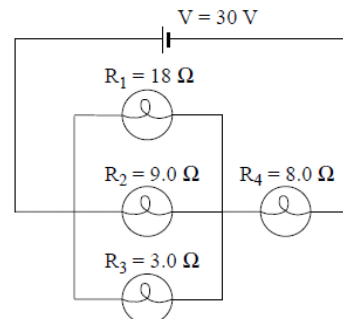


Circuits Lab

Use the DC Circuit Construction Kit at the Phet website (http://phet.colorado.edu/simulations/sims.php?sim=Circuit_Construction_Kit_DC_Only) to help answer the following problems:

1. Find the current in the 8.0 Ω bulb shown below.



The 3.0 Ω bulb is removed from the circuit so that only 3 bulbs remain.

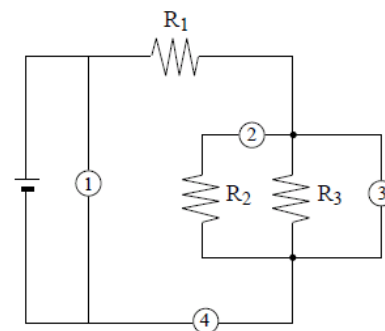
The 8.0 Ω bulb will now:

- A. be dimmer.
- B. be brighter.
- C. remain the same.

Using principles of electrical circuits, explain your answer.

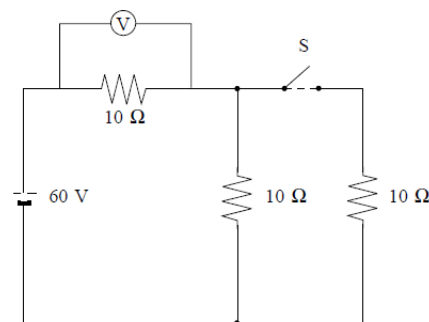
2. The diagram below shows a circuit with four possible meter locations. In which locations should an ammeter and voltmeter be connected to correctly measure the current through R₂ and the voltage drop across R₂ ?

	CURRENT THROUGH R ₂	VOLTAGE DROP ACROSS R ₂
A.	2	1
B.	2	3
C.	4	1
D.	4	3



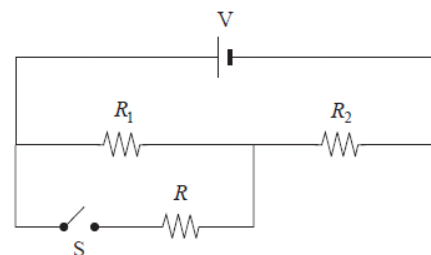
3. In the circuit shown below, voltmeter readings are taken when switch S is closed and open. Which of the following is correct?

	VOLTMETER READINGS	
	SWITCH CLOSED	SWITCH OPEN
A.	20 V	30 V
B.	30 V	30 V
C.	40 V	20 V
D.	40 V	30 V



Prove your answer with a calculation.

4. Switch S is originally open as shown in the circuit below. How does the current through resistors R_1 and R_2 change when switch S is closed?

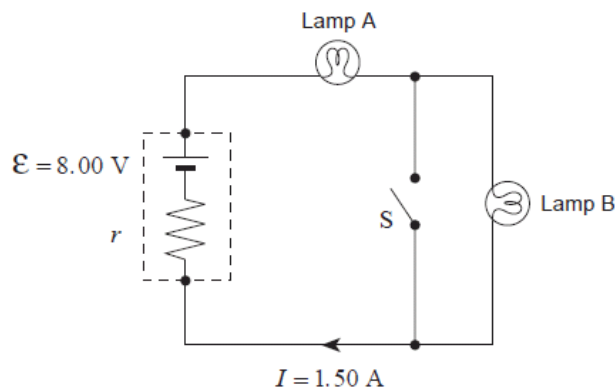


	CURRENT THROUGH R_1	CURRENT THROUGH R_2
A.	increases	increases
B.	increases	decreases
C.	decreases	increases
D.	decreases	decreases

Explain your answer using circuit principles.

5. The circuit shown consists of an 8.00 V battery and two light bulbs. Each light bulb dissipates 5.0 W. Assume that the light bulbs have a constant resistance. Switch S is open.

a) If a current of 1.50 A flows in the circuit, what is the internal resistance r of the battery? Show your work



The switch S is now closed.

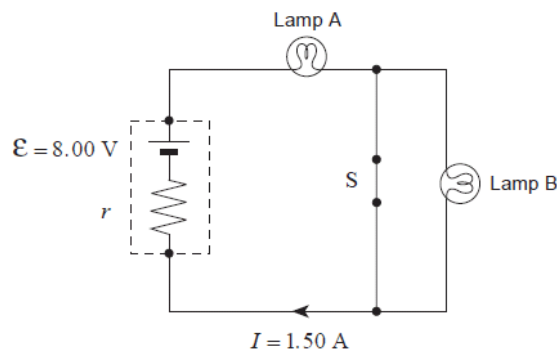
Lamp A will now be (Check one response.)

- brighter.
- the same brightness as before.
- dimmer.

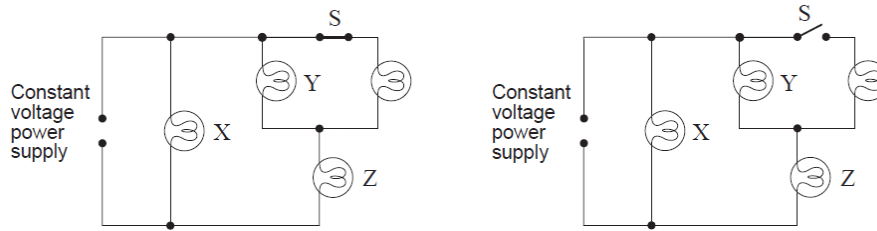
The battery's terminal voltage will now be (Check one response.)

- greater than before.
- the same as before.
- less than before.

Using principles of physics, explain your answers.



6. If switch S is opened, how does the brightness of each bulb (X, Y, and Z) compare to the situation when the switch was closed?



	BULB X	BULB Y	BULB Z
A.	same	same	same
B.	same	dimmer	brighter
C.	same	brighter	dimmer
D.	dimmer	dimmer	dimmer

Using principles of physics, explain your answers.