Summative Assessment Task

Part 1

HS-PS1-1: Use the periodic table as a model to predict the relative properties of elements based on the patterns of electrons in the outermost energy level of atoms.

Given a location of an element on the periodic table:

- Predict physical and chemical properties of the element, including reference to
  - the electron configuration of the element and how this configuration explains its properties
  - the relationship between the number of valence electrons and the reactivity of the element
- Based on the location of this element on the periodic table, name elements that are more or less reactive than the element described, and support your rationale with relevant evidence.

Part 2

HS-PS1-2: Construct and revise an explanation for the outcome of a simple chemical reaction based on the outermost electron states of atoms, trends in the periodic table, and knowledge of the patterns of chemical properties.

Given two elements, use the periodic table to:

- Describe and illustrate (using a Lewis Dot structure) the electron configuration of each element and use the configuration as a rationale to explain its properties
- Predict the outcome of the chemical combination of these two elements by writing and balancing a chemical equation

After watching a series of videos of the two elements reacting, (with no verbal explanation) use your knowledge of the periodic table to:

- Explain the outcome of the reaction
  - What conditions were essential for the reaction to occur?
  - Support observations from the reaction using periodic trends, patterns, and relationships of elements
- Identify the product formed as a result of the chemical reaction
- Write and balance a chemical reaction for what occurred in the video

Reflection:

- Was your initial prediction supported by the evidence in the video?
- How did your explanation of the reaction change as a result of watching the video of the reaction?

Extension/Challenge:

Given information from an analysis (atomic weights, electron structure, etc.) of new elements from a newly discovered solar system, use the properties from the analysis to propose a new periodic table that shows the trends and properties of these new elements. (HS-PS1-1, HS-PS1-2, C.3)

Task Neutral Scoring Criteria				
Indicator	1	2	3	4
Use the periodic table as a model to predict the relative properties of elements based on the patterns of electrons in the outermost energy level of atoms. (HS-PSI-1-1)	Student is able to locate an element on the periodic table.	Student is able to locate an element on the periodic table, identify its basic properties, and determine the number of electrons in the outermost energy level.	Student is able to use the periodic table to accurately predict relative physical and chemical properties of elements. Student is able to describe the relationship between the pattern of electrons and other characteristics of that element.	Student is able to analyze observed relative physical and chemical properties of elements and classify them appropriately in the periodic table.
Construct and revise an explanation for the outcome of a simple chemical reaction based on the outermost electron states of atoms, trends in the periodic table, and knowledge of the patterns of chemical properties. (HS-PS1-2)	Student is able to determine the outcome of a simple chemical reaction.	Student is able to determine the outcome of a simple chemical reaction and explain it in relation to the elements' locations on the periodic table.	Student is able to use their knowledge of the periodic table to predict the outcome of simple chemical reactions. Student is able to explain the outcomes by explicitly referencing the periodic table and its inherent patterns such as outermost electrons, trends, and properties.	Student is able to compare the results of different chemical reactions and explain the differences in outcomes by explicitly referencing the periodic table and its inherent patterns such as outermost electrons, trends, and properties of the reactants.