MakeyMakey & Scratch Lesson – Engineering Room

Elementary

Time: Approximately 2 - 2 ½ hours (can be shortened, lengthened, or spread out across multiple days)

Objectives	Materials	Standards
• Teach the literacy of coding with drag and drop programming • Use "when block" to create logical sequence and program keys • Create logical expressions to work with Makey Makey and conductive materials • Use pen tool to draw geometric patterns in Scratch • Craft riddles and rhyme schemes to create a logic puzzle • Storyboard game and revise for most logical sequence • Write a logical sequence of events for Scratch game	• MakeyMakey • Alligator Clips • Assortment of conductive materials (may include fruits, play dough, aluminum foil, marshmellows, etc.) • Scratch (online program)	3-PS2-3: Ask questions to determine cause and effect relationships of electric or magnetic interactions between two objects not in contact with each other. 4-PS3-2: Make observations to provide evidence that energy can be transferred from place to place by sound, light, heat, and electric currents. MS-ETS1-2: Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem. HS-PS3-1: Create a computational model to calculate the change in the energy of one component in a system when the change in energy of the other component(s) and energy flows in and out of the system are known. HS-PS3-3: Design, build, and refine a device that works within given constraints to convert one form of energy into another form of energy. *Note: These are the NGSS Standards. Common Core standards may also apply, depending how Scratch is implemented. This can be adapted for your classroom content.

Procedure:

1. Students will be introduced to Scratch through a short video clip found _____
2. Teacher will lead students through Scratch vocabulary, movements, and procedures. (ex-sprites, scripts, etc.)
3. Practice low-level codes, using Scratch cards.

Scratch commands and procedures can be taught in advance, or this trip can be spread over multiple days for a slower-paced experience

4. Students write riddles as poetry -focusing on sequencing – one riddle per alligator clip for MakeyMakey

   Examples:
   "I bend and fold, so your chips won't get old" (chip clip)
   "I'm feeling so low, can you make a flower grow?" (touch water)
   "You might try with your fist to beat down the door, but just a simple twist is all it takes, to lead you to a new floor." (key)

5. Sequence and storyboarding - Have students create storyboards before making games. Check the sequence of the game before creating the logic puzzle in Scratch.
6. Attach MakeyMakeys and Play!

**Note: For younger students, give them specific objects like bananas and Play-doh to write their first riddles. I had a group of 6-8 year olds successfully create a very simple riddle game! We just wrote riddles, made the game, and then connected the Makey Makeys to test their programming.*

This lesson was adapted from: http://makeymakey.com/lessons/logic-puzzles-lesson/