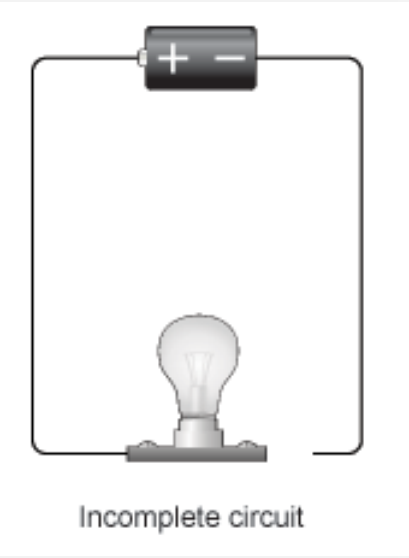
18.4

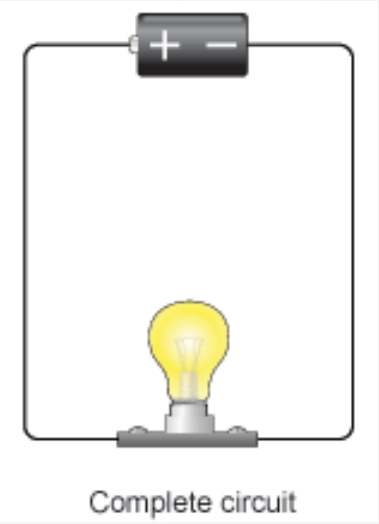
Electrical Circuits

Electrical Circuits

- An electric circuit is a complete path through which a charge can flow.
- For the charge to flow, the path must be a complete loop.



Incomplete circuit



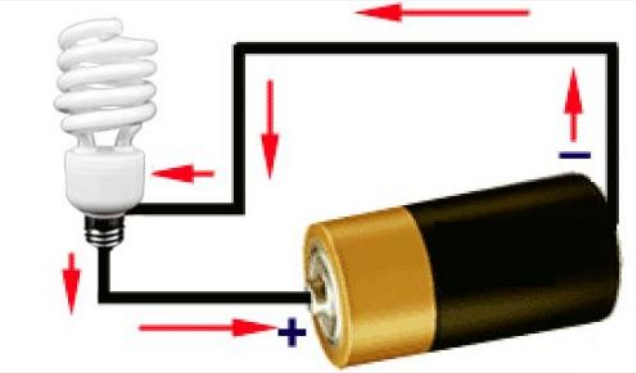
Complete circuit

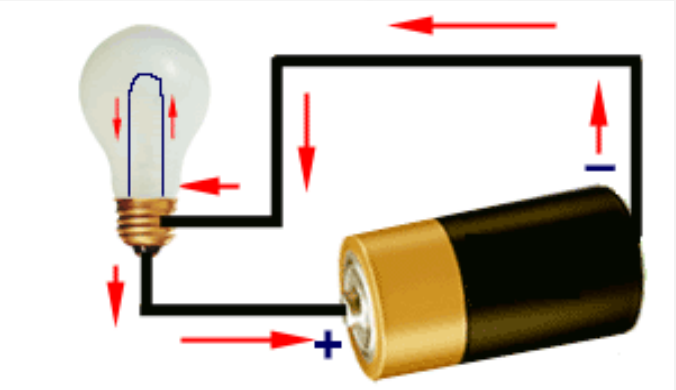
Circuit Diagram

- Circuit diagrams use symbols to represent parts of a circuit, including a source of electrical energy and devices that are run by the electrical energy.
- In a simple circuit a battery provides the energy to operate a device such as a bell or a light bulb.
- A circuit diagram shows the possible complete paths in which charge can flow.

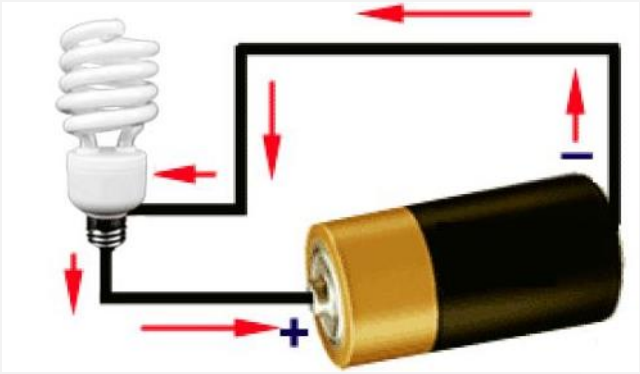
Circuit Diagram

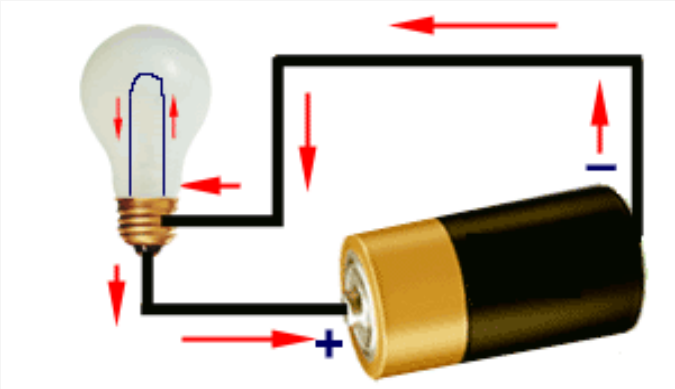
In the figure below, show an electrical circuit. The "+" and the "-"on the battery indicate the positive and negative terminals. Arrows show the direction of current, from negative to positive. (Remember; the charge flowing thru the circuit is the electrons which has a "-"charge.)

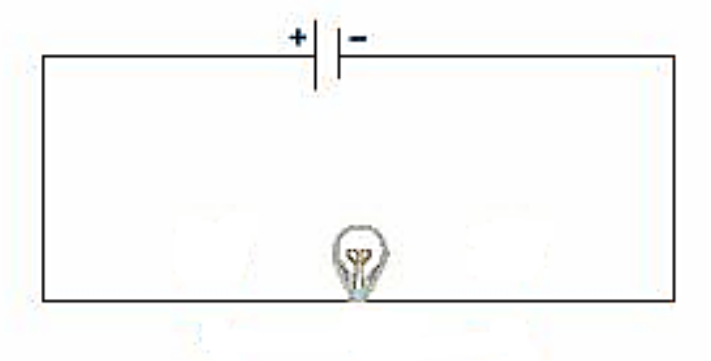




Circuit Diagram







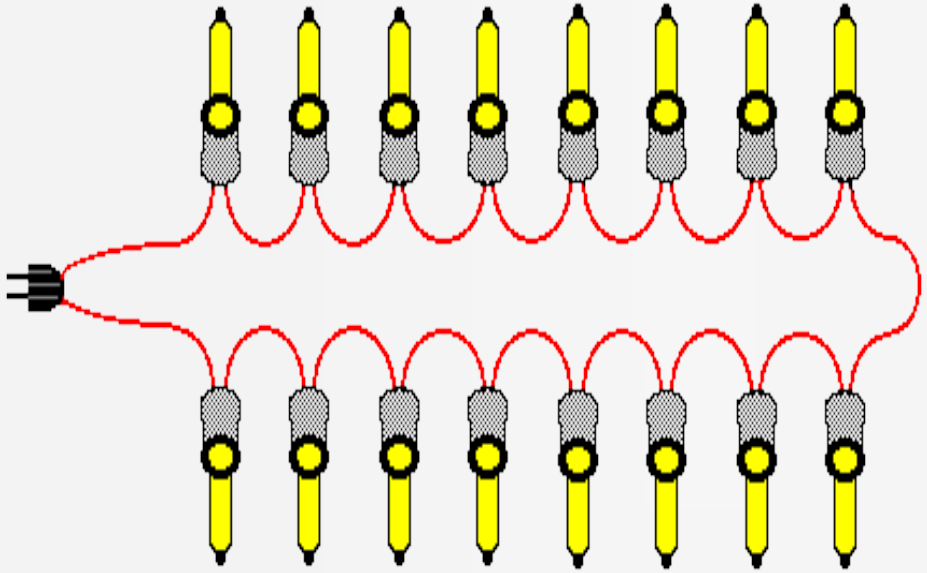
Series Circuits

- In a series circuit, charge has only one path through which it can flow.
- If one element stops functioning in a series circuit, none of the elements can operate.

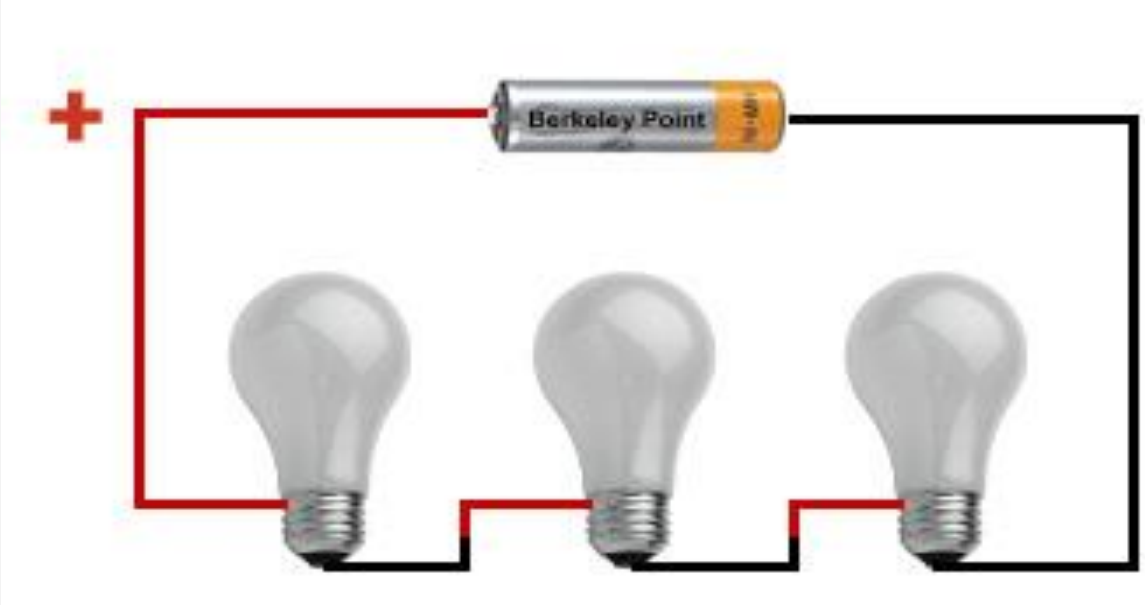
Series Circuits

Example:

Old Christmas Tree Lights



Series Circuits



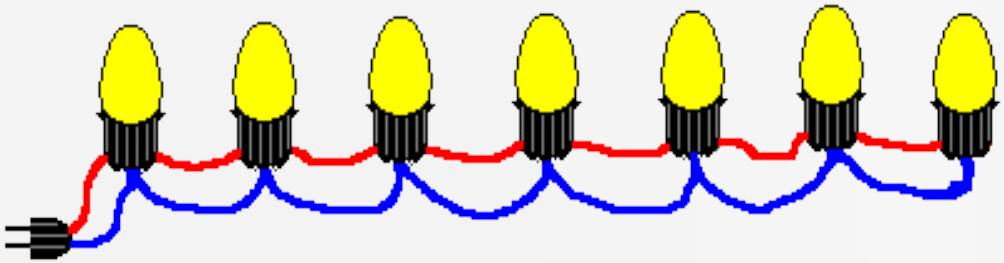
Parallel Circuits

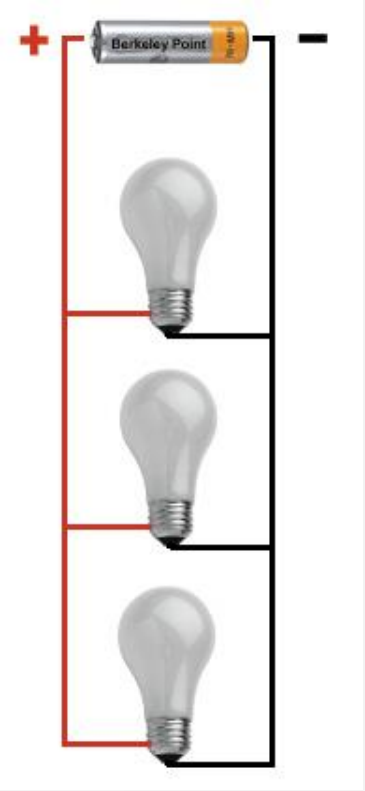
- In a parallel circuit, electric charge has more than one path that it can flow
- If one element stops functioning in a parallel circuit, the rest of the elements still can operate.

Parallel Circuits

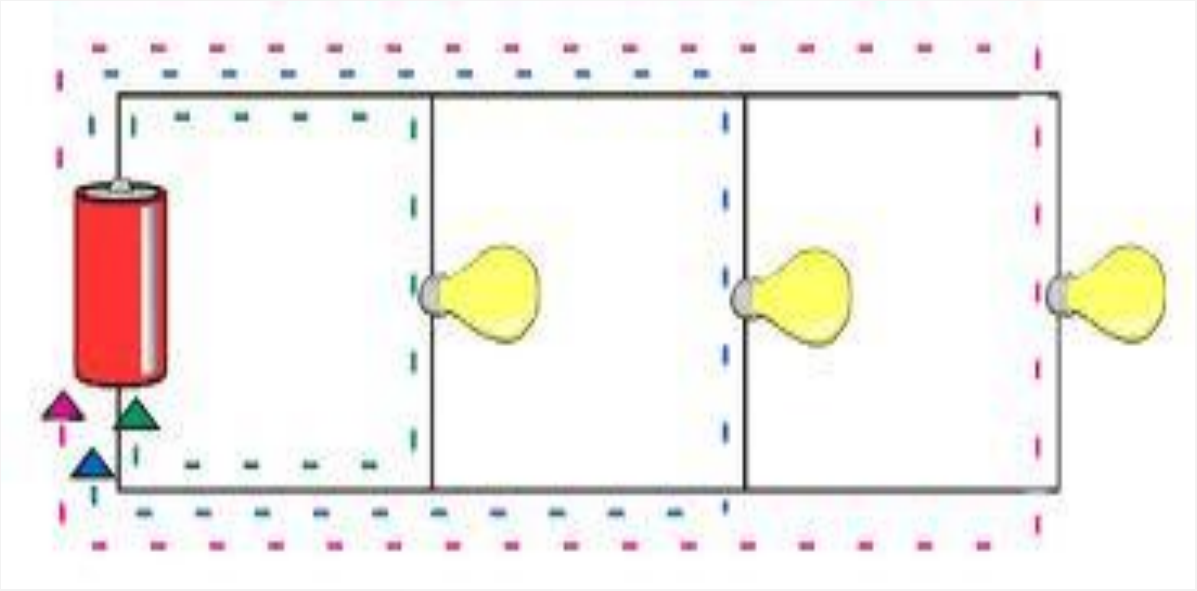
Example:

New Christmas Tree Lights

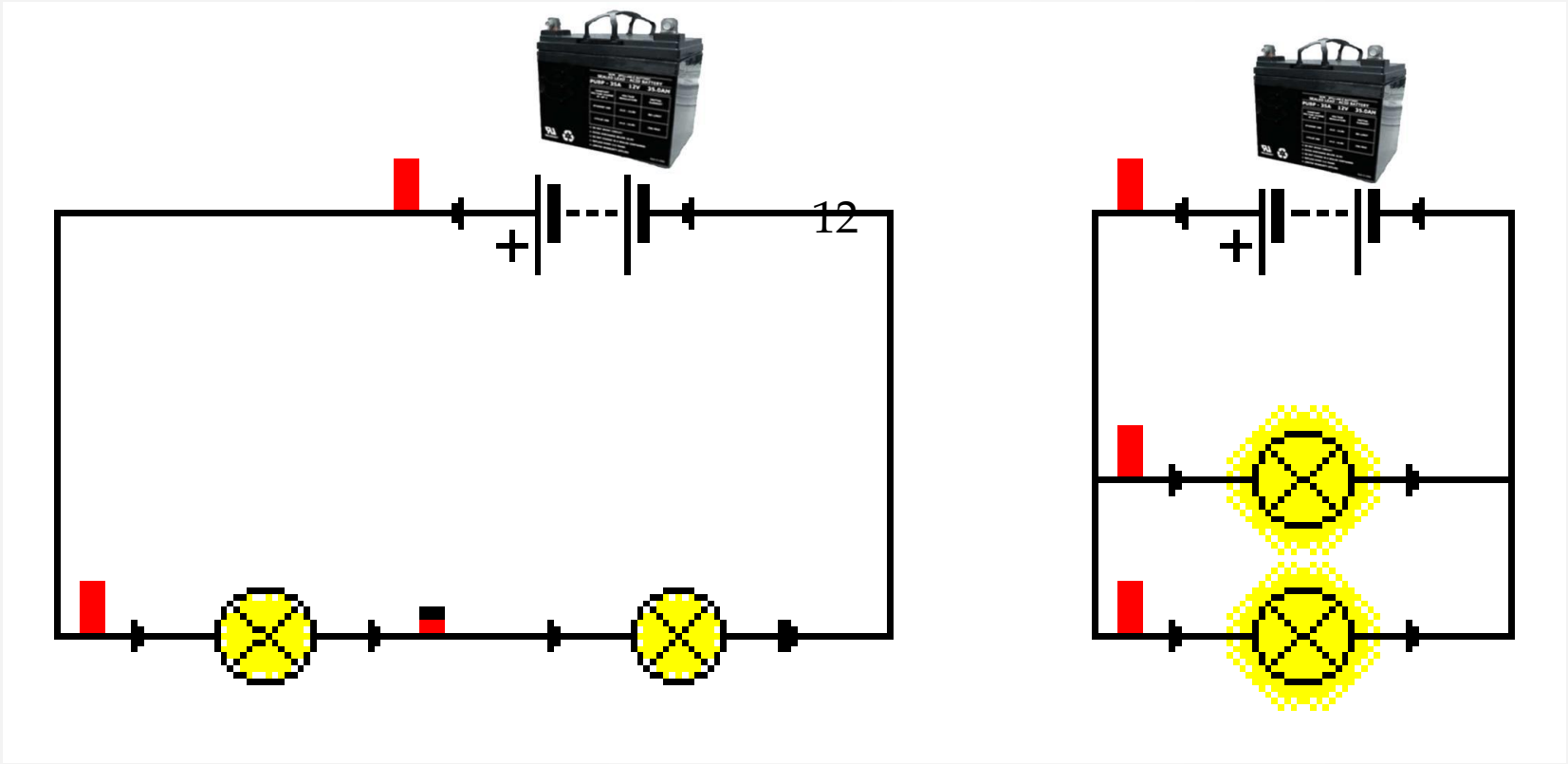




Parallel Circuits



What kind of circuit?



CONCEPT CHECK

What is the difference between a series and parallel circuit?

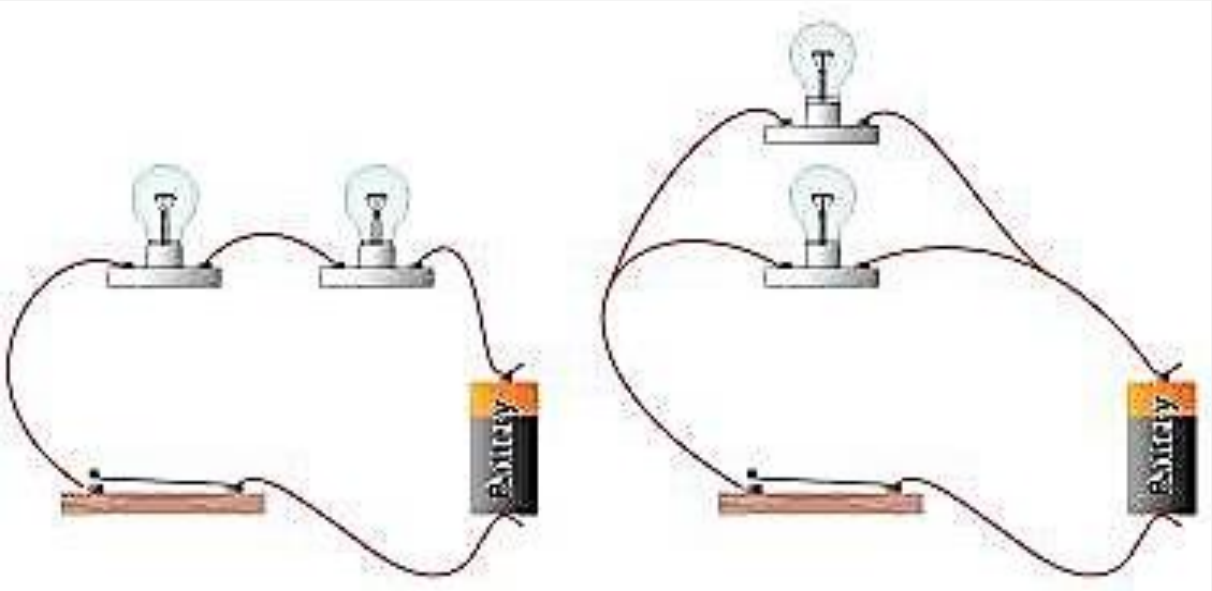
***Series*: Only one path for the current to flow**

***Parallel*: More than one path for the current to flow.**

18.4 Assessment

Question #1

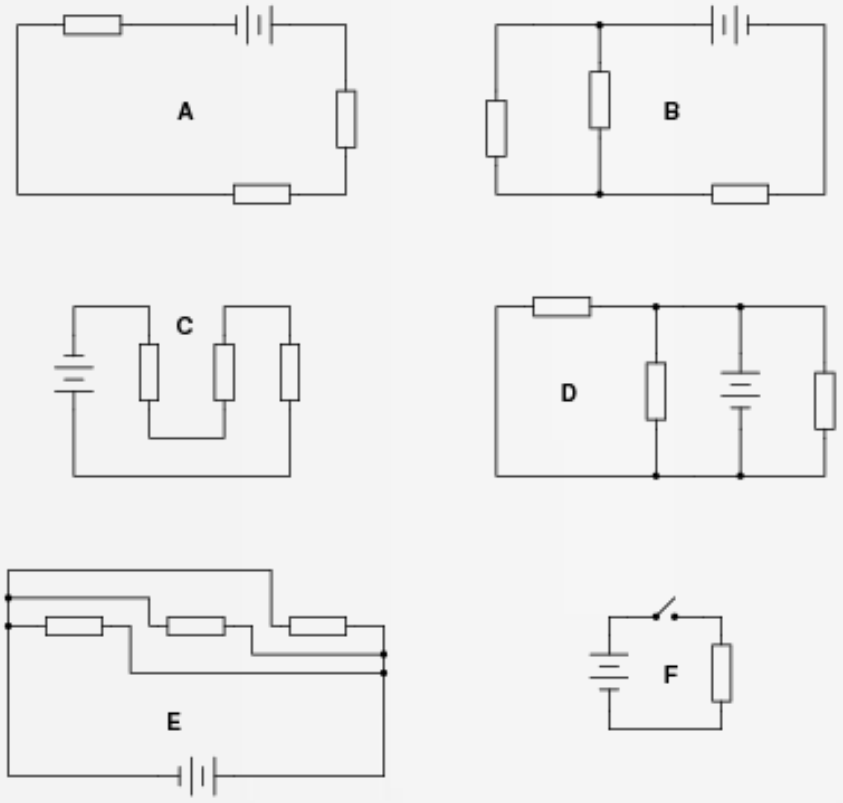
Identify each circuit as either a series circuit or a parallel circuit.



18.4 Assessment

Question #2

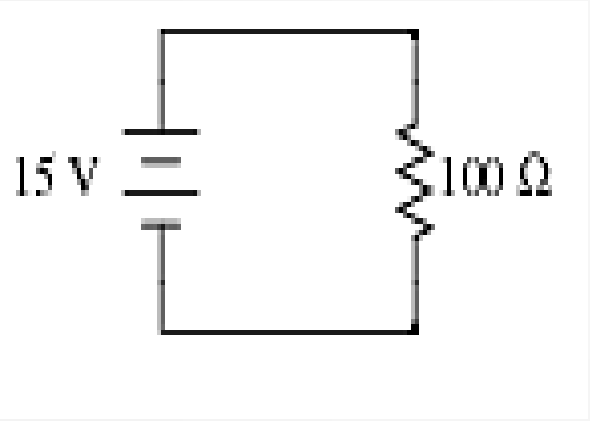
Identify each circuit as either a series circuit or a parallel circuit.



18.4 Assessment

Question #3

a. Identify the type of circuit
b. Using Ohm's Law, calculate the current in the circuit.



18.4 Assessment

Question #4

Name two elements that are included in a circuit diagram.

18.4 Assessment

Question #5

What is needed to make charge flow through a circuit?

18.4 Assessment

Question #6

Identify which of these components are connected directly in series with each other, and which are connected directly in parallel with each other

Figure 1

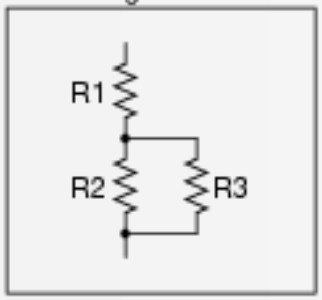


Figure 2

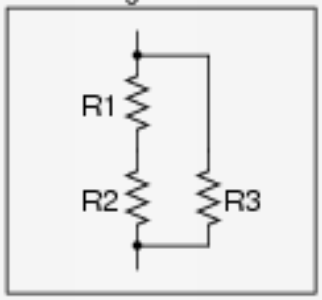


Figure 3

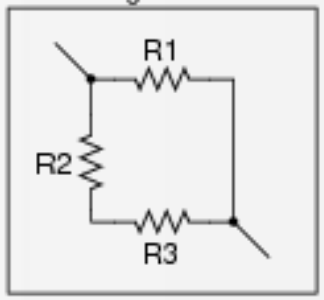


Figure 4

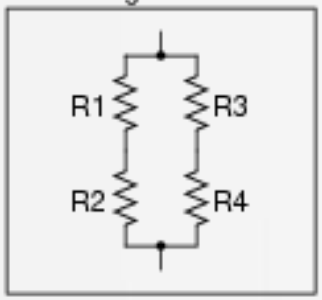


Figure 5

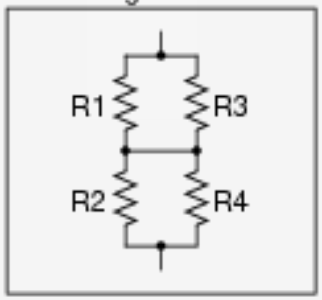
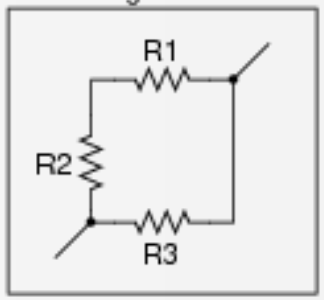


Figure 6



18.4 Assessment

Question #7

Draw a simple series circuit.

18.4 Assessment

Question #8

Draw a simple parallel circuit.