Learning with Our Bodies Tool

Human Circuit

Overview

Families experiment and explore how electricity travels by acting out the "human circuit." Everyone holds hands in a circle to embody a complete circuit, including volunteers who play the power source and load. Adding a Energy Stick takes everything to the next level, though it isn't required!



Materials

- A large, clear space
- Optional: Energy Stick(s)
- Optional: Bowl of water & other materials to test conductivity

min.

This activity:

- Allows for movement, collaboration & spontaneity
- Encourages playful & generative experimentation
- Centers the ideas and connections families bring
- Makes visible the role of electricity in everyday life
- Engages even very young learners



Family Sketch

Looking around the room for other objects to test with the Energy Stick, one participant picked up a leftover slice of pizza from dinner! He and a partner each touched a part of the pizza and the Energy Stick only to find out that, yes, it pizza is both delicious and conductive!

Step-by-step

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Invite everyone to stand and form a circle to create the "Human Circuit."

Ask for two volunteers: one source (such as a battery, electrical outlet, etc) & one load (such as light bulb, radio, etc.). When the circuit is connected, the load will show they are powered-on by dancing, singing, or another action of their choice.

- Explain that everyone else is a wire that connects the source to the load and helps to get the electricity to where it needs to go!
- Divide the rest of the group in half: one half is he positive side (ask them to smile) and the other half is the negative side (ask them to frown). Explain that electricity moves through a circuit from positive to negative poles of the power source.
- 5 Request that everyone hold hands. Explain that when everyone is connected, electricity can travel freely. Remind the load that they need to show they are powered on when the circuit is connected like this!
- 6 Ask for one more volunteer, in either wire group, to be the switch. The switch will decide when to stop holding hands with one of their partners, which means that the load volunteer must power off and be silent and still. Everyone should watch closely for the switch to connect and reconnect, especially the load volunteer!
- 7

Explain that a switch is like a drawbridge that completes a circuit when it's down. and interrupts or 'breaks' a circuit when it's up. This is what happens when you flip a light switch and the light goes off and on: when the electrical current is running through the light bulb, the light is on; when the circuit is broken, the light turns off.

Extension: Energy Sticks

- B If you have an Energy Stick, introduce it as another type of load. Give it to another volunteer and ask everyone to work together to get it to light up and make noise. Hint: Everyone must hold hands for it to work (or for an individual to hold each silver electrode in separate hands). If the circuit is broken, it will power off.
 - See how many people in the group can be in the circuit. Try creating a switch.
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Test the conductivity of water, or other available objects, by having two participants touch the item with one hand and the Energy Stick in the other. Explain that materials that allow electricity to flow are called conductors. Some examples of conductive materials are metal and water. Human bodies are around 65% water, so that's why the Energy Stick also powered on with just our hands!

Background Info

Circuit	Electricity flows along one path, which is made up of a material that conducts electricity from the power source to whatever component needs to be powered and then back to the power source.
Conductor	A material that is conductive, like a copper wire (or water even).
Load	A component that needs to be powered, like a light or motor.
Short Circuit	This happens when a circuit doesn't have a load. For example, if a lamp is connected to the circuit, but a direct connection is present between the battery's negative (-) terminal and its positive (+) terminal.



∲⁻ Other ideas

How can this activity fit into your setting?

It was important to us to offer other options if participants didn't want to hold hands. They can touch wrists, for instance.

Folks can do this activity seated if needed.

What worked for us

This is a great way to get to know one another in a positive and low-pressure way. That's why we like to start of the program with this activity!

We use this as an introduction to learning about electricity, circuits, and computer science.

We love how playful families are when testing out the conductivity of different materials.

Special thanks to Chad Sansing who made this activity: https://chadsansing.makes.org/thimble/LTY3MjU5NTk2OA==/human-circuits

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