Black box activity (Based on Perimeter Institute's Black Box Activity)

Objectives / Learning Targets / Purpose:

- To engage students in scientific ways of thinking and exploration
- To support students in learning to collaborate in physics class
- To guide students to begin generating questions as they practice science
- To guide students to understand what a model is and how we revise models in science
- To teach that science is trial and error, messy, it's ok to be wrong! "What happens if we're wrong?" ala Scott. "It's not there YET."
- To build community
- To practice self-reflection and metacognition in writing
- To spark curiosity about science
- To HAVE FUN!
- To begin developing proficiency with handheld and power tools

Timeline & Agenda

Pre class:

- Build two different example boxes (Creates conflicting but connected data)

9/2 & 9/3 (First full day of school. Begin about ½ way through class, after review classroom norms/expectations)

- Groups look at inputs and outputs of black box. Look for patterns. Based on patterns, hypothesize how the internal mechanism works.
- How were you left feeling? Metacognition writing activity

9/7 & 9/8 (Expecting will take a full 90 minutes… If not more time?)

- First construct whiteboard meeting norms AND teach strategies for listening. TO DO: Outline how to intentionally create norms and teach these listening strategies.
- For whiteboard meeting: Draw what you think the mechanism looks like and explain why they think that.
- Take opaque tubes away now (so they have to build based off of their prediction)
- Discussion of tools and safety. (Do we limit the types of tools we show). TO DO: ask Eric/Quincy if they have an intro to tool safety narrative.
- Kids try to build their own with the same outputs based on their thoughts. We give them lots of different potential materials.
- Reflection: Here's how I really contributed to my group based on our norms. What do you think one norm our class should intentionally reflect on? What is one norm I need to be successful in this class? [Use pollev.com, show responses in the next class?]

9/9 & 9/10

- DQ: Show poll responses and then ask,
- Then show the translucent (one-way mirror film w/flashlight) acrylic tube w/both mechanisms w/ "new tools" (a flashlight)
- We have a new tool to help us get more data to help us support or refute our theories. Then we revise our model.