Bean Tower Challenge

Your challenge:

- Build the tallest freestanding tower capable of holding up a can of beans at the top.

Materials:

- 2 Sheets of paper
- 1 Foot of masking tape
Session Objectives

➔ Share practical NGSS & EDP ideas for K-12 classrooms and robotics/engineering courses

➔ Make intimidating technology (sensors/coding/RC cars/microcontrollers) doable

➔ Give an argument for “When am I going to use this in real life?”

We want you to walk away feeling confident, inspired, and with at least one new thing you can implement in your own classroom. (Or at least try to!)
Overview of Our Experiences

RET @ CMU

➔ Side-by-side with CMU engineers
➔ Professional Development with NGSS
➔ Special emphasis on Engineering Design Process (EDP)
Overview of Our Experiences

Allison

➔ Senior at CMU
➔ Secondary education: Biology major, chemistry minor

Alex

➔ Student Teaching @ Clare Middle School
➔ NGSX Training (highly recommend!)
➔ Algebra I at Mount Pleasant High School
Where We’re Headed

1. The Intimidating Technology
   a. Raspberry Pis
   b. Arduinos
   c. Sensors

2. Programming and Its Implications
   a. Coding
   b. Scratch
   c. Block Coding

3. Incorporating the NGSS and EDP
   a. Bean Tower
   b. Gliders
   c. Legos
1. Intimidating Technology -
It doesn’t actually have to be intimidating!

Microcontrollers
➔ Raspberry Pi (~$35)
➔ Arduino Uno (~$25)

Application
➔ Great for STEM or technology class, robotics club
➔ Early introduction to engineering and coding
➔ Can use kits to get started
  ◆ Sensor kits
  ◆ PiCar
2. Programming and Its Implications

Scratch Coding In The Classroom

➔ “Block coding” (like LEGO Mindstorms)
➔ Math application (coordinate planes, functions)
➔ NGSS Modeling standards
➔ Need: time, computers

This is an Investment!

➔ Sparking interest
➔ College prospects
➔ Trade skills
➔ Graphic arts
➔ Music
3. Incorporating the NGSS and EDP
3. Incorporating the NGSS and EDP

➔ Bean Can Tower
  ◆ Incorporated EDP
  ◆ Illustrated Vascular Bundles

➔ Photosynthesis Equation Model
  ◆ LEGO bricks to make a model
  ◆ Chemistry and Biology standards

➔ Gliders
  ◆ Apply concepts of aerodynamics and Bernoulli’s principle
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Thank you for coming.