

## **USING GRAPHS**

### **Experiment 1**

#### **INTRODUCTION:**

Graphs are an important tool in science. They are a pictorial display of data. The shape of a graph often reveals a relationship that may not be readily apparent from the raw data itself. Graphs can also be used to predict quantities without actually measuring them. In this lab you will predict some measurements from graphs and compare them with their actual values, and determine the percent error of your predictions.

#### **MATERIALS:**

- |                          |               |
|--------------------------|---------------|
| ? 3 pieces of wire       | ? ruler       |
| ? 3 pieces of floor tile | ? graph paper |
| ? balance                |               |

#### **PROCEDURE:**

##### **Part A:**

1. Measure the length of the three wires to the nearest 0.1 cm.
2. Measure the mass of only the longest and shortest wire.
3. Make a graph of mass vs. length. Refer to Appendix IV for directions on graphing data.
4. Predict the mass of the middle length wire from the graph prepared above.
5. Measure the mass of the middle length wire on the balance, and calculate percent error, using the equations below:

$$\text{Percent error ? } \frac{(\text{observed value}-\text{true value})}{\text{true value}} \times 100$$

(**Note:** the mass measured on the balance in the true value)

**Part B:**

6. Measure the dimensions of the two rectangular pieces of tile and record data.
7. Calculate the area of the 2 rectangular pieces of tile. Be sure to show your calculations on the Report Form.
8. Measure the masses of the 2 rectangular tiles.
9. Make a graph of mass vs. area for the tiles. Refer to Appendix IV for directions on graphing data.
10. Measure the dimensions of the triangular piece of tile, and record data.
11. Calculate the area of the rectangular tile. Be sure to show your calculations on the Report Form.
12. Use the graph prepared in step 9 to determine the mass of the rectangular tile.
13. Measure the mass of the triangular tile on the balance, and calculate percent error.  
(**Note:** the mass measured on the balance in the true value)

**REPORT FORM**  
Experiment 1

**Part A**

<b>Quantity</b>	<b>Record data with units or show calculations where appropriate.</b>
Length of short wire	
Length of long wire	
Mass of short wire	
Mass of long wire	
Length of medium wire	
Predicted mass of medium wire (from graph)	
Measured mass of medium wire	
Percent error	

**Part B**

<b>Quantity</b>	<b>Record data with units or show calculations where appropriate.</b>	
Dimensions of small square tile		
Area of small square tile		
Dimensions of large square tile		
Area of large square tile		
Mass of large square tile		
Mass of small square tile		
Dimensions of triangular tile		
Area of triangular tile		
Predicted mass of triangular tile (from graph)		
Measured mass of triangular tile		
Percent error		