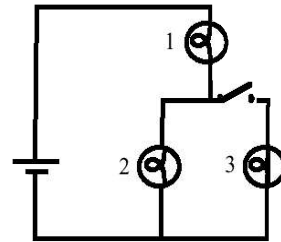


**Physics Lab**  
**Electric Circuit Puzzles**

Each puzzle below involves a battery pack, two or more small light bulbs, and in some cases a 1.0-F capacitor. You are asked to make a prediction about the circuit. After the prediction, you can connect the circuit and test your prediction. Afterwards reconcile with your lab partners any differences between your observations and your predictions.

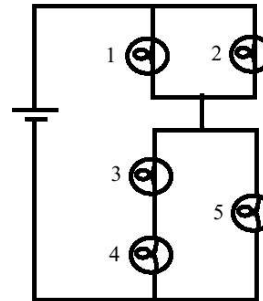
**Puzzle 1:**

Use three D-cells, three bulbs, and a switch. Predict what happens to the brightness of each of the bulbs 1, 2, and 3 when the switch is closed.



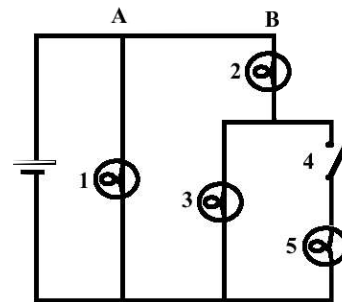
**Puzzle 2:**

Use three D-cells and five bulbs. Predict the relative brightness of the five bulbs, the brightest bulb being listed first. Indicate if you think that any bulbs are equally bright.



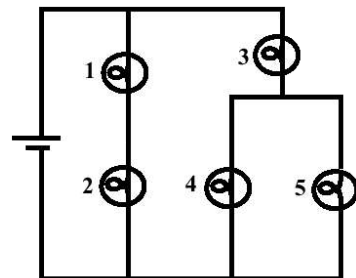
**Puzzle 3:**

Use three D-cells, four bulbs, and a switch. Predict what happens to the brightness of bulbs 1, 2, 3, and 4 when the switch is closed.



**Puzzle 4:**

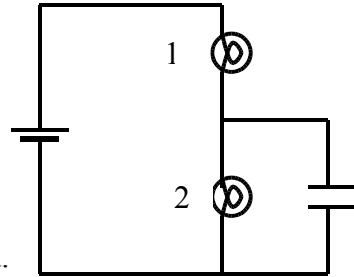
Use three D-cells and five bulbs. Predict the relative brightness of the five bulbs, the brightest bulb being listed first. Indicate if you think that any bulbs are equally bright.



**Puzzle 5:**

Use two D-cells, two bulbs, a capacitor and a switch connected to the battery.

- (a) Predict what happens to the brightness of each bulb during the 10-s time interval immediately after the switch is closed.
- (b) After the capacitor becomes charged, what happens over time to the brightness of each bulb when the switch is opened.



**Puzzle 6:**

Use three D-cells, three bulbs, a capacitor and a switch connected to the battery.

- (a) Predict what happens to the brightness of each bulb during the 10-s time interval immediately after the switch is closed.
- (b) After the capacitor becomes charged, what happens over time to the brightness of each bulb when the switch is opened.

