FRANKLIN-SIMPSON HIGH SCHOOL

Course Name: Pre-AP Chemistry **Unit Name:** **Measurement and Analysis of Matter** **Days: 6**

Quality Core Objectives:

Unit 2 Measurement and Analysis of Matter		
I.A.1.	Scientific Inquiry	a. Identify and clarify research questions and design experiments
		b. Design experiments so that variables are controlled and appropriate numbers of trials are used
		c. Collect, organize, and analyze data accurately and use techniques and equipment appropriately
		d. Interpret results and draw conclusions, revising hypotheses as necessary and/or formulating additional questions or explanations
		e. Write and speak effectively to present and explain scientific results, using appropriate terminology and graphics
		f. Safely use laboratory equipment and techniques when conducting scientific investigations
		g. Routinely make predictions and estimations
I.A.2.	Mathematics and Measurement in Science	a. Distinguish between precision and accuracy with respect to experimental data
		b. Use appropriate SI units for length, mass, time, temperature, quantity of matter, area, volume, and density; describe the relationships among SI unit prefixes (e.g., centi-, milli-, kilo-); recognize commonly used non-SI units
		c. Use the correct number of significant figures in reporting measurements and the results of calculations
		d. Use appropriate statistical methods to represent the results of investigations
		e. Express numbers in scientific notation when appropriate
		f. Solve for unknown quantities by manipulating variables
		g. Use graphical, mathematical, and/or statistical models to express patterns and relationships inferred from sets of scientific data
I.A.3.	Science in Practice	b. Explain why experimental replication and peer review are essential to eliminate as much error and bias as possible in scientific claims
II.A.1.	Mass, Volume, and Density	a. Explain why mass is used as a quantity of matter and differentiate between mass and weight
		b. Explain density qualitatively and solve density problems by applying an understanding of the concept of density

Purpose of the Unit: The purpose of this unit is to review what students learned about the metric system, SI units, laboratory measurements, and scientific notation in previous science classes and apply it to analyze scientific data. Students will also differentiate between mass and weight as well as accuracy and precision with respect to experimental data.

Prerequisites: Students should be able to:

- identify base units of measurement in the metric/SI system
- use and convert between scientific and standard notation
- create graphical representations of data
- differentiate between mass and weight
- use scientific and mathematical formulas

Daily Lesson Guide

Day	Lesson Content and Objectives	Focus Questions	Critical Thinking (High Yield / Literacy /LTF/etc.)	Engagement	Assessment and/or Accommodations
1	*** Scientific notation** *** SI units and metric pre-fixes, convert** ***Mass vs. weight** **I.A.2.b, e** **II.A.3.b**	*** How are quantities measured and expressed in science?** *** How can I differentiate between mass and weight?**	*** Summarizing and note taking** *** I Do – We Do – You Do** *** Identifying similarities and differences** *** Analysis/ Application**	*** Pre-test** *** ACT bell ringer** *** Modeled notes** *** Practice problems together (formative)** *** Article about weight differences on different planets**	*** Evaluate pre test and formative assessment, check for understanding on article comprehension** **Enrichment: Less guidance in note taking, more independence in practice, more challenging examples in formative**

2	*** Significant figures in measurements and calculations** *** Precision vs. accuracy** *** Types of graphs and relationships expressed (ex: slope on a line graph)** **I.A.2.a, c, d, g**	*** How many decimal places should be recorded in measurements and calculations?** *** How can I differentiate b/t accurate and precise measurements?** *** What info can I use from a graph?**	*** Summarizing and note taking** *** I Do – We Do – You Do** *** Application** *** Identifying similarities and differences** *** Non-linguistic representation**	*** ACT bell ringer** *** Modeled notes** *** Venn Diagram for graph types** *** Analysis of graphs (formative)**	*** Evaluate formative assessment and Venn diagrams** **Enrichment: Less guidance in note taking, more independence in creation of Venn diagram**
3	*** Density and density calculations** **I.A.2.f** **II.A.1.b**	*** How can D be determined for regularly and irregularly shaped objects?** *** What else can density tell me about a sample?**	*** Summarizing and note taking** *** I Do – We Do – You Do** *** Analysis and application**	*** ACT bell ringer** *** Graphic organizer (math notes) for sample problems** *** Practice problems together (formative)**	*** Evaluate formative assessment and math notes** **Enrichment: Less guidance in note taking, more independence in practice, more challenging examples in formative**
4	*** Laboratory: Using density to date a penny** **I.A.1.a, b, c, d, e, f, g** **I.A.2.a, b, c, d, e, f, g** **I.A.3.b** **II.A.1.a, b**	*** How can I apply what I know from this unit to determine the date of a penny based on mass and volume data?**	*** Synthesis** *** Application/ Analysis** *** Identifying similarities and differences** *** Learning with others** *** Authenticity** *** Novelty and Variety** *** Generating and testing hypotheses**	*** ACT bell ringer** *** Conduct lab according to procedures provided (summative)**	*** Evaluate lab report** **Enrichment: Student development of lab procedures with less guidance**

5	*** Review** **I.A.1.a, b, c, d, e, f, g** **I.A.2.a, b, c, d, e, f, g** **I.A.3.b** **II.A.1.a, b**	*** What can I do to be better prepared for the exam?**	*** Use clickers to test students' knowledge and clarify and misconceptions before the exam with immediate feedback.**	*** ACT bell ringer** *** Use clickers to review with exam like questions (summative)**	*** Students participate in review** **Enrichment: Less time to solve problems and limited use of aides**
6	*** Exam** **I.A.1.a, b, c, d, e, f, g** **I.A.2.a, b, c, d, e, f, g** **I.A.3.b** **II.A.1.a, b**	*** Can I demonstrate my knowledge on the exam?**	*** Evaluation** *** Analysis** *** Application** *** Synthesis**	*** ACT bell ringer** *** Students take exam (summative)**	*** Evaluate exam** **Enrichment: No use of supports with exemption of periodic table, periodic table only has element symbols, not names**