

PRESENTED

BY:



Graphite Circuit

Can you illuminate an LED using graphite? Draw a design to make your LED shine as you explore circuitry with a sheet of paper and pencil.

TEKS:

SCI 4.6 B: The student is expected to differentiate between conductors and insulators of thermal and electrical energy.

SCI 4.6 C: The student is expected to demonstrate that electricity travels in a closed path, creating an electrical circuit.

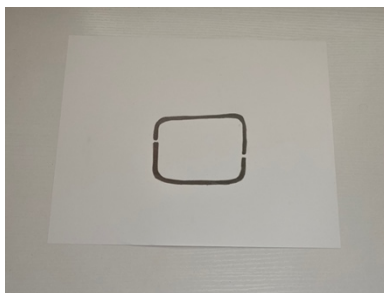
SCI 5.6 B: The student is expected to demonstrate that the flow of electricity in closed circuits can produce light, heat, or sound.

Materials:

- 9V battery
- Graphite pencil
- 5mm LED
- Ruler
- Sheet of paper
- Tape

How To:

1. Use a graphite pencil to draw a design on a sheet of paper, leaving a one-centimeter gap in two different places. With the exception of the two gaps, your design must loop in a continuous, thick line.



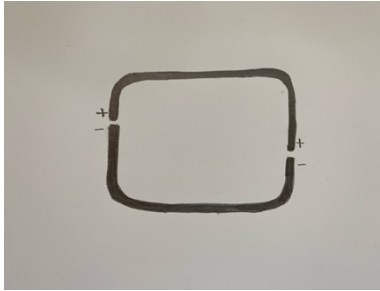
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2. Label one of your lines the “positive” line and the “negative” line.



3. Bend each wire of the LED into an “L” shape so that it can stand on its own.
4. Tape the LED to one of the gaps in your graphite design. The longer leg represents the positive end and should touch the “positive” line. The shorter leg represents the negative end and should touch the “negative” line.



5. Place the 9V battery on the other gap of your design, touching the positive and negative ends to the correct lines of your drawing. The LED should light up!
6. Once you have your circuit working, try experimenting with different designs. What happens if you make your line shorter? Longer? What happens if the line is thinner? thicker? Will different types of graphite pencils have different results?

STEM Explanation:

A circuit is a path that conducts electricity. In a closed circuit, the power source—often a battery—provides electrical current to an object, like an LED. If these two objects were to come in direct contact with each other, the LED would light up automatically. Materials that allow electricity to flow through them are called conductors, and they keep electricity flowing through the circuit. The graphite that you used for your design is a conductor! As electricity left the battery, it traveled through your graphite design, into the LED, and back to the battery, creating a closed circuit. This is what caused the LED to light up!

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Career Connection:

Electrical engineers work with electricity in many forms, from constructing small-scale circuits to building large electrical systems. They create wireless communication systems, develop the latest media displays like HDTV, design computer processors and other hardware, and work in robotics.

Resources:

<https://www.kiwico.com/diy/stem/electronics-robotics/graphite-circuit>

<https://www.science-sparks.com/graphite-pencil-circuit/>

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