



ELECTRICITY

SECTION 2: SERIES CIRCUIT

STANDARDS:

Students know basic energy types, sources, and conversions.

Students describe the flow of energy through an object or system.

Students recognize or illustrate simple direct current series and parallel circuits composed of batteries, light bulbs, wire and on/off switches.

BACKGROUND:

A circuit means ‘to go around’. It is a circle or path that carries an electric current. An electric circuit must have an energy source, wire to carry the energy and an object requiring the energy. Each group of students will be given these three things and asked to figure out how to make the light bulb light up. Allow students to figure this out on their own through trial and error- a true inquiry lesson.

SAFETY:

Discuss safety with students prior to experiment. The bulbs break easily. The battery can produce enough heat to cause a slight burn. The wire is sharp.

MATERIALS:

D cell battery and battery holder

Wire (2-4 pieces per group, 5-6 inches long)

Light bulb and bulb holder (2 per group if possible-check that the kind of bulb is the same for each group. If the group has one oblong-shaped bulb and one circle-shaped bulb it will affect the circuit.

PROCEDURE:

1. After reviewing the safety information, instruct students to get into groups.
2. Pass out the worksheet.
3. Instruct students to brainstorm together to figure out how to make the circuit work to light the bulb. Have them list the objects they need and list on the worksheet. Have one person from each group get the materials.
4. Remind students to fill in their findings on their worksheet.
5. Once they are ready to go on to the third task requiring the use of another bulb and battery, have the groups pair up (if supplies are limited) or hand out more bulbs and batteries.
6. Once groups have completed their tasks, have them report their findings to the class. They can share information from the last task or they can write them on the chalkboard.

CONCLUSION:

Discuss successful circuits and the flow of electricity through the circuit. The electricity goes from the battery, out of the positive terminal, through the wire, into the battery holder to the bulb (base terminal or side terminal), out the wire and to the negative terminal of the battery.

Discuss correct answers to brightness question.

Ask students to connect 2 bulbs and 2 batteries in a circuit. Then have them unscrew a bulb. What happens? The circuit was broken. Explain that this is a series circuit. In a series circuit, when one bulb breaks or is missing, it stops the flow of electricity.

Electricity

Series Circuits

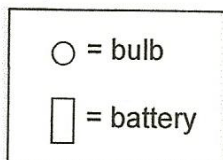
List materials needed to make a circuit.

Draw a series circuit that includes one light bulb. Draw arrows showing the flow of electricity.

Draw a series circuit that includes two light bulbs and two batteries. Draw arrows showing the flow of electricity.

Draw pictures of all your series circuits. Which examples have the brightest bulbs? After they're drawn, label your examples 1,2,3 and 4 to show the brightest to the dimmest (1 is the brightest.)

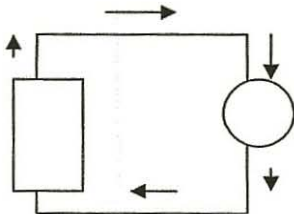
Key



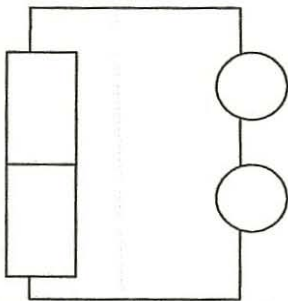
ANSWERS
Electricity
Series Circuits

List materials needed to make a circuit.
WIRE, LIGHT BULBS, BATTERY

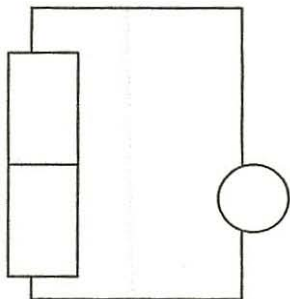
Draw a series circuit that includes one light bulb.



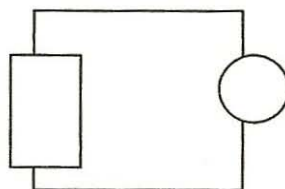
Draw a series circuit that includes two light bulbs and two batteries.



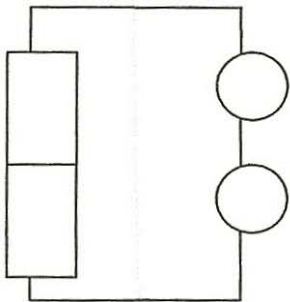
Draw pictures of all your series circuits. Which examples have the brightest bulbs? After they're drawn, label your examples 1,2,3 and 4 to show the brightest to the dimmest (1 is the brightest.)



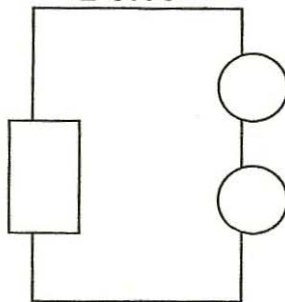
1



2 OR 3



2 OR 3



4