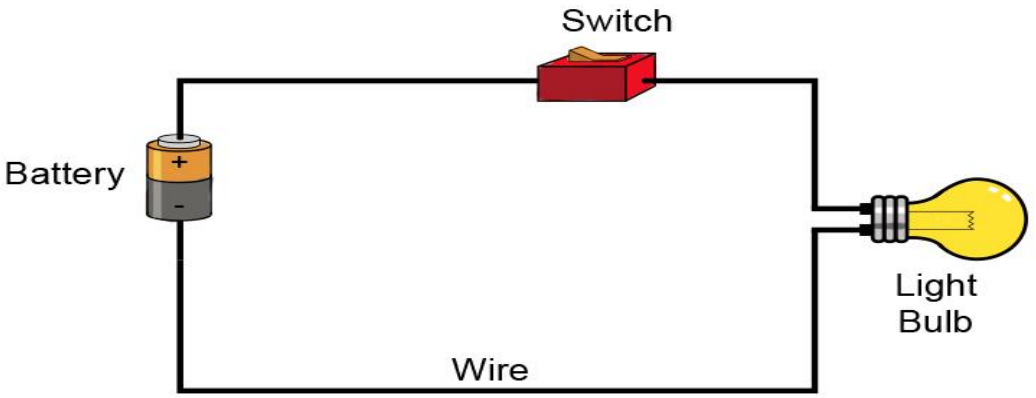
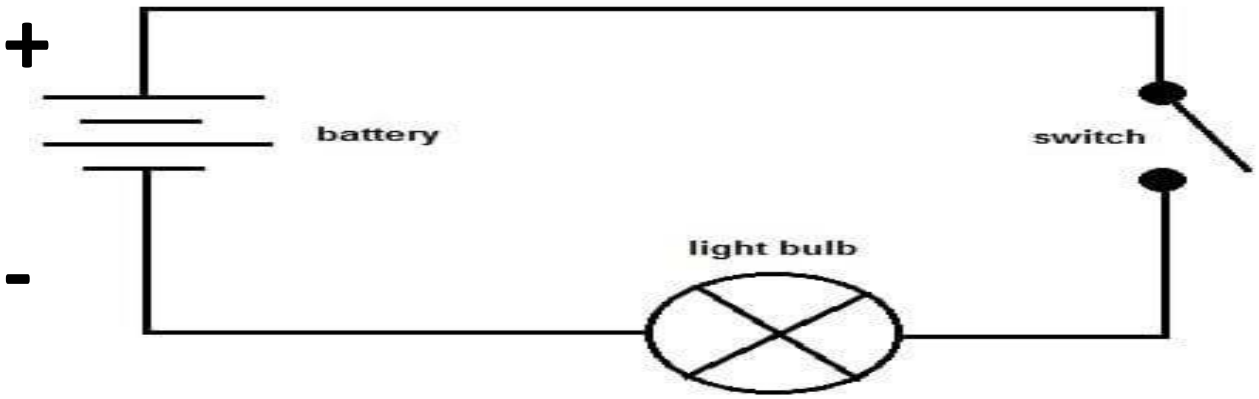
Simple circuits

Use wires , batteries and switches to turn components on and off.
The switch allows electricity to flow

A working sketch

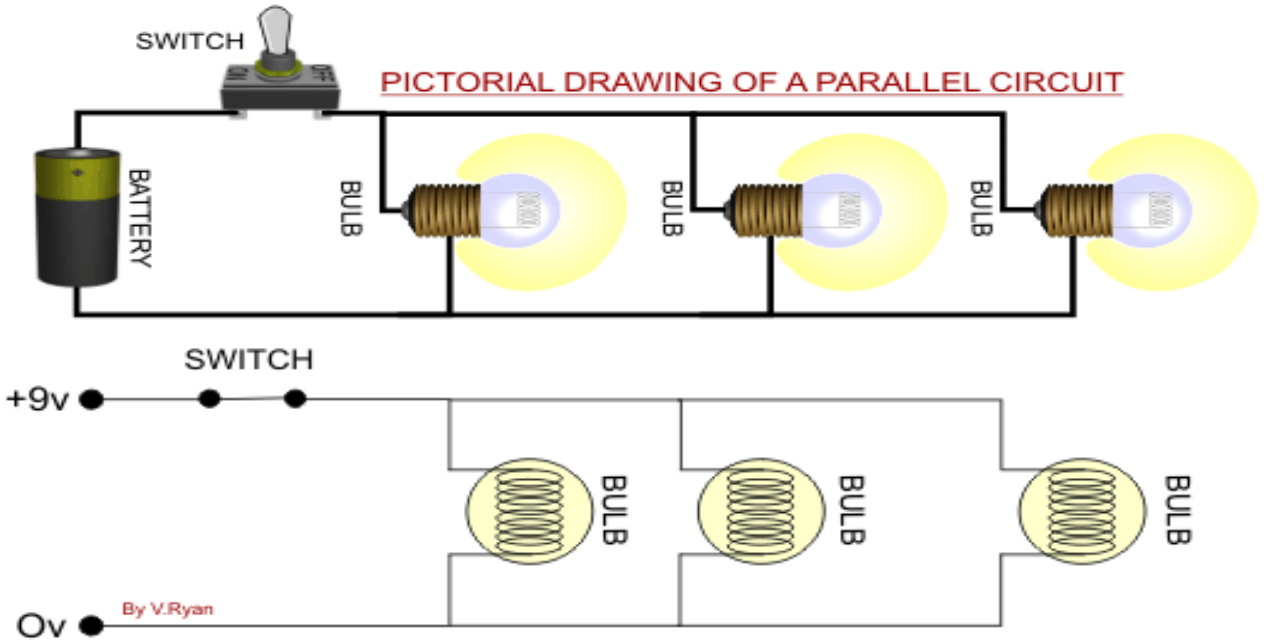


A Circuit Diagram uses symbols to simplify the drawing



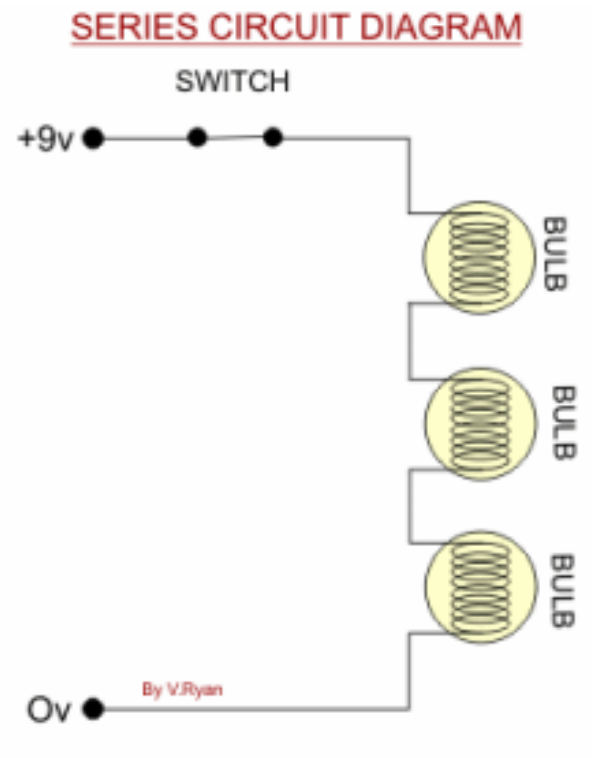
Parallel Circuits

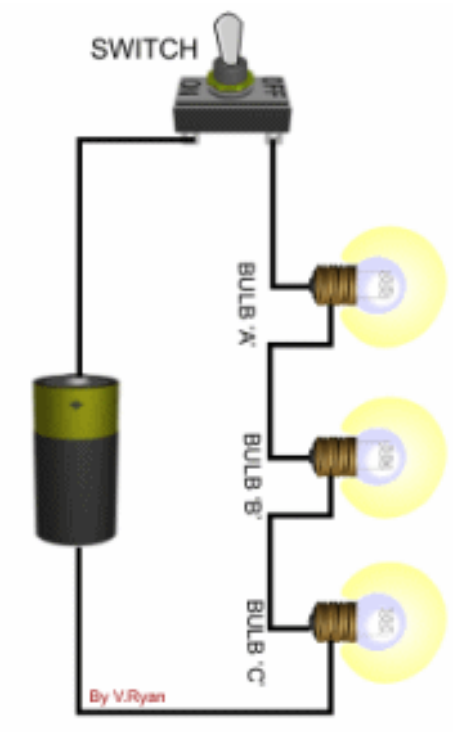
The circuit below shows three bulbs placed in **parallel**. This is a parallel circuit. Current can flow through each of the bulbs without first having to flow through any others. If any of the bul



Series circuits

The circuit opposite shows three bulbs placed in series. This is a called a series circuit. Current flows through each of the bulbs in sequence. Current flows through bulb A, then bulb B and finally bulb C. The more bulbs that are added, the less bright they shine. It is possible to added so many bulbs that they do not light at all. This is due to the resistance in each bulb. If any of the bulbs fail, current cannot flow through the circuit and the other components will not work.





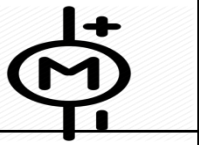
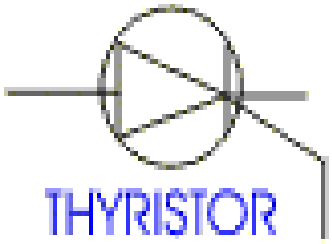
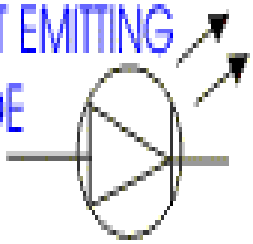
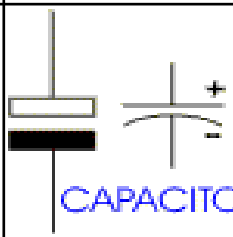
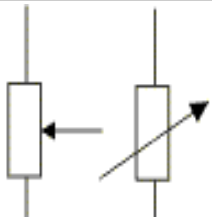
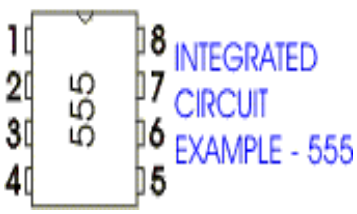
QUESTIONS:

1. Draw a simple series circuit and explain how it works.

2. Draw the same components but this time arranged as a 'parallel' circuit. How do the two circuits differ?

3. Is it possible to have a circuit that has some components arranged in parallel whilst others are arranged in series? If your answer is 'yes' draw a circuit that has two bulbs and two motors. Place the two bulbs in series and the two motors in parallel.

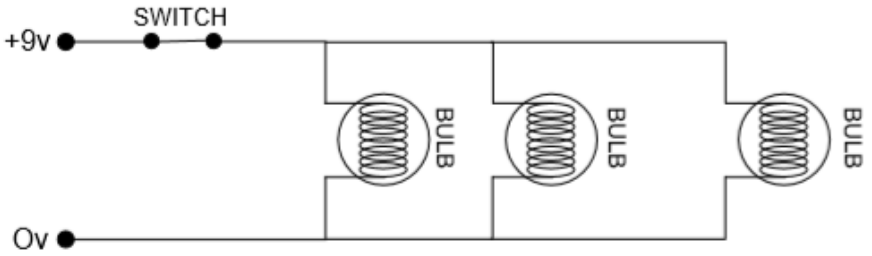
4. What will happen if one of the components fails in a series circuit?

POWER SUPPLY +9 0v	Provides electrical energy 	 LIGHT DEPENDENT RESISTOR	Changes flow of electricity depending on room temperature
BATTERY CELLS	Provides electrical energy 	 DIODE	Allow electricity to flow in one _____ only
SINGLE POLE SWITCH		 NPN TRANSISTOR	Electronic switch
LAMP 	 motor 	 THYRISTOR	Electronic switch. Latching That stays on once it is activated. Needs a re set switch
BUZZER	Vibrates to make a single buzzing tone 	LIGHT EMITTING DIODE 	Allow electricity to flow in one direction or 
LOUD SPEAKER	Vibrates to make many different sounds	 CAPACITOR 	Hold small amounts of electricity and then lets it out like a battery
FIXED RESISTOR	Reduces flow of electricity	Thermist  	
VARIABLE RESISTOR/ POTENTIOMETER	Variable resistor – adjusts the electricity flow 	 1 2 3 4 555 8 7 6 5 INTEGRATED CIRCUIT EXAMPLE - 555	Contains tansistors and capacitors on a computer chip

CIRCUITS IN PARALLEL

1. The circuit seen below has its components arranged opposite each other. What is this type of circuit known as?
Underline the correct answer.

BACK TO BACK CIRCUIT STAGE BY STAGE PARALLEL CIRCUIT SERIES CIRCUIT



Explain your choice of answer.

2. Add another bulb to the circuit shown above - the completed circuit should have four bulbs.

3. When a fourth bulb is added, what will happen to the brightness of all the bulbs? Explain your answer.

4. What will happen to the circuit if one of the bulbs fails?

5. Draw the same circuit as seen above but this time use LEDs in place of bulbs. (You may need to include resistors).

6. Write two advantages of using LEDs instead of filament bulbs?