Pappas

Welcome to Ms. Pappas' Wiki Page!

Spring 2013

Fellows: Jessica Scholnic and Riley Meehan

Semester Outline:

This semester, we plan to build on the science and design foundations from last semester by using LEGO Mindstorms technology to complete robotics challenges in cooperation with classrooms around the world. See https://lego.k12engineering.com/ for online community.

Week 1: Human Robot

Week 2: Silly Walks

Week 3: Introduce online community, evaluate and present silly walks.

The remaining challenges will be revealed as they are revealed on k12engineering -- part of the community aspect of the unit is that all students find out about the challenges at the same time.

Fall 2012

Fellows: Riley Meehan and Jessica Scolnic

Semester Outline:

Week 1: Intro Lesson: Tinfoil boats with penny loading

Introduce students to designing and making things in a scientific context. Class used a set amount of tin foil and tape to build a boat that floated and held as many pennies as possible. Activity went well, students were all engaged, had a class-wide discussion about what worked well and what did not; including role of volume, shape of boat. Did not discuss forces, kept it more open, just tried to get science ideas flowing.

Week 2: Intro to Earthquakes: Open-ended science discussion

STOMPers led more of a traditional lesson about P-waves/S-waves, plate tectonics etc. Did wave demonstrations with slinky and rope. Demos would have been better done on the floor as opposed to in mid air. Purpose of this lesson was to engage students in thinking like scientists, not necessarily getting them to say all correct answers but just think critically about science concepts. All students participated in full-class discussion and small group discussions, as well as "journal time." No hands-on activity today.

Week 3-5: Develop an Engineering Scientific Model

Week 3: Planning

Week 4: Building

Week 5: Finishing touches and presentations/class discussion

Students reminded each other of a list of science related to earthquakes, broke up into groups to develop models of different important science ideas (eg: plates moving/fault lines, ground shaking, and earthquakes near water.) Students requested a list of materials to be brought in next time, also had small group "share-out" time to get more ideas and suggestions about their designs.

STOMPers could have been clearer about the intentions and purposes of this activity-- many students fell back on the idea of building sturdy vs not sturdy buildings and demonstrating why they are that way, while our intention was to have them develop models of science concepts to be used in a variety of engineering tests later on.

When students did building, most of the models turned out really great-- students definitely thought about the concepts and developed skills to evaluate models. However, all the projects turned out MESSY-- sand, dirt, water, clay, beans, etc; all the projects had to be dumped out at the end of Week 5. Therefore they could not be used as intended to move into engineering based on their models.

Week 6: Evaluate an Outside Model, Build a Sturdy Structure

STOMPers brought in a model they had constructed of "the ground shaking" out of some craft materials and an NXT motor. STOMPers presented the model to the class as one constructed by another team, with different materials but studying the same topics. The class watched the model run, and then wrote in their science journal answers to the following questions: What is this a model of? What does the model do well? What about it could be improved? Students then talked about the model in small groups, then as a class. Once it had been fleshed out, we did a blind vote on whether or not to accept the model into our class and use it for testing further projects. The class voted to accept it, although a few kids disagreed---we had a discussion with students sharing arguments on both sides. After the model had been accepted, we challenged them to build a two-story house out of raw spaghetti and clay that could survive the earthquake simulation. We thought it would be difficult given the materials and the building requirements (the base could only be a certain size) but all groups built surviving structures; many groups did not the first time, but did a redesign. This was a great culminating activity for the past 4 weeks of classes.

Week 7: Introduction to Electricity--Squishy Circuits

Opened class with a discussion about electricity, conductors and insulators. Talked about circuits, what a "closed-circuit" means and looks like. Did a demo of a circuit with play-doh and an LED. Also demo-ed a circuit with water vs distilled water-what is the difference? What makes certain materials conductive? Students then had ~30 minutes to experiment freely with Squishy Circuits-lighting lights, powering motors.

Materials: Play-Doh, 9-Volt Batteries, LEDs, small motors.

Week 8-9: Final Project: Build an Earthquake Sensing Circuit

This two week project involved students using squishy circuits to build, in essence, a motion-sensing circuit that would alert them when an earthquake was happening-- ie: when the shake table was on. There turned out to be really two approaches--- either students began with a closed circuit and the simulator disconnected it (the "alert" being the light turning off, the sound stopping, etc) or students began with an open circuit, and the simulator closed it (so the light/sound turned on.)

Spring 2012

Fellows: Alyssa Kody and Daniel Pavitt

Semester Outline

Activities

Fall 2011

Fellows: Alyssa Kody and Danielle Pike

Semester Outline

Activities

- Egg Helmet
- Pulleys
- Paper Towers
- Introduction to Programming with Pulleys
- Designing Aztec Machinery
- Programming with Fans
- Building/Programming Snow Removal Device