

Name: _____

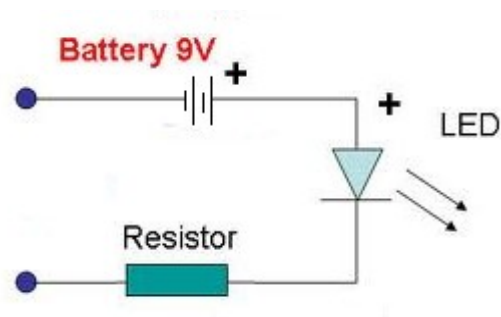
Build an LED Conductivity Tester SPH4C

Purpose: to test the conductivity of various materials using a circuit containing an LED

Materials: LED, resistor (200 Ω – 250 Ω), 9-V battery, connecting wires with alligator clips, iron nail, plastic ruler, various other materials

Procedure:

1. Identify the positive terminal lead (anode) and negative terminal lead (cathode) of the LED. The positive terminal lead is furthest from the flat part of the diode's base; it is also longer than the negative lead. This positive terminal lead must be connected to the positive terminal of the battery for the LED to be forward-biased.
2. Construct the circuit illustrated in the figure below.



Explain why the resistor must be connected in series with the LED:

Show your circuit to your teacher and have your teacher initial this space: _____

3. Place the ends of an iron nail between the alligator clip ends.
Describe what you observe:

4. Place the ends of a plastic ruler between the alligator clip ends.
Describe what you observe:

5. Test the conductivity of other materials and describe the results of each test in the table below:

Table 1: _____

Material	Observations

6. Reposition the LED in the reverse bias direction. Repeat Step 3, placing the ends of an iron nail between the alligator clip ends. Describe what you observe:

Explain why this is what you would expect:

7. Explain how your circuit could be used to test electrical switches:

Extend your thinking:

Your circuit could have been constructed with an incandescent light bulb instead of an LED. (In fact, you are welcome to try doing so.) Identify at least two benefits of using an LED instead of an incandescent light bulb in electronic equipment. (You may wish to look up this information on the Internet.)
