Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Exploring Kinds of Circuits**

**Objective**: We will use our knowledge of electric circuits to create and analyze different pathways that can light several bulbs at once.

1. **Explore:** Take 5 minutes to explore the sim and build a working circuit. Draw your successful circuit below and label the electricity source and receiver.



2. **Turn and Talk:** Share your working circuit with your partner.

* Is there more than one way to create a working circuit?
* What do working circuits require?

**Inquiry Question:** Can you light several bulbs brightly with one battery?

3. Complete the following table by creating, drawing, and observing circuits that meet the criteria.

|  |  |  |  |
| --- | --- | --- | --- |
| Create a circuit using… | Drawing of your circuit: | Did the bulb or bulbs light?  | Observationsbrightness? speed of electrons?  |
| 1 bulb, 1 battery, 3 wires  |  | Yes | No |  |
| 2 bulbs, 1 battery, 3 wires |  | Yes | No |  |
| 2 bulbs, 1 battery, 4 wires  |  | Yes | No |  |
| Try that one again: Make a *different* circuit using 2 bulbs, 1 battery, 4 wires  |  | Yes | No |  |

4. **Turn and Talk**:

* Were you able to create a circuit that lights 2 bulbs brightly?
* How is this kind of circuit different from circuits with 2 dimly lit bulbs

 or 1 bulb?

5. Circuit A is a working circuit that uses 3 bulbs and 1 battery. The electrons flow throughout the circuit, but the bulbs do not light brightly. They’re so dim you can hardly tell that they are lit!

 Circuit A:

Without the sim, design a circuit that lights 3 bulbs brightly using only 1 battery. Draw your circuit below.



6. **Turn and Talk:** In Circuit A, what would happen if one of the light bulbs burned out or broke? What about in the circuit you designed?

7.

|  |  |  |
| --- | --- | --- |
| Type of Circuit | What it is | What it looks like |
| \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Circuit | a circuit that has one pathway for electricity to flow from the source to all receivers |  |
| \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Circuit | a circuit that has individual pathways from the source to each receiver  |  |

8. Imagine you work for a company that designs strings of Christmas lights. Which type of circuit would be the best design to use? Why? Use evidence from your investigation to support your choice.