

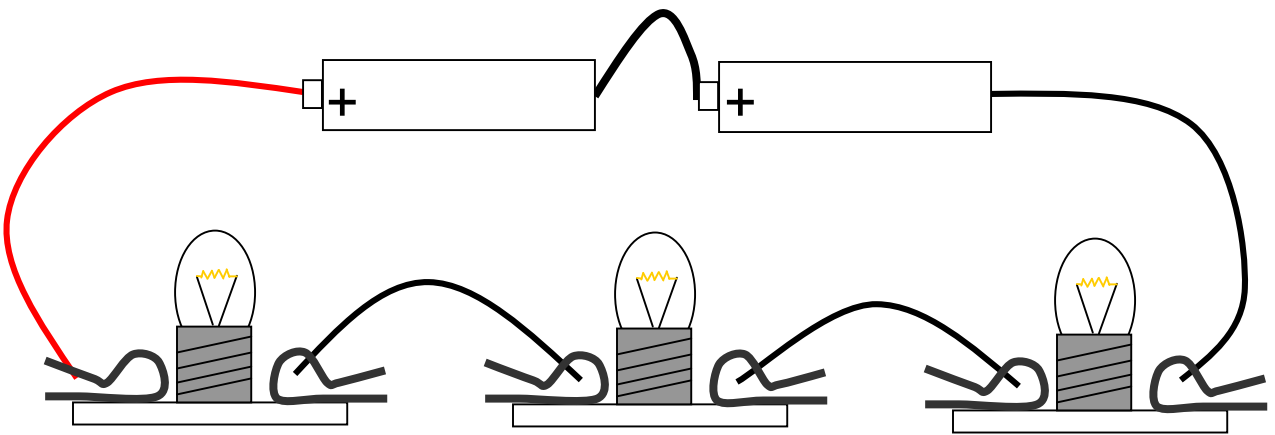
# Simple Circuits

## Series / Parallel Circuits

There are two types of circuit designs you will need to build, a series and a parallel circuits. First read about each design, and then answer the first four questions. After answering the questions, construct the designs and then answer the follow-up questions.

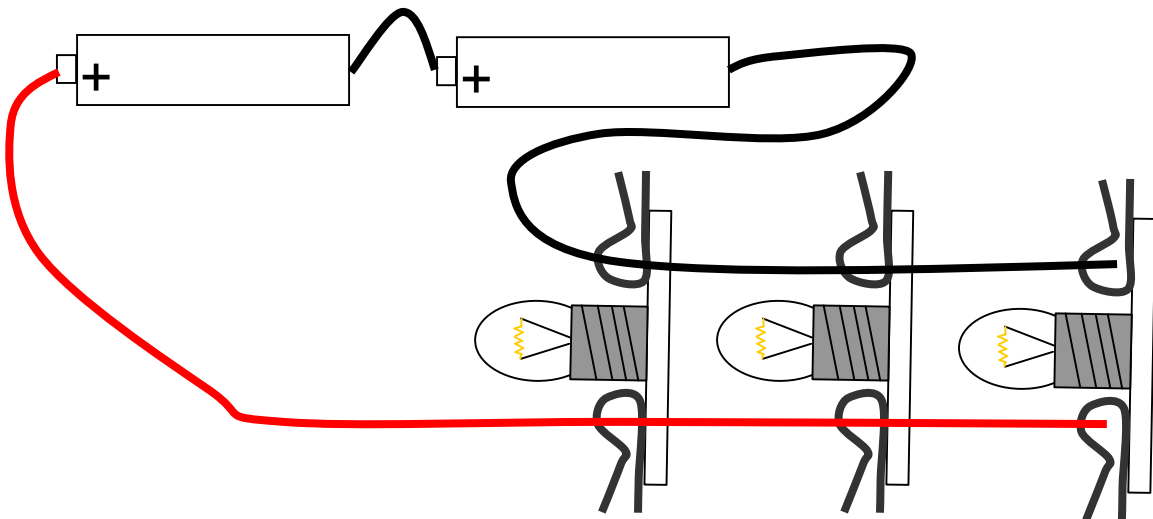
### Series Circuit:

In a series circuit, electricity has only one path on which to travel. Electricity flows from the voltage source to each bulb, one at a time, in the order they are wired to the circuit. In this case, electricity can only flow in one path, and the electricity flow is dependent on the other bulbs in the circuit. For example, if one of the bulbs blew out, the other bulb would not be able to light up because the flow of electric current would have been interrupted.



### Parallel Circuit:

In a parallel circuit, electricity has more than one path on which to travel. Electricity flows in multiple paths allowing for each bulb to light independent from one another. In this case, as the electricity can flow in more than one path, if one of the bulbs blew out, the other bulb would still be able to light up because the flow of electricity to the broken bulb would not stop the flow of electricity to the good bulbs.



# Building your circuits

## Materials:

Flashlight Bulbs (3)

Flashlight Bulb Holders (3)

Small, Thick rubber-bands (2)

AA Batteries (2)

C Clips (4)

Wire Stripper

Misc. Wire

## Procedure:

- 1) Wrap each rubber-band around each battery lengthwise.
- 2) Screw a Flashlight bulb into each of the three flashlight bulb holders
- 3) Insert wires into C-Clips on batteries and Flashlight Bulb Holders as shown in the previous diagrams.

## Test and Results

After building the series and parallel circuits, now test your predictions for questions 2, 3 and 4 above, and respond to the questions.

1. Were your predictions about the brightness of the bulbs accurate? If not, what happened that was different than expected? Explain in detail.

2. Were your predications about what happened if a bulb was removed from the parallel and series circuits accurate? If not, what happened was different than expected? Explain in detail.

## Discussion Questions

1. Do you think holiday lights are an example of parallel or series bulbs in a circuit? Explain in detail why you believe the holiday lights are either parallel or series.

2. When wiring a home, is it better to use a parallel circuit or series circuit. Use logical reasoning to discuss your answer.

Name \_\_\_\_\_

# Answer These First

## **Predictions and Pre-construction questions:**

1. Do you think the bulbs in the parallel circuit or the series circuit will burn brighter? Explain in two or three sentences.

2. If you remove a bulb in your parallel circuit, with the other bulb(s) still light? Explain in two or three sentences.

3. If you remove a bulb in your series circuit, with the other bulb(s) still light? Explain in two or three sentences.

4. Show Brian the work above before constructing the circuits.