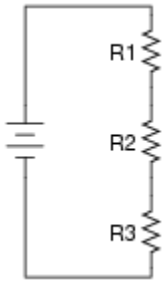
SNC1D
UNIT 3: CHARACTERISTICS OF ELECTRICITY
CHAPTER 11: ELECTRIC CIRCUITS

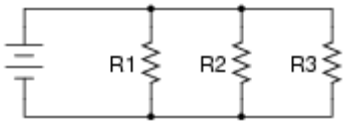
11.3: MEASURING the PROPERTIES of SIMPLE CIRCUITS

Simple Series and Parallel Circuits **Page 456**

What is the key difference between a series circuit and a parallel circuit? See the diagrams below as well as those on page 456.



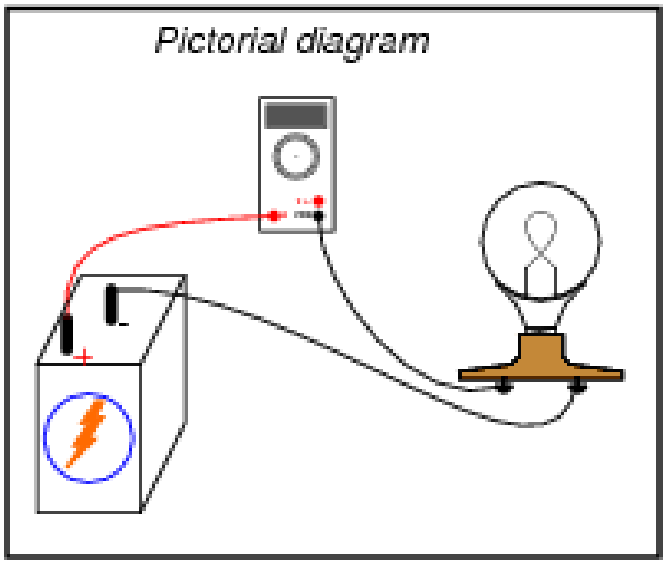
Three loads connected in series

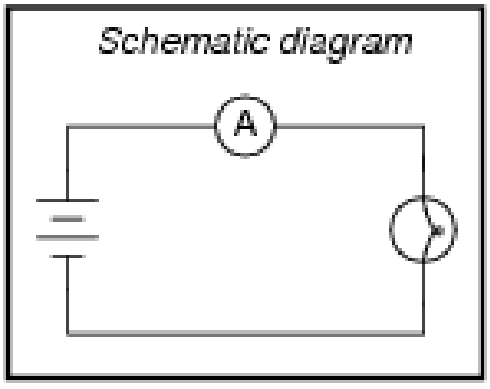


Three loads connected in parallel

① Measuring CURRENT **Page 458**

Electric current is measured using a device called an _____, which must be connected in **series** with the load as shown in the diagram below. This ensures that all the current flows through the meter.



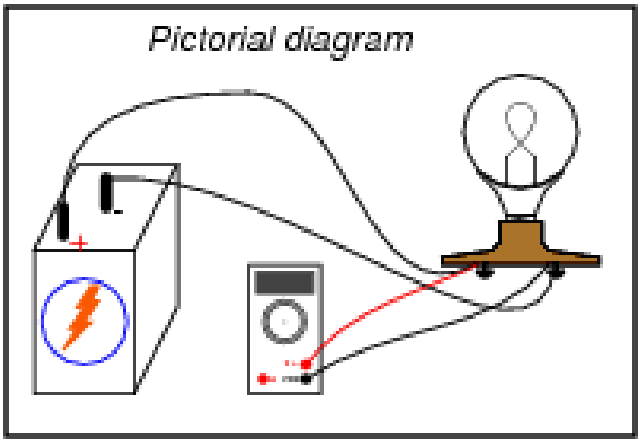


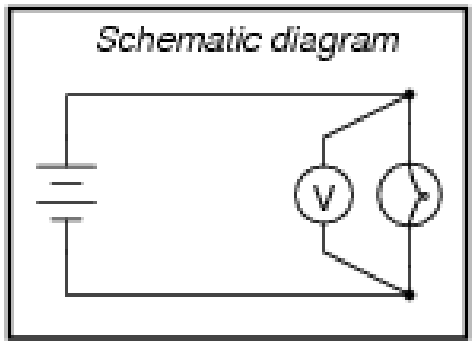
http://www.allaboutcircuits.com/worksheets/amp_m.html

② Measuring POTENTIAL DIFFERENCE **Page 458**

Potential difference is measured using a _____ connected in **parallel** with the voltage to be measured.

:

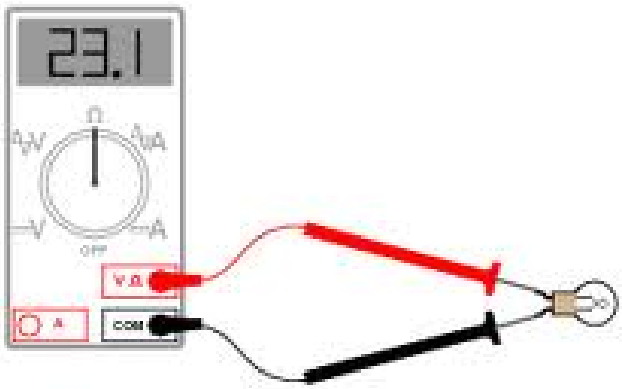




http://www.allaboutcircuits.com/worksheets/volt_m.html

③ Measuring RESISTANCE

The instrument for measuring electrical resistance is called an _____.:



The ohmmeter works by supplying the voltage and current to the device or circuit being tested. Therefore to avoid damage and possible injury, the device or circuit must first be completely disconnected and/or all the power turned off.

Question:
Draw a schematic diagram for an ohmmeter being used to measure the resistance of a light bulb.

Designing Circuits

What to Do

Use information from section 11.3 to help you draw the circuit diagrams described below.

Be sure to use the proper circuit symbols and label your drawings, including the positive and negative terminals of the battery, ammeter, and voltmeter. In each diagram, include an arrow to indicate the direction in which the current flows.

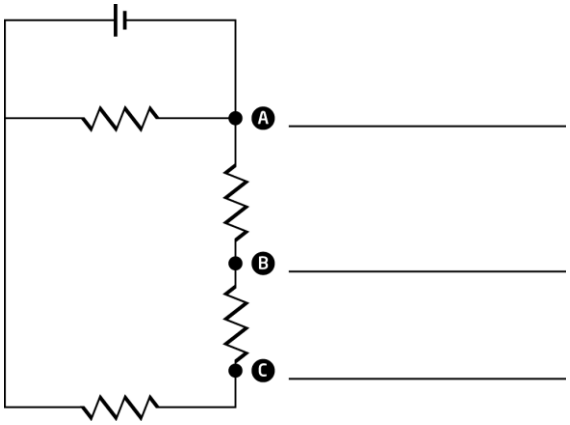
1. Draw a diagram of a circuit that consists of a 9 V battery, an ammeter, and a 25 Ω resister in series. Include a voltmeter that is measuring the potential difference across the resistor.

2. Draw an electric circuit consisting of a battery made up of two 1.5 V cells, a switch, two lamps, and an ammeter in series.

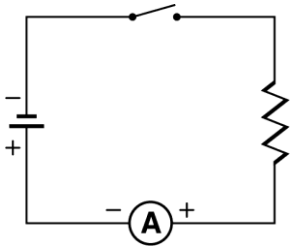
3. Draw an electric circuit consisting of a battery made up of four 1.5 V cells, one switch, one lamp, two 0.50 Ω resistors in series, and a voltmeter connected across the resistor that the current flows through first.

11.3 REVIEW

1. Label each connection as either series or parallel.

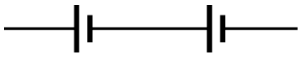


2. Identify what is incorrect about this circuit diagram



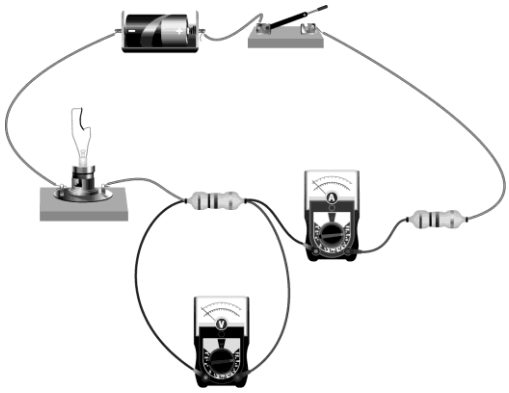
3. Draw the circuit symbol for a 9 V battery using 1.5 V cells in series.

4. What is the total potential difference in the battery shown?

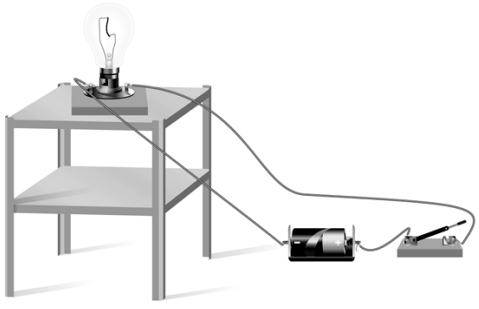


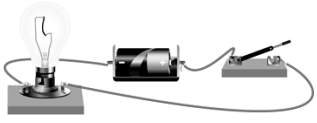
1.5 V 2.0 V

5. Draw the circuit diagram for this circuit.



6. A light bulb is put on a table and another one is put on the ground. The light bulbs are identical. Does one bulb need a greater voltage to operate, or does gravity have no effect?





7. **a.** Draw a 6 V battery using:

1.5 V Cells	**2.0 V Cells**

b. What happens when you connect a 6 V battery into a circuit that uses D cells?

A. The circuit is four times more efficient.

B. The circuit runs the same as if you put a D cell in.

C. It depends on how many resistors the circuit has.

D. The circuit will overheat and components will be damaged.

8. In electric circuits, both electrons and energy are conserved.

a. A quantity that is conserved remains _____.

b. If each cell is 1.5 V, what is the total energy consumed by the two identical bulbs in the circuit below?