

# 13.1 Circuits & Circuit Diagrams

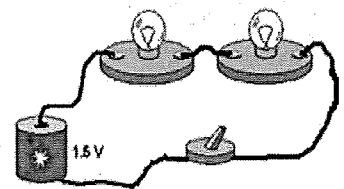
**Learning Goals/Success Criteria:** *At the end of this lesson, I will be able to:*

- Draw and interpret circuit diagrams using the proper symbols
- Describe how electricity affects the human body

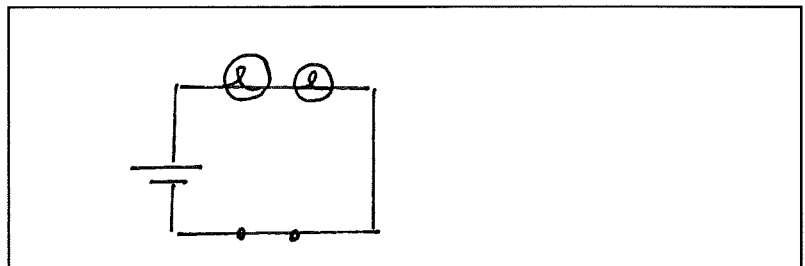
**Circuit Diagrams:** are standard ways of drawing an electrical circuit.

There are 2 rules to follow when drawing circuit diagrams:

- (1) Use a ruler
- (2) Draw wires at 90° angles



Now redraw the above diagram, this time using the correct symbols. See pg. 606 Table 4 as a reference.



1. Use pages 606 and 607 to draw the symbols for each of the following:

Category	Device	Description	Symbol
Control devices	switch (open and closed)	allows current to flow if closed	
	fuse	safety device that will "blow" if most of the current is too high	
Electrical loads	light bulb/lamp	converts electrical energy to light energy	
	resistor	restricts the flow of charge	
	speaker	converts electrical energy to sound energy	
	motor	converts electrical energy to kinetic energy	
Energy source	cell	supplies electrical energy	
	battery	two/more cells joined together	
Meters	ammeter	measures current	
	voltmeter	measures voltage	
Connectors	conducting wires	connect components & passes current from one part of the circuit to another	
	connection	wires are joined/connected	
	ground connection	connection to the earth	

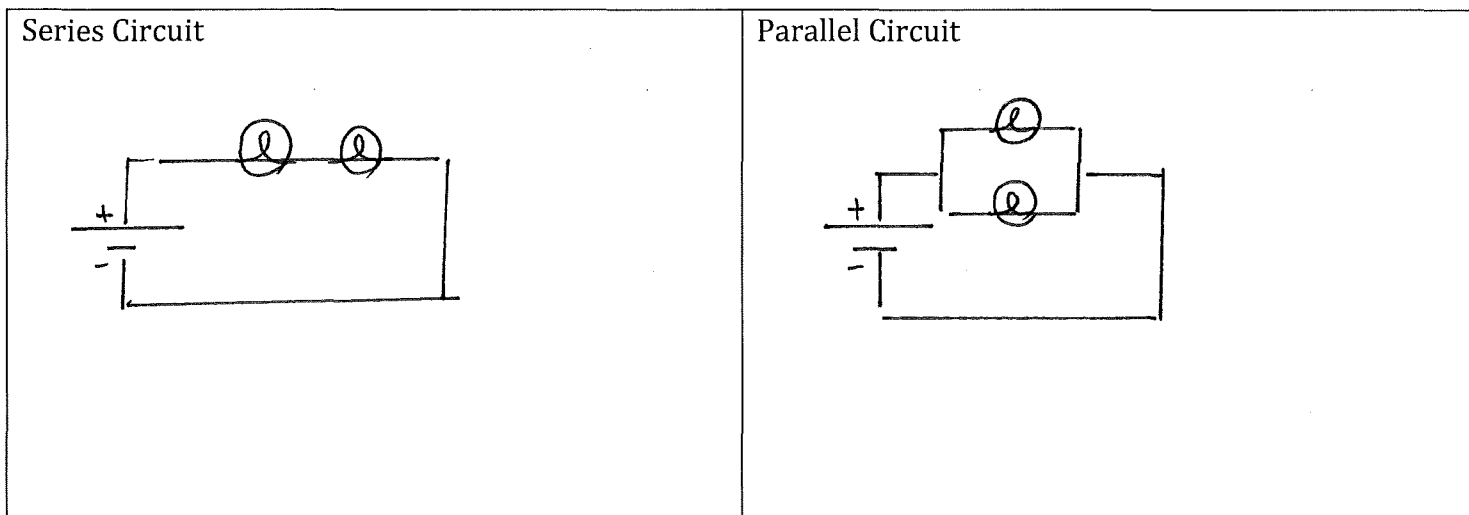
## Series & Parallel Circuit (page 552)

2. a) What is a **series circuit**? flow of  $e^-$  only follows one path

b) How many paths does a series circuit have to allow the flow of electrons? 1

3. a) What is a **parallel circuit**?  $e^-$  can flow along different paths

4. Draw an example of a series circuit (Fig. 2b) and a parallel circuit (Fig. 3b) on Pg 552



*Answers may vary*

**Electrical Safety** – Go to the course website and click on the links related to electrical safety:

4. How does current damage the body?

- electrical signals sent through the nervous system control the body
- small amounts of current can range from barely noticeable to stimulate the external/fix response
- higher values can result in paralysis and ventricular fibrillation  
↓  
irregular heartbeat

5. What is more dangerous: alternating current (AC) or direct current (DC)?

- AC current
- fluctuation rate of 60 Hz can affect the heartbeat

6. Why is it dangerous to handle an electrical device with wet hands?

wet hands have a lower resistance than dry skin  
the layer of skin made of dead skin cells is a good resistor  
wet hands/cynuria allows electricity to pass through the skin  
skin breaks down around 400-600 V