

What Can You Makey Makey?

Interactive Art Made by Completing Circuits

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Grade Level	3rd – 5th Grade	**Time Frame**	50 minutes
Subject	Science, Visual Arts	**Duration**	2-3 class periods
Course	Oklahoma Young Scholars/Javits		

Essential Question

How can art be integrated into a circuit? In what ways can art produce sounds?

Summary

Students will make interactive artwork by creating circuits using Makey Makeys and their knowledge of conductive materials.

Snapshot

Engage: Students will be intrigued by watching a video clip or seeing a demonstration of playable artwork that makes sounds when touched in certain places.

Explore: Students work in groups to experiment with connecting a Makey Makey to complete a circuit. They then test items to see which are conductors and which are insulators.

Explain: Using the Stand-Up, Sit-Down strategy, students share information they believe is important about the exploration and what worked well for their groups. The class discussion focuses on differentiating between items that are conductors and those that are nonconductors.

Extend: Students create a circuit drawing using Makey Makey and the free piano app to create a playable instrument using a minimum of three sounds.

Evaluate: Students participate in Beach Ball Talk and Toss answering the essential questions and interacting with each other's musical drawings.

Standards

Oklahoma Academic Standards (Fine Arts: Visual Art (4th Grade))

4.PS3.2.1: Energy can be moved from place to place by moving objects or through sound, light, or electric currents.
4.PS3.2.2: Energy is present whenever there are moving objects, sound, light, or heat.
4.PS4: Energy can also be transferred from place to place by electric currents, which can then be used locally to produce motion, sound, heat, or light.

Oklahoma Academic Standards (Fine Arts: Visual Art (4th Grade))

4.VA.CP.1.2 : Apply knowledge of available resources, tools, and technologies to investigate personal ideas through the art-making process.
4.VA.CP.2.2 : Demonstrate an understanding of the safe and proficient use of materials, tools, and equipment in a manner that prevents danger to oneself and others.
4.VA.P.3.1 : Explore and experiment with materials and techniques to expand personal interests and skills.

Attachments

- Is It Conductive Date Sheet—What Can You Makey Makey - Spanish.docx
- Is It Conductive Date Sheet—What Can You Makey Makey - Spanish.pdf
- Is It Conductive Date Sheet—What Can You Makey Makey.docx
- Is It Conductive Date Sheet—What Can You Makey Makey.pdf
- Lesson Slides—What Can You Makey Makey.pptx
- What is a Makey Makey Info Sheet—What Can You Makey Makey.docx
- What is a Makey Makey Info Sheet—What Can You Makey Makey.pdf

Materials

- Lesson slides (attached)
- What is a Makey Makey Info Sheet (attached)
- Is it Conductive? Data Sheet (attached; one per group)
- Class set of Makey Makey
- iPad/Chromebook or computer for each student
- Foil boards (cardboard with strips of foil glued on)
- 6B graphite pencils work best, but regular pencils work with thick lines
- Variety of small everyday items: (Conductors of electricity such as: pennies, paper clips, play dough, tinfoil, etc.) (Nonconductors or insulators such as: string, beads, plastic, ribbon, etc.)
- Materials for individual projects: construction paper, foil, brads, tape, scissors, glue sticks
- Additional Makey Makey apps available for the individual projects

15 minutes

Engage

Display **Slide 4** and show students the Makey-Makey Art - Caterpillar Song or demonstrate a completed Makey-Makey project.

Use the S-I-T (surprising, interesting, troubling) strategy on **Slide 5** and have students jot down their thinking on a sticky note or small dry erase board. Have them share with an elbow partner and then call on pairs to share their thinking.

20 minutes

Explore

Teacher's Note, Prerequisite Knowledge:

Depending on prior knowledge, you may need to review or introduce open and closed circuits. You can do a quick review by watching the Electrical Circuits and Conductivity video on **Slide 6.** If you are teaching this lesson after the students have learned about circuits, you can skip this step.

Teacher Prep:

Briefly introduce the Makey-Makey to your class. A picture of it is on **slide 7**. Then group students into working teams and provide groups with an iPad/Chromebook or computer connected to the free "Is it Conductive" app on Makey Makey's website using **slide 8**.

Procedures:

Pass out foil boards to each group. If you want your students to make their own foil boards, use **slide 9.**

1. Give each group a set of test objects that include both conductive and non-conductive items.
2. Show **slide 10** and have students hook up a Makey Makey to their device and complete a circuit while testing and sorting objects by conductivity. They will record their results on their **Is it Conductive? Data Sheet** (attached).

If they need more information on how to set up the system, have the class watch the first 55 sec. of the video on **slide 11**. (*If you watch more than the first 55 seconds with your students, you will tell them the answers to what they are to discover. **So please don't do IT**!)*

15 minutes

Explain

Use the Stand-Up, Sit-Down strategy to discuss the circuit conductor activity. The student directions are also on **slide 12.**

Directions:

1. Start by asking students to write down three pieces of information they think are important to know about the activity or what they learned from it.
2. Allow a few minutes for students to reflect and write.
3. Have all students stand up.
4. One at a time, your students will share just one item from their list. If a student's peer shares an item that is listed on their paper, they will mark it off.
5. As students share, write their main points on the board or chart paper.
6. Once a student has shared or marked off all of their understandings on their paper, they will sit down.

After this sharing session, review the points on the board. Identify and discuss any gaps in understanding or missing information and add it to the chart.

Guiding Questions:

- How are the conductive items alike?
- What do the insulators have in common?
- What makes a conductor different from an insulator?
- What items did you not test that you think might be conductive?
- Why do you think the alligator clips and alligator heads are covered in plastic?

40 minutes

Extend

Show **slides 13 and 14** to demonstrate your own additional art projects showcasing your use of Makey Makeys.

Then, tell students that they will be using a 6B graphite pencil, paper, their digital device, a Makey Makey, and the free piano app from the Makey Makey website to create a playable instrument utilizing a minimum of three sounds.

Use **slide 15** to go over the directions for drawing and then show the video, "Drawable Circuits and Buttons" on **slide 16**. For additional drawing tips, use **slide 17.** After their drawings are complete, have students connect to the Makey Makey piano app. **Slides 18 and 19** will guide students to the app and help them troubleshoot if their drawing is not working.

15 minutes

Evaluate

Have students display their creations and invite others to come and “play” or watch each other while they demonstrate their project. This should be based on the comfort level of each student.

Move to **slide 20** and have students participate in a Beach Ball Talk and Toss using the following questions:

- *How were you able to mix art with circuits?*
- *What is one thing you would do to make your project better?*

Opportunities for Advanced Learners

Provide a variety of materials including construction paper, foil, brads, tape, scissors, and glue sticks for students to create a personal work of art. This art creation should integrate with Makey Makey and possibly Scratch.com.

Resources

- Education Gallery. (n.d.). Electrical Circuits and Conductivity. [Video]. YouTube. https://www.youtube.com/watch?v=wYE24otiwVQ
- Foust, Tom. (n.d.). Makey Makey Art-Caterpillar Song. [Video]. YouTube. https://www.youtube.com/watch?v=lZCo78utHK8
- K20 Center. (n.d.) Beach Ball Talk and Toss https://learn.k20center.ou.edu/strategy/3049
- K20 Center. (n.d.) S-I-T https://learn.k20center.ou.edu/strategy/926
- K20 Center. (n.d.) Stand-up, Sit-down https://learn.k20center.ou.edu/strategy/1771
- Makey Makey. [app]. Classic Piano. https://apps.makeymakey.com/piano/
- Makey Makey. [app]. Is it Conductive? https://apps.makeymakey.com/play/#is%20it%20conductive

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