WHAT? Math can be fun? Hands-on projects in algebra classes.

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What’s the point of doing projects in math classes? (From our observations)

- Students learn the material and they don’t even realize it
- Makes the class interesting
- Students enjoy the interaction with other classmates
- Students enjoy “playing and eating” in class
- Learn by discovery
- Too many AHAAA Moments!!
What’s the point of doing projects in math classes? (What experts say)

- It encourages students to raise questions, plan and carry out investigations, make observations, and reflect on what they have discovered (Intel, 2007)

- It makes for stronger classroom learning opportunities (Intel, 2007)

- Students' abilities to acquire new understanding are enhanced when they are "connected to meaningful problem-solving activities, and when students are helped to understand why, when, and how those facts and skills are relevant" (Bransford, Brown, & Conking, 2000, p. 23)

- Students become more engaged in learning when they have a chance to dig into complex, challenging, and sometimes even messy problems that closely resemble real life (Intel, 2007)

- It engages students, cut absenteeism, boost cooperative learning skills, and improve academic performance (George Lucas Educational Foundation, 2001)
Some of the projects we do in class

- **Linear Equations**
  - Barbie Bungee
  - Dream car project
  - Spaghetti bridges

- **System of Equation**
  - CSI

- **Quadratic Equation**
  - Basketball in math
  - Marble shooting
Some of the projects we do in class

- **Percentage**
  - Room remodel
  - Skittles

- **Proportion**
  - Road trip
  - Deer population
  - Tower

- **Angles**
  - Tower measuring
What students say…

“All of the hands-on activities were very helpful for me, not to mention activities with candy are fun and yummy. Now I will probably think of skittles and M & M’s when I take math classes”.

“Previously, before any road trip, I would figure out the number of miles we'd be traveling, miles per gallon, and cost of gas to make sure we could make the trip. I had never seen that as real-life algebra”.

“I really never understood graphing. I could read one and interpret the data, but in an abstract context like an algebra class, I would panic. ..I never understood how to figure out the slope of the line of a graph, despite passing Math 120 and 121 (just barely).”
What students say...

“I really never understood how a ratio of red skittles to the whole pack could be related to algebra. I could see the ratio, the fraction, the percentage, but I never before thought those things related to algebra in any way.

“I have more concrete concepts to attach in my mind to what used to be very abstract algebraic ideas... you helped build or rebuild the cognitive roots I need to be successful in math”.
Let’s try it... (first as a big group)

- 1000 lockers
Imagine you are at a college that has student lockers. There are 1000 lockers, all shut and unlocked, and 1000 students.

Here's the problem:

1. Suppose the first student goes along the row and opens every locker.

2. The second student then goes along and shuts every other locker beginning with number 2.

3. The third student changes the state of every third locker beginning with number 3. (If the locker is open the student shuts it, and if the locker is closed the student opens it.)

4. The fourth student changes the state of every fourth locker beginning with number 4. Imagine that this continues until the thousand students have followed the pattern with the thousand lockers. At the end, which lockers will be open and which will be closed? Why?
Look for patterns:

1. Which lockers will only be touched once?
2. Which lockers will only be touched twice?
3. Is there any locker that will be touched three times? If so, which ones?
4. Which locker has been touched more? Locker 36 or locker 48?
5. After the 36th student opens/closes lockers, which lockers are open? Which are closed?
6. After the 100th student opens/closes lockers, which lockers are open? Which are closed?
Let’s try it... (Now, let’s break into small groups)

- Barbie Bungee (Linear equation)
- Skittles (Ratio and Proportions)
- Deer Population (Estimation and ratio)
- Tower (Angles and Proportion)
- Road Trip (Measurement/ratio)
- Shopping Spree (Percentage)
- Puerto Rico – Hurricane (Measurement and $rt=d$)

**MOST OF THIS PROJECTS WERE CREATED BY SOMEONE ELSE BUT ARE ADAPTED TO FIT STUDENTS AT COMMUNITY COLLEGE**
Thank you!!

Questions or comments??

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