

**A fan in a circuit uses 220 mA of current at 2.25 watts.**

**A. Draw a schematic showing this test (Use 2 batteries in series)**

**B. A resistor is added to the circuit. Re-draw the schematic:**

**C. Which number would you expect a more dramatic change?**

**A diode is put in series with a light bulb.**

**A. Draw the schematic:**

**B. What do you expect will happen to the brightness of the bulb after the diode is added?**

**A student wants to see what happens when the diode is reversed.**

**C. Draw the new schematic:**

**D. How bright will the bulb be after the change?**

**A light bulb is on a circuit with 2 batteries and a capacitor.**

**The switch is open.**

**A. Draw the schematic:**

**B. Describe what happens when the switch is closed:**

**C. What will happen when the batteries are taken out of the circuit, and the wires are connected?**

**D. Challenge:**

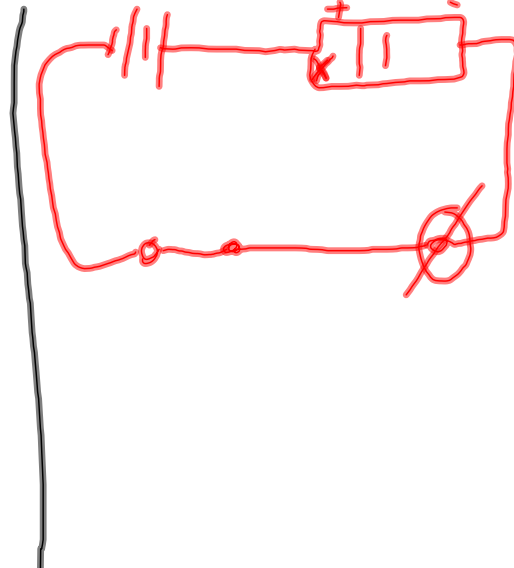
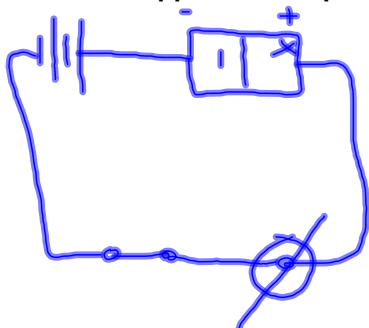
**Draw a circuit with a light bulb, capacitor and LED in series with 2 batteries.**

**The circuit should let the capacitor charge, but not discharge.**

A student builds the circuit shown. The fan spins fast.



Mystery Box X contains a battery. The diagram shows which side is positive. What will happen to fan speed when Box X is added as shown in each situation?

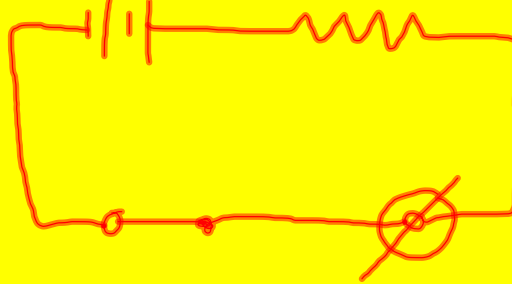


A fan in a circuit uses 220 mA of current at 2.25 watts.

A. Draw a schematic showing this test (Use 2 batteries in series)



B. A resistor is added to the circuit. Re-draw the schematic:

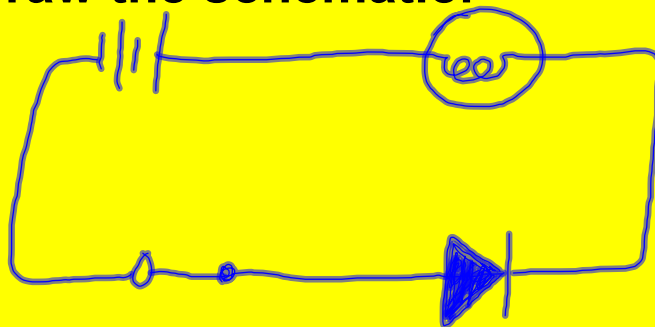


C. Which number would you expect a more dramatic change?

*I would expect a larger drop in the Amperage since resistors resist the flow of current*

A diode is put in series with a light bulb.

A. Draw the schematic:

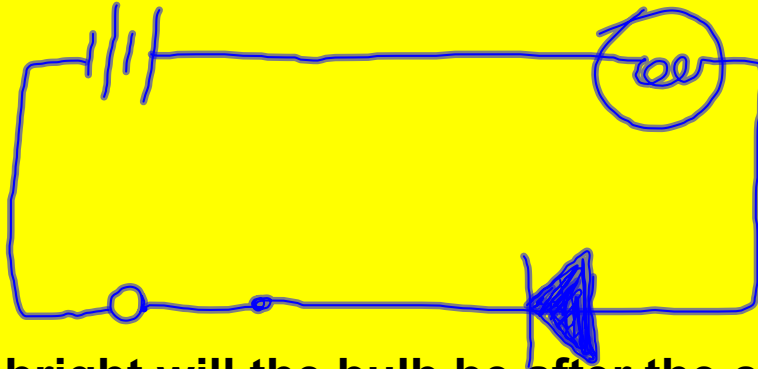


B. What do you expect will happen to the brightness of the bulb after the diode is added?

*The bulb would become a little bit dimmer because of the diode's resistance*

A student wants to see what happens when the diode is reversed.

C. Draw the new schematic:



D. How bright will the bulb be after the change?

The light bulb would be off because the diode would block the current

A light bulb is on a circuit with 2 batteries and a capacitor.

The switch is open.

A. Draw the schematic:



B. Describe what happens when the switch is closed:

The light bulb will shine brightly, but then become dimmer and dimmer. After about 30 seconds, it will be off

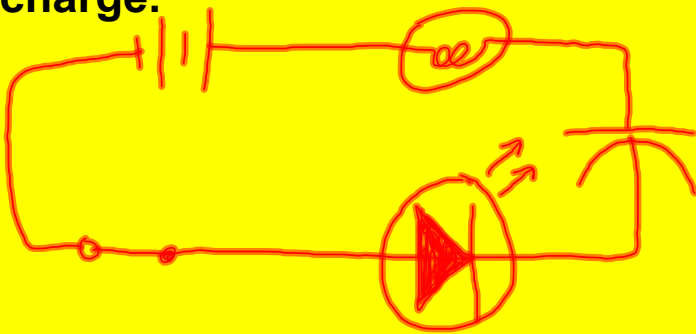
C. What will happen when the batteries are taken out of the circuit, and the wires are connected?

*The light will start bright, then fade to dim, then off in about 10 seconds*

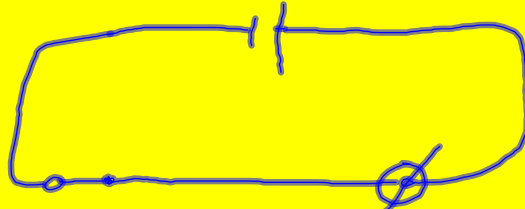
D. Challenge:

Draw a circuit with a light bulb, capacitor and LED in series with 2 batteries.

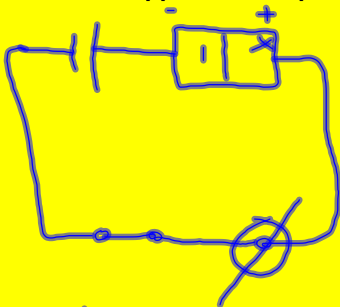
The circuit should let the capacitor charge, but not discharge.



A student builds the circuit shown. The fan spins fast.



Mystery Box X contains a battery. The diagram shows which side is positive. What will happen to fan speed when Box X is added as shown in each situation?



*The fan will speed up because there are 2 batteries in series*



*The fan will STOP because the batteries are aligned in opposite directions, cancelling each other out*