CONCEPTUAL PHYSICS LAB ELECTRIC CIRCUITS

PURPOSE: To study various arrangements of batteries and bulbs and the effects of those arrangements on bulb brightness.

MATERIALS:

4 size-D dry cells or 1 9-Volt (batteries)bare copper wire2-3 flashlight bulbs2-3 bulb holdersalligator clips and leads

PROCEDURE:

- 1. Arrange one bulb *without* a holder, one battery pack, and copper wire in as many ways as you can to make the bulb emit light. Be specific about what part of the bulb you are touching with the wire.
 - a. Sketch each of your arrangements, including failures as well as successes. Label the sketches of the successes.

2. Use a bulb *in a holder*, one battery pack, and wires. Arrange these in as many ways as you can to make the bulb light. *What two parts of the bulb does the holder make contact with?*

3. Using one battery pack, light as many bulbs *in holders* as you can. *Sketch each of your arrangements, and note the ones that work.*

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 wire

 battery

 light bulb or any device that uses electrical energy in a circuit

Diagrams for electric circuits use symbols like these:

1. Connect two bulbs in holders, the battery pack, and wires as shown in the circuit diagram below:



This is an example of a series circuit. Do both bulbs light in this circuit?

2. In the series circuit, with both bulbs lit, unscrew one of the bulbs. *What happens to the other bulb?*

3. Now set up the circuit diagram shown below, and ask your teacher to check that your circuit is correct. This is an example of a *parallel* circuit.



Do both bulbs light in this circuit?

4. In the parallel circuit, with both bulbs lit, unscrew one of the bulbs. *What happens to the other bulb?*

5. In your own words, describe the difference between series and parallel circuits.

6. Experiment with series and parallel circuits involving two or three bulbs. Pay special attention to the brightness of the bulbs in these different configurations. What types of circuits result in the brightest bulbs?