IPS Chapter-1 **Course Introduction, Volume and Mass**

"I Can" Statements

1. Access, navigate, and utilize all course related websites: WebAssign.net, Classroom.google.com, Chemistrybyscott.org, & Celinaschools.org.
2. Follow and interpret all the rules on the "Science Laboratory Safety Agreement".
3. Access and use and google docs for class assignments and lab reports.
4. Properly operate and safely assemble ordinary science lab equipment such as: inserting glass tubing into a rubber stopper, collecting gas by water displacement, lighting and adjusting a flame on a Bunsen burner, assembly and adjustment of various common clamps, rings, tubing, and support equipment used in the chemistry lab.
5. Make detailed qualitative observations while carrying out a laboratory experiment.
6. Convert from any metric prefix to another between pico and Giga.
7. Measure length using a ruler.
8. Measure volume using a graduated cylinder.
9. Tell how many significant figures are in a number.
10. Calculate properly (add, subtract, multiply, divide) using significant figures.
11. Round numbers using the even rule.
12. Write any mathematical value in scientific notation.
13. Enter scientific notation values into a scientific calculator.
14. Use values expressed in scientific notation in calculations.
15. Correctly measure mass using either a mechanical balance or an electronic balance.
16. Measure the volume of air space found in a particulate structure of solid such as sand.
17. Recognize that if a solid dissolves in a liquid, the volume may not be conserved; and that when rock salt dissolves in water the total volume decreases.
18. Describe the basic operation of an equal arm balance.
19. Correlate the proper functions of an electronic balance to the mass readings produced by successively adding masses that are less than the minimum sensitivity of the balance.

IPS Chapter-2 **Mass Changes in Closed Systems**

"I Can" Statements

1. Conduct an experiment designed to explore whether mass changes when salt dissolves in water inside a closed container.
2. Conduct an experiment designed to explore whether mass changes when frozen water melts inside a closed container.
3. Conduct an experiment designed to explore whether mass changes when a chemical reaction producing a gaseous product occurs inside a closed container.
4. Construct histograms using mass-change data collected in the laboratory
5. Analyze histograms and draw conclusions from the data.
6. Use experimental data to predict whether or not the mass changes when physical or chemical events happen in closed systems.
7. Decide what to do about condensation that forms on the outside of a container during an experiment involving low temperatures.
8. Show how the mass of a container changes when a pressurized gas is released from the container.
9. Distinguish between the laws of nature and the laws of society.
10. Defend the Law of Conservation of Mass using your own experimental results and those of your classmates.

IPS Chapter-3 **Characteristic Properties**

"I Can" Statements

1. Use characteristic properties to tell if two objects are made of the same substance.
2. Measure the masses and volumes of solids, liquids, and gases and use these measurements to calculate their densities.
3. Differentiate among substances and phases using density
4. Regularly measure temperature change of a substance and produce a graph of temperature vs. time.
5. Identify the phase changes on a temperature vs time graph
6. Define mass and volume
7. Compare the mass and volume of two or more objects made of two or more substances and predict differences and similarities.
8. Accurately measure both mass and volume of a liquid while transferring it between containers between measurements.
9. Describe the range of densities of solids, liquids, and gases.
10. Assess the relationship of phase (solid, liquid, and gas) to the range of densities found in nature.
11. Describe the relationship between air pressure and boiling point
12. Discriminate among substances based on the properties of density, melting point, and boiling point.

IPS Chapter-4 **Solubility**

"I Can" Statements

1. Distinguish between melting and dissolving
2. Identify a saturated solution and an unsaturated solution
3. Describe the characteristics of a solution
4. Express the concentration of a solution
5. Measure the concentration of a solution
6. Compare the concentrations of two or more solutions.
7. Define solubility
8. Determine if various solutes are soluble in various solvents.
9. Compare the solubility of substances when given a solubility graph
10. Use a solubility graph to predict the following:
    i. Changes in maximum mass of dissolved solute due to changes in temperature
    ii. Mass of precipitate formed when a saturated solution is cooled
    iii. Volume of solvent required to dissolve a given mass of solute at a certain temperature
    iv. Mass of additional solute that will dissolve in a given volume of solvent at any temperature in the graphic range
    v. Minimum temperature required to dissolve all of a given mass of solute in a given volume of solvent
11. Describe the general solubility of gases in water as temperature changes
12. Relate the solubility of substances in water to the common everyday topics of: acid rain, formation of limestone caves, sink-holes, hard water, and drinking water composition.

IPS Chapter-5 **The Separation of Mixtures**

"I Can" Statements

1. Separate a mixture of liquids by fractional distillation
2. Safely test the flammability of a liquid
3. Measure the density of a liquid
4. Test the solubility of solids in a liquid
5. Produce a graph of temperature vs time using periodic temperature measurements
6. Identify the number of liquids in a mixture by examining a temperature-time graph
7. Identify the boiling points of liquids by examining a temperature-time graph.
8. Describe the prevalent theory of how petroleum was developed.
9. Describe the process by which petroleum is separated into its primary useful components
10. Describe the separation of a mixture of insoluble solids by flotation
11. Separate a mixture of solids using solubility
12. Describe and explain the separation process of a mixture of soluble solids
13. Use paper chromatography to separate a mixture of water soluble ink
14. Distinguish between mixtures and pure substances

IPS Chapter-6 **Compounds and Elements**

"I Can" Statements

1. Use the process of electrolysis to decompose water molecules
2. Use a burning/glowing splint to identify hydrogen gas and oxygen gas
3. Explain what volume ratio of oxygen gas and hydrogen gas is expected when water is electrolyzed.
4. Predict the volume(s) of un-reacted gas when various ratios of hydrogen and oxygen gas are ignited in a sealed container.
5. React Zn metal with hydrochloric acid; separate the unreacted metal; evaporate the water and recover the product.
6. Use mass measurements of reacted Zn metal and zinc chloride produced to calculate the ratio of Zn to zinc chloride.
7. Use the ratio of Zinc to zinc chloride to predict the mass of product when various masses of Zn are reacted.
8. Distinguish between complete and incomplete reactions.
9. Distinguish between excess and limiting reactants in a chemical reaction.
10. Define the terms "element" and "compound".
11. Identify the highest percentage elements found near the surface of the earth.
12. Relate the general location of the highest percentage elements found near the surface of the earth.