

Unit A – Matter, Metric, and Density

Papers worth reviewing

- What Makes a Good Data Table?
- What makes a Good Graph?
- LAD A1 – Law of Conservation of Mass
- LAD A2 – Density of Liquids
- LAD A3 – Density of Solids
- LAD A4 – Extensive, Intensive, Quantitative, and Qualitative
- LAD A5 – Cartesian Divers
- NoteSheet A1 – Metric Conversions
- NoteSheet A2 – Significant Figures
- NoteSheet A3– Error Analysis
- NoteSheet A4 – Density
- NoteSheet A5 – Accuracy and Precision
- NoteSheet A6 – Dimensional Analysis (aka Factor Label Method)
- Practice A1 – Metric Conversions
- Practice A2 – Significant Figures
- Practice A3 – Density of Liquids
- Practice A4 – Density of Solids
- Practice A5 – Dimensional Analysis
- Practice A6 – Graphing Practice
- Practice A7 – Extensive, Intensive, Quantitative, Qualitative, Observation and Inference
- Consider using the class presentation and clicker questions for review as well (available on the unit A document page at the top)

Objectives

1. Define mass. Define volume. Give appropriate units for each.
2. Demonstrate that you can use a balance to determine the mass of various objects. Record the value of an object's mass in a manner consistent with the limit of precision of the balance.
3. Develop, from experimental evidence, the law of conservation of system mass.
4. Relate the volume of a container (in cm^3) to the volume of liquid it contains (in mL).
5. Recognize that instruments have a limit to their precision; relate the data recorded to the quality of the measurement.
6. Round off calculated values to the appropriate number of significant figures.
7. Given a graph of mass vs. volume of a substance, write the equation of the line and state the meaning of the slope.
8. Recognize the physical properties can be extensive or intensive and quantitative or qualitative.
9. Recognize that density is a characteristic property of matter. How can density be used to identify unknown substances?
10. Use density as a conversion factor between mass and volume; show examples of converting mass to volume and vice-versa.
11. Draw particle diagrams to represent solids, liquids and gases in a way that is consistent with their densities.
12. Given an error source, state which data is affected, and how subsequent calculation(s) will be affected
13. Use the metric system effectively, converting between units including compound (g/mL) and derived units (squared and cubed)
14. Use dimensional analysis as a method for problem solving.

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Vocabulary List

- mass
- volume
- density
- extensive
- intensive
- quantitative
- qualitative
- uncertainty of measuring device
- significant figures
- metric prefixes, base units
- accuracy
- precision
- dimensional analysis (aka factor label method)
- error analysis
- percent error
- percent yield
- slope
- x y scatter graph
- lab safety & common sense!

This vocabulary list is meant to complement your study. Knowing this list alone, without the concepts on the front would not prepare you for the test.