
The STEM-A-THON Bundle
Wizard of OZ: Structural Engineering
Swoosh with Straw Rockets: Aeronautical Eng.
Wind Which Way: Structural Engineering
Marbles on the Fast Track: Engineering with Force and Motion
What goes up, Must Come Down: Materials Eng.
STEM Your Nest: Structural Engineering
Squish and Stick Structures: Structural Engineering
Row, Row, Row our Boat: Marine Engineering
Read All About It: A Newspaper Tower
Beauty and the Beast: Engineer a Celebration
Engineering is a Scream – Haunted Houses and Electricity
Flying Goblins – Aeronautical Engineering
Pumpkin' Chuckin' - Catapults, Levers, and Projectiles
Bats that Zip – Gravity and Acceleration
Over the River and through the Woods with STEM – Bridges
Rah! Rah! STEM! - Engineer Bleachers for the Game
Bobbing for Apples with STEM

Saving Frosty -Materials Engineering
Gum Drop 3-D Engineering: Structural Engineering
Elf Engineering - Mechanical Engineering
Protect the Head!
Spin the Web!
Build a Back-Up!
Leaping Super Heroes!
Eggs of Steel!
The STEM Carnival: Amusement Park Engineering!
Bungee Jump
Merry Go Round
High Wire Act
Roller Coaster

A Bundle of Ancient History STEM and Engineering
Engineering in Ancient Greece
Engineering in Ancient Rome
Engineering in Ancient Egypt

STEM AHoy! Engineer Like a Pirate
Engineer Like a Pirate and Design a Flag Mast
Engineer Like a Pirate and Create a Navigational Compass
Engineer Like a Pirate and Design a Ship
Engineer Like a Pirate and Design a Canon