Concept Storyline: *Experimenting with Mixtures, Compounds, and Elements*

UNIFYING THEME	UNIT CONCEPT	GRADE-LEVEL CONCEPTS
• All matter consists of mixtures, compounds, and elements.	• Mixtures, compounds, and elements can be distinguished by their physical and chemical properties.	• Mixtures have the properties of their components and can be separated by physical means. • Compounds have properties different from those of their constituent elements and can be separated by chemical means. • Elements are the basic forms of matter, have unique physical and chemical properties, and cannot be separated into other forms.

SUBCONCEPT 1

Students have ideas, preconceptions, and misconceptions about pure substances and mixtures.

Lesson 1: The Nature of Matter
Students complete a circuit of eight inquiries that introduces concepts about pure substances and mixtures studied in the unit.

SUBCONCEPT 2

Substances can be classified as pure substances or mixtures based on their composition and behavior.

Lesson 2: Pure Substance or Mixture?
Students investigate the appearance, behavior, and possible separation of substances.

Lesson 3: Separating a Soluble and an Insoluble Substance
Students use filtering to separate an insoluble solid from a mixture.

Lesson 4: Separating Solutes
Students use paper chromatography to separate a mixture of inks and identify an unknown substance.

Lesson 5: Changing Mixtures
Students investigate the effects of the components of a mixture on its characteristic properties.

SUBCONCEPT 3

A compound has properties different from its constituent elements and can be separated only by chemical means.

Lesson 6: Breaking Down a Compound
Students use electrolysis to separate water and test the properties of its components.

SUBCONCEPT 4

Elements can be identified by their physical appearance, chemical structure, and behavior.

Lesson 7: Examining and Grouping Elements
Students examine the properties and behavior of elements to classify them and compare their system with the periodic table.

SUBCONCEPT 5

Elements can be combined chemically to form compounds.

Lesson 8: Combining Elements
Students form a new compound by combining an element with oxygen.

Lesson 9: Exploration Activity
Students select a compound and study its formation from constituent elements, physical and chemical properties, history, and uses. They present their findings to the class.

Lesson 10: Chemical Reactions Involving Metals
Students investigate the reaction rates of metals with acids and the properties of acids and bases.

Lesson 11: Countering Corrosion
Students investigate the reaction rates of metals with oxygen and the means of countering corrosion.

SUBCONCEPT 6

Mass remains constant during chemical reactions.

Lesson 12: Mass and Chemical Reactions
Students calculate changes in mass when an effervescent tablet reacts with water.

Lesson 13: Final Assessment
Students complete performance and written assessments of their understanding of the concepts and processes in the unit.