

WOW! on Wheels – STEM Labs

Makey Makeys

Information and Activity Ideas

NOTE: Students will need access to a computer with a USB input to use the Makey Makey.

A classroom set of 30 kits can be borrowed through WOW! on Wheels. Each kit includes:

- 1 Makey Makey device
- 1 set of directions
- 1 USB connection cable
- 7 Alligator clips

You will also need to add supplies. Below are a list of examples you might want to have available.

aluminum foil	LED's	Play-doh or clay
cardboard	Markers	rubber bands
conductive aluminum tape	metal brads	scissors
copper tape	paper or cardstock	staples
duct tape	paperclips	tape
foam	pipe cleaners	thumb tacks
glue stick		wire
graphite pencils		yarn/string/twine

- bananas (Yes! They are conductive.)
- other fruits and vegetables work too
- you can also try: gummy bears and marshmallows

A special thanks to the team at SOITA for helping me put this together!

<https://www.soita.org/>

The more you experiment with the Makeys, the more ideas you and your students will come up with.



Here is a link to the First Time Set Up! Basic How-to Guide:

<https://makeymakey.com/blogs/how-to-instructions/first-time-set-up-basic-how-to-guide>

*This walks you through how to connect the Makey to your computer.

Makey Makey offers a lot of free project ideas.

<https://makeymakey.com/>

<https://makeymakey.com/pages/how-to>

More great tips:

<https://www.instructables.com/makeymakey/>

Makey Makey is also compatible with Scratch!

<https://makeymakey.com/blogs/how-to-instructions/getting-started-with-scratch>

<https://makeymakey.com/blogs/how-to-instructions/3-ways-to-program-click-with-scratch>

Apps for plug and play, no coding involved:

<https://makeymakey.com/blogs/how-to-instructions/apps-for-plug-and-play>

*The following are some suggested activities for **Beginning Users**:*

Lesson One: Craft a Simple Circuit – Grades: 4-12

<https://makeymakey.com/blogs/how-to-instructions/lesson-one-simple-circuit>

Suggested Time

10-15 minutes

Supplies

Makey Makey

Downloadable Template (PDF on website)

3V Coin Cell Battery



3mm or 5mm LEDs
Aluminum Foil

Vocabulary Used

Simple Circuit
Short Circuit
Polarity
LED

Learn how a simple circuit works so you can create your first circuit and light your first LED! You will learn how to craft a simple circuit, learn how Makey Makey works by completing a circuit, and learn how humans can connect to make a key press on your computer!

Lesson Two: Hands on a Makey Makey – Grades: 2-8

<https://makeymakey.com/blogs/how-to-instructions/lesson-two-hands-on-a-Makey-Makey>

Suggested Time

15-30 minutes

Supplies

Makey Makey
Other people

Learn how Makey Makey works so you can start inventing. You will make a simple sketch of Makey Makey, use your hands to trigger Makey Makey for piano, build a human circuit, and play and explore with Makey Makey and their new apps.

Lesson Three: What is Conductive – Grades: 3-8

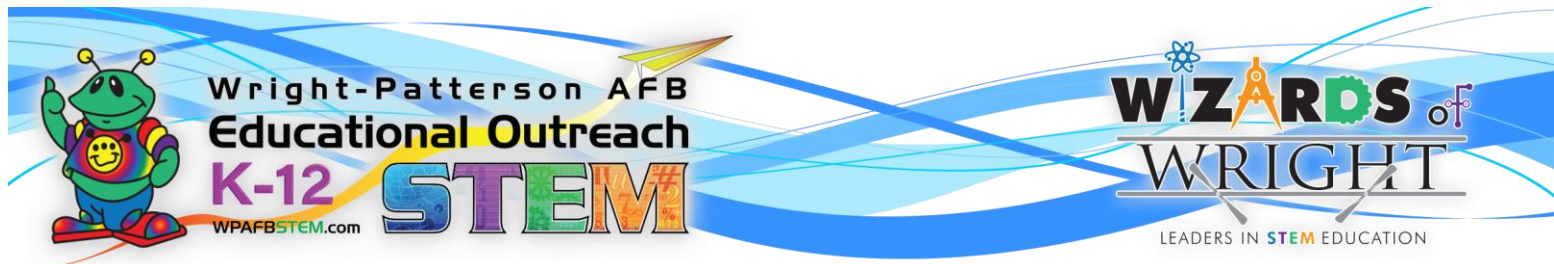
<https://makeymakey.com/blogs/how-to-instructions/lesson-three-what-is-conductive>

Suggested Time

30 minutes

Supplies

Makey Makey
A piece of cardboard
Conductive base: HVAC tape or kitchen foil
A ruler (It helps when testing materials, so you don't accidentally complete the circuit with your touch!)



Lots of items for testing: Apples, plants, cotton, stuff around your house!
Print or Create an "[Conductive/Non-Conductive](#)" chart in your Science journal (link on website)
Makey Makey
Laptop with "[Is it Conductive?](#)" Plug and Play App (link on website)

Vocabulary Used

Conductor
Insulator
Prototype/Prototyping
Iteration

Makey Makey works by alligator clipping into everyday things that have some conductivity. When you hook an alligator clip into a banana and you hold an alligator clip connected to EARTH, you are actually the conductive stuff that closes the circuit and makes Makey Makey work! But what materials can we use with Makey Makey besides bananas? What does it mean for an item to be conductive? or an insulator? or even a resistor? Let's set up a simple experiment to find out! In this lesson, you will make a conductivity testing board to test items for conductivity; learn that everything in the world is either or conductive or an insulator; and start to ideate inventions with everyday stuff you can find in your home.

Lesson Four: Draw a Playable Instrument – Grades: 2-12

<https://makeymakey.com/blogs/how-to-instructions/lesson-four-draw-a-playable-instrument>

Suggested Time

30 minutes

Supplies

Makey Makey
Graphite Pencil
Paper
Video Inspiration: "Sketch it! Play it!" from Jay Silver (link on website)

Draw your own playable instrument, connect Makey Makey to your drawings, and create a classroom band.



Lesson Five: Code Your Key Presses in Scratch – Grades: 3-8

<https://makeymakey.com/blogs/how-to-instructions/lesson-five-code-your-key-presses-in-scratch>

Suggested Time

45 minutes

Supplies

Makey Makey

Scratch

Teacher: Links to Google Slides (link on website)

Get started with Scratch, add sounds, motion, create and choose backdrops, change costumes for Sprites, begin to use If Statements and Forever Loops.

*The following are some suggested activities for **Intermediate Users**:*

Maker Class Lesson One: Crafting and Designing Switches – Grades: 3-8

<https://makeymakey.com/blogs/how-to-instructions/lesson-eight-crafting-and-designing-switches>

Suggested Time

45-60 minutes

Supplies

Makey Makey

6B Pencil

Paper

Cardboard

Foil

Rubber Bands

Up until now you've learned how circuits work and explored Makey Makey. But now let's go further by exploring switches. Switches are a simple type of sensor. Sensors and microcontrollers power our world. But what is a sensor? And what is a microcontroller? And how do they work together?



Maker Class Lesson Three: Designing and Crafting Alarm Systems – Grades: 4-10

<https://makeymakey.com/blogs/how-to-instructions/maker-class-lesson-three-alarms>

Suggested Time

45 minutes

Supplies

Makey Makey
Switches from Lesson One
Foil
Cardboard

In the previous lesson, we focused on creating simple buttons and interactive switches with different materials. In this class, you'll learn to code alarms with these inventions, and be challenged to design your own alarm system.

Maker Class Lesson Four: Recyclable Tilt Sensors – Grades: 4-10

<https://makeymakey.com/blogs/how-to-instructions/maker-class-lesson-four-recyclable-tilt-sensors>

Suggested Time

45 minutes

Supplies

Makey Makey
Toilet Paper Tube
Paperclips
Foil
Gluestick

In this lesson, you'll start playing with movement and how movement can close a switch. Build a tilt sensor out of foil and a toilet paper tube and use it to control the Scratch cat!



More Great Ideas from Makey:

Super Easy Floor Piano – Grades: K-12

<https://makeymakey.com/blogs/how-to-instructions/super-easy-floor-piano>

Suggested Time

10-15 minutes

Supplies

Makey Makey
Alligator Clips
HVAC tape
Duct tape
Template

Ultimate Stomp Pad – Grades: 4-12

<https://makeymakey.com/blogs/how-to-instructions/ultimate-stomping-pad>

Suggested Time

up to 1 hour

Supplies

Makey Makey
Chipboard or Cardboard
Foil Strips
Two extra long wires
Conductive tape
Duct tape
Glue stick
Rubber bands of varying sizes

Your students will learn to make an over-sized weight sensitive stomp pad to control one button games and Scratch projects. Make two stomp pads to practice jumping jacks or make four for the ultimate dance mat! This durable floor pad uses rubber bands as an insulator and as an added bonus helps the floor pad stay in place.



Math/Science Classify and Sort – Grades: 3-8

<https://makeymakey.com/blogs/how-to-instructions/math-science-classify-and-sort>

Suggested Time

up to 1 hour

Supplies

Makey Makey

Alligator Clips

Protractor Ruler

for Lesson A: Hinged cardboard box, duct tape, copper tape, aluminum foil

for Lesson B: Poster board, pencils

Lesson Objectives

Lesson A: Classifying Shapes

- Identify Shapes: polygon, quadrilateral, triangle, square, rectangle, rhombus, trapezoid, parallelogram, hexagon, diamond, pentagon, octagon, decagon,
- Use a geoboard to brainstorm shapes
- Describe objects: vertices, angles, sides, quadrilateral, right, acute, and obtuse angles, parallel, intersecting, perpendicular lines

Lesson B: Classifying Triangles

- Identify types of triangles by sides: Scalene, Isosceles, Equilateral
- Identify types of triangles by angles: Acute, Right, Obtuse, Equiangular
- Draw all types of triangles, figure out the angles, calculate the sum of the angles of each triangle

Not Bored Game – Grades: 6-12

<https://makeymakey.com/blogs/how-to-instructions/game>

Suggested Time

1-2 hours

Supplies

Box cutter

Sheet of cardboard, cut to board game size

Crayons or markers

Permanent marker



Glue stick
Extra cardboard
Awl (the tool on a pocketknife or multi-tool designed to poke holes in material)
22 gauge wire, ideally in two different colors
Wire cutter/stripper
Copper tape with conductive adhesive, 1/2" width
Masking tape
Playing piece, either one you create or a small figurine you re-purpose
Hot glue gun and hot glue stick
Small pieces of wood (optional) or strips of cardboard
Needle nose pliers
Alligator clips
Computer running Scratch

Create your own physical board game that connects to Scratch.

Distance Rate and Time for Math/Science/Physics – Grades: 6-12

<https://makeymakey.com/blogs/how-to-instructions/distance-rate-and-time-for-math-science-physics>

Suggested Time

up to 1 hour

Supplies

Makey Makey
Hotwheels Track
Toy Cars
Magnetic weights to add to cars
DIY Switches - foil, copper tape, paper clips, coffee stirrs, straws, legos
Telephone wire or hookup wire

How does acceleration change from a downward drop, to a flat surface, to an uphill ramp? With Makey Makey and Scratch you can measure the change in rate over your desired distance and catch the correct time as your toy car drives over simple DIY switches.



Cardboard Guitar – Grades: 4-12

<https://makeymakey.com/blogs/how-to-instructions/creating-a-guitar-in-scratch-or-soundplant>

Suggested Time

up to 1 hour

Supplies

Makey Makey
cardboard
conductive tape or foil
brass fasteners
foil
hook up wire
alligator clips