Science – Electricity and Magnetism

I can Demonstrate that a continuous LOOP of conducting material is needed for an uninterrupted flow of current in a circuit.

New Vocabulary:

Current electricity circuits closed circuit open circuit series circuit parallel circuit

How did you do?

Understanding at a:

EG – Excellent Level

CG – Grade Level

AG – Approaching Grade Level

NG – Not yet a t Grade Level

CURRENT ELECTRICITY AND CIRCUITS

1. Current Electricity

Current electricity is electricity that is moving or flowing in wires. Current electricity is much more useful than static electricity and is used to operate all of our electrical appliances. Current electricity always moves in circuits. Everyday examples of current electricity are:

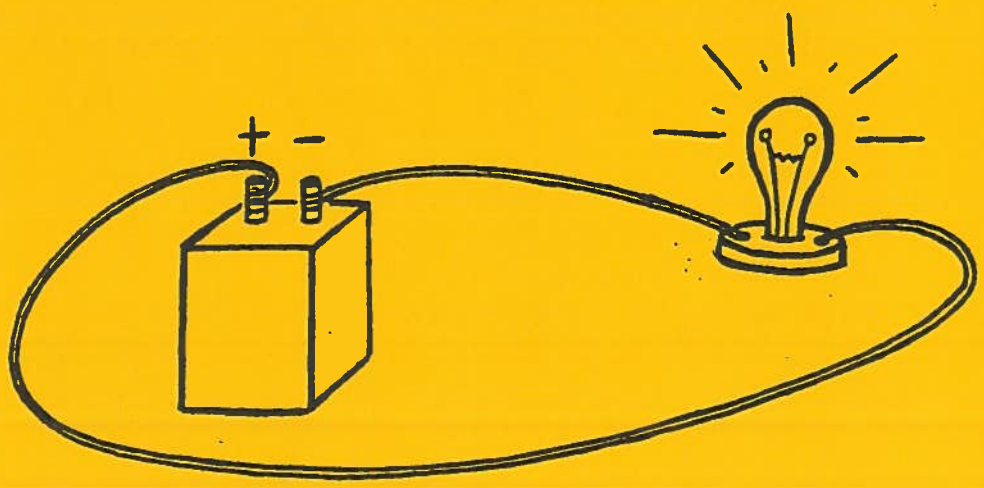
1) electricity used to make a lightbulb shine
2) electricity used to start a vehicle
3) electricity used to run a stereo system.

2. What Are Circuits

A circuit is an unbroken pathway along which electrons can flow. (Circuit comes from the word "circle") If there is a break in the pathway, the electricity will stop.

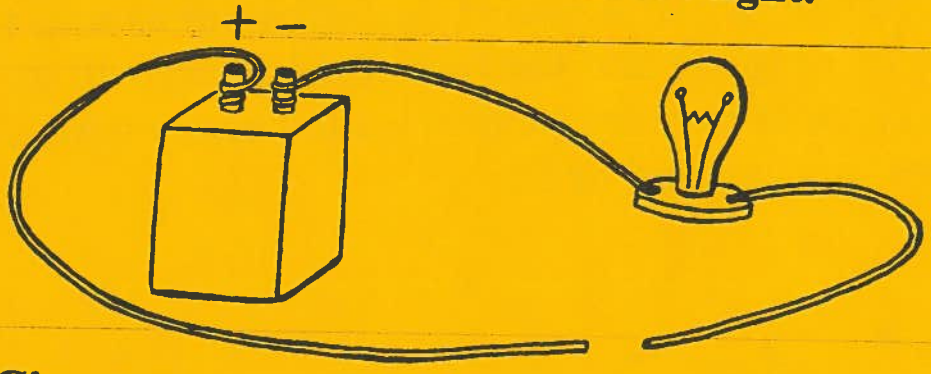
Complete Circuit

The electrical current flows in a complete circle. It flows from the battery, through the light, and back to the battery - a complete circuit.



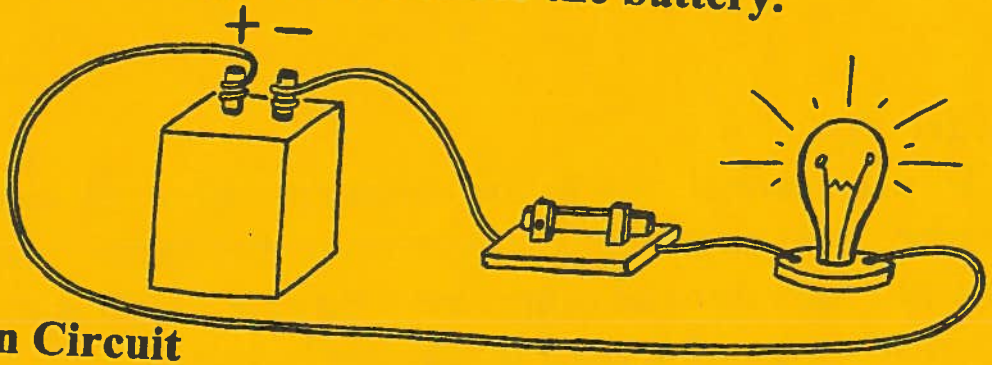
Incomplete Circuit

The path for the electricity to flow has been broken. The electricity will stop and the bulb will not light.



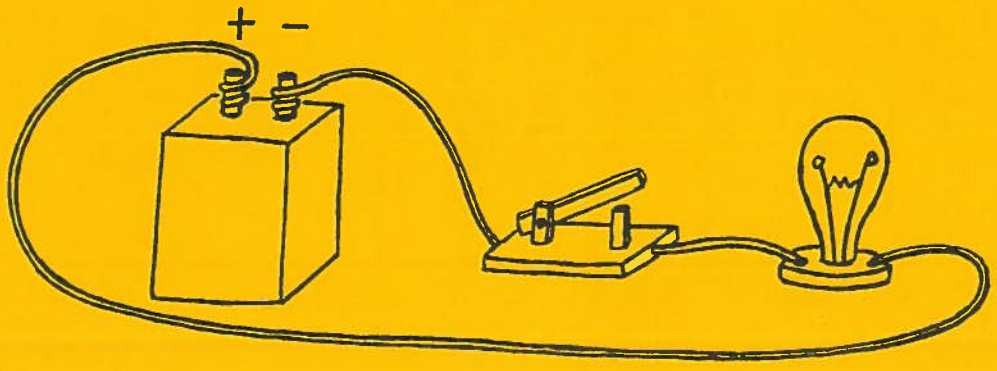
Closed Circuit

A closed circuit is an example of a complete circuit except that a switch has been added. When the switch is closed, the current flows from the battery, through the closed switch, through the light and back to the battery.



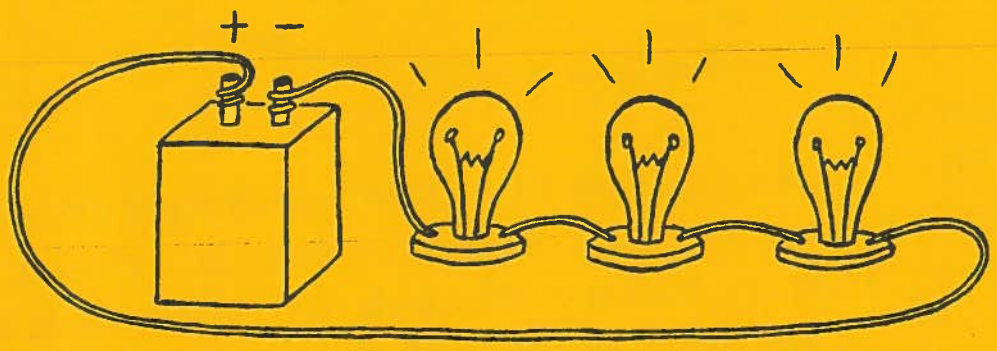
Open Circuit

In this case the switch is open and the circuit is incomplete. The electricity will stop and the bulb will not light.



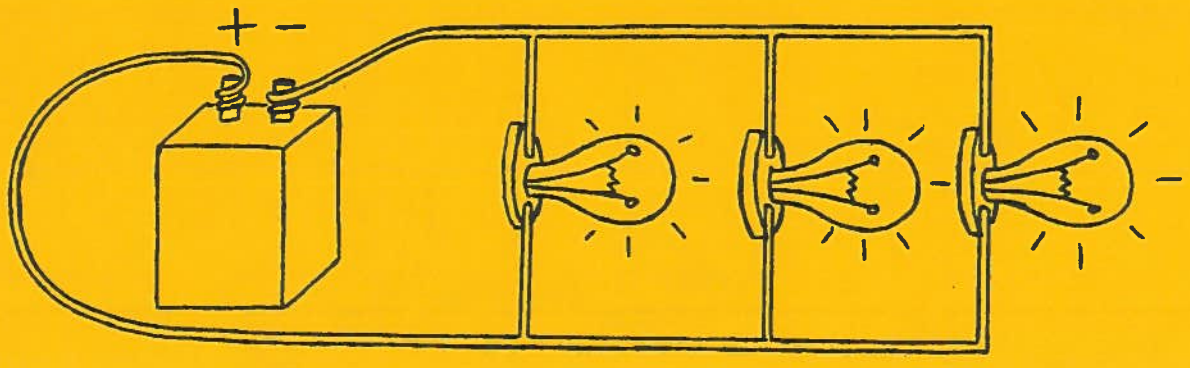
Series Circuit

If there are two or more lights hooked together, one after the other like a train, they are in series. The main problem in a series circuit is that if one of the bulbs burns out, the circuit will be incomplete and the rest of the lights will go out. Series circuits can also be overloaded easily which can lead to wires melting and fires.



Parallel Circuit

Parallel circuits have all the bulbs connected directly to the power source. All the bulbs will turn on at the same time but if one bulb goes out the others will stay lit. This is a safer way of wiring and is used in all new houses.



Name: _____

Electricity

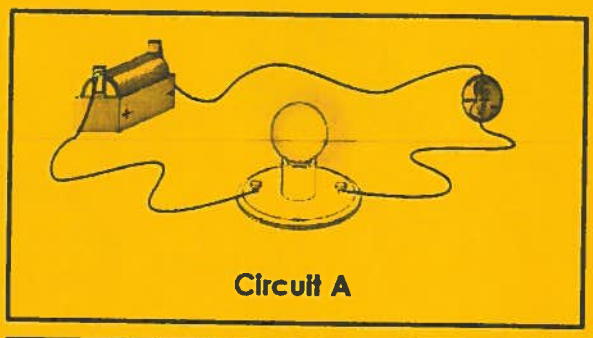
Choose the best answer for each question. Write the letter on the line.

_____ **1.** What supplies energy in an electric circuit?

a. a conductor **b.** light bulb
c. a wire **d.** a battery

_____ **2.** Which material is a conductor?

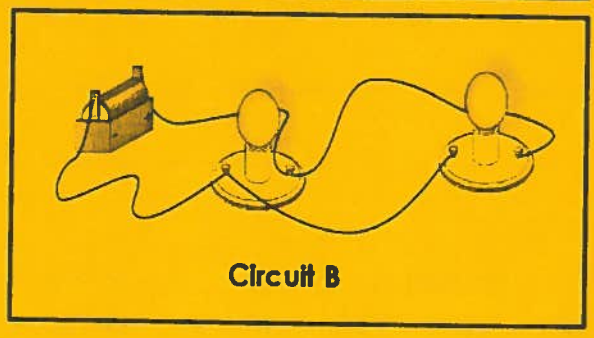
a. plastic **b.** silver
c. glass **d.** wood



Circuit A

_____ **3.** Which type of circuit is Circuit A?

a. series **b.** parallel
c. perpendicular **d.** current



Circuit B

_____ **4.** Which item is a resistor in Circuit B?

a. light bulb **b.** wire
c. battery **d.** screws

_____ **5.** Why did the person who made Circuit A probably connect the wires to a penny?

a. They needed to use a penny to make the bulb light.
b. They were testing to see if the penny conducts electricity.
c. They used the penny to supply extra power.
d. The penny will prevent sparks.

_____ **6.** Which of these could be used as a resistor in a circuit?

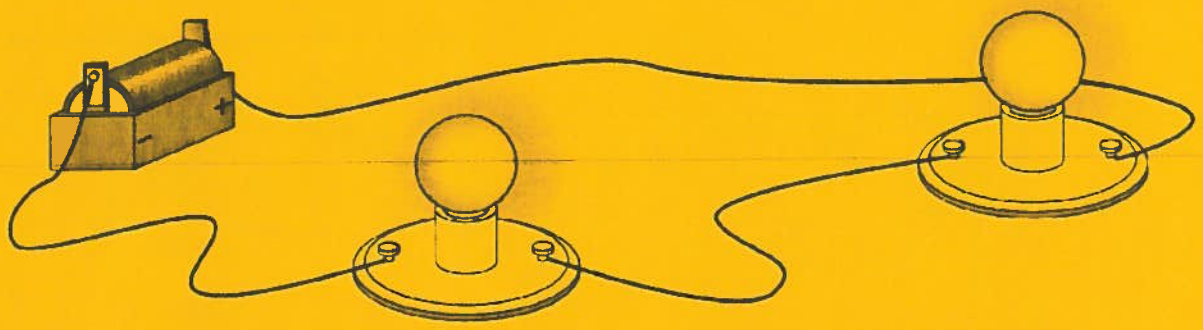
a. a pencil
b. a gas engine
c. a rubber eraser
d. an electric motor

Name: _____

Series and Parallel Circuits

In a **series circuit** electric current has only one path to follow. All parts are connected one after another. Electric current flows from the negative side of the battery around in a loop to the positive side.

Draw arrows to show the path of electric current in this series circuit.



If a light bulb is missing or broken in a series circuit, will the other bulb light? Explain.

_____

_____

In a **parallel circuit**, electric current has more than one path to follow. The electric current can follow different paths as it flows from the negative side of the battery to the positive side.

Draw arrows to show the different paths electric current can travel in this parallel circuit.

If a light bulb is missing or broken in a parallel circuit, will the other bulb light? Explain.

_____

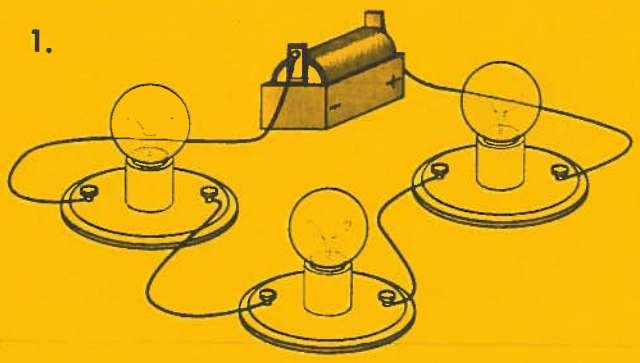
_____

Name: _____

Series & Parallel Circuits

Tell whether each picture shows a **series circuit** or **parallel circuit**.

1.



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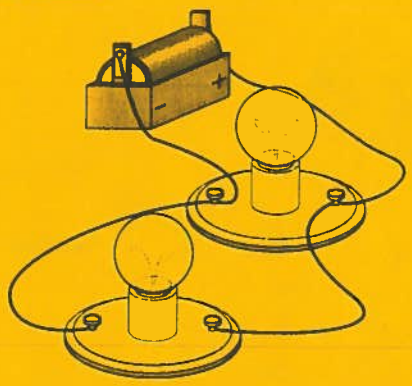

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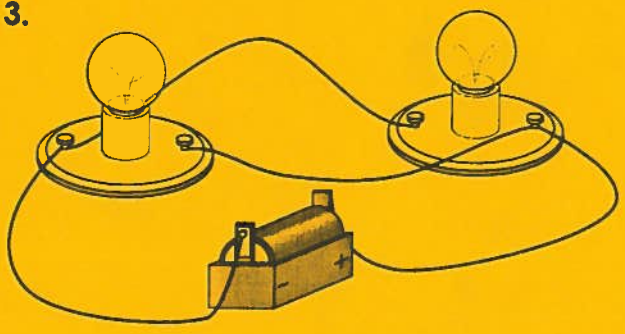

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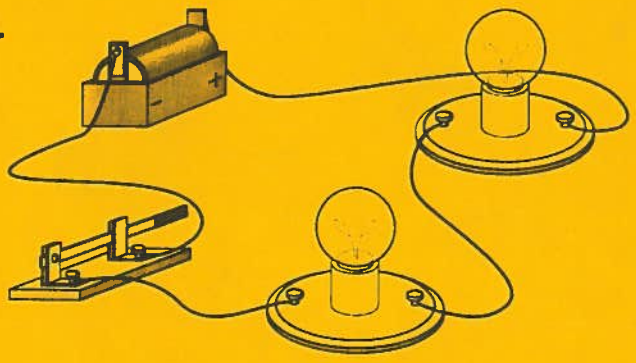

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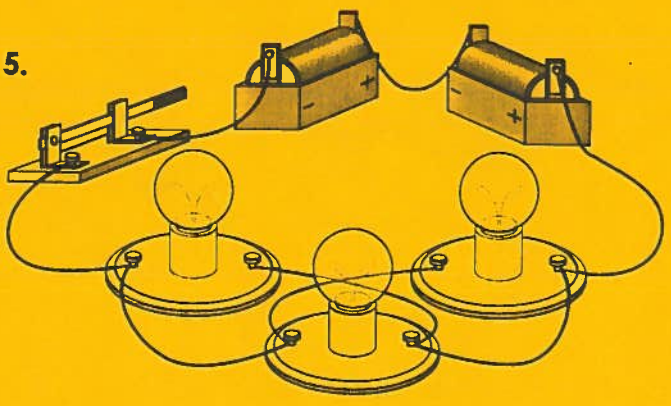

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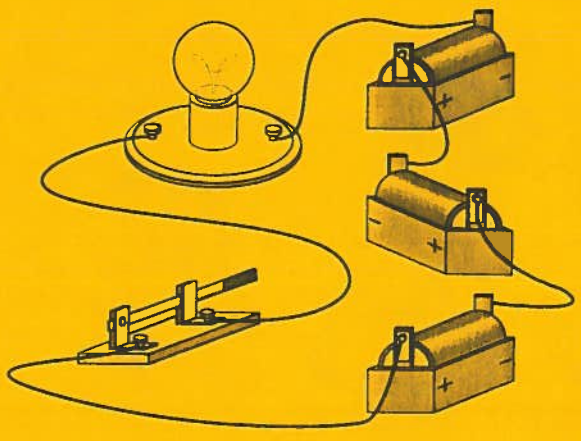

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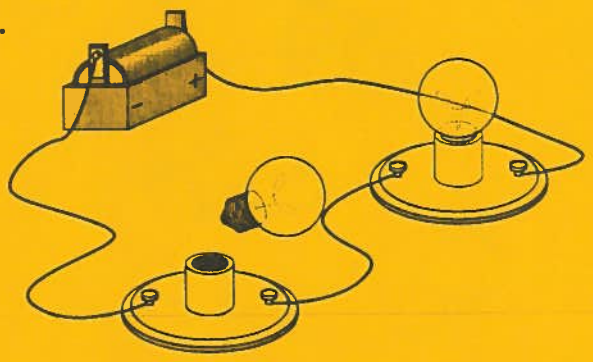
Electrical Circuits

Tell whether the light bulb or bulbs **will light** or **will not light** based on the circuit.

1.



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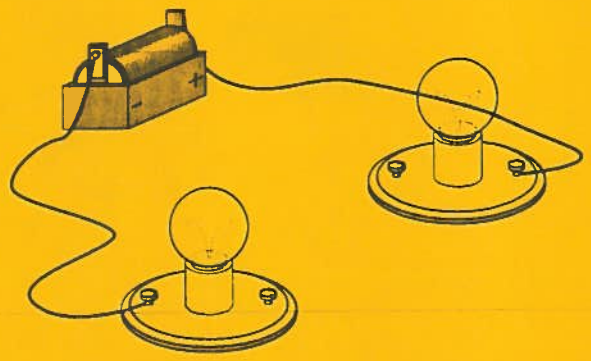

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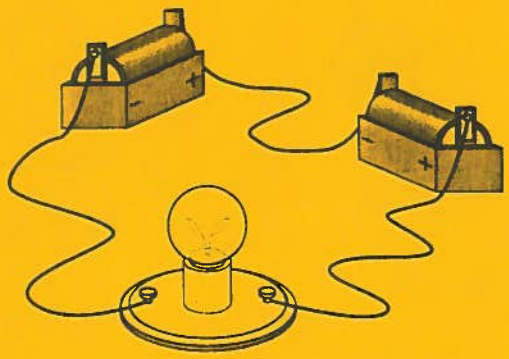

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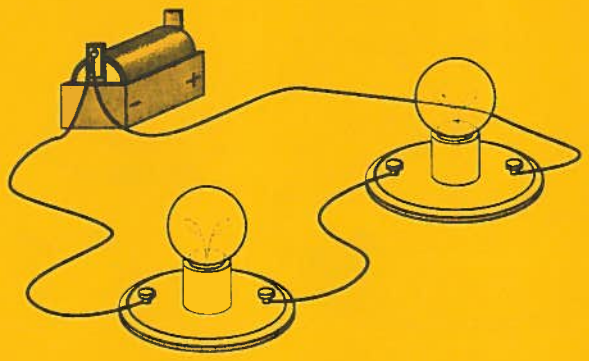

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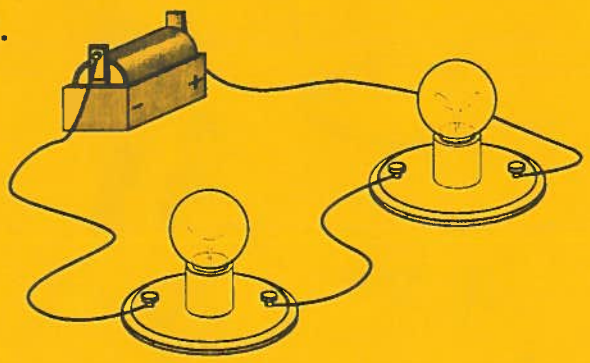

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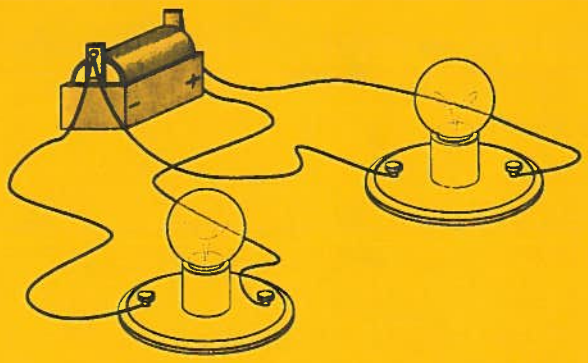

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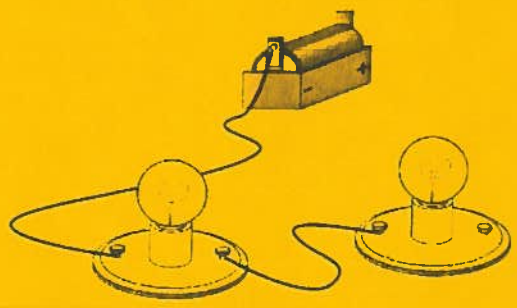
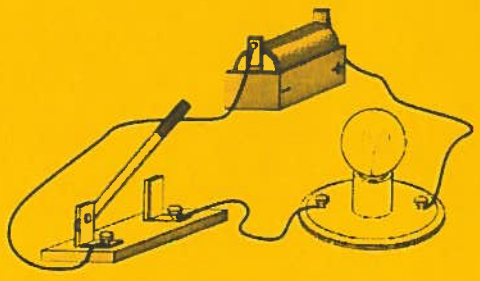
Name: _____

What's Wrong With These Circuits?

1. Explain why the light bulbs won't light in the circuit pictured on the right.



2. Explain why the light bulb isn't lighting up in the circuit pictured on the right.



3. Explain why the light bulb isn't lighting up in the circuit pictured on the right.