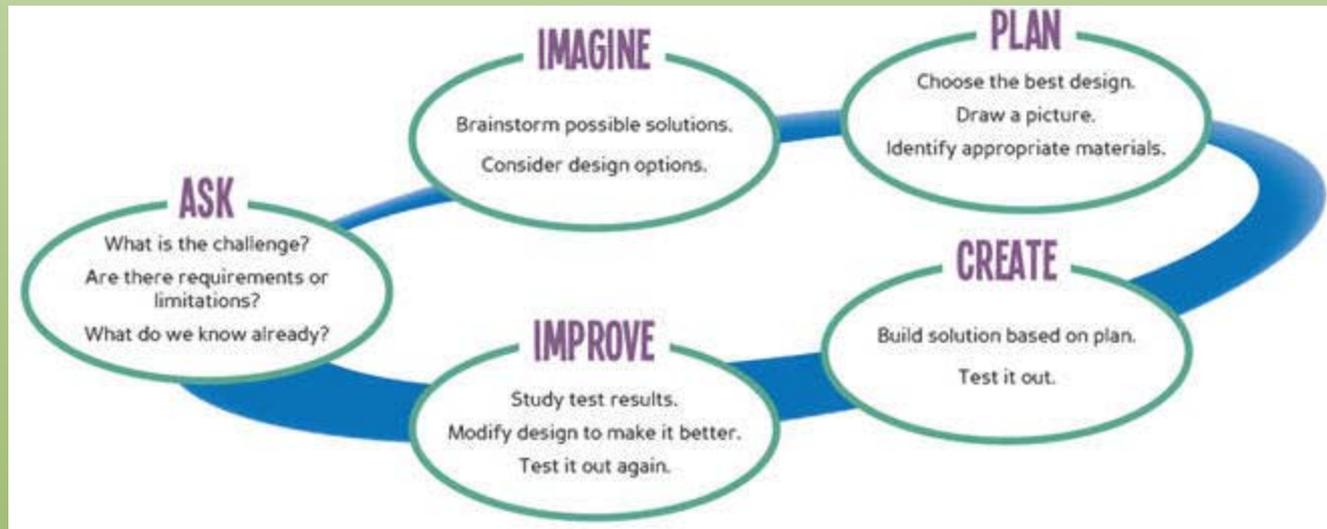


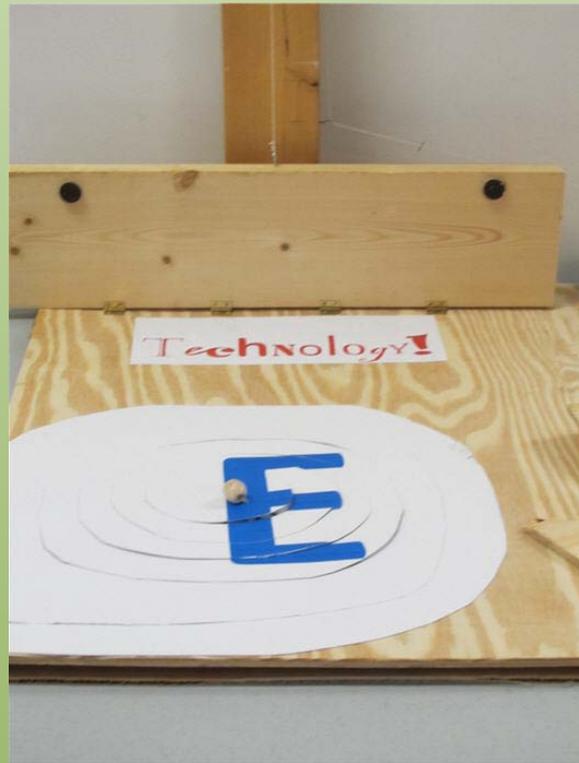
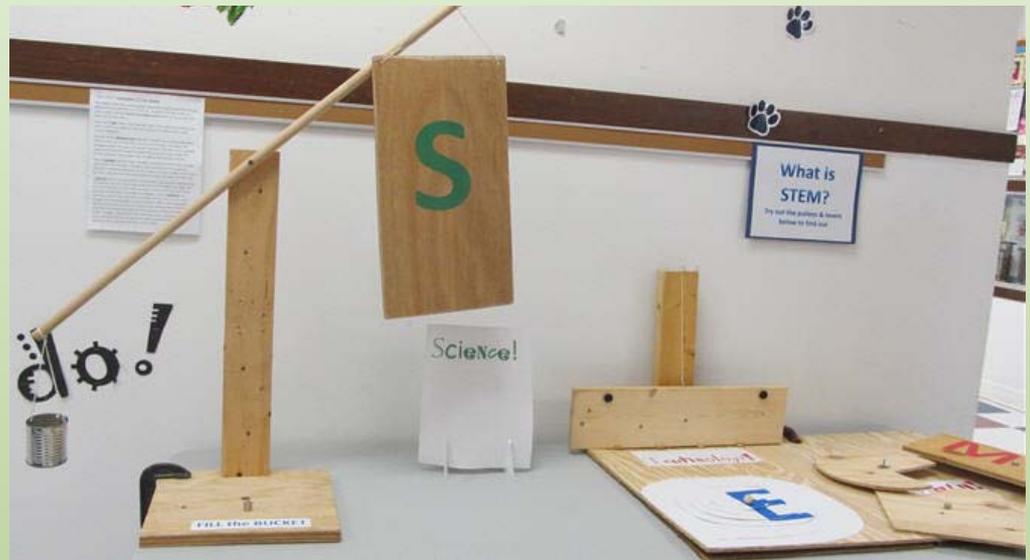
# Dahlgren STEMposium May 3, 2012



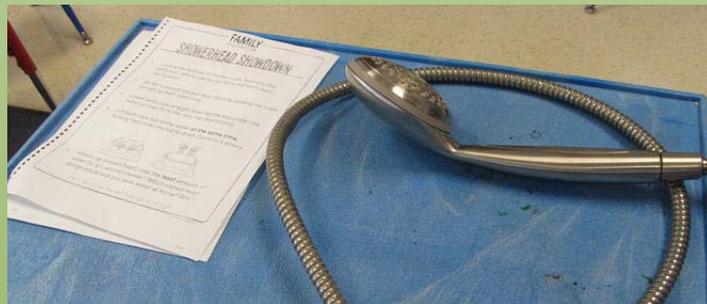


Dahlgren's hallways were decorated with STEM displays and informative bulletin boards that welcomed students and their families to their 2012 STEMposium event.





Every classroom teacher designed a STEM activity for their students to explore during the school day. The teachers continued the event into the afternoon so students could explore all of the classroom activities with their families after dismissal.

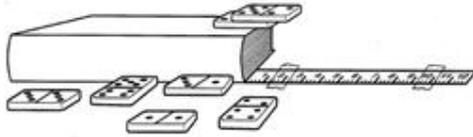


engineering

# DOMINO DIVING BOARD

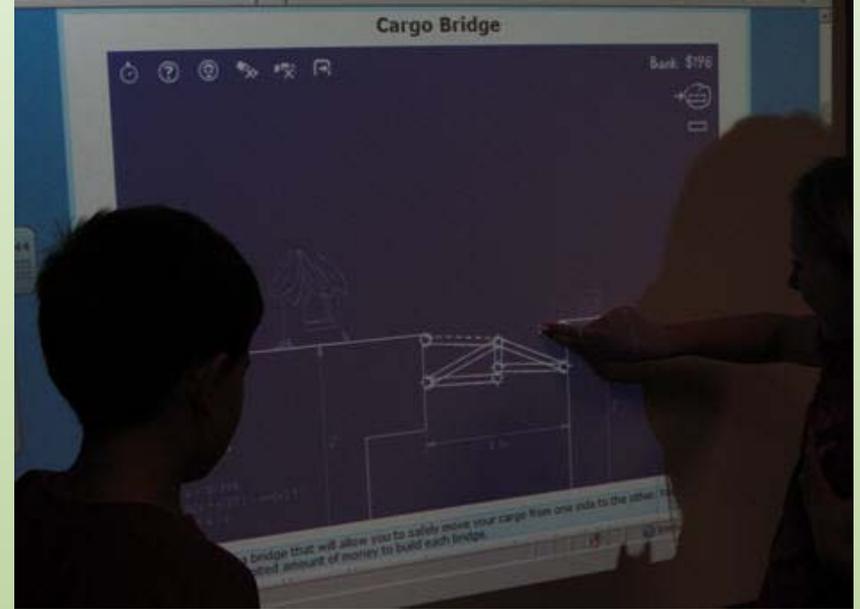
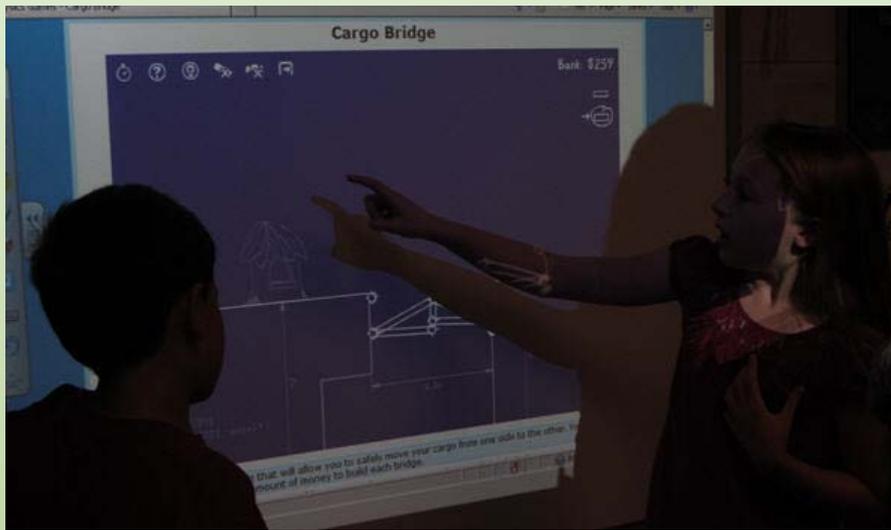
How can engineers help us  
"hang out" safely?

1. Build a ledge that "hangs out" over the edge of the book, like a diving board over a pool. **No dominoes can touch the table!**
2. Watch the ruler to see how far your ledge "hangs out" before it collapses.
3. Improve your design and try again!









Students and their families used their construction skills on the SMART board to play Cargo Bridge - a physics based construction game that lets you build your own bridge to help the workers safely move cargo from the other side of the valley in this free online physics game.



# Learning From Failure Activity

Students created a boat out of one piece of aluminum foil and predicted how many pennies it could hold before it sank. They placed pennies on their boats, one-by-one, until it sank and then redesigned their boats to hold more pennies.



engineering

## LEARNING FROM FAILURE

How can failure lead to success?

1. Create a boat out of **one** piece of aluminum foil and place it in the water. Predict how many pennies you think your boat will hold before it fails and sinks.
2. Place pennies in your boat gently, one-by-one. Watch the boat carefully as it gets close to sinking.
3. Can you change your boat design to hold more pennies? Try again using the same foil or **one** new piece.
4. What did you learn from watching your boat sink?

A black and white line drawing of a cargo ship, viewed from the side. The ship has a white hull and a dark superstructure. It is carrying a large stack of rectangular cargo containers on its deck. The ship is shown on a simple line representing the water.





# "STEM-tastic"

## Learning

We found out that  
we can learn a lot from failure!  
We studied our results and  
modified and improved  
our designs.  
The best designed boat held 55  
pennies!





Students and their families used the SMART Board to extend the activity with the Ship Loader internet activity. The objective in this fun physics puzzle game is to load containers of different weights into the ship using the magnetic crane. You must be careful how you balance the containers and avoid the captain from falling.

# **DAHLGREN SCHOOL STEMPOSIUM**

## **FAMILY ENGINEERING DESIGN CHALLENGE**

### **BALLOON-POWERED RACE CARS**

#### **Directions:**

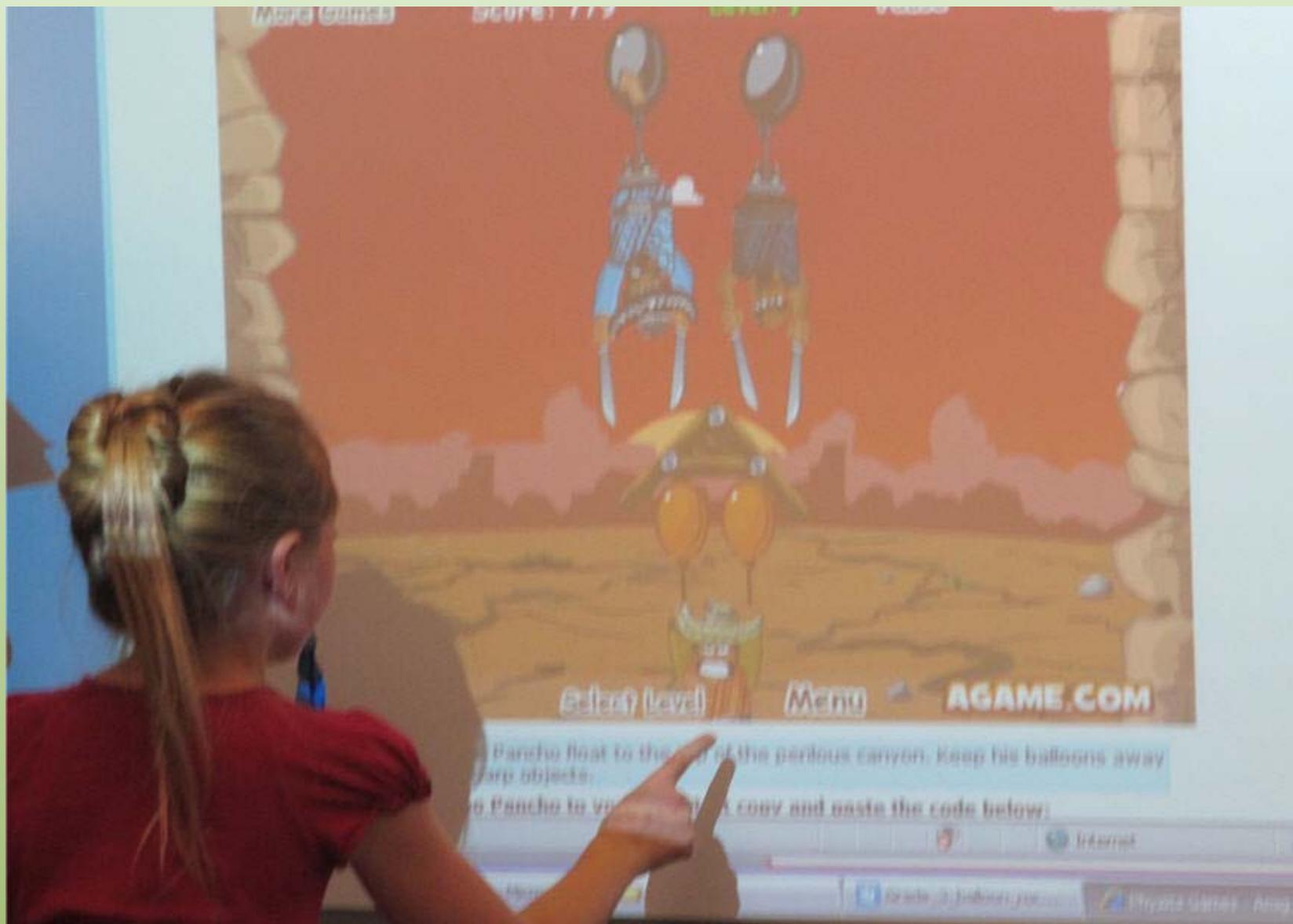
- Go to each design challenge and pick up your “STEM Bucks”**
- Redeem your “STEM Bucks” at the library and receive your Family Engineering Design Challenge Packet**













**Fifth Grade**

**Angry Bird**

**Launcher**

**STEM Challenge**

[nickleshi.blogspot.com](http://nickleshi.blogspot.com)

Cience

echnology

ngineer

math

ASK  
What do we know?  
What do we want to know?

Imagine  
Design  
Brainstorm

PLAN  
Create the best design  
Build a prototype  
Improve your design

Create  
Build a prototype based on plan  
Test it out

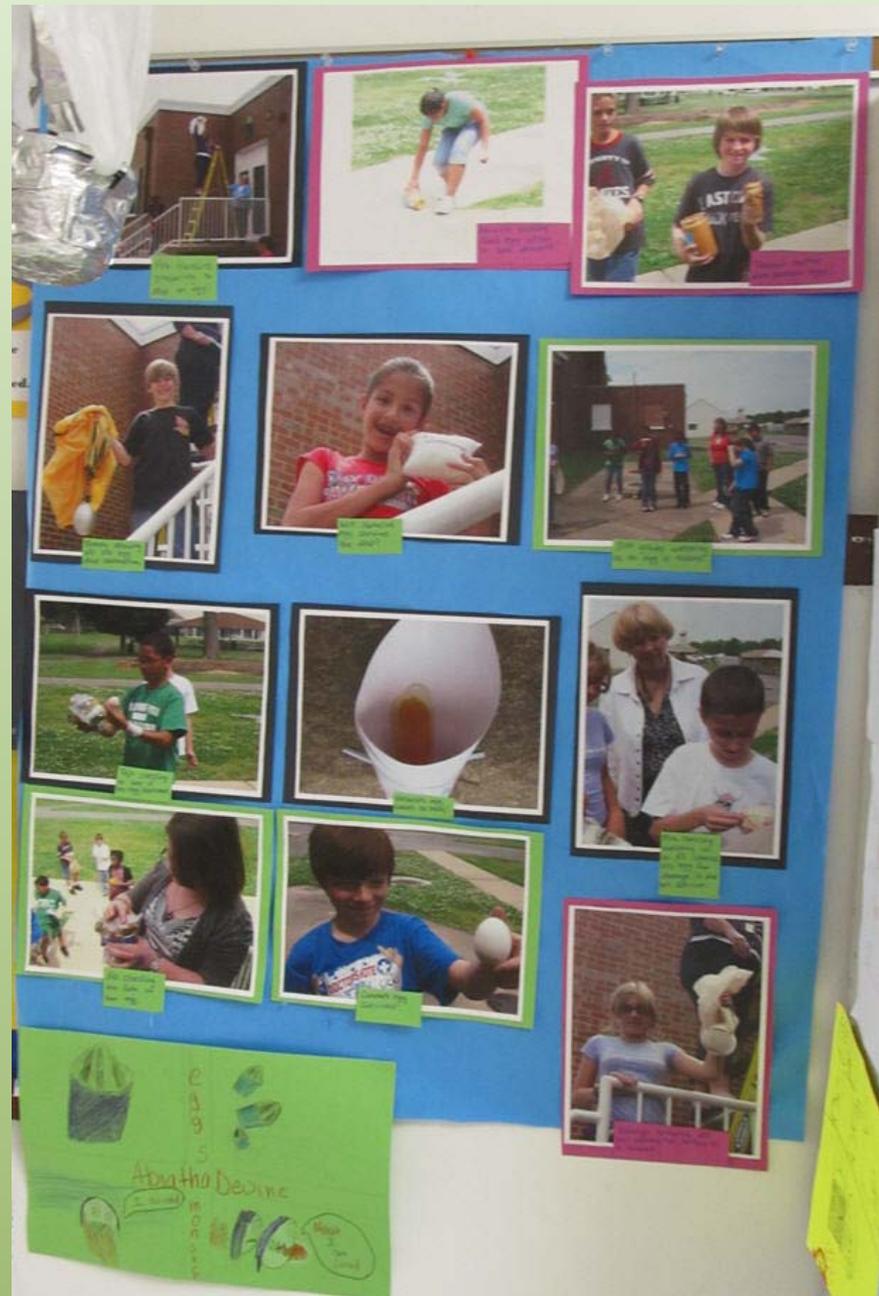
Math







Students used the engineering process to create a device that can keep a raw egg from breaking when dropped from the top of a building.



# Mining for Chocolate



Students and their families decided which type of tool was the best to use to mine the chocolate chips out of two different landmasses – soft and hard chocolate chips.

The engineers were challenged to create a process for extracting the valuable resource of chocolate chips from the cookies while dealing with constraints on time, materials, and environmental impact





# Earth Day Presentation

Dahlgren STEM professional explains the properties of different types of rocks. Students were able to do hands on investigations with rock samples to see the different properties.



## SOLID GROUND

**Engineering Fields**

- geological engineering
- civil engineering

**Engineering Concepts & Skills**

- optimization/tradeoffs
- controlled experimentation and testing

**Supplies**

- 3 plastic containers (quart size)
- 1/5 cups of each of the following loose earth materials: natural crushed rock with rough, angular edges (¾ inch pieces), natural rounded pea-size gravel with smooth, tumbled edges (e.g., aquarium gravel), and clean natural sand
- a large plastic LEGO®/DUPLO® blocks or other same size blocks
- Solid Ground activity sign (Appendix A)

**Advance Preparation Supplies**

- masking tape
- marker

### How firm is your foundation?

#### Advance Preparation

- Fill each of the three plastic containers with 1/5 cups of a different earth material.
- Use masking tape and a pen to label the containers—"Rough Gravel," "Smooth Gravel," and "Sand."
- Place a large LEGO®/DUPLO® block on top of the earth material in each container.



Young Engineers from the Dahlgren community talked to the AVID students about their careers and what the students can do to start preparing for a future as a Scientist, Technologist, Engineer, or Mathematician.

