FLINN SCIENTIFIC

Name_____

Series and Parallel Circuits Worksheet

Series Circuit Observations

One Lightbulb

Two Lightbulbs

Three Lightbulbs

Open Circuit

Parallel Circuit Observations

Two Lightbulbs

Three Lightbulbs

Open Circuit

Two Lightbulbs and One Short Circuit

Name_____

Series and Parallel Circuits Worksheet, continued

Post-Lab Questions

1. Which circuit design produced the brightest lightbulbs? Relate this to the amount of current flowing through each lightbulb.

2. What happened when all three lightbulbs were connected in series? Why did this occur?

3. Is there more resistance in the series circuit or the parallel circuit? How can you tell?

4. What is one advantage of a series circuit? What is one disadvantage?

5. What is one advantage of a parallel circuit? What is one disadvantage?

6. What happened with the two parallel-connected lightbulbs and the short circuit?

7. Is it better to have a string of lights, such as Christmas-tree lights, connected in series, or parallel? Explain.

Name_____

Pith Ball Electroscope Worksheet

Observations

Charge by Induction

Charge by Conduction

Post-Lab Questions

1. What did the pith balls do when the positive and negative charges were brought near them? Did the pith balls respond differently to the positive and negative charges?

2. What did charging the electroscope by conduction do? (Optional) Draw a picture showing the charged electroscope.

3. After the electroscope was charged by conduction, what charge (positive or negative) did the electroscope carry? How do you know?

4. Explain why the pith balls immediately "fly away" from the charged rod after making contact.

Name_____

Measuring Cell Potentials Worksheet

Data Table

Part A. Cell Potentials versus Zinc as the Reference Electrode				
Metal	**Positive Electrode (Cathode)**	**Negative Electrode (Anode)**	**Measured Cell Potential E^{o}_{cell} (V)**	**Calculated Value E^{o}_{red} (V)**
Copper				
Magnesium				

Part B. Predicted and Measured Cell Potential			
Cathode/Anode	**Calculation (Equation 1)**	**Predicted Cell Potential**	**Measured Cell Potential**

Post-Lab Questions

1. Which metal was most easily oxidized (it always appeared as the anode)? Which metal ions were most easily reduced (the corresponding metal always appeared as the cathode)?

2. Rank the three metals tested (including zinc) from most positive to most negative standard reduction potential. Write a general statement describing the relationship between the standard reduction potential of a metal and metal activity.

3. Look up the literature values of the standard reduction potentials for Cu and Mg, and calculate the percent error for each. *Hint:* Note the symbol for "absolute value."

$$\text{Percent error} = \frac{|\ \text{Experimental value} - \text{Literature value}\ |}{\text{Literature value}} \times 100\%$$

Name_____

Resistance Worksheet

Observations

"Simple Circuit" lightbulb brightness

Thick wire lightbulb brightness

Thin wire lightbulb brightness

Thin wire (1 m) lightbulb brightness

Post-Lab Questions

1. How does the brightness of the lightbulb relate to the resistance in the circuit?

2. How did the length of the short wire affect the brightness of the lightbulb? What does this mean in terms of the resistance in the circuit?

3. How did the thickness of the wire affect the brightness of the lightbulb? What does this mean in terms of the resistance in the circuit?

4. What are the two physical dimensions that affect the resistance in a wire? How do these physical dimensions affect the resistance in a wire?