Activity 1: Make a Greeting Card Using a Simple Circuit

Makey Makey (Beginner Makey Makey Course)

Subject: Physical Science	**Topic or Unit of Study:** Circuits
Grade/Level: Grades 2-5	**Time Allotment:** 1 hour
Synopsis: Students will design a product (a light-up greeting card) using a simple circuit. Students will troubleshoot and iterate through different designs.	**Standards:** **4.PS3-2:** Make observations to provide evidence that energy can be transferred from place to place by sound, light, heat, and electric currents.

Materials:

- Teacher/instructor lesson plan
- Teacher/instructor Google Slides presentation
- Teacher computer with access to internet and teacher presentation
- Student computers
- Adhesive-backed copper conductive tape
- Small-sized LED lights (one per student)
- Coin cell battery (one per student)
- Card template printed on cardstock or construction paper, assorted colors (multiple copies per student to allow for student color choice)
- Scissors (one pair per student)
- Push-pins for instructors/Near Peer Mentors
- Clear tape
- Glue stick or glue
- Card decorating supplies (stickers, markers, colored pencils, crayons, etc.)

Activity 2: What is Conductive and Hands-On

Makey Makey (Beginner Makey Makey Course)

Subject: Physical Science	**Topic or Unit of Study:** Circuits
Grade/Level: Grades 2-5	**Time Allotment:** 1 hour
Objectives: ● We will understand how MakeyMakey works. ● We will start building and coding our own inventions. ● We will create a science experiment with things around your house. ● We will make observations that energy can be transferred from place to place by electric currents.	**Standards:** ● **3. CS.D.01 -** Identify internal and external parts of computing devices that function together to form a system. ● **4. CS.HS.01 -** Identify and describe a variety of ways computer hardware and software work together as a system to accomplish a task, using appropriate technical terminology (e.g., input, output, processors, sensors, storage). ● **3. AP.M.01 -** Decompose a simple problem into a precise set of sequence instructions. ● **3. AP.C.01 -** Create programs using a programming language that includes sequences, loops, conditionals, and variables to solve a problem or express an idea.
Synopsis: Make a simple sketch of Makey Makey and build a human circuit. Create a conductivity testing board so you can ideate materials for inventing!	**Materials:** ● Teacher/instructor lesson plan ● Teacher/instructor Google Slides presentation ● Teacher computer with access to internet ● Student computers ● Makey Makey Classic kits (one per student) ● Conductive and non-conductive materials (fruit, aluminum foil, toothpicks, rubber, plastic straw, paper plate, etc.) ● Play-Doh

Activity 3: Cardboard Guitar

Makey Makey (Beginner Makey Makey Course)

Subject: Physical Science	**Topic or Unit of Study:** Circuits
Grade/Level: Grades 2-5	**Time Allotment:** 1 hour
Objectives: ● We will code with Makey Makey sampler. ● We will create our own codes using sounds. ● We will use recycled materials to create circuits.	**Standards:** ● **3. CS.D.01 -** Identify internal and external parts of computing devices that function together to form a system. ● **4. CS.HS.01 -** Identify and describe a variety of ways computer hardware and software work together as a system to accomplish a task, using appropriate technical terminology (e.g., input, output, processors, sensors, storage). ● **3. AP.M.01 -** Decompose a simple problem into a precise set of sequence instructions. ● **3. AP.C.01 -** Create programs using a programming language that includes sequences, loops, conditionals, and variables to solve a problem or express an idea.
Synopsis: Learn to upload your own guitar sounds to the Makey Makey sampler to turn recycled cardboard into a musical instrument!	**Materials:** ● Teacher/instructor lesson plan ● Teacher/instructor Google Slides presentation ● Teacher computer with access to internet ● Student computers ● Makey Makey Classic kits (one per student) ● Cardboard guitar (one per student) ● Aluminum foil ● Gluesticks (one per student) ● Brass fasteners (at least 6 per student) ● Hook up wire ● Alligator clips ● Markers

Activity 4: Draw an Instrument

Makey Makey (Beginner Makey Makey Course)

Subject: Physical Science	**Topic or Unit of Study:** Circuits
Grade/Level: Grades 2-5	**Time Allotment:** 2 hours (extension activity requires additional time)
Objectives: ● We will create, design and draw a basic circuit layout. ● We will learn to debug and problem solve.	**Standards:** ● **4-PS3-2:** Make observations to provide evidence that energy can be transferred from place to place by sound, light, heat and electric currents. ● **4-PS3-4:** Apply scientific ideas to design, test and refine a device that converts energy from one form to another.
Synopsis: Draw your own instrument, plug it in to various piano apps and play your drawing!	**Materials:** ● Teacher/instructor lesson plan ● Teacher/instructor Google Slides presentation ● Teacher computer with access to internet and teacher presentation ● Student computers ● Makey Makey Classic kits (one per student) ● 6B Artist Graphite Pencil (one per student) ● Plain white paper ● Various types of pencils (at least 3 different types per student for testing) ● A damp sponge/paper towel for students to wet their hands to increase conductivity ● Several examples of drawn instruments

Activity 4: Introduction to Scratch

Makey Makey (Beginner Makey Makey Course)

Subject: Physical Science	**Topic or Unit of Study:** Circuits
Grade/Level: Grades 2-5	**Time Allotment:** 2 hours
Objectives: ● We will learn the basics skills of the Scratch coding platform.	**Standards:** ● **5. AP.A.01 -** Develop, compare, and refine multiple algorithms for the same task and determine which algorithm is the most appropriate. ● **3. AP.PD.03 -** Analyze and debug an existing program or algorithm that includes sequencing, repetition, and variables in a programming language. ● **3. AP.C.01 -** Create programs using a programming language that includes sequences, loops, conditionals, and variables to solve a problem or express an idea.
Synopsis: Learn the basics of the Scratch platform to prepare to use our Makey Makey drawings with Scratch!	**Materials:** ● Teacher/instructor lesson plan ● Teacher/instructor Google Slides presentation ● Teacher computer with access to internet and teacher presentation ● Student computers