EMG Education

Static Electricity

Read **pages 126-127** (5.1 Static Electricity) in your Longman Physics book

Complete *questions 1-3* on **page 129**

Static Charge Lab

Type the following address for the *PHET Interactive Simulator* into your web browser:

https://phet.colorado.edu/sims/html/balloons-and-static-electricity/latest/balloons-and-static-electricity_en.html

Make sure that the "show all charges" button is selected. You should see a sweater with positively charged particles (**Protons)** and negatively charged particles (**Electrons**) as well as a yellow balloon with less particles.

1. Using the PHET Simulator, take the balloon and place it near the wall. Describe what happens below:

_____

_____

2. Take the yellow balloon and drag it across the sweater. You will observe that the **free electrons** on the sweater attach to the balloon, which previously had an even amount of positive and negative charge. Release the balloon and describe below the effect of this transfer of electrons:

_____

_____

3. Using page 126-127, define the following words:
    a. Static Electricity: _____

    _____
    b. Conductor: _____

    _____
    c. Insulator: _____

EMG Education

Electricity Circuits

1. Using Figure 2.2 on page 130, draw the simple circuit below.

2. The image in your book has an open switch. Describe the effect of the open switch. What would change if the switch were to be closed?

_____

_____

_____

_____

3. Using pages 130-131, define the following words:

   a) Circuit: _____

   _____

   b) Conventional Current: _____

   _____

   c) Electron Flow:_____

   _____

   d) Short circuit: _____

   _____

4. Identify (draw) the circuitry symbols for the following terms:

   a. Bulb (resistance) b. Battery c. Wire

5. Using Figure 2.4 and 2.5 on page 131 of your book, draw and label a series and parallel circuit below.

6. Describe the difference between opening and closing a switch on a series circuit to opening and closing a switch on a parallel circuit.

_____

_____

_____

_____

7. Using page 131, define the following words:

a) Series Circuit: _____

_____

b) Parallel Circuit: _____

_____

c) Resistance:_____

_____

d) Short circuit: _____

_____

(The following lesson will involve computer and internet access.)

Voltage and Amperage Lab

Type the following address for the PHET Interactive Simulator into your web browser:

https://phet.colorado.edu/sims/html/circuit-construction-kit-dc/latest/circuit-construction-kit-dc_en.html

This is an online simulator which allows you to create circuits using a variety of materials. In class we use wire, batteries, and bulbs however there are many different mediums on earth with varying (different) levels of conductivity (ability to allow heat or electricity to travel through).

8. Using the PHET Simulator, create parallel and series circuits using the different materials.
9. Use the voltmeter and ammeter tools to measure voltage and amperage.
10. Add resistance and voltage and measure the effects.
11. Click the button to switch to circuitry symbol and draw the image shown in the space below:

12. Add at least one unconventional (irregular) type of resistance and describe the effect below.

_____

_____

_____

_____

13. Using page 132 and 136, define the following words:
    a) Ammeter: _____
    _____
    b) Variable Resistor: _____
    _____