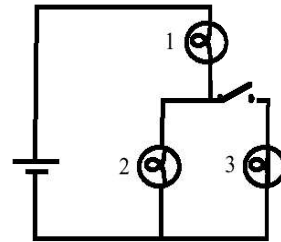


Physics Lab
Electric Circuit Puzzles

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.

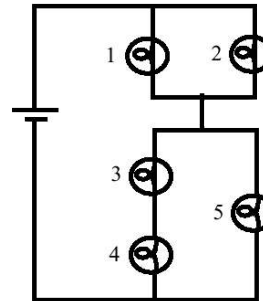
Puzzle 1:

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.



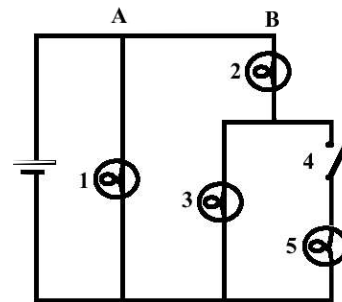
Puzzle 2:

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.



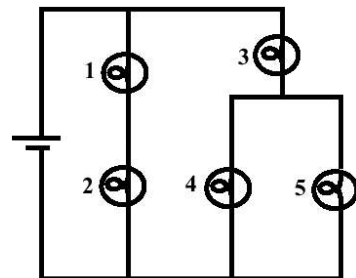
Puzzle 3:

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:

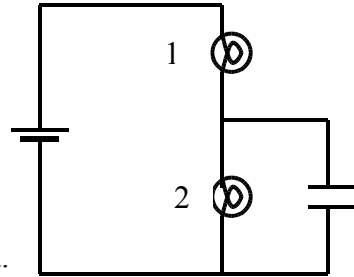
Use three D-cells and five bulbs. Predict the relative brightness of the five bulbs, the brightest bulb being listed first. Indicate if you think that any bulbs are equally bright.



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.

