Chemical Toolkit

Scientific Inquiry

Numbering like a scientist
- Numbers have three parts
  - Magnitude (size)
  - Unit
  - Precision (number of significant figures)
- Finding significant figures
  1. All nonzero digits are significant
  2. Zeros between nonzero digits are significant
  3. Zeros to the right of a nonzero digit *and* to the left of a decimal are significant
  4. Zeros after *both* a decimal *and* a nonzero digit are significant
- Significant figures and math
  - Add and subtract: precision of the final answer must end in the same column as the term with the fewest significant decimal places
  - Multiply and divide: final precision must be the same as the quantity with the fewest number of significant figures

Graphing
- Identify graphs and equations of the following relationships:
  - Constant
  - Exponential
  - Direct
  - Inverse

Mathematics: (See Table T)
- Percent Error: $\%\ \text{error} = \frac{\text{measured value} - \text{accepted value}}{\text{accepted value}} \times 100$
- Density: $\text{density} = \frac{\text{mass}}{\text{volume}}$ or $d = \frac{m}{V}$
- Dimensional analysis using conversion factors
  - SI prefixes (See Table C)

Periodic Table
- Metals, metalloids, nonmetals
- Blocks: s, p, d, f
- Groups (columns) and Periods (rows)

Reference Tables
- Table G: solubilities
  - unsaturated, saturated, supersaturated
- Table H: vapor pressure of four substances
  - Higher BP corresponds to stronger intermolecular forces (IMFs)