FLINN SCIENTIFIC

Name_____

Resistance Mystery Worksheet

Data Table 1. Identifying the Resistors

Resistor #	Resistor Color Code	1st digit	2nd digit	Multiplier	Tolerance	Resistance	Range

Data Table 2. Series and Parallel Connections

Resistors	Connection Type	Current	Voltage	Measured Resistance	Calculated Resistance	Percent Error
	Series					
	Parallel					
	Series					
	Parallel					

Post-Lab Questions and Calculations *(Use a separate sheet of paper to answer the following questions.)*

1. Calculate the possible range of each resistor according to the tolerance and fill these values in on the table for Part A.
2. Calculate the percent error for each of the resistor arrangements and fill these values in on the table for Part B. Use Equation 5.

$$\text{Percent Error} = \frac{|\text{Measured Resistance} - \text{Listed Resistance}|}{\text{Listed Resistance}} \times 100 = \_\_\_\_\_ \qquad \textit{Equation 5}$$

Was the percent error less than the tolerance for the resistor combination? *Hint:* If all three resistors have the same tolerance, this becomes the tolerance for the combination.

3. What would be the color code of a 390 kΩ resistor, with 10% tolerance?
4. What would be the color code of a 6.8 Ω resistor, with 1% tolerance?
5. Calculate the current across each resistor in the parallel combination for both setups. Which resistors typically pass more current—lower values, or higher ones?
6. Compare the effective resistance of both the parallel and series combinations of resistors. Which has a higher resistance?
7. What would happen if one of the three resistors were removed and replaced with a simple wire in a series circuit? Parallel?
8. Because of its low resistance, the resistor with two gold bands is not recommended for use in a parallel circuit. Why? Speculate on how it would fare in a series circuit.