Building a Series Circuit

**Draw a diagram for each circuit created.**

|  |  |  |
| --- | --- | --- |
| Step 1: Circuit 1Make one bulb light up.Materials: one bulb, batteries, wire  | Step 2: Circuit 2Make two bulbs light up.Materials: two bulbs, batteries, wire | Step 3: Circuit 3Make three bulbs light up.Materials: three bulbs, batteries, wire |
| Step 4: Stop and AnswerWhat do you notice about the brightness of the bulbs in each circuit?After you have made 3 light bulbs light, unscrew one bulb and record what happens:Screw the bulb back on, what happens? | Step 5: Circuit 4Make one bulb turn on and off with a switch.Materials: one bulb, batteries, wire, switch  | Step 6: Circuit 5Make two bulbs turn on and off at the same time with a switch.Materials: two bulbs, batteries, wire, switch   |

|  |  |  |
| --- | --- | --- |
| Step 7: Circuit 6Make three bulbs turn on and off at the same time with a switch.Materials: three bulbs, batteries, wire, switch  | Step 8: Circuit 7With three light bulbs and a switch, can you make 1 or 2 light bulbs light up and not the others? Materials: three bulbs, batteries, wire, switch  | Step 9: Stop and AnswerExplain what makes a circuit closed or open. |
| Notes: |

****Building a Parallel Circuit

**Draw a diagram for each circuit created.**

|  |  |  |
| --- | --- | --- |
| Step 1: Circuit 1Make two bulbs light up. After they are lit, unscrew one bulb. What happens? If both lights go out, try the circuit again so that one light stays on. Materials: two bulbs, batteries, wire  | Step 2: Circuit 2Make light bulbs light up. Unscrew 1 bulb, what happens to the other 2? Unscrew 2 bulbs, what happens to the 3rd bulb?Materials: three bulbs, batteries, wire | Step 3: Circuit 3Make two light bulbs turn on and off at the same time with a switch.Materials: two bulbs, batteries, wire, switch |
| Step 4: Circuit 4Make one light bulb turn on and off with a switch while the other bulb stays lit. | Step 5: Challenge 1Make two light bulbs turn on and off with a switch while the third bulb stays lit. | Step 6: Challenge 2Using two switches and three bulbs, what other combinations can you make?  |

Questions for Reflection

Describe the differences between a closed and open circuit.

What do you notice about the brightness of the bulbs in the series circuits as you added more bulbs to them?

What do you notice about the brightness of the bulbs in the parallel circuits as you added more bulbs to them?

How does removing a bulb or opening and closing the switch affect a series circuit?

How does removing a bulb or opening and closing the switch affect a parallel circuit?

How did the simulation process compare to the experimentation process? How did the completion of the simulations help you in your experimentation process?