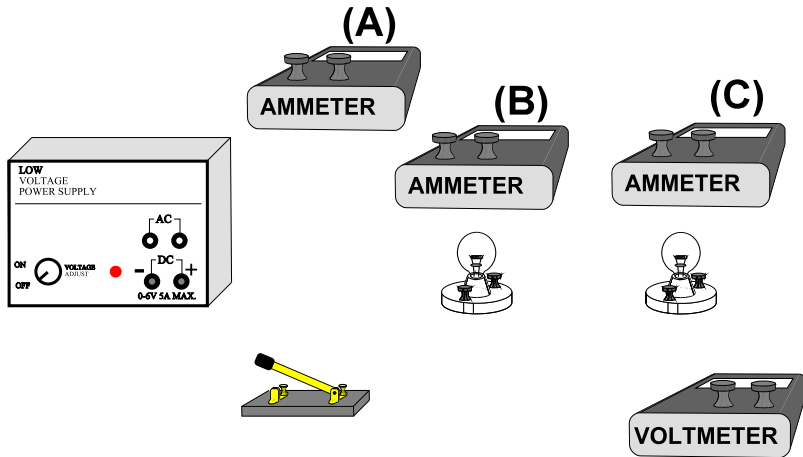


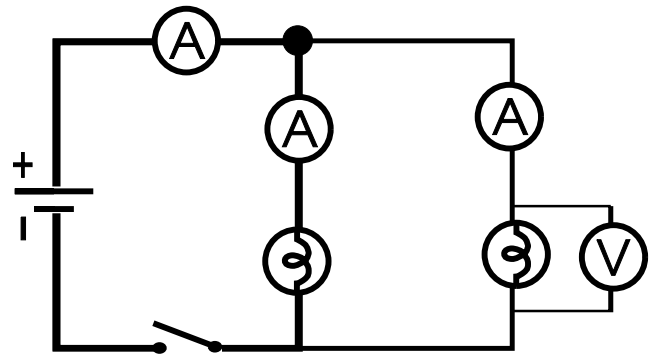
Lesson 3: [||e|+|e|] Parallel Circuits

1) Connect the Circuit Picture with lines for wires using the Schematic Diagram. Locate the junction indicated with the large black dot on the Schematic Diagram with a large black dot on the Circuit Picture.

Circuit Picture



Schematic Diagram

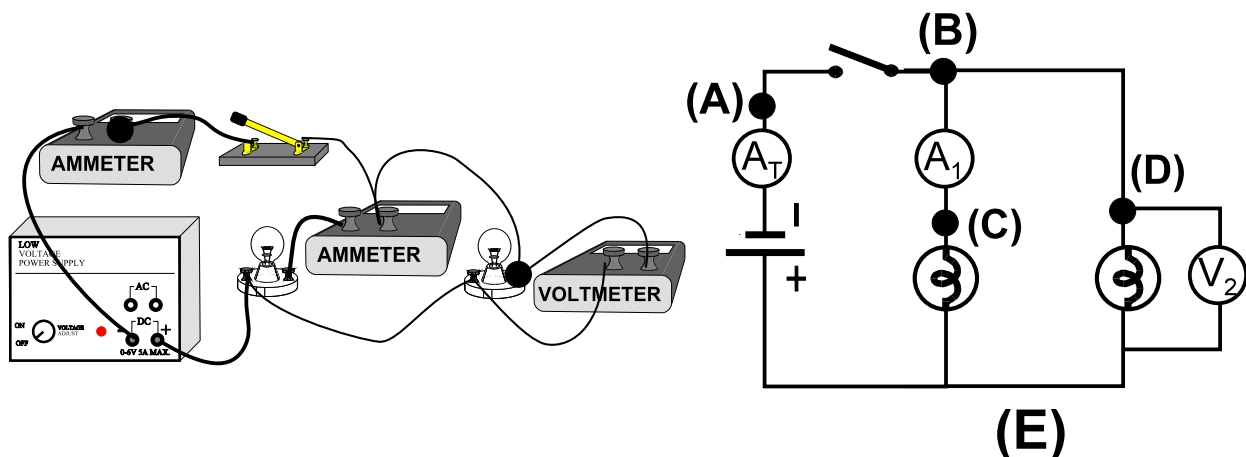


- 2) When bulbs (or anything else) are connected side by side so that the current must divide at branch points, we call it a _____ circuit.
- 3) In the above circuit, if the voltage (potential) gain across the source is 1 Volt, what does our model predict about the voltage drop across the light bulb will be? Explain.
- 4) What does our model predict the voltage drop across the other light bulb will be? Explain.
- 5) If the voltage drop across the light bulbs is the same, what does our model predict the current through the bulbs will be? Explain.
- 6) Assume both bulbs are identical. In the above circuit, if the electric current through Ammeter (C) is one coulomb per second, then the current through Ammeter (B) will be _____ coulomb per second. What does our model predict about the electric current through Ammeter (A)? Explain.
- 7) If more bulbs are connected in parallel, what does our model predict about the brightness of each bulb? Explain

- 8) If more bulbs are connected in parallel, what does our model predict about the current in the main circuit [Ammeter (A)]?
- 9) If more bulbs are connected in parallel, what does our model predict about the current in the branches [Ammeter (B) and Ammeter (C) or any additional ammeter]?
- 10) As more bulbs are connected in parallel, what will happen to the number of paths for the current to flow?
- 11) In a parallel circuit, if one light bulb burns out, what does our model predict will happen to
- A) the current in the main circuit [Ammeter (A)]?
 - B) the current in the branch circuits [Ammeter (B) or (C)]?
 - C) the brightness of the remaining bulbs?
- 12) Is there ever any parallel circuit where one branch gets all the current and the other gets none ?"

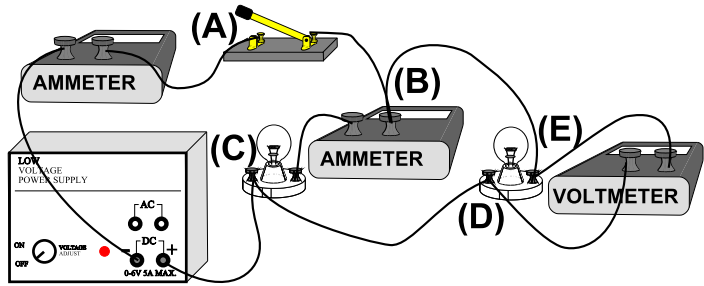
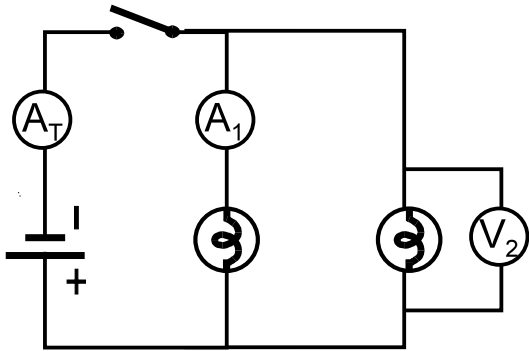
More Practice Connecting Circuits from Schematic Diagrams

- 13)a) Label all the points indicated on the schematic diagram on the circuit picture.
- b) Assume power supply produces 6 amperes and 12 volts, write the expected readings beside the each meter



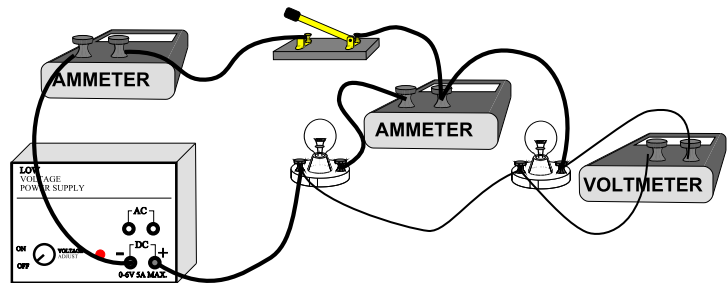
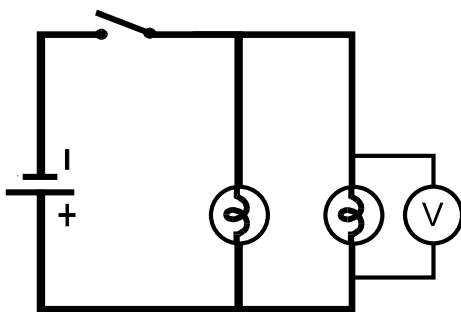
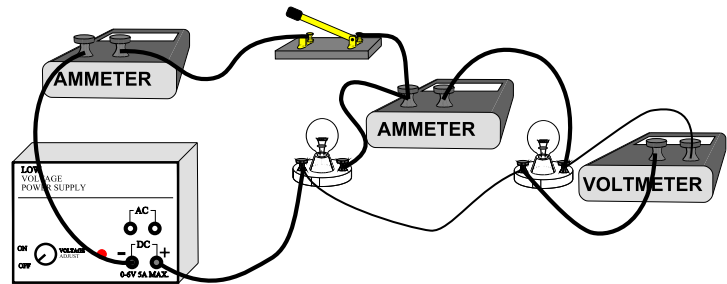
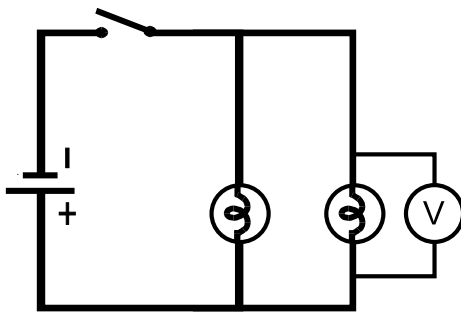
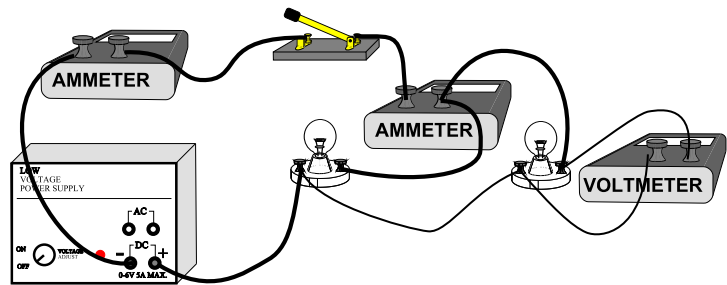
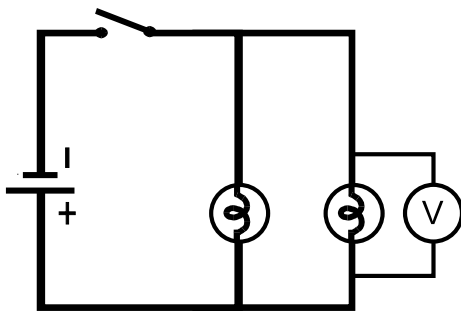
14)a) Label all the points indicated on the circuit picture on the schematic diagram.

b) Assume power supply produces 6 amperes and 12 volts, write the expected readings beside the each meter



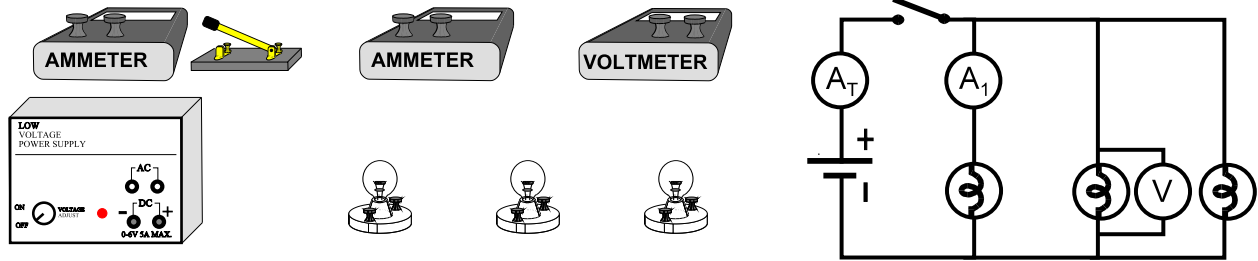
15)a) On the following three sets of diagrams, show where the Ammeters wired in the Circuit Picture, are on the Schematic Diagram

b) Assume power supply produces 6 amperes and 12 volts, write the expected readings beside the each meter



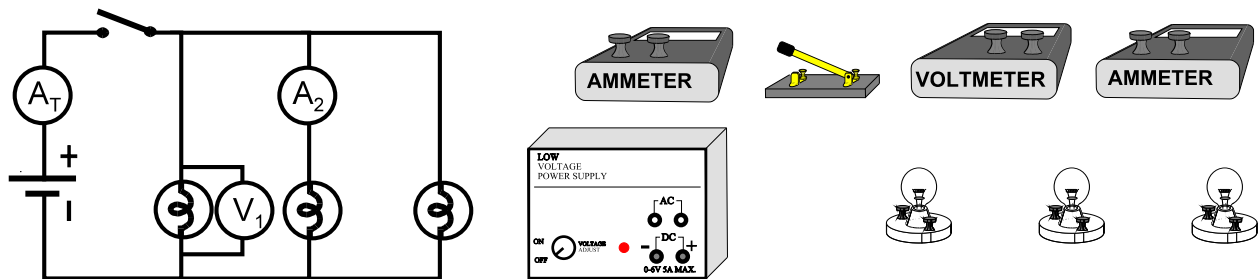
16)a) Draw lines to represent conductors on the Circuit Picture in order to complete the circuits shown the Schematic Diagram.

b) Assume power supply produces 6 amperes and 12 volts, write the expected readings beside the each meter



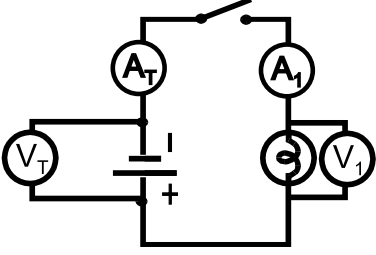
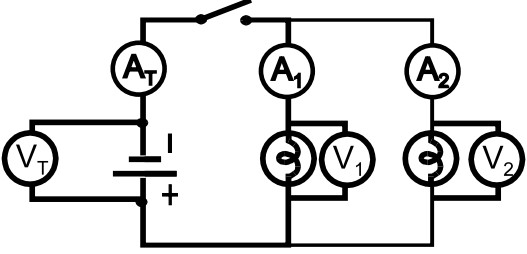
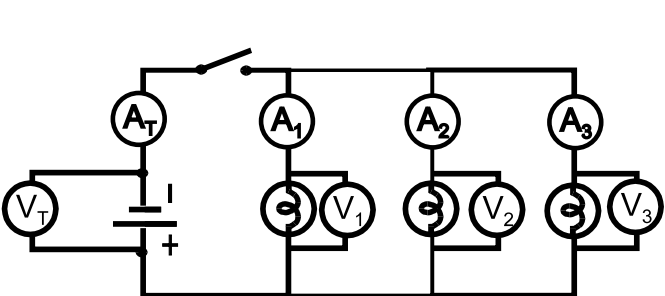
17)a) Sometimes its hard to physically place a meter in the same relative position (where it should be) Draw lines to represent conductors on the Circuit Picture in order to complete the circuits shown the Schematic Diagram.

b) Assume power supply produces 6 amperes and 12 volts, write the expected readings beside the each meter



REALITY CHECK - Wiring Real Circuits

Wire the parallel circuits shown. Record the meter readings and compare bulb brightness. Note all meters do not have to be connected at once. Connect the meter in one particular position, take the reading, remove it and reconnect it in the next position.

Schematic Diagram	Voltage (Volts)		Current (Amperes)		Bulb Brightness	If one bulb is turned out:	
	V_T	V_1	A_T	A_1			
	V_T		A_T		Normal Brightness		
		V_1		A_1			
	V_T		A_T		----- Brightness compared to the Normal	The other bulb -----	
		V_1		A_1			
			V_2				A_2
	V_T		A_T		----- Brightness compared to the Normal	The other bulbs -----	
		V_1		A_1			
			V_2				A_2
			V_3				A_3

Use the results from your table to answer the following;

- In any parallel circuit, what can you say about the voltage drop across any bulb is about _____ as the voltage gain across the source?
- In a circuit containing
 - ONE bulb, the current through the source is about ____ the current through the bulb.
 - TWO identical bulbs, the current through the source is about ____ the current through each bulb.
 - THREE identical bulbs, the current through the source is about ____ the current through each bulb.

Circle \uparrow for increase, \downarrow for decrease, \leftrightarrow for unchanged, and $\rightarrow 0$ for goes to zero

3) Look at all three circuits;

As more bulbs are connected in parallel;

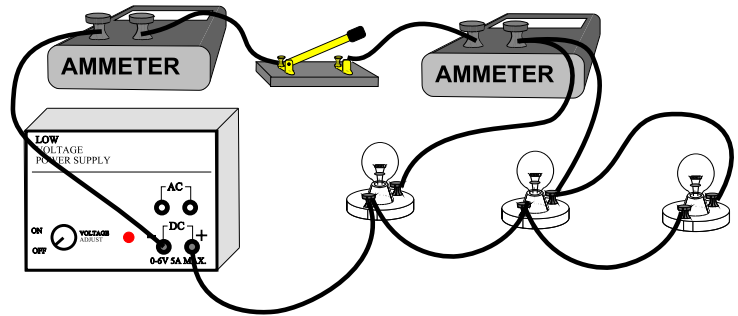
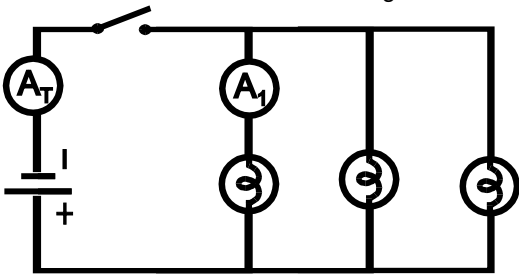
- | | | | | |
|--|------------|--------------|-------------------|-----------------|
| A) the brightness of each bulb | \uparrow | \downarrow | \leftrightarrow | $\rightarrow 0$ |
| B) the current in the main circuit | \uparrow | \downarrow | \leftrightarrow | $\rightarrow 0$ |
| C) the current in the branches | \uparrow | \downarrow | \leftrightarrow | $\rightarrow 0$ |
| D) the number of paths for the current | \uparrow | \downarrow | \leftrightarrow | $\rightarrow 0$ |

4) In a parallel circuit, if one light bulb burns out,

- A) the current in the main branch \uparrow \downarrow \leftrightarrow $\rightarrow 0$
- B) the brightness of the remaining bulbs \uparrow \downarrow \leftrightarrow $\rightarrow 0$

5) Voltmeters are connected in _____ to the rest of the circuit.

6) A student has used the schematic diagram below to wire the circuit picture shown. The ammeter (A_T) at the source reads 6 Amps. The reading on ammeter (A_1) should be ___ Amps. When the switch is closed, everything works as it should but the reading on the ammeter (A_1) is three times what it should be. What is wrong?



On the schematic diagram show where the ammeter (A_1) is really wired. On the wiring diagram only one wire needs to be moved to correctly wire ammeter (A_1). Draw in where the wire should be.

7) Another student has used the Schematic diagram below to wire the circuit picture shown. The ammeter (A_T) at the source reads 6 Amps. The reading on an ammeter placed at (A_2) on the schematic should be ___ Amps. When the switch is closed, the second light does not go on. The reading on the meter beside the second light is zero. What is wrong?

