

## Title: Density of Wood Blocks

**Purpose:** To determine the density of a set of wooden blocks.

- To practice metric measurement
- To calculate using metric units
- To organize and graph data
- To determine density via direct calculate and by graphing
- To practice determining slope from a graph
- To calculate percent error

### Materials:

- set of wooden blocks
- metric ruler
- balance

### Procedure:

1. Measure length, width, and height of each block (to nearest .01 cm)
2. Determine mass of each block using balance (to nearest .01 g)
3. Calculate volume ( $V = l \times w \times h$ ) of each block
4. Determine mean volume
5. Calculate density ( $D = m/V$ ) for each block
6. Determine mean density for all wood blocks (**this is the *calculated* value**)
7. Graph volume (x-axis) vs mass (y-axis)
8. Draw a "line of best fit"
9. Determine slope of this line ( $y_2 - y_1 / x_2 - x_1$ ) (Use triangle method.....teacher will demonstrate)
10. Compare *calculated* value for density with that from the *slope* determined by triangle method.
11. Calculate percent error 3 ways: **(A - O / A) x 100%**
  - a. using *calculated* value as "actual value" (A) and *slope* determined by triangle method as "observed value" (O) (GRAPHING ERROR)
  - b. using value provided by teacher as actual value and *calculated* value as observed value (MEASUREMENT ERROR)
  - c. using value provided by teacher as actual value and *slope* determined by triangle method as observed value (OVERALL ERROR)

### Results:

- data chart for calculations
- graph of mass vs volume
- data chart percent error calculations

### Discussion:

1. Briefly summarize what you did.
2. Comment on measurement problems
3. Compare calculated and graphically determined slope values
4. Restate percent error
5. Comment on precision and accuracy of your measurements (remember the definitions of these terms!)
6. Comment on possible sources of error

**Conclusion** The easiest conclusion to make from this lab is the wood density value.

**Reflection:** Personal statement