

# FRANKLIN-SIMPSON HIGH SCHOOL

**Course Name:** Pre – AP Chemistry    **Unit Name:** Periodicity

**Days:** 7

## Quality Core Objectives:

Unit 10 Periodicity	
I.A.1. Scientific Inquiry	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	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	d. Explain why all scientific knowledge is subject to change as new evidence becomes available to the scientific community
	g. Compare the scientific definitions of fact, law, and theory, and give examples of each in chemistry
IV.B.2. Periodic Table and Periodicity	a. Describe the historical development of the modern periodic table, including work by Mendeleev and then Moseley
	b. Describe and explain the organization of elements into periods and groups in the periodic table
	e. Identify regions (e.g., groups, families, series) of the periodic table and describe the chemical characteristics of each
	f. Compare the periodic properties of the elements (e.g., metal/nonmetal/metalloid behavior, electrical/heat conductivity, electronegativity and electron affinity, ionization energy, atomic/covalent/ionic radius) and how they relate to position in the periodic table
	g. Use the periodic table to predict and explain the valence electron configurations of the elements, to identify members of configuration families, and to predict the common valences of the elements

### **Purpose of the Unit:**

Students will be able to describe, from a historical context, the development of the periodic table as we know it today. They will also be able to identify and describe the properties of the different regions and families of elements located on the periodic table. They will be able to compare and contrast properties of elements based on their location on the periodic table. Students will be able to identify trends across the periodic table and provide explanations for these trends based on the atomic structure of the atom.

### **Prerequisites:**

- \* Represent elements by their electron configuration.
- \* Identify valence electrons of an element by its position on the periodic table.
- \* Knowledge of the basic states of matter, as well as basic properties of metals and non-metals.
- \* Basic grouping and organization skills.

### **Daily Lesson Guide**

<b>Day</b>	<b>Lesson Content and Objectives</b>	<b>Focus Questions</b>	<b>Critical Thinking (High Yield / Literacy /LTF/etc.)</b>	<b>Engagement</b>	<b>Assessment and/or Accommodations</b>
<b>1</b>	<b>* Pre-test * Video from United Streaming – <u>Simply Science: Periodic Table</u> IV.B.2.a, b, e</b>	<b>*Why are the elements organized on the periodic table? *Who made the periodic table?</b>	<b>* Summarizing and note taking * Advanced organizers * Similarities and differences</b>	<b>* Pre-test * ACT bell ringer * KWL chart with video (formative) * Article on Mendeleev</b>	<b>* Pre-test for unit * Video quiz * Evaluate comprehension of article Enrichment: Completion of video quiz without aid of notes, extended KWL chart</b>
<b>2</b>	<b>*Short lecture on development of periodic table and families on the periodic table. IV.B.2.a, b, e</b>	<b>*What are the properties of the different families of elements on the periodic table?</b>	<b>* Summarizing and note taking * Advanced organizers * Nonlinguistic representation</b>	<b>* ACT bell ringer * Take notes * Code a periodic table with information (formative)</b>	<b>* Evaluate coded periodic table Enrichment: coding of families on periodic table as well as coding for s, p, d and f blocks</b>

3	<p><b>*“Creating the Periodic Table” project</b>  <b>*Research in computer lab.</b>  <b>I.A.1.e</b>  <b>IV.B.2.b, e</b></p>	<p><b>* Can I identify the properties of an element?</b>  <b>* Can I identify the uses of an element?</b></p>	<p><b>* Applications/ Synthesis</b>  <b>* Summarizing and note taking</b>  <b>* Nonlinguistic representation</b>  <b>* Choice</b>  <b>* Working with others</b></p>	<p><b>* ACT bell ringer</b>  <b>* Research an element and construct its block on the periodic table</b>  <b>* Present research to class (formative)</b></p>	<p><b>* Evaluate project</b>  <b>Enrichment: Higher level students will receive more challenging elements, atomic number &gt;50.</b></p>
4	<p><b>Group activity: Using properties of unknown elements to construct the periodic table.</b>  <b>IV.B.2.a, b, e, f</b></p>	<p><b>* How did the first scientists decide how to arrange the periodic table?</b>  <b>* Can I create a periodic table and use it to make predictions?</b></p>	<p><b>* Synthesis</b>  <b>* Application/ Analysis</b>  <b>* Identifying similarities and differences</b>  <b>* Learning with others</b>  <b>* Authenticity</b>  <b>* Novelty and Variety</b>  <b>* Generating and testing hypotheses</b></p>	<p><b>* ACT bell ringer</b>  <b>* Work cooperatively to construct a periodic table with unknown elements using only properties of those elements.</b>  <b>(summative)</b></p>	<p><b>* Evaluate completed table</b>  <b>Enrichment: Students will complete the task with 2-3 missing elements and will then have to verify the missing elements fit their predictions.</b></p>
5	<p><b>*Short lecture on periodic trends</b>  <b>I.A.1.g</b>  <b>I.A.3.d</b>  <b>IV.B.2.b, e, f, g</b></p>	<p><b>* How can you use the location of elements relative to each other to predict trends and characteristics?</b></p>	<p><b>* Summarizing and note taking</b>  <b>* Analysis/ application</b>  <b>* Generating hypothesis</b></p>	<p><b>* ACT bell ringer</b>  <b>* Take notes</b>  <b>* Make predictions for groups of elements based on the know trend (formative)</b></p>	<p><b>* Evaluate exit slip with three-four elements and the prediction of three trends.</b>  <b>Enrichment: Students will predict patterns for groups of 3-4 elements, use of AP exam questions</b></p>
6	<p><b>* Review</b>  <b>I.A.1.c, d, e, f, g</b>  <b>I.A.2.g</b>  <b>I.A.3.d, g</b>  <b>IV.B.2.a, b, e, f, g</b></p>	<p><b>* What can I do to be better prepared for the exam?</b></p>	<p><b>* Use clickers to test students’ knowledge and clarify and misconceptions before the exam with immediate feedback.</b></p>	<p><b>* ACT bell ringer</b>  <b>* Use clickers to review with exam like questions (summative)</b></p>	<p><b>* Students participate in review</b>  <b>Enrichment: Less time to solve problems and limited use of aides</b></p>

7	<ul style="list-style-type: none"> <li>* Exam</li> <li>I.A.1.c, d, e, f, g</li> <li>I.A.2.g</li> <li>I.A.3.d, g</li> <li>IV.B.2.a, b, e, f, g</li> </ul>	<ul style="list-style-type: none"> <li>* Can I demonstrate my knowledge on the exam?</li> </ul>	<ul style="list-style-type: none"> <li>* Evaluation</li> <li>* Analysis</li> <li>* Application</li> <li>* Synthesis</li> </ul>	<ul style="list-style-type: none"> <li>* ACT bell ringer</li> <li>* Students take exam (summative)</li> </ul>	<ul style="list-style-type: none"> <li>* Evaluate exam</li> <li>Enrichment: No use of supports with exemption of periodic table, periodic table only has element symbols, not names</li> </ul>
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