

Physical Science 10: Series and Parallel Circuit

Procedure: Create each of the following circuits with the materials in the kit. On a separate piece of paper and using a ruler draw the schematic for each circuit and answer the questions that are listed on the bottom of the page (each group member should help by drawing one or two and only one per group please). For each circuit use a battery of three or four cells. Please don't leave the batteries connected if you don't need to as that will drain them quickly.

Series Circuits

- Batteries, a switch, and two lights.
- Batteries, a switch, and three lights (Note what happens with the extra light and you may have to borrow a light from another group).
- Batteries, a switch, two lights and a motor (we only have two motors, please share).
- Batteries, a switch, three lights and a motor. (Are there any differences from only two lights and a motor? What about when there were only three lights?)

Parallel Circuits

- Batteries, a switch that controls both lights at once, and two lights in parallel.
- Batteries, a switch that controls both lights at once, and three lights in parallel.
- Batteries, two lights in parallel, and a switch that only controls one light (so that means one light is always on).
- Batteries, two lights in parallel, and three switches (one controls the entire circuit, and one to control each light).
- Batteries, one light and motor in parallel, and a switch that controls the entire circuit.
- Batteries, two lights in series that is in parallel with a third light, and two switches (one to control the lights in series and one for the other light). Remove and replace one bulb at a time, what affect on the brightness of the lights does this have? (this is question 2c below)

General Questions

1. For a series circuit:
 - a. What happens to the brightness of the lights as more bulbs are added?
 - b. Explain your answer in (a) in terms of the energy coming from the battery.
 - c. What happens if one bulb burns out?
 - d. Think of, and write down, an example of a series circuit used in a home.
2. For a parallel circuit:
 - a. In theory identical light bulbs should have the same brightness when connected in parallel; did that happen in this lab? Provide an explanation to your answer.
 - b. What type of circuit used more wire, series or parallel?
 - c. See the instructions for your last parallel circuit setup.

Challenge (if time)

- Set up a circuit with one light bulb and two –three way switches. Each switch should turn the light on or off.