

# Lab Sheet

Name \_\_\_\_\_

## Error in Measurement

1. Measure the length and width of a **large rectangular surface** in the classroom (such as a table, the blackboard, or the teacher's desk). Take these measurements to the nearest 1/16th of an inch. Express these answers as fractions.

What did you measure: \_\_\_\_\_ Length = \_\_\_\_\_ Width = \_\_\_\_\_

2. Measure the length and width of a **small rectangular surface** in the classroom (such as an eraser, a box of chalk, or a small memo pad). Take these measurements to the nearest 1/16th of an inch. Express these answers as fractions.

What did you measure: \_\_\_\_\_ Length = \_\_\_\_\_ Width = \_\_\_\_\_

3. Determine the **precision** of your measuring instrument. Find the smallest scale division on your ruler (is it 1/16th, or 1/32nd, or .....?) Take one-half of this value and add it to (and subtract it from) the measurements made above to establish the **tolerance intervals**.

**Large surface tolerance interval (length)** \_\_\_\_\_

**Large surface tolerance interval (width)** \_\_\_\_\_

**Small surface tolerance interval (length)** \_\_\_\_\_

**Small surface tolerance interval (width)** \_\_\_\_\_

4. Calculate the **smallest possible area** for each surface.

Smallest possible area (large surface) = \_\_\_\_\_

Smallest possible area (small surface) = \_\_\_\_\_

5. Calculate the **largest possible area** for each surface.

Largest possible area (large surface) = \_\_\_\_\_

Largest possible area (small surface) = \_\_\_\_\_



6. Examine the **ranges between the largest and smallest possible areas** for each surface. Does the size of the surface seem to have an influence upon these ranges? State your findings in the form of an hypothesis.

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7. Test your hypothesis by **taking one additional set of measurements**. What size surface should be used to test your hypothesis? \_\_\_\_\_

Record your results below.

Length = \_\_\_\_\_ Tolerance interval for length: \_\_\_\_\_

Width = \_\_\_\_\_ Tolerance interval for width: \_\_\_\_\_

Smallest possible area = \_\_\_\_\_

Largest possible area = \_\_\_\_\_

Range between smallest and largest possible areas: \_\_\_\_\_

Is your hypothesis supported? \_\_\_\_\_ If NO, how would you reformulate your hypothesis? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_