Foundations of Scientific Inquiry Pre-IB/H
Mid-Year Final Topics

- **Scientific Method (Chapter 1)**
  - ✓ Define and describe the process of science
  - ✓ Describe the steps which may be used by scientists to investigate a problem
  - ✓ Be able to recognize the scientific method in experiments including identifying the control, constants and variables.

- **Scientific Equipment**
  - ✓ Identify, use and care for the equipment used in lab investigations throughout the year
  - ✓ Be able to mass an object on an electronic balance
  - ✓ Be able to measure liquid volume in graduated cylinder
  - ✓ Be able to measure temperature with Celsius thermometer
  - ✓ Be able to measure length with metric ruler and meter stick

- **Laboratory Safety (Introduction)**
  - ✓ Know location and proper use of all safety equipment in the laboratory
  - ✓ Use all lab equipment in a safe manner
  - ✓ Conduct themselves in a safe and appropriate manner at all times
  - ✓ Understand safety procedures and first aid instructions given in a handout

- **SI / Metric System (Chapter 1)**
  - ✓ Understand the development of SI/metric system
  - ✓ Know the standards for the base units in the SI system
  - ✓ Distinguish between base and derived units
  - ✓ Know the metric units and prefixes
  - ✓ Use the factor label method for conversion of units

- **Reading Scales and Estimating Digits**
  - ✓ Read a number scale which is divided into fractional units
  - ✓ Read scales to the appropriate number of significant figures
  - ✓ Read measurements to include the appropriate estimated digits

- **Math Skills in Science (Chapter 1)**
  - ✓ Convert numbers into and out of scientific notation
  - ✓ Recognize the order of magnitude for numbers in scientific notation
  - ✓ Know rules of rounding numbers and properly use them in calculations
  - ✓ Know rules of significant figures and properly use them in calculations
  - ✓ Use formulas for calculating area and volume
  - ✓ Use unit analysis to solve problems

- **Density**
  - ✓ Determine the volume of regular solids by measurement and calculations
  - ✓ Determine the volume of irregular solids by water displacement
  - ✓ Be able to calculate the density of an object after obtaining the volume and mass to the correct number of sig figs

- **Percent**
  - ✓ Calculate percent from a decimal and fraction
  - ✓ Use a percentage to calculate the amount of the part
  - ✓ Use part and total to calculate the percent of the total
  - ✓ Know how to calculate percent difference in lab investigations
  - ✓ Know how to calculate percent error in lab investigations

- **Data Tables and Graphs (Chapter 1)**
  - ✓ Be able to interpret and construct data tables
  - ✓ Be able to interpret and construct best-fit line, bar, and circle graphs
  - ✓ Develop methods of interpolation and extrapolation to interpret line graphs

- **Energy Unit (Chapters 9 – 10)**
  - ✓ Distinguish between kinetic and potential energy
  - ✓ Explain the law of conservation of energy
  - ✓ Contrast heat and temperature
  - ✓ Convert temperature between Fahrenheit, Celsius and Kelvin scales
  - ✓ Explain what determines the thermal energy of matter
  - ✓ Compare and contrast the transfer of thermal energy by conduction, convection, and radiation
  - ✓ Understand the difference between conductors and insulators
  - ✓ Explain the function of insulation in energy transfer and conservation
  - ✓ Define specific heat
  - ✓ Calculate the change in thermal energy using specific heat

- **Classification and States of Matter (Chapter 2 & 6)**
  - ✓ Describe the four states of matter
  - ✓ Use the kinetic theory of matter to explain characteristics of solids, liquids and gases
  - ✓ Identify the six crystal shapes
  - ✓ Describe viscosity
  - ✓ Explain thermal expansion of matter
  - ✓ Interpret state changes in terms of kinetic theory of matter
  - ✓ Define heat of fusion and heat of vaporization in state changes
  - ✓ Distinguish between substances and mixtures
  - ✓ Distinguish between elements and compounds
  - ✓ Compare and contrast solutions, colloids, suspensions
  - ✓ Describe miscibility
  - ✓ Describe emulsions and emulsifiers
  - ✓ Distinguish between physical and chemical properties
  - ✓ Distinguish between physical and chemical changes
  - ✓ State and explain the law of conservation of mass