

Basic Circuits

Name _____



Objectives:

Students will be able to....

- know the difference between a closed circuit and an open circuit.
- construct simple to more complicated series and parallel circuits
- explain the difference between a series and parallel circuit.
- use symbols to draw the different circuits they created.

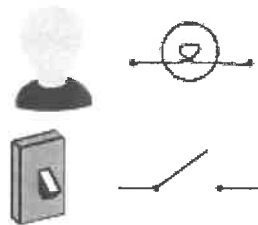
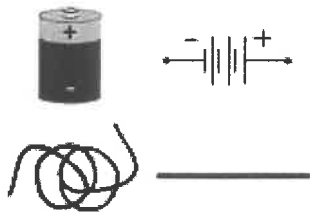
Vocabulary: Define these words on a sheet of paper or in your science notebook.

- Circuit
- Conductor
- Current
- Electrons
- Voltage
- Series Circuit
- Parallel Circuit
- Resistance

Materials per group of 2 students

- 2 D batteries
- 3 Small penlight bulbs
- 3 Sockets
- 2 switches
- Many pieces of Insulated wire

Symbols to use when you draw your circuits:



Directions:

Using the materials on your desk, create the following circuits:

Series Circuits: Once your circuit is working, have your teacher check the circuit.

Using the symbols above, draw the circuit you created.

<p>a. Using one bulb, batteries and some wires, make one light bulb turn on.</p>	<p>b. Now make 2 light bulbs turn on with batteries and some wire.</p>
<p>c. Using 3 bulbs, batteries, and some wires, make 3 light bulbs turn on.</p>	<p>What do you notice about the brightness of the bulbs in each circuit?</p>
<p>After you have made 3 light bulbs light, unscrew one bulb and record what happens.</p> <p>Screw the bulb back on, what happens?</p>	<p>d. Using one light bulb and a switch, make one bulb turn on and off with the switch.</p>

<p>e. using 2 bulbs, batteries, 1 switch, and some wires, make 2 light bulbs light up and turn off at the same time with the switch.</p>	<p>f. using 3 bulbs, batteries, and 1 switch, make 3 light bulbs light up and turn off at the same time with the switch.</p>
<p>g. With 3 light bulbs and a switch, can you make 1 or 2 light bulbs light up and not the other(s)? Why/Why not?</p>	<p>Explain what makes a circuit closed or open.</p>

Parallel Circuits: Remember to draw your circuits after your teacher has checked to see if your circuit works.

h. Using 2 bulbs, batteries, and some wires, **make 2 light bulbs light up**. After they are lit, unscrew one bulb, what happens? If both lights go out, try the circuit again.

i. Make 3 light bulbs light up. Unscrew one bulb, what happens to the other 2? Unscrew 2 bulbs, what happens to the 3rd bulb?

j. Make 2 light bulbs **turn on and off** at the **same time** with a switch.

k. Make 1 light bulb **turn on and off** with a **switch** while the other bulb stays lit.

<p>l. Challenge: Make 2 light bulbs turn on and off with a switch while the 3rd bulb stays lit.</p>	<p>m. Challenge: Using 2 switches and 3 bulbs, what other combinations can you make?</p>
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Conclusions:

1. Describe the differences between a **closed** and **open** circuit.

2. What do you notice about the **brightness** of the bulbs in the **series** circuits as you added more bulbs to it?

3. What do you notice about the **brightness** of the bulbs in the **parallel** circuits as you added more bulbs to it?

4. How does removing a bulb or opening and closing the switch affect a **series** circuit?

5. How does removing a bulb or opening and closing the switch affect a **parallel** circuit?

6. Look at the diagrams below and label all the parts and tell if each is a series or parallel circuit:

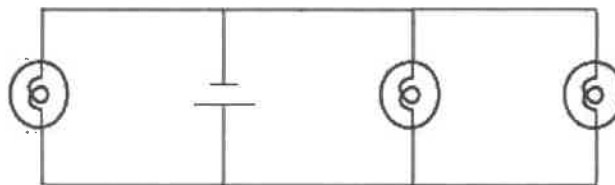
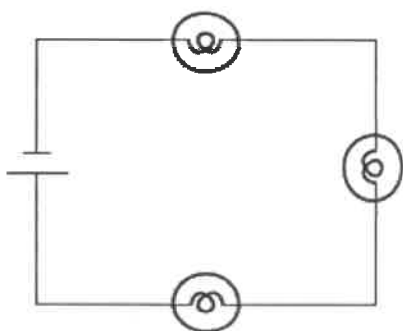


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