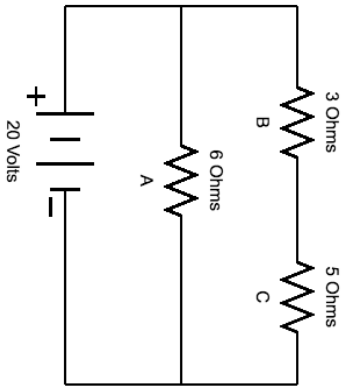
CIRCUITS 2

Name _____

Part G: Series and Parallel Vocabulary

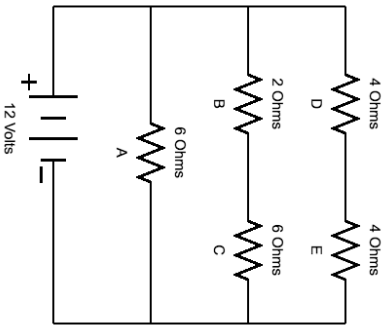
"in series" Two light bulbs are 'in series' when all current going through one must go through the other
"in parallel" Two light bulbs are 'in parallel' when current must split between the two of them
Combination Circuits In some circuits, with more than two light bulbs, some of the bulbs are in parallel and some are in series.

For the following circuits, use the vocabulary above to describe the circuit:



G.1. Resistor B is _____ with resistor C.

G.2. Resistor A is _____ with resistors B and C.



G.3. Resistor A is _____ with the other resistors.

G.4. Resistor D is _____ with resistor C.

G.5. Resistors D and E are _____ with resistors B and C.

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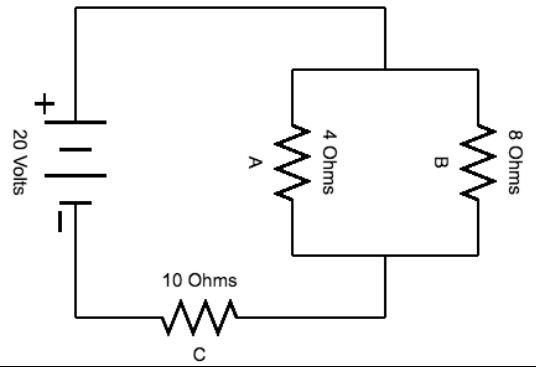
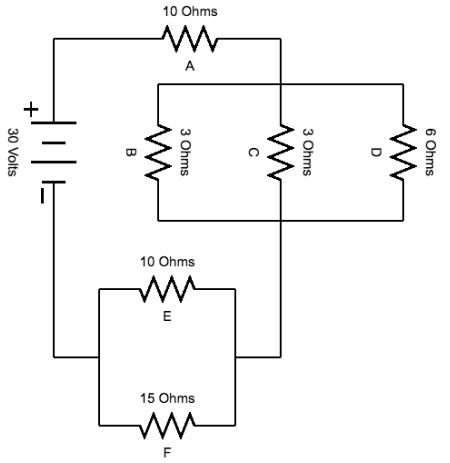


G.6. Resistor A is _____ with resistor B.

G.7. Resistor C is _____ with resistors A and B.



G.8. Resistors A is _____ with the battery.

G.9. Resistors B, C, and D are _____.

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Part H: Dimness and Brightness Challenges

Dimness and Brightness:

Whenever two light bulbs are *in series*, they become dimmer.

Whenever two light bulbs are *in parallel*, they become brighter.

H.1 Build a circuit with one battery and 3 light bulbs, labeled A, B, and C:
Bulb A and B should have the same brightness.
Bulb C should be *brighter* than bulbs A and B.

Draw your solution, and be sure to label the light bulbs A, B, and C in your drawing:

H.2 Build a circuit with two batteries and 3 light bulbs labeled A, B, and C:
Bulbs A and B should have the same brightness.
Bulb C should be *dimmer* than bulbs A and B.

Draw your solution, and be sure to label the light bulbs A, B, and C in your drawing:

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Part E: Circuits, Incomplete Circuits, and Short Circuits

Electric Circuit

You have built an *electric circuit* when the electrons have a path from one end of the battery to the other.

Incomplete Circuit

In an incomplete circuit (or an open circuit), the current is not able to get form one end of the battery to the other. A wire touches only one side of the battery, or there is a break in the wire that makes it go only partway around the circuit.

Short Circuit

- A short circuit is an electric circuit that does not contain any resistors (such as light bulbs).

- Short circuits are usually built by accident. People want to build a circuit, but accidentally add an extra wire that goes *around* the light bulb or cuts off the light bulb.

- Short circuits are **DANGEROUS**! If you leave a short circuit operational, it will begin to get very hot. Also, the battery will run out very quickly.

- Short circuits are *not necessarily* short. They can follow a very long path. As long as there is no resistor (light bulb), it will be a short circuit.

- For simple circuits, you can tell a circuit is a short circuit because the light bulb does not light, but the battery becomes *warm*.

- short circuits also cause the battery to die quickly.

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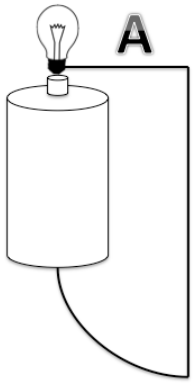
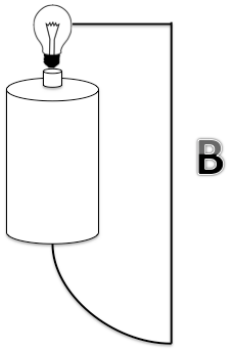
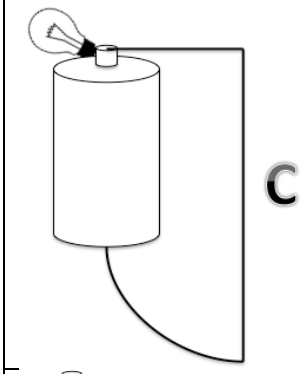
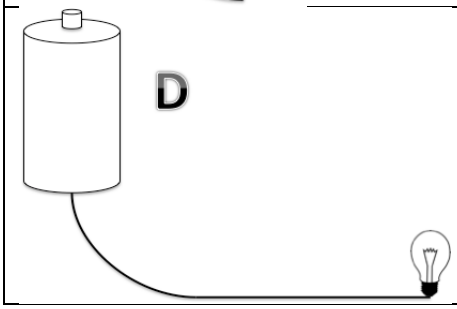
Build each of the following structures on the following page.
Determine if the light bulb lights, and if the battery warms.
If the bulb lights, it is good circuit. If the battery warms up but the bulb does not light, it is a short circuit. If nothing happens, it is an incomplete circuit, which isn't a circuit at all!

	Does the light bulb light?	Does the battery get hot?	What is it?
	A. yes B. no	A. yes B. no	a) a good circuit b) a short circuit c) not a circuit
	A. yes B. no	A. yes B. no	a) a good circuit b) a short circuit c) not a circuit
	A. yes B. no	A. yes B. no	a) a good circuit b) a short circuit c) not a circuit
	A. yes B. no	A. yes B. no	a) a good circuit b) a short circuit c) not a circuit

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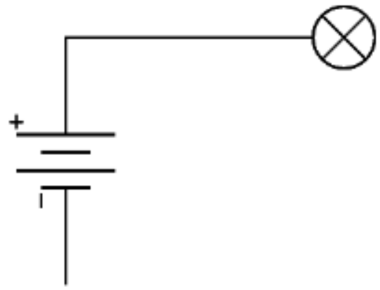
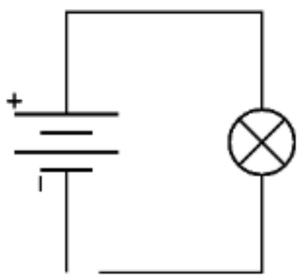
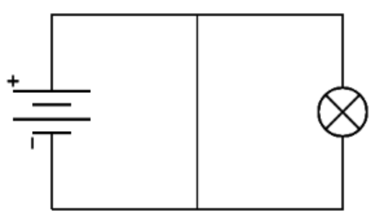
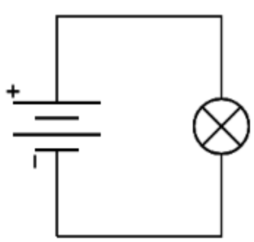
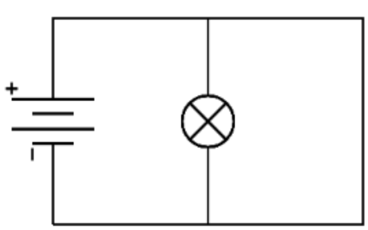
	Does the light bulb light?	Does the battery get hot?	What is it?
	A. yes B. no	A. yes B. no	a) a good circuit b) a short circuit c) not a circuit
	A. yes B. no	A. yes B. no	a) a good circuit b) a short circuit c) not a circuit
	A. yes B. no	A. yes B. no	a) a good circuit b) a short circuit c) not a circuit
	A. yes B. no	A. yes B. no	a) a good circuit b) a short circuit c) not a circuit
	A. yes B. no	A. yes B. no	a) a good circuit b) a short circuit c) not a circuit

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Answers:

G.1 in series
G.2 in parallel
G.3 in series
G.4 in series
G.5 in parallel
G.6 in parallel
G.7 in series
G.8 in series
G.9 in parallel