

FRANKLIN-SIMPSON HIGH SCHOOL

Course Name: Pre-AP Chemistry

Unit Name: Introduction to Chemistry: What Matters?

Days: 7

Quality Core Objectives:

Unit 1 Introduction to Chemistry: What Matters?	
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
I.A.2. Mathematics and Measurement in Science	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
	g. Use graphical, mathematical, and/or statistical models to express patterns and relationships inferred from sets of scientific data
II.A.2. Elements, Atomic Mass, and Nomenclature	b. Compare the characteristics of elements, compounds, and mixtures
II.B.1. Phases of Matter, Phase Changes, and Physical Changes	a. Compare the definition of matter and energy and the laws of conservation of matter and energy
	b. Describe how matter is classified by state of matter and by composition
	c. Describe the phase and energy changes associated with boiling/condensing, melting/freezing, sublimation, and crystallization (deposition)
	d. Explain the difference between chemical and physical changes and demonstrate how these changes can be used to separate mixtures and compounds into their components
	e. Define chemical and physical properties and compare them by providing examples
IV.A.1. Structure of Liquids and Solids	b. Describe and perform common separation techniques (e.g., filtration, distillation, chromatography)

Purpose of the Unit: The purpose of this unit is to provide a brief review of basic science concepts (measurement, experimental design, SI units, safety, data analysis, etc.) and introduction to chemistry concepts such as matter, phase changes, law of conservation of mass/ energy, physical and chemical properties, and separation techniques.

Prerequisites: Students should be able to:

- * create graphical representations of data
- * differentiate between physical and chemical properties and changes
- * distinguish between states of matter and define various phase changes

Daily Lesson Guide

Day	Lesson Content and Objectives	Focus Questions	Critical Thinking (High Yield / Literacy /LTF/etc.)	Engagement	Assessment and/or Accommodations
1	<ul style="list-style-type: none"> * Matter & Energy; states and Law of Conservation * Phase and energy changes II.B.1.a, b, c	<ul style="list-style-type: none"> * How are matter and energy related to chemistry? * Why do substances change phases? 	<ul style="list-style-type: none"> * Summarizing and note taking * Identifying similarities and differences * Analysis 	<ul style="list-style-type: none"> * Pre-tests * ACT bell ringer * Modeled notes * Demonstration of conservation * Interpret phase diagram 	<ul style="list-style-type: none"> * Evaluate pre-test * Evaluate exit slip requiring students to identify points on a phase diagram. Enrichment: Less guidance in note taking, more independence in practice, more challenging examples in formative
2	<ul style="list-style-type: none"> * Elements, Compounds, and Mixtures II.B.2.b	<ul style="list-style-type: none"> * How are elements, compounds and mixtures similar/ different? 	<ul style="list-style-type: none"> * Summarizing and note taking * Identifying similarities and differences * Use of organizers * Learning with others 	<ul style="list-style-type: none"> * ACT bell ringer * Modeled notes * Venn Diagram 	<ul style="list-style-type: none"> * Evaluation of students' presentation of Venn Diagram Enrichment: Less guidance in note taking, more independence in creation of Venn diagram

3	<ul style="list-style-type: none"> * Physical & Chemical Changes & Properties * Separating compounds II.B.1.d, e 	<ul style="list-style-type: none"> * How can physical and chemical properties be utilized to separate elements and compounds? 	<ul style="list-style-type: none"> * Summarizing and note taking * Application * 3-2-1 	<ul style="list-style-type: none"> * ACT bell ringer * Modeled notes * United Steaming video- electrolysis in industry (chrome, aluminum refining, etc.) * Article on recycling aluminum 	<ul style="list-style-type: none"> * Evaluate 3-2-1 exit slip * Evaluate students' comprehension of article Enrichment: Less guidance in note taking, more independence in practice, more challenging examples in formative
4	<ul style="list-style-type: none"> * Methods of Separation of Mixtures IV.A.1.b 	<ul style="list-style-type: none"> * What techniques can be used to separate mixtures? 	<ul style="list-style-type: none"> * Summarizing and note taking * Non linguistic representation * Identifying similarities and differences between techniques * Application 	<ul style="list-style-type: none"> * ACT bell ringer * Modeled notes * Flow chart for separation lab 	<ul style="list-style-type: none"> * Evaluate students' separation procedures Enrichment: Less guidance in note taking, more independence in practice, more challenging examples of mixtures in formative
5-6	<ul style="list-style-type: none"> * Laboratory: Separation of a mixture I.A.1.a, b, c, d, e, f I.A.2.b, g II.A.2.b II.B.1.a, b, c, d, e IV.A.1.b 	<ul style="list-style-type: none"> * How can I use what I know to separate a mixture and classify the substance at each step of the separation? 	<ul style="list-style-type: none"> * Synthesis * Application/ Analysis * Identifying similarities and differences * Learning with others * Authenticity * Novelty and Variety * Generating and testing hypotheses 	<ul style="list-style-type: none"> * ACT bell ringer * Conduct lab according to procedures provided (summative) 	<ul style="list-style-type: none"> * Evaluate lab report Enrichment: Student development of lab procedures with less guidance
6	<ul style="list-style-type: none"> * Review I.A.1.a, b, c, d, e, f I.A.2.b, g II.A.2.b II.B.1.a, b, c, d, e IV.A.1.b 	<ul style="list-style-type: none"> * What can I do to be better prepared for the exam? 	<ul style="list-style-type: none"> * Use clickers to test students' knowledge and clarify and misconceptions before the exam with immediate feedback. 	<ul style="list-style-type: none"> * ACT bell ringer * Use clickers to review with exam like questions (summative) 	<ul style="list-style-type: none"> * Students participate in review Enrichment: Less time to solve problems and limited use of aides

7	<ul style="list-style-type: none"> * Exam I.A.1.a, b, c, d, e, f I.A.2.b, g II.A.2.b II.B.1.a, b, c, d, e IV.A.1.b 	<ul style="list-style-type: none"> * Can I demonstrate my knowledge on the exam? 	<ul style="list-style-type: none"> * Evaluation * Analysis * Application * Synthesis 	<ul style="list-style-type: none"> * ACT bell ringer * Students take exam (summative) 	<ul style="list-style-type: none"> * Evaluate exam Enrichment: No use of supports with exemption of periodic table, periodic table only has element symbols, not names
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