STEM for Sale

NCGS Conference - June 2017
Presenters: Ann Hamilton-Dixon, Christy Irving and Annie Kapetanis

St. Catherine's School
Richmond, Virginia
Library/Tech Class

Weekly one hour class periods for each 4th grade class

Team taught by Christy Irving, LS Librarian and Ann Hamilton-Dixon, LS Technology

Students are introduced to and practice:
- Research Process
- Design Process
  - 3D designing/printing
  - Coding
- Self-guided learning
Cross-Curricular Support

**Art**
Positive and Negative space
Additive Art

Jacque Minarik
LS Art

**Science**
Properties of solids (plastic)
Melting points
Extrudability

Amy Adkins
LS Science

**Economics**
Understanding the relationship between:
- Revenue
- Profit
- Expenses

Doug Bader
US Economics

**Classroom**
Vocabulary development
Math concepts
- 2D/3D Cartesian Coordinate system
- 3D geometric shapes
Mentors for Student Committees
Support for students during design process

Mayan Cavallo, Sloan HIscock,
Judy McCallum, Pam Roberts
Grade 4 Classroom Teachers
Schoolwide Support

**Head of School**
Provided Summer Grant program to support the development of the project

Terrie Scheckelhoff

**Director of Lower School**
Supported project from conception to sale

Annie Kapetanis

**Office of Alumnae Relations**
Supports the sale
Meets with student representatives to plan the event

Laura Birdsey

**Business Office**
Meets with student representatives to discuss best ways to collect money at sale

Kathy Laube

**Director of Technology**
Found funds for acquiring the LS 3D printer
Meets with student representatives to discuss tech needs for the sale
Provides tech support for the sale

Doran McBride

**Event Coordinator**
Meets with student representatives to discuss setting up space for the sale

Carroll Keiger
The Fourth Grade Design Project

Research

3D Design and Printing

Computer Coding

Entrepreneurship
Entrepreneurship and Research Thread
Research

Efficient, reasonable search terms

Knowing what information you are seeking, but being open to finding the unexpected

Purpose: Create a Business Plan

Library Databases and Search Engines

Search Engine for finding websites

Periodical Database for finding articles

Mrs. McCallum’s Class’s Business Guide

1. Set a goal/plan
2. Find your inspiration
3. Get money and/or supplies do we need to start.
4. Set your time frame.
5. Get business Permissions
6. Choose business location and work dates.
7. Decide what to sell.
8. Decide price for products
9. Learn how to use materials (get training)
10. Learn from you mistakes
11. Advertise
12. Sell your product
13. HAVE FUN!!!
Starting a Business - Entrepreneurship

Making a business plan
Conducting market research
Reporting findings to whole class
Understanding division of labor
Determining reasonable sale price
Supporting the community
Determining a Reasonable Price

The goal is to make $22.00.

Spool of plastic data

How much plastic was used in each design?

Economic Terms from Mr. Bader

What does one meter of filament cost?

There are 71 objects for sale.

How much should we charge for each item?
Training

Video Tutorials

Read and Do Tutorials
Engineering Design Process

Used for both the coding project and the 3D design project.

Iterative
Repeat until goal is reached.
3D Design Process

1. Imagine
   Doodles of possible objects

2. Plan
   To-scale drawing

3. Create
   3D designing in TinkerCad.com
Coding Design Process

1. Imagine
Ideas for possible animations

2. Plan
Storyboard

3. Create
Coding in Scratch
Committees

Permissions
January
Mrs. Roberts
Met with Mrs. Birdsey

Organization
March - April
Mrs. Cavallo
Met with Mrs. Keiger, Mrs. McBride, Mrs. Laube and Mrs. Birdsey

Advertising
March - April
Mrs. Hiscock and Mrs. McCallum
Created Poster
Engaging with Alumnae:

A meeting of generations
Vote Results for Spending Profits

The results are in:

**On what do you think the sale profits should be spent? (Check as many as you want.)**

- Ear ring have: 28 (56%)
- Split ring for: 27 (54%)
- Magnetic Taps: 25 (50%)
- Rule of curve: 23 (46%)
- Enamel, avar: 20 (40%)

**If a roll of filament is bought for fourth grade, what color should it be? Select 1 color from the choices below.**

- White: 12 (24%)
- Black: 10 (20%)
- Light Green: 7 (14%)
- Dark Green: 6 (12%)
- Orange: 4 (8%)
- Pink: 3 (6%)
- Blue: 2 (4%)
- Silver: 1 (2%)
- Purple: 1 (2%)

The profits will be spent in the following order:
1. $25.00 will be saved to purchase an accessory kit for an e-Nable hand.
2. $4.00 will be used to purchase a package of earring hooks.
3. $10.00 will be used to purchase a package of split rings.
4. $30.00 will be saved to purchase a particular color of plastic for an e-Nable hand.
5. $5.00 will be used to purchase a small roll of magnetic tape.
6. $30.00 will be used to purchase a roll of purple or silver filament for next year's 4th Grade Design Project if a spool is not bought for e-Nable.
Questions?
Sites to Explore

goo.gl/Lc627m