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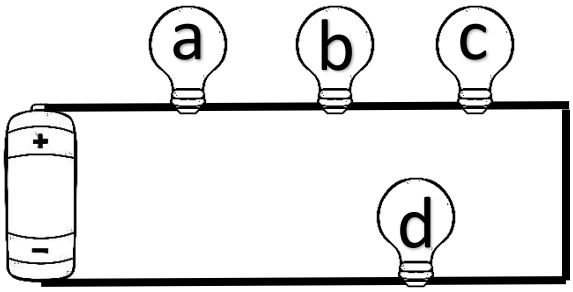
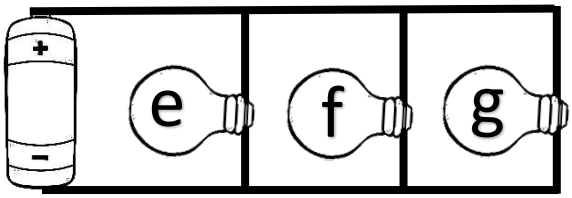
Series & Parallel Circuits

Name:_____ Date: _____





_____ _____

Directions: Answer the following questions about the circuits above.

1. Label each circuit as series or parallel.
2. If bulb A burns out, will bulb d still light? _____
3. If bulb f burns out, will bulb g still light? _____
4. If bulbs a, b, & c burn out, will bulb d still light? _____
5. If bulbs e & f burn out, will bulb g still light? _____
6. If bulb e burns out, will bulb g burn brighter? ___
7. If bulb a is removed and the circuit is reconnected, will bulbs b, c, and get burn brighter than they did when bulb A was in the circuit? _____
8. If another bulb is added to the series circuit, will bulbs a, b, c, and d get brighter? _____
9. If another bulb is added to the parallel circuit, will bulbs e, f, and g burn brighter? _____
10. If the voltage of the battery in the series circuit is 30V. How much voltage is each bulb receiving? _____
11. If the voltage of the battery in the parallel circuit is 30 V, how much voltage is each bulb receiving?_____
12. Would a series or parallel circuit be better for wiring a house? Why? _____

Series vs. Parallel Circuits

Name:_____ Date: _____

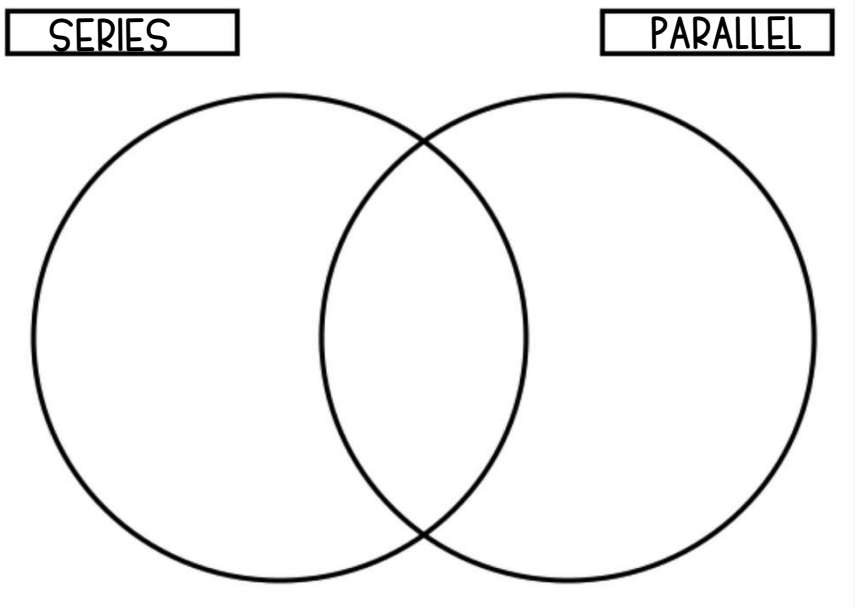
Electric circuits create paths for electricity to flow and can be set up in two basic ways. In a **series circuit**, the devices are connected one after the other, and current flows in only one path. In a **parallel circuit**, devices are connected so that current flows in a separate path to each device.

In a series circuit, all of the devices must be "on" in order for current to flow. If you switch off one of the devices, the circuit is open and current will not flow. If a string of lights is wired in a series circuit, all of the lights will go out if one bulb is broken or missing.

In a parallel circuit, each device has its own path for the current and sometimes its own switch. Houses and other buildings are usually wired with parallel circuits. This means you can turn off the lights and still watch TV or make microwave popcorn!

Both types of circuits require a power source, conductive material for electrons to flow, and a load (device that converts electrical energy into another form of energy), such as a light bulb.

Part A: Compare and contrast series and parallel circuits using the information above. Then, complete the Venn diagram.



Part B: Answer the questions below.

1. Explain why a light bulb works in a closed circuit but does not work in an open circuit.

_____

_____

2. List an example of something that might be wired in a series circuit. _____

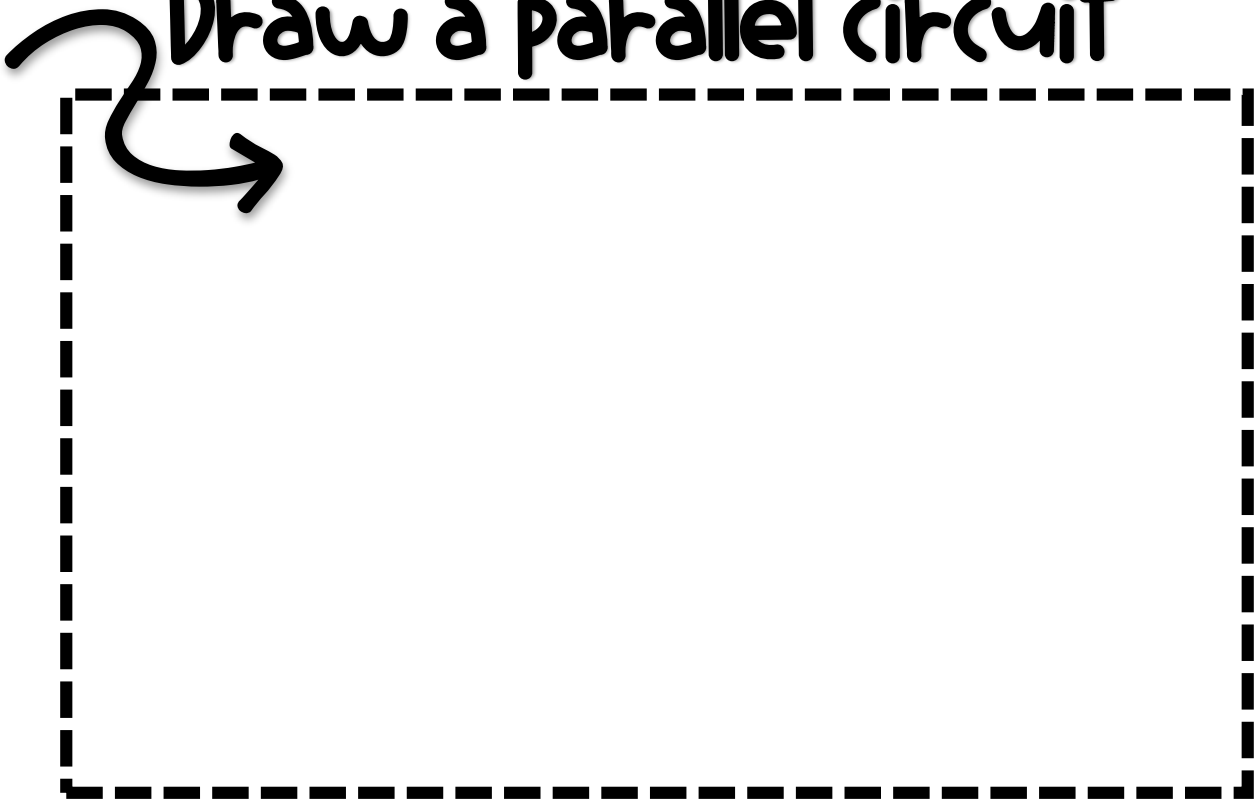
3. List an example of something that might be wired in a parallel circuit._____

4. Why do you think a school building might be wired in a parallel circuit?

_____

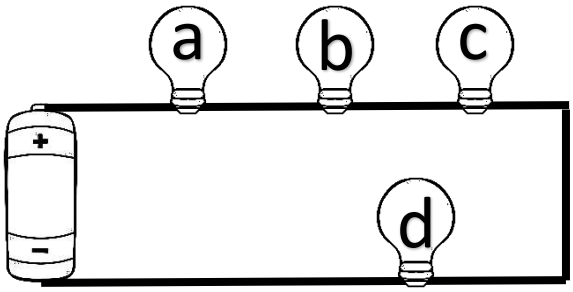
Draw a Series circuit

Draw a parallel circuit

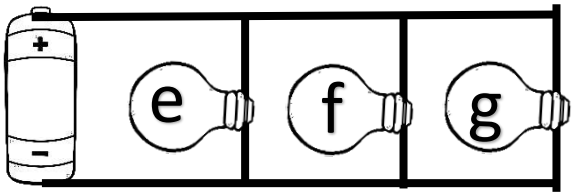


Series & Parallel Circuits

Answer Key



Series circuit



Parallel circuit

1. Label each circuit as series or parallel.
2. If bulb A burns out, will bulb d still light? no
3. If bulb f burns out, will bulb g still light? yes
4. If bulbs a, b, & c burn out, will bulb d still light? no
5. If bulbs e & f burn out, will bulb g still light? yes
6. If bulb e burns out, will bulb g burn brighter? No, because it will receive the voltage of the battery (as will all of the other bulbs)
7. If bulb a is removed and the circuit is reconnected, will bulbs b, c, and get burn brighter than they did when bulb A was in the circuit? Yes, because they no longer have to share the voltage with bulb a
8. If another bulb is added to the series circuit, will bulbs a, b, c, and d get brighter? No, they will most likely become more dim (or drain the battery)
9. If another bulb is added to the parallel circuit, will bulbs e, f, and g burn brighter? No, because the extra bulb will receive the same voltage as the other bulbs.
10. If the voltage of the battery in the series circuit is 30V. How much voltage is each bulb receiving? 7.5 Volts (30 ÷ 4 bulbs)
11. If the voltage of the battery in the parallel circuit is 30 V, how much voltage is each bulb receiving? 30 volts (each bulb gets the full voltage of the battery)
12. Would a series or parallel circuit be better for wiring a house? Why? Parallel, because when one circuit is open in the house, electricity can still get to other rooms.

Series vs. Parallel Circuits

Answer Key

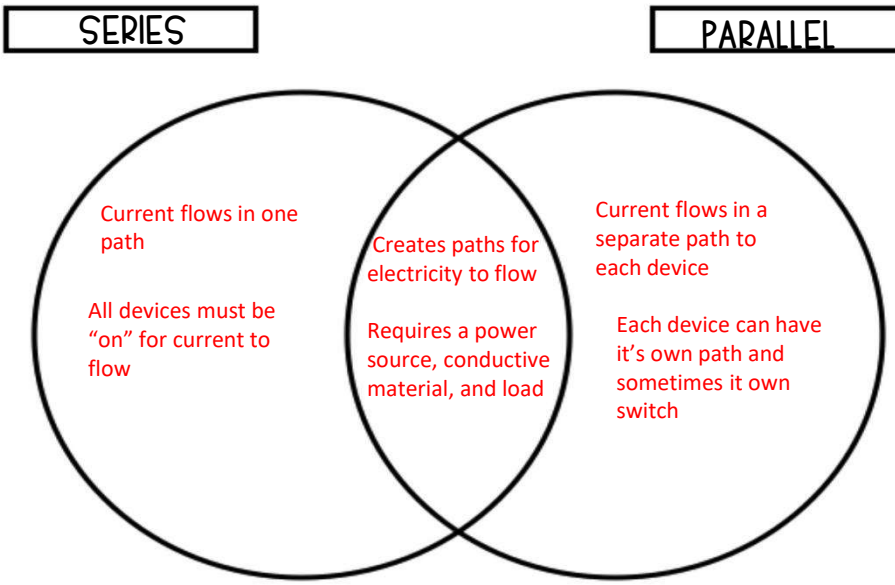
Electric circuits create paths for electricity to flow and can be set up in two basic ways. In a **series circuit**, the devices are connected one after the other, and current flows in only one path. In a **parallel circuit**, devices are connected so that current flows in a separate path to each device.

In a series circuit, all of the devices must be "on" in order for current to flow. If you switch off one of the devices, the circuit is open and current will not flow. If a string of lights is wired in a series circuit, all of the lights will go out if one bulb is broken or missing.

In a parallel circuit, each device has its own path for the current and sometimes its own switch. Houses and other buildings are usually wired with parallel circuits. This means you can turn off the lights and still watch TV or make microwave popcorn!

Both types of circuits require a power source, conductive material for electrons to flow, and a load (device that converts electrical energy into another form of energy), such as a light bulb.

Part A: Compare and contrast series and parallel circuits using the information above. Then, complete the Venn diagram.

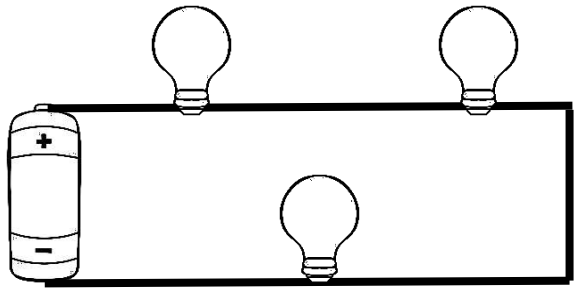


Part B: Answer the questions below.

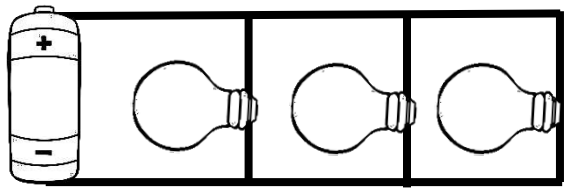
1. Explain why a light bulb works in a closed circuit but does not work in an open circuit.
A lightbulb works in a closed circuit because electricity can flow. When the circuit is open, electricity isn't able to flow.
2. List an example of something that might be wired in a series circuit. Outdoor lantern lights
3. List an example of something that might be wired in a parallel circuit. Grocery store lights
4. Why do you think a school building might be wired in a parallel circuit?
So that different classrooms can have control of their own lighting.

Draw a Series circuit

Answer Key



Draw a parallel circuit



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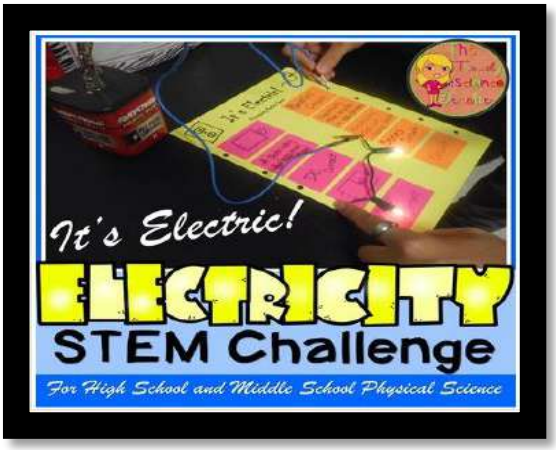

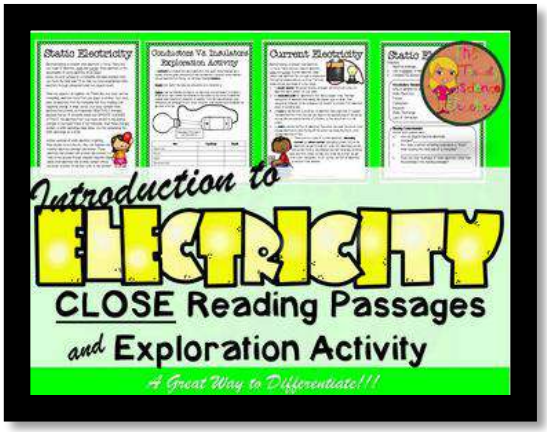

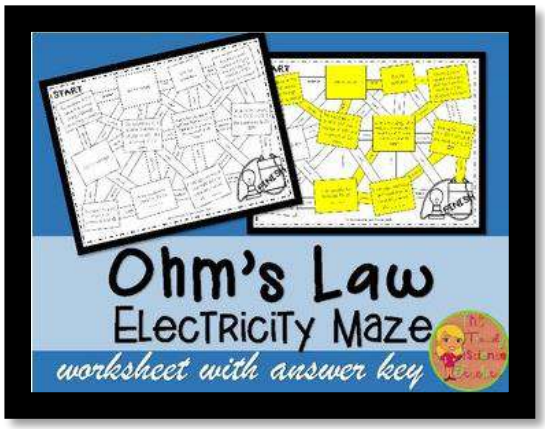

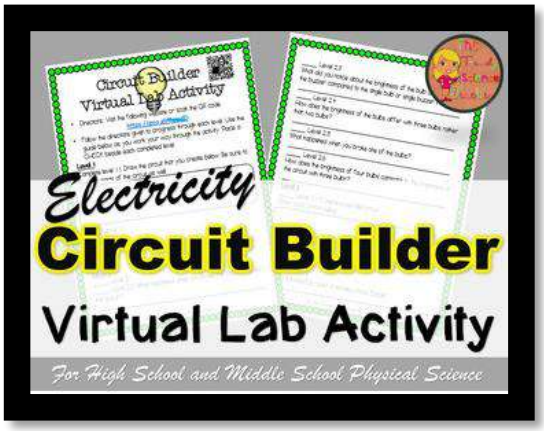

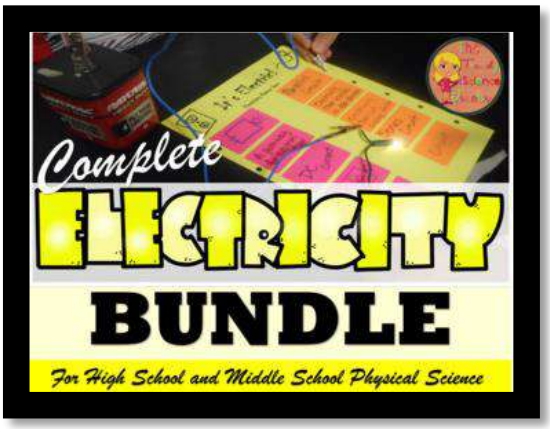

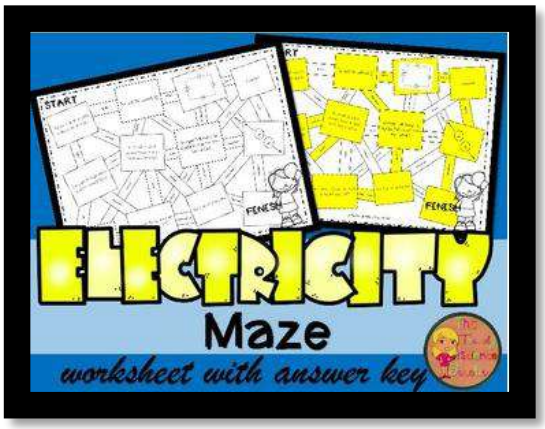

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