Girlstart Flashlight

Don't be scared when the lights go out! Discover how Electrical engineers design new and better electronics. Connect the circuit to create your own flashlight.

TEKS:

4.6A Differentiate among forms of energy, including mechanical, sound, electrical, light, and heat/thermal.

4.6D Demonstrate that electricity travels in a closed path, creating an electrical circuit, and explore an electromagnetic field.

5.6A Explore the uses of energy, including mechanical, light, thermal, electrical, and sound energy.

5.6B Demonstrate that the flow of electricity in circuits requires a complete path through which an electric current can pass and can produce light, heat, and sound.

Materials:

- 1 Empty toilet paper roll
- 1 Flashlight bulb
- 1 Paper cup – 3 oz.
- 2 Brads
- 2 D-cell batteries
- 3 Pieces of insulated wire with stripped ends
- Cardboard
- Electrical tape
- Heavy tape (masking, plastic, etc.)
- Scissors
- Wire cutters/strippers

How To

1. Take the 2 D-cell batteries and tape them end to end using electrical tape. Make sure the negative terminal of one battery is taped to the positive terminal of the second battery.
2. Poke two holes in the side of the cardboard tube about one and one half inch apart. Stick one brad through each hole.
3. Place a paper clip securely under the top of one of the brads. Press the brad firmly against the cardboard tube.
4. Cut the tube so that it can unroll. Wrap one wire around each brad, and then press the brads open to secure the wires in place.
5. Place the two batteries inside the cardboard tube.
6. Tape the loose end of one of the wires to the negative terminal of the batteries.

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How To Continued

7. Roll the cardboard together to remake the tube. Tape the tube together. The loose end of the second wire should stick out of the end of the tube where the positive terminal of the battery is located.
8. Wrap the stripped end of the wire around the base of the light bulb. Tape it in place using a narrow strip of electrical tape
9. Cut out a circle from a piece of cardboard that fits over the end of the flash light. This is the light bulb holder. Heavy cardboard will help secure the light bulb in place.
10. Poke a hole through the middle of the light bulb holder large enough to stick the bulb through. Stick the light bulb through the hole.
11. Press the light bulb holder firmly onto the flashlight so that the bottom of the light bulb makes contact with the positive terminal.
12. Tape the light bulb holder to the flashlight with strong tape. The bulb may move around a little, but will light if secured firmly in place.
13. Take a paper cup and poke a hole in the bottom large enough to fit the light bulb through. Place the cup over the end of the flashlight to help direct the light. Tape the paper cup in place.
14. Touch the paper clip to the second brad to test the flashlight. Make necessary adjustments.

Why Does It Work?

Flashlights are a type of circuit — a path through which electricity is able to flow. When the paperclip is not touching the brad, it is called an open circuit. An open circuit is one that is not fully connected, breaking the electricity's path. When the paperclip is touching the brad, it is called a closed circuit. A closed circuit is one that is fully connected; this allows the electricity from the batteries to flow all the way through the light bulb!

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