

STOMP Lesson Plan: Columbus Afterschool  
Thursdays 2:30 – 4:00

Natalie Varner and Ryan Nelson

***Lesson 1: Thursday February 24<sup>th</sup>***

*Egg Drop*

Activity: Have students create a device to allow an egg to safely drop

Main idea: Get students introduced to team projects and working with different materials and the engineering design process

Materials: tissue paper, tape, eggs, cotton balls, straws

***Lesson 2: Thursday March 4<sup>th</sup>***

*Goop*

Activity: Create Goop (cornstarch and water)

Main idea: Objects can exist in two different states of matter at the same time (goop, shaving cream, jello, etc.)

Materials: corn starch, water, bowls, plastic spoons

***Lesson 3: Thursday March 11<sup>th</sup>***

*Gum Drop Towers*

Activity: Create towers out of gum drops and see which one can hold the most weight

Main Idea: Learn how to build a sturdy tower and conserve materials

Materials: gum drops, toothpicks, some type of weight

***Lesson 4: Thursday March 18<sup>th</sup>***

*Wire Maze*

Activity: Construct a wire maze—when you hit the wire, the light turns on

Main Idea: Electric current, Electric circuits (analogy to water flowing/)

Materials:

One 9V battery w/connection plate and attached wires

24 inches of un-insulated wire (stripped insulated wire between 20 - 24 AWG should work).

One 1-Watt light bulb w/ lamp base.

One 24 inch length of insulated wire w/stripped ends.

One 8 inch length insulated wire w/stripped ends.

Electrical tape

Cardboard base (optional)

Four alligator clips (optional)

Popsicle stick or pencil

***Lesson 5: Thursday March 25<sup>th</sup>***

*Introduction to motors, and programming*

Activity: Build a motor, Human robot

Main Idea: Learn About the phenomenon of Electricity and magnetism

Materials: Magnet Wire (insulated), small powerful magnets (perhaps from haligan??), yogurt cups, tape/glue, wire strippers or scissors, paper clips  
Motor design: several loops of magnet wire, with ends sitting on paper clips, attached to a battery, complet. The loop of wire is free to spin—when hooked up to a power supply, a magnetic field is created, or an electro-magnet. By stripping only half of the wire, you can get it so be driven on one side, and its momentum will carry it the rest of the turn

***Lesson 6: Thursday April 1<sup>st</sup>***

*Build a Fan, Programming with NXT. Extension: variable speed fan*

Activity: Build a fan powered by the NXT, using a loop

Main Idea: How to program the NXT, and how to vary fan speed (extension)

Materials: NXT Kits, Laptops

***Lesson 7: Thursday April 8<sup>th</sup>***

*Platform 9 <sup>3</sup>/<sub>4</sub>*

Activity: Build a car (with help), and determine the amount of time to run the motor so that it will move 9 <sup>3</sup>/<sub>4</sub> feet, by taking a 2 distance/time measurements.

Main Idea: Programming NXT's to go a certain distance based on known response.

Relate extrapolation to engineering.

Materials: NXT Kits, Laptops

***Lesson 8: Thursday April 29<sup>th</sup>***

*Making Ice Cream*

Activity: Make ice cream using chemistry principles

Main idea: Learn about chemistry and chemical engineering and watch a chemical reaction.

Materials: zip-lock bags, ice, salt, whole milk, heavy cream, sugar, vanilla