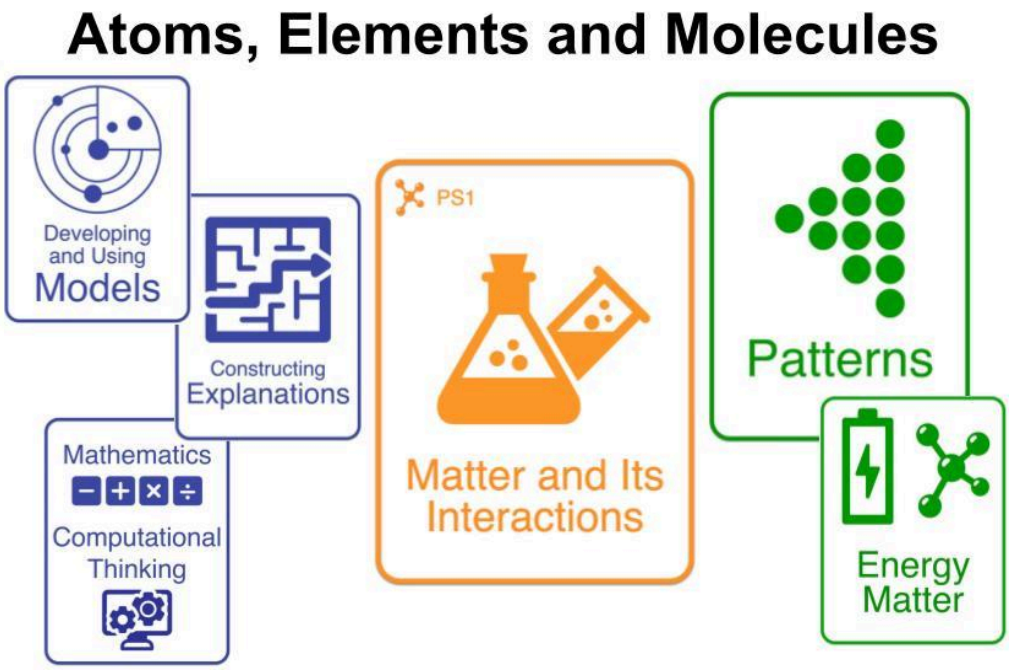
Storyline Unit Design

Understanding by Design (UbD) Template*

Unit		Course(s)	
Designed by		Time Frame	

Anchor Model



*UbD Unit Planner is from Wiggins, Grant and McTighe, Jay. Understanding by Design Guide to Creating High-Quality Units. Alexandria, VA: Association for Supervision and Curriculum Development. 2011.

Stage 1: Desired Results

Performance Expectations

HS-PS1-1: Valence Electrons and Properties of Elements
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-PS1-2: Simple Chemical Reactions
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-PS1-7: Conservation of Atoms in Chemical Reactions
Use mathematical representations to support the claim that atoms, and therefore mass, are conserved during a chemical reaction. (Energy and Matter)

Anchoring Phenomenon

Anchoring Phenomenon Worksheet

Enduring Understandings	Essential Questions

Stage 2: Assessments

HS-PS1-1 - Ordering Reactivity
HS-PS1-2 - Predicting Products
HS-PS1-7 - Toe Warming Chemistry

Assessment Screening Tool Slides

Backward Design Elements

What new skills (practices) will students need to learn?	What thinking concepts will students need to learn?	What science concepts will students need to learn?

Stage 3: Learning Plan			
Phenomenon or Problem	Learning Performance - What will they do? The three dimensions woven together into a single learning performance.	Why is this important? How does this activity help build understanding of the anchoring phenomenon.	Learning Experience - How will they do it? Graphic organizers, protocols, scaffolds, labs, mini-lesson, student discourse, etc.
Design a Fireworks display Fireworks accident	Students will ask questions the cause and effect of using different elements and chemical reactions to create a fireworks display	All students have experienced elements and chemical reactions from fireworks.	Students will read an article and watch a video about the fireworks accident and fill out a graphic organizer about their questions
Formative Assessment - What information are you collecting to know that they met the target?			
Which elements make specific colors in fireworks?	Students will obtain, evaluate, and communicate information by planning and carrying out investigations burning wood splints soaked in different salt solutions and discover patterns of elements and the colors they produced when burned based on the patterns of electrons in the outermost energy level of atoms.		Students will design and plan an investigation to test many different salts (some with the same metallic salt). They will reflect on the patterns that they see with the colors and the elements in the solutions.
Formative Assessment - What information are you collecting to know that they met the target?			
Fireworks accident	Students will design solutions to support the claim that atoms, and therefore mass, are conserved during a chemical reaction and create a plan for a fireworks display		
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<u>Summative Assessment</u> What information are you collecting to know that they met the target?			
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Summative Assessment What information are you collecting to know that they met the target?			

Materials / Resources

Vocabulary

HS-PS1-1
Atoms
Nucleus (positively-charged)
- Protons
- Neutrons

Electrons (negatively-charged)
Valence electrons
Periodic table
Elements
Elemental properties (e.g. reactivity of metals, types of bonds formed, number of bonds formed, reactions with oxygen)
Reactivity
Patterns

HS-PS1-2
Chemical reaction (e.g. sodium and chloride, carbon and oxygen, carbon and hydrogen)
Reactants and products
Bonds (i.e. ionic, covalent)
Reaction type (e.g. formation of ionic compound, combustion of hydrocarbons)
Electronegativity
Main group elements
Valence electrons
Periodic table
Chemical properties
Patterns

HS-PS1-7
Chemical reaction
Balanced chemical equation
Reactants and products
Atoms (or molecules or ions)
Moles
Mass
Conservation of mass
Atomic scale
Macroscopic scale
Matter

Mini Lessons
Patterns Level 7 - Patterns Level 7 - Causal Patterns at Varying Scale
Patterns Level 7 - Patterns Level 7 - Causal Patterns at Varying Scale Thinking Slides

Graphic Organizers
Phenomena Observation Graphic Organizer
Questioning Graphic Organizer
Modeling Graphic Organizer
Planning an Investigation Organizer - Experimental
Planning an Investigation Organizer - Observational
Investigation Evidence Organizer
Engaging in Argumentation Organizer

Differentiation / Modifications