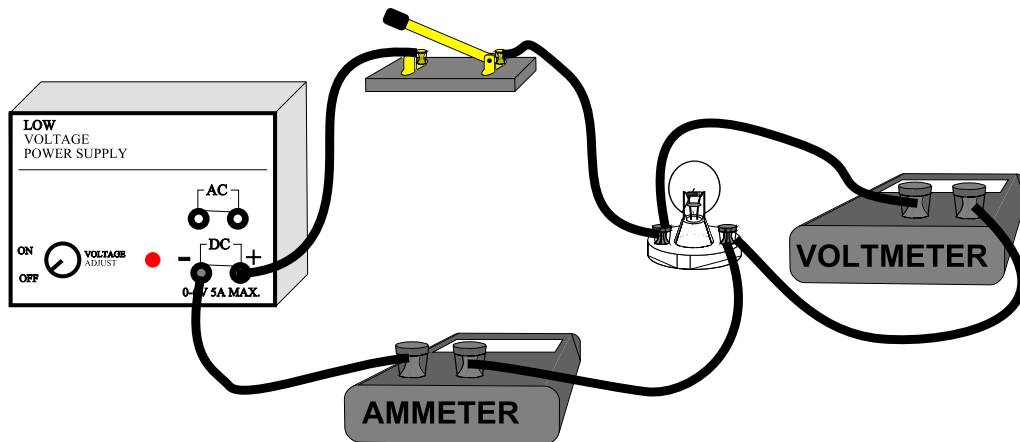


# CURRENT ELECTRICITY

The problem with understanding electricity, is that it's effects happen too quickly and you can't see it. For this reason we use models to understand it. Two models that have been found useful are the Styrofoam Ball Model, and the Water Model.

## Lesson 1: A Simple Electric Circuit



1) In the table below describe what the following parts in the circuit above, do.

Electric Circuit Part	What the parts do.
Battery (or Source)	
Conductor (wires)	
Switch	
Insulator	
Ammeter	
Volt"meter"	
Light Bulb	

- 2) In order to connect a \_\_\_\_\_ to a circuit you must break the circuit and insert the meter.
- 3) In order to connect a \_\_\_\_\_ to a circuit you measure around the circuit component.
- 4) What is a circuit?

5) Fill in the table below







Type Of Meter	Physical Quantity Measured	Unit Of Measurement	Relationship To Other More Fundamental Units
Ammeter			
Voltmeter			

- 6) A Light Bulb, Motor, Electrical Heater, Radio can all be referred to as a \_\_\_\_\_.
- 7) What does our model predict about where can a switch be placed in our circuit?
- 8) What is current?
- 9) What does our model predict about the amount of current flowing through different points in our circuit?
- 10) What is voltage?
- 11) What does our model predict about the voltage gain at the source compared to the voltage drop across the light bulb?
- 12) What is a short circuit?
- 13) What does our model predict will happen in a short circuit?
- 14) What actually happens to the current in a short circuit?

# Schematic Diagrams

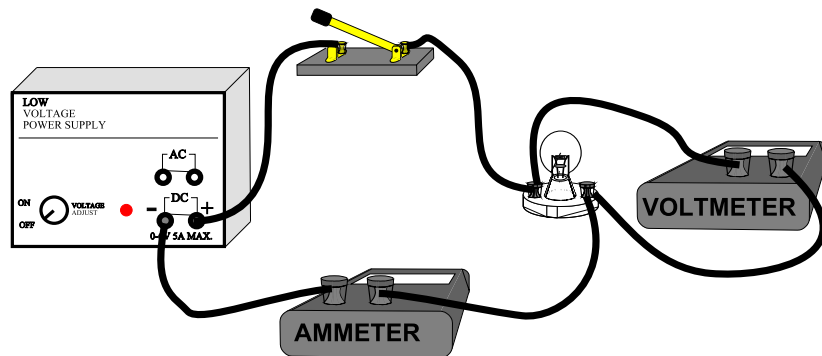
A Schematic Diagram is a short hand system for drawing an electric circuit. In order to simplify the diagrams, symbols are used instead of pictures and conductors are represented with horizontal or vertical lines.

1) Complete the table below with the names for the schematic symbols shown.

Schematic Symbol	Part Name
	
	
	
	
	
	

2) Draw the Schematic Circuit Diagram for the circuit below. Remember conductors are represented with horizontal or vertical lines.

Circuit Picture



Schematic Circuit Diagram

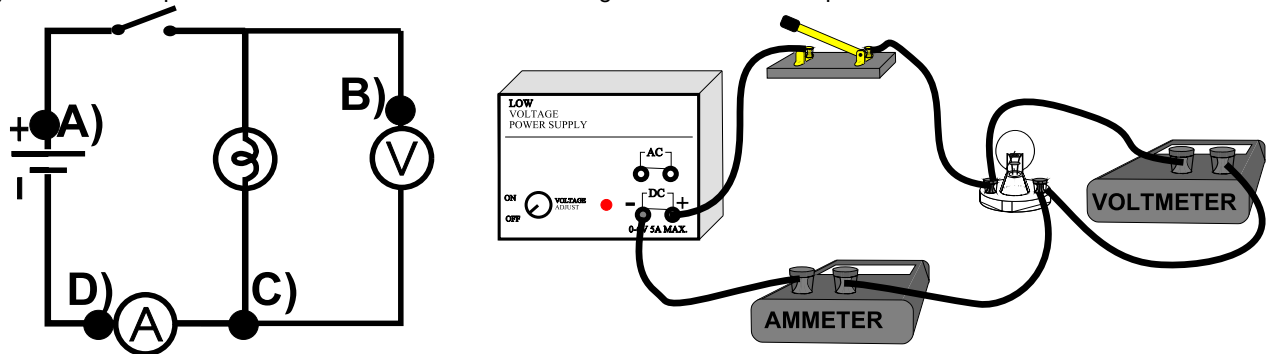
# REALITY CHECK - Wiring Real Circuits

Models and theories are useful in explaining and predicting what happens in real circuits. But they must be checked to ensure they are always useful. Unfortunately wiring real electric circuits from schematics can be difficult. There are a few tricks that will help.

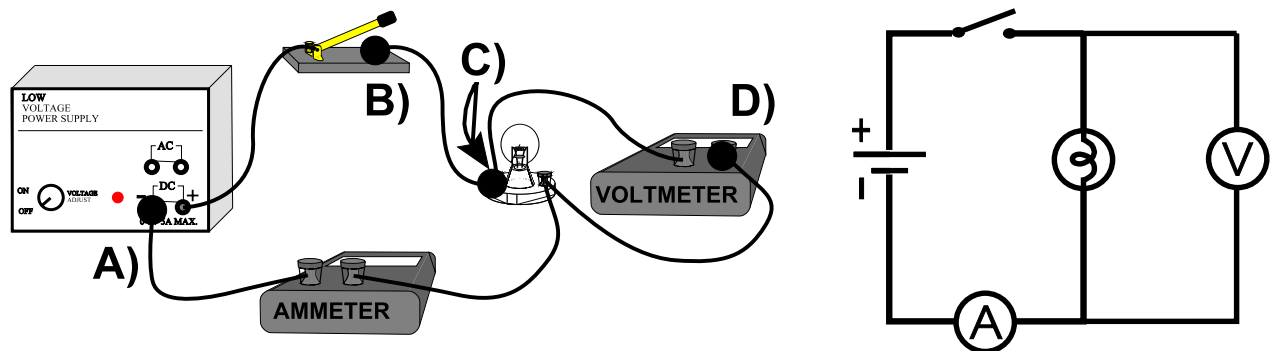
**Trick #1** Place all the circuit parts in the **same relative position** that they are in the schematic diagram. This will help you locate where to connect the different meters later.

Practice comparing locations on the schematic and real circuits with the pictures below

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



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



**Trick #2** Connect the ammeter when connecting the rest of the circuit because it is "in line" with other circuit parts

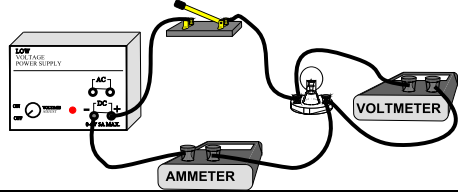
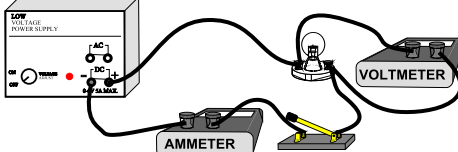
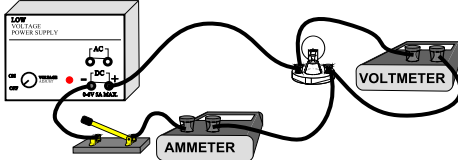
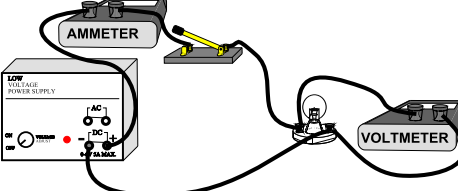
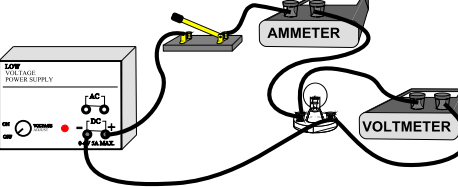
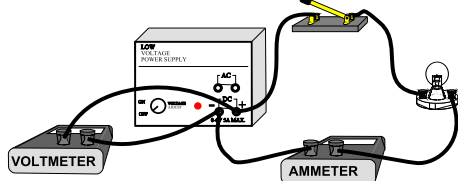
! **Connect the voltmeter last.** Since the voltmeter is connect "around" other circuit parts leave it until the last

**Trick #3** If the light bulb does not light when the switch is closed, there are a number of things you should do.

! Check the **bulb** to make sure it is **screwed in tightly** and **not burned out**

! Check all **connections** to see if they are **loose** by gently shaking them. Sometimes loose connections act like little open switches that you can not see.

Wire the circuits shown and complete the table.

Circuit Picture	Schematic Diagram	Ammeter	Voltmeter
			
			
			
			
			
			

Complete these statements.

- 1) In these circuits, the amount of current measured anywhere in the circuit is about \_\_\_\_\_.
- 2) In a circuit containing ONE bulb, the voltage drop across the bulb is about \_\_\_\_\_ the voltage gain across the source.
- 3) In these circuits, a switch placed \_\_\_\_\_ will control the light bulb.