

# Chapter 1 Cramsheet: Matter and Measurement

1. Define and state the characteristics of the following:

- element
- compound
- mixture
- pure substance
- homogeneous mixture
- heterogeneous mixture

-Use the following chart as an aid:

2. Define physical change:

3. Define chemical change:

4. A change of state is a PHYSICAL change. Also know the three states of matter and what terms are used to change one to the other? Use this chart:

5. Define these ways to separate mixtures:

- distillation:
- chromatography:
- filtration:

6. Know the following prefixes: kilo-, centi-, milli-, nano- and remember the density formula:  $D=M/V$

7. Convert between Celsius and Kelvin. We need to learn how to convert between Fahrenheit and Celsius.

$$\frac{5}{9}(\text{°F} - 32) = \text{°C} \quad \text{or} \quad \frac{9}{5}(\text{°C}) + 32 = \text{°F}$$

8. Significant Figures:

- If the decimal is present (Pacific), count from the left, starting with the first nonzero digit.
- If the decimal is absent (Atlantic), count from the right, starting with the first nonzero digit.
- When multiplying or dividing, use the amount of sig figs present in the number with the least sig figs in the problem. (Weakest player on the team)
- When adding or subtracting, use the same number of decimal places as the value with the least amount of decimal places. (Weakest player on the team)

9. Review scientific notation calculations. Multiply and divide especially. (p.641-642)

10. Convert using dimensional analysis (factor label table).

11. What are the steps of the scientific method?

12. Particularly, how does a theory become a law and how are models insufficient?

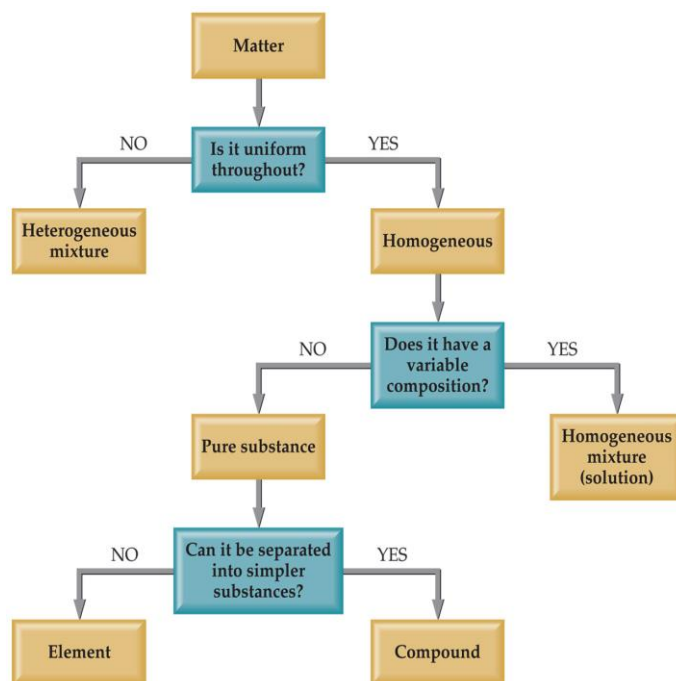
13. What is the difference between independent and dependent variables?

14. Define precision and accuracy and draw dartboards to explain the difference, like this:

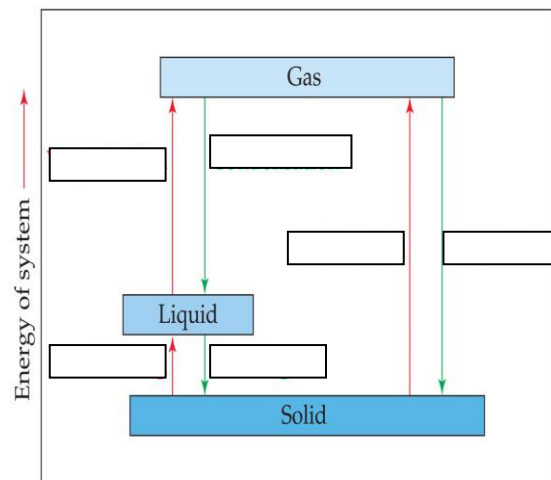
15. In class stuff:

- Sig Fig rule of thumb.
- Calculating uncertainty: random v. systematic error
- Derived units

**Solve the following from your textbook: p. 21 #1, p.22, # 2, 3, 5, 12, 13, 15, 16, 19, 22, 24, 25, 27, 31, 34, 39, 45, 49, 55, 66**



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