LITERACY & LEARNING
TEXAS WOMAN'S UNIVERSITY

Playdough Circuits

Activity Instructions	Video Instructions	Extension Activity Video Instructions
https://docs.google.com/document/d/1XYqNZPfH8nyfnBNzeZSM-7xotaguZJLS_NDVZCqYz8w/edit?usp=drive_link	https://drive.google.com/file/d/1sX5g0o8Y7_uFo5VfFt6MWPmqhkR2VLFW/view?usp=drive_link	https://drive.google.com/file/d/1LydqA6yVtjpCDAOdUCbtxXpE68-P7_id/view?usp=drive_link

DESCRIPTION: This activity provides a fun way to introduce electrical engineering and the concept of a closed circuit using playdough. Reading the book, Rosie Revere, Engineer by Andrea Beaty provides an introduction to "perfect failure" and the idea of persistence which is needed whenever you try to make electrical connections.

AMOUNT OF TIME: 5-10 minutes

MATERIALS NEEDED:

1 Playdough container

9V batteries

9V battery wire connectors, $7 for 5 from Walmart, https://www.walmart.com/ip/5-Pcs-Black-Plastic-T-Type-9-Volt-Battery-Clip-Connectors-Buckle-Cable-Leads/995556117?athbdg=L1600&adsRedirect=true

An assortment of 3 or 5 mm LED light diodes, $8 for 100 from Walmart, https://www.walmart.com/ip/100pcs-5-Colors-5mm-Round-Superbright-Emitting-Diode-LED-Lights/1115641799?athcpid=1115641799&athpgid=AthenaItempage&athcgid=null&athznid=si&athieid=v0_eeMjAuMCw5ODAuMCwwLjAxNTkxNTM2MDQ4MzIwMzI1LDAuNV8&athstid=CS055&athguid=G2GWNPqnTNSbqJOMOPOxBvxsS0stBgiqztfF&athancid=3566224445&athposb=11&athena=true&athbdg=L1700

OBJECTIVE(S):

1. The student will be able to make a LED light turn on using only a 9V battery and playdough to create a closed circuit.

COMMON CORE STATE STANDARDS:

K-2nd grade—ELAR, Speaking and Listening: Presentation of knowledge and ideas, #6: Speak audibly and express thoughts, feelings, and ideas clearly.; Produce complete sentences when appropriate to task and situation.; … in order to provide requested detail or clarification.

K-2-ETS1-1. Engineering Design: Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.

STEPS TO COMPLETE THE ACTIVITY:

1. Create two very small balls of playdough (no bigger than your thumbnail).
2. Place playdough close together without the two balls of playdough touching each other.

3. Place the (red) positive wire of the 9V battery wire connector into one ball of playdough.
4. Place the (black) negative wire of the 9V battery wire connector into the other ball of playdough.
5. Connect the battery connector to the posts of the 9V battery.
6. Spread the legs of the LED light apart after identifying which leg is longer (this is the positive connection).
7. Place the long leg of the LED light into the playdough with the positive wire connection (red wire).
8. Place the short leg of the LED light into the playdough with the negative wire connection (black wire)
9. IF your light does not light up make sure there is nothing interrupting the connection (to be a closed connection the playdough can't be touching and the positive and negative LED legs must be in the correct balls of playdough). Otherwise, if it doesn't light up it might be due to the LED light or battery being a problem so try another of each ONE of those items one at a time so you can determine which one is the problem.

VOCABULARY:

Closed connection or closed circuit— a connection that allows an uninterrupted flow of energy/electricity

Diode—an electrical device that conducts electrical currents using two terminals with the energy only flowing in one direction

LED—light emitting diode

Terminals—legs on a diode or posts on a battery used as points of connection

Electrical engineer—a discipline of engineering that focuses on the design, study, and application of devices, systems and equipment that uses electricity.

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EXTENSION ACTIVITIES:

ADDITIONAL MATERIALS NEEDED:

Paper

Markers

Copper or aluminum tape

OBJECTIVE(S):

1. The student will be able to make a LED light turn on using only a 9V battery and electrical tape to create a closed circuit.
2. The student will create an illustration or words on a piece of paper to include as part of the closed circuit design.

STEPS TO COMPLETE THE ACTIVITY:

1. Draw an illustration or write words on a piece of paper.
2. Decide how to place the tape on the design to create a closed circuit.
3. Place the 9V battery wires in one of the two pieces of tape.
4. Place the legs of the LED on the tape associated with the positive and negative pieces of tape so the circuit is closed and the LED will light up.