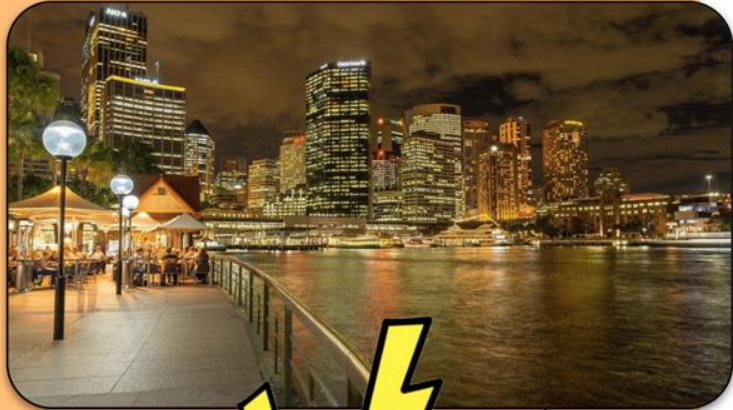




# ELECTRICAL CIRCUITS

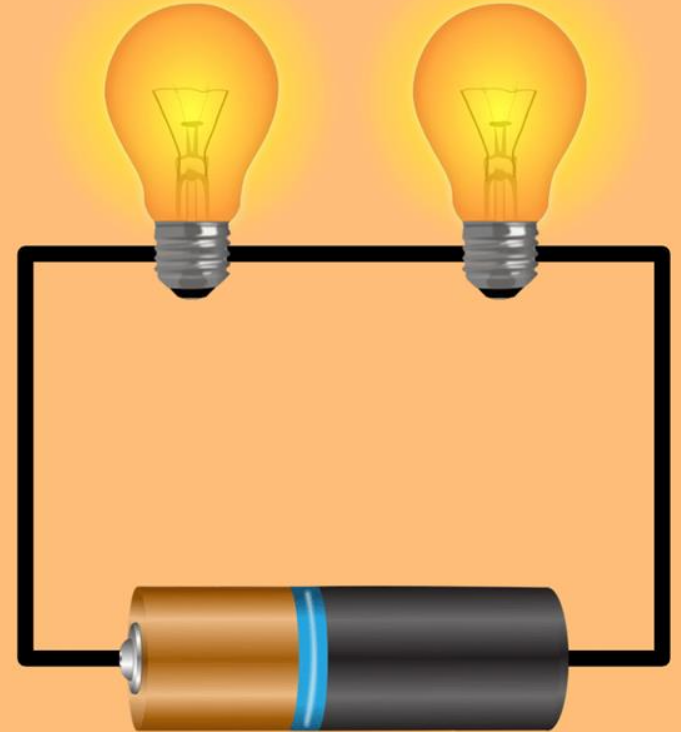
# CURRENT ELECTRICITY



- Electricity can either be **static** or **current**.
- Electricity that moves from one place to another is called **current electricity**.
- In contrast, **static electricity** is electricity that gathers in a single location.

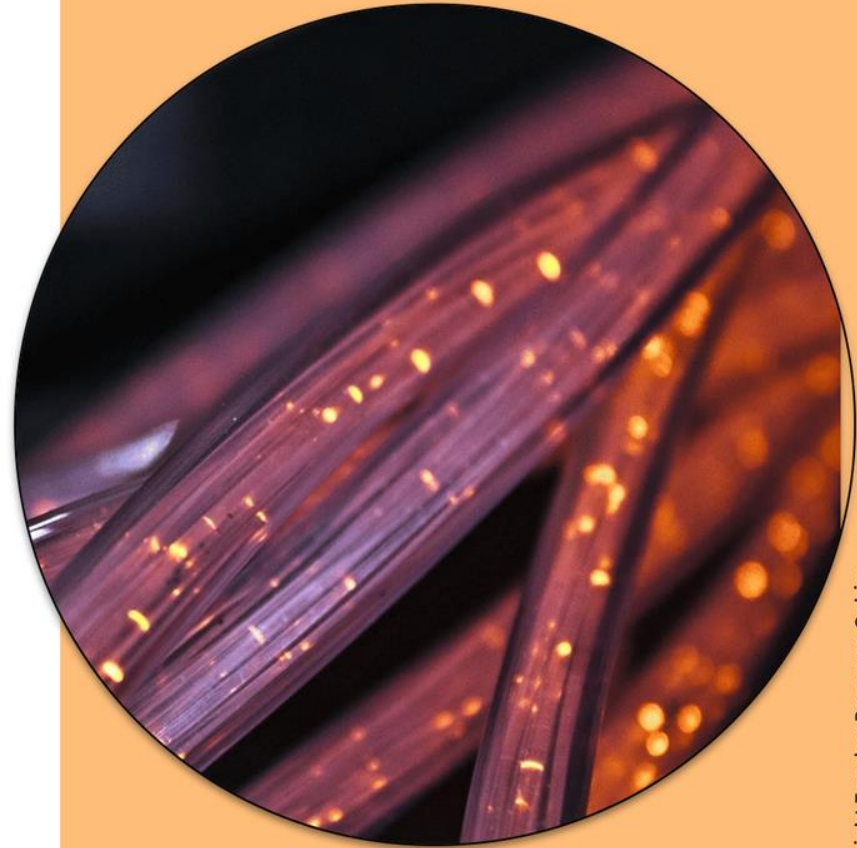
# CURRENT ELECTRICITY

- **Current electricity** is electricity that has been made or controlled by humans.
  - Relies on a material that can move an electrical charge
- A material that is able to carry an electrical charge is known as a **conductor**.



# CURRENT ELECTRICITY

- An **electrical current** refers to the movement of electrons within the circuit.
- Electrical currents have a **battery** that provides the **power for the circuit**.
  - The electrons flow from one side of the battery to the other.



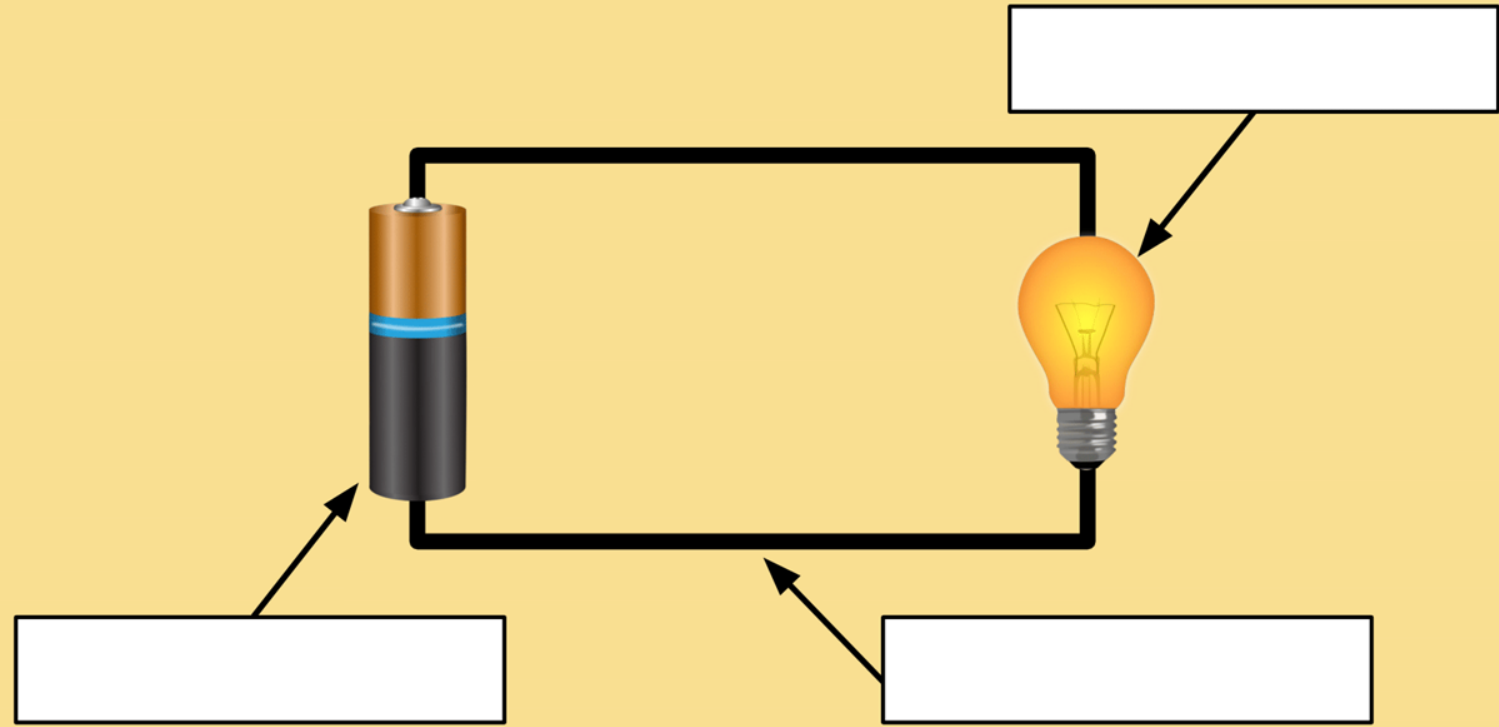
# CURRENT ELECTRICITY

A **simple circuit** has three basic components:

- **Power Source**: The power source is where the energy in the circuit comes from.
- **Load**: The load is the thing in the circuit that is using the electricity.
- **Conductor**: The conductor is the material that is used to connect the power source to the load and the load back to the power source again.



Use the Word Bank to label the circuit below.



Word Bank		
Load	Power source	Conductor



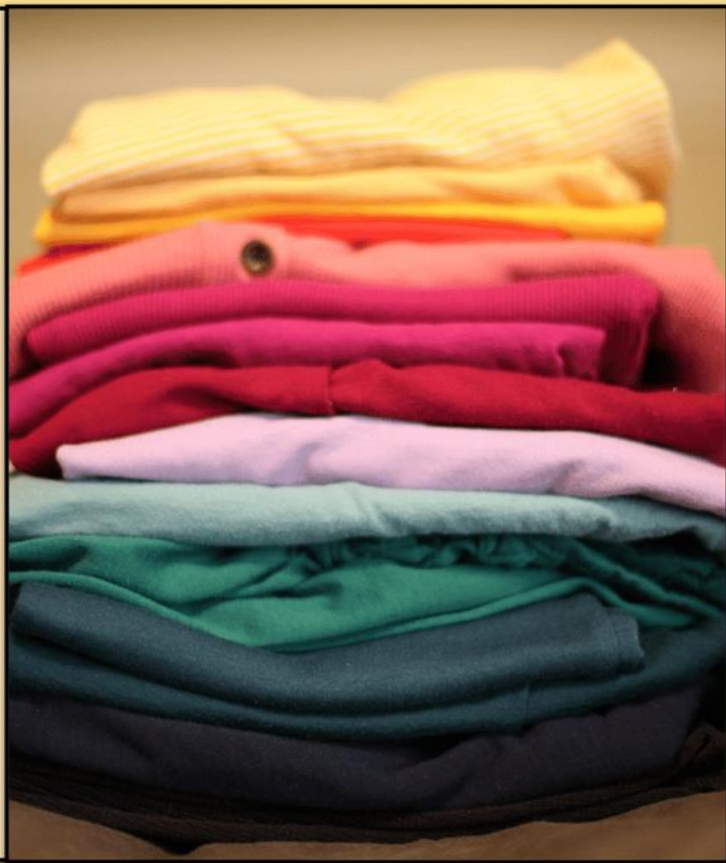
How is current electricity different from static electricity? Give an example of each.



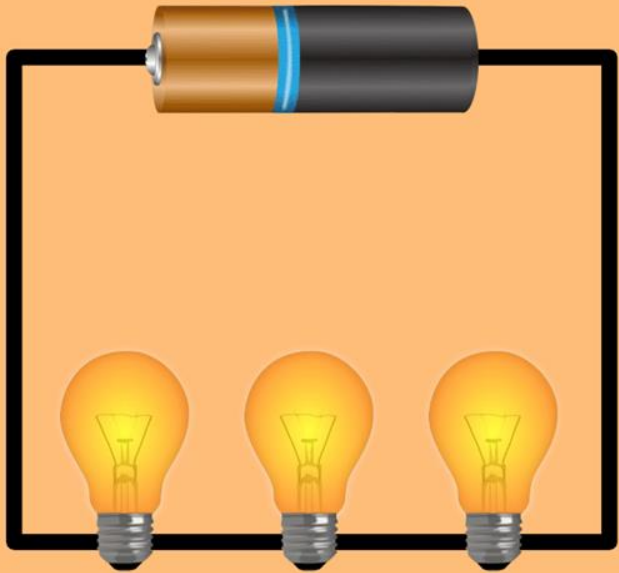


Suppose you feel a “zap” while putting away your clean laundry. Explain the science behind what you just experienced.

A “zap” from clean laundry is caused by...



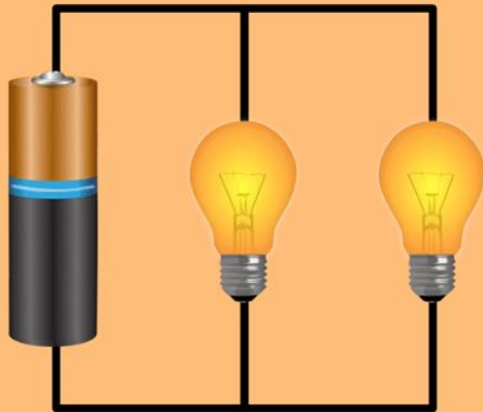
# SERIES CIRCUITS



- The two basic types of circuits are **series** and **parallel**.
- A **series circuit** is a circuit that has more than one load, but **only one path** that the electrons flow through.
  - If there is a break in the path, the circuit will not work.



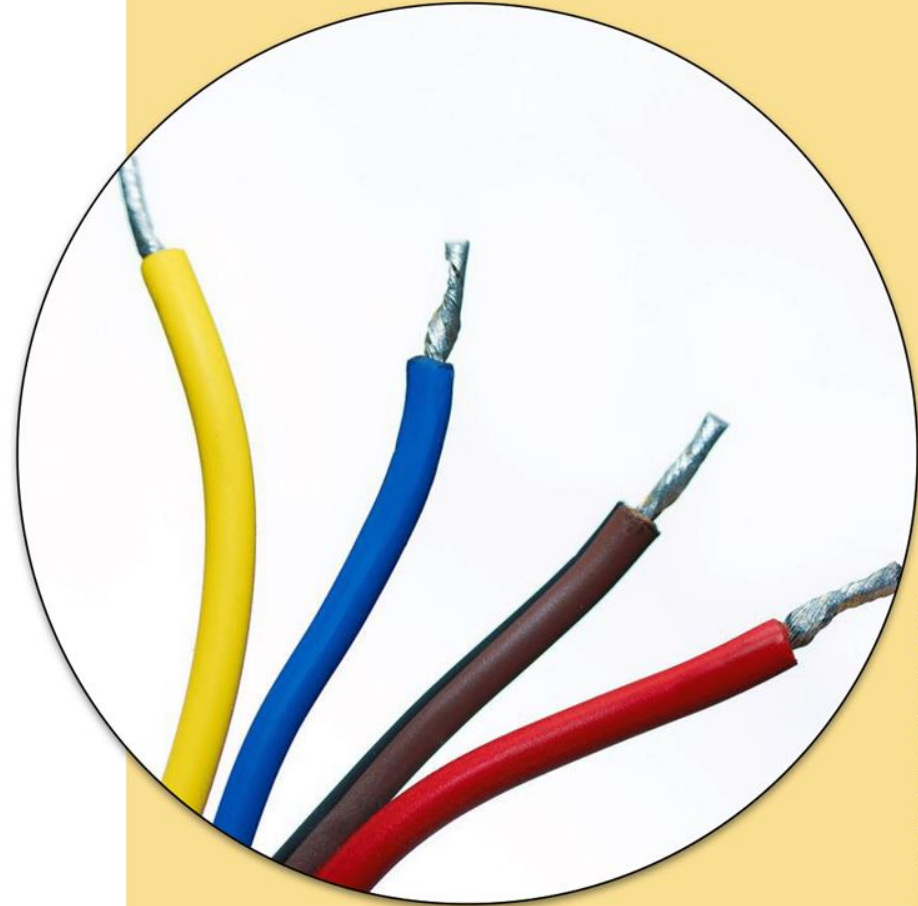
# PARALLEL CIRCUITS



- A **parallel circuit** has more than one load and **has multiple paths**.
  - Electrons can travel from one end of the cell to another through various branches.
- The electricity in a house runs on a parallel circuit.
  - **Example:** If one light bulb burns out, the rest of the electricity in the house still works.

# CONDUCTORS

- An **electrical conductor** is a material which electricity **can flow** through.
- Electrical conductors are used as **wires** in circuits to carry an electrical current.



# CONDUCTORS

- Most metals are conductors.
  - Copper and iron are both metals that are good conductors.
  - Silver is the most conductive element.
- Water is also a good conductor, particularly when it has high mineral content.



# RESISTORS

- **Resistors** are materials with properties that make it **difficult for electricity to flow** through them.
- **Examples:** Steel and carbon



# INSULATORS

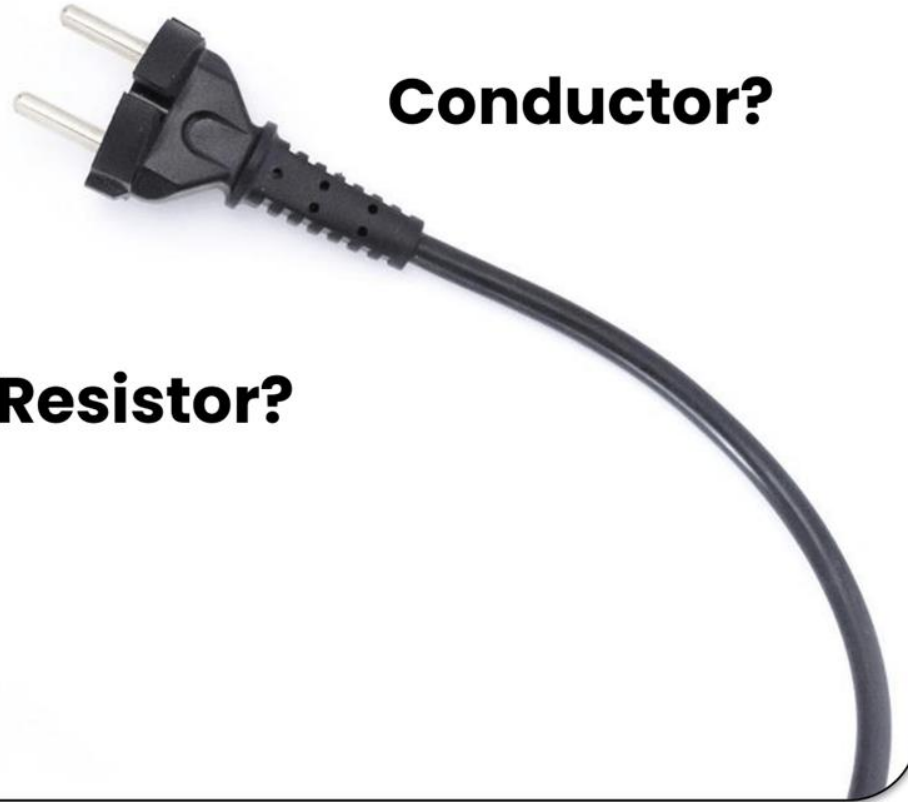
- Materials that **completely stop** an electrical flow are called **insulators**.
  - **Examples:** Plastic, rubber, ceramics, and glass
- Electrical wires are covered with an insulating material to prevent electricity from leaving the wire.





What do you think is the material inside electrical wires?  
Why?

**Insulator?**

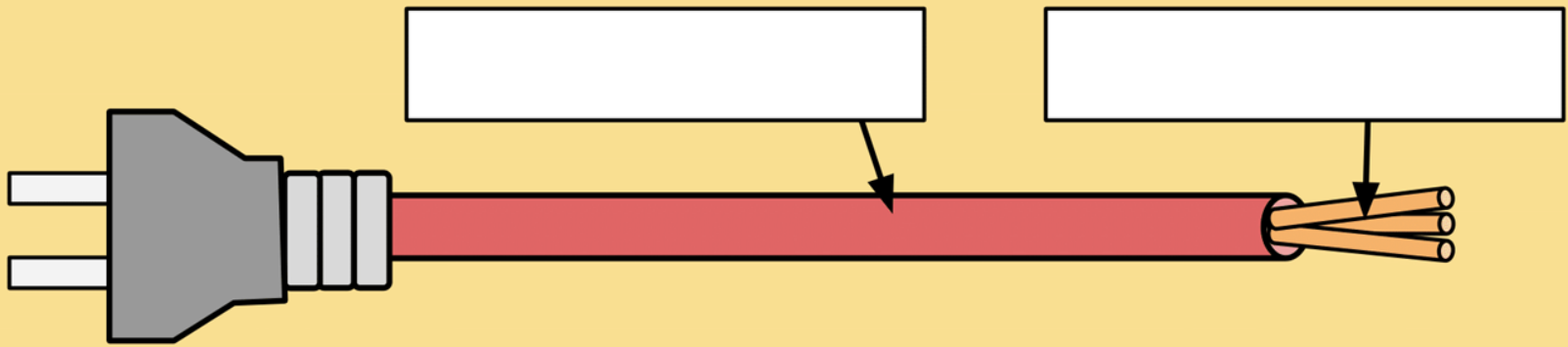


**Conductor?**

**Resistor?**



Label the copper and plastic in the wire diagram.

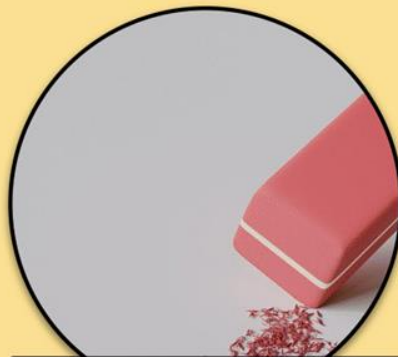


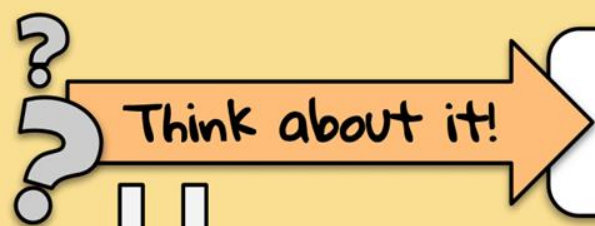
What safety hazards could be present if an insulator is not wrapped around a conductive wire?



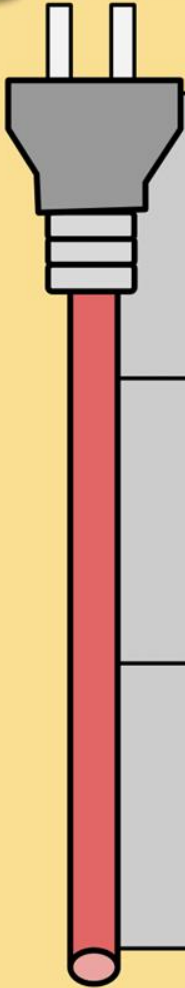
Think about it!

Label each item as a conductor or an insulator.





Write the definition for each word below.



**Conductor**

**Resistor**

**Insulator**



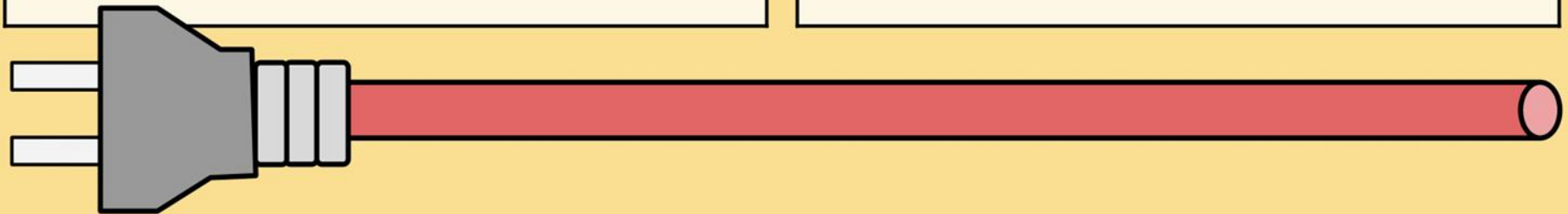

Describe different applications where it would be beneficial to have conductors or insulators.

**Using conductors...**

Blank space for writing applications of conductors.

**Using insulators...**

Blank space for writing applications of insulators.





Can you think  
of any devices  
that utilize  
series circuits?

