Marietta City Schools

District Unit Planner

Everything on the unit planner must be included on the unit curriculum approval statement.

Science Grade 8

Unit title	*Classification & Properties of Matter*	**MYP year**	*3*	**Unit duration (hrs)**	*9 Hours*

Mastering Content and Skills through INQUIRY (Establishing the purpose of the Unit): *What will students learn?*

GSE Standards

Standards

S8P1. Obtain, evaluate, and communicate information about the structure and properties of matter.

a. Develop and use a model to compare and contrast pure substances (elements and compounds) and mixtures. (Clarification statement: Include heterogeneous and homogeneous mixtures. Types of bonds and compounds will be addressed in high school physical science.)

d. Construct an argument based on observational evidence to support the claim that when a change in a substance occurs, it can be classified as either chemical or physical. (Clarification statement: Evidence could include ability to separate mixtures, development of a gas, formation of a precipitate, change in energy, color, and/or form.)

f. Construct an explanation based on evidence to describe conservation of matter in a chemical reaction including the resulting differences between products and reactants. (Clarification statement: Evidence could include models such as balanced chemical equations.)

Prior Student Knowledge: (REFLECTION – PRIOR TO TEACHING THE UNIT)

Students have already explored atoms and elements through Atomic Structure and the Periodic Table. Students will now relate atoms that combine to 2 or more as molecules and compounds. Students as well can see the chemical formula of certain molecules and can identify them based on their Chemical Symbol to relate it to the Periodic Table.

Concepts/Skills to be Mastered by Students

- Matter (structure, composition, properties)
- Mixtures and solutions
- Elements and compounds
- Conservation of Matter

Key Vocabulary: (KNOWLEDGE & SKILLS)

pure substances, matter, element, compound, molecule, atom, mixtures, homogeneous, heterogeneous, particle, state, physical property, mass, volume, density, melting point, boiling point, freezing point, chemical properties, reactivity, combustibility, physical change, chemical change, chemical reaction, precipitate, law of conservation of matter, created, destroyed, transformed, reactants, products, chemical equation, mass, open system, closed system

Year-Long Anchoring Phenomena: (LEARNING PROCESS)

How does matter and energy interact within the universe?

Unit Phenomena (LEARNING PROCESS)
How can we get clean drinking water in the middle of the woods?

Possible Preconceptions/Misconceptions: (REFLECTION – PRIOR TO TEACHING THE UNIT)

- Students may have difficulty determining visually and using models, how to represent elements, compounds, homogeneous, and heterogeneous mixtures. Students may also have difficulty distinguishing between these models.
- Students may have difficulty counting atoms of reactants/products as evidence of LOCOM.

Key concept	Related concept(s)	Global context
Change Change is a conversion, transformation or movement from one form, state, or value to another. Inquiry into the concept of change involves understanding and evaluating causes, processes and consequences.	Models (MYP)	**Scientific and technical innovation** Students will explore the natural world and its laws; the interaction between people and the natural world; how humans use their understanding of scientific principles; the impact of scientific and technological advances on communities and environments; the impact of environments on human activity; how humans adapt environments to their needs.

Statement of inquiry

Scientists and technical innovations allow us to visualize, model, and explain properties of and changes in systems of matter.

Inquiry questions

Factual

- What is matter?
- What is the difference between pure substances and mixtures?
- What is LOCOM?
- What are reactants? What are products?

Conceptual

- How can models be used to distinguish between pure substances and mixtures?
- How can we model the number of atoms within a molecule?
- How can a chemical equation be used to show the Law of Conservation of Matter?

Debatable

- How can I uncover the identity of mystery substances?
- What method or investigation can I use/develop to demonstrate the Law of Conservation of Matter?

MYP Objectives	**Assessment Tasks**	
*What specific MYP **objectives** will be addressed during this unit?*	***Relationship** between summative assessment task(s) and statement of inquiry:*	*List of common formative and summative assessments.*
Science A: Knowing and Understanding I. describe scientific knowledge Ii. apply scientific knowledge and understanding to solve problems Iii. analyze information to make scientifically supported judgments Science B: Inquiring and designing I. describe a problem or question to be answered by a scientific investigation Science C: Processing and Evaluating I. present collected and transformed data Ii. interpret data and describe results using scientific reasoning Science D: Reflecting on the Impact of Science	SOI: Scientists and technical innovations allow us to visualize, model, and explain properties of and changes in systems of matter. Throughout the unit, students are required to use models to illustrate the differences between pure substances and mixtures on a macro and molecular scale. The MYP unit assessments use models, laboratory investigations, and scenarios to evaluate students' ability to correctly visualize, model, and explain characteristics and properties of matter. Students are also tasked with asking appropriate questions to determine whether something is a pure substance or mixture. Students will also use chemical equations as models to uphold the Law of Conservation of Matter in chemical reactions. In their assessment, students are challenged to review experimental design procedures to determine how those procedures could be altered in order to ensure the representation of the Law of Conservation of Matter.	**Formative Assessment(s):** Pure Substances & Mixtures CFA **Summative Assessment(s):** Classification and Properties of Matter UA Paper I and Paper II

Iii. apply scientific knowledge effectively Design A: Inquiring and Analyzing I. explain and justify the need for a solution to a problem Design B: Iv. develop accurate planning drawings/diagrams and outline requirements for the creation of the chosen solution Design C: Iii. follow the plan to create the solution, which functions as intended Design D: Ii. explain the success of the solution against the design specification Iii. describe how the solution could be improved		

Approaches to learning (ATL)
Category: Communication **Cluster:** Communication Skills **Skill Indicator:** Make inferences and draw conclusions.

<u>Learning Experiences</u> Add additional rows below as needed.		
Objective or Content	**Learning Experiences**	**Personalized Learning and Differentiation** ● Discovery Education Science Techbook

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S8P1. Obtain, evaluate, and communicate information about the structure and properties of matter. d. Construct an argument based on observational evidence to support the claim that when a change in a substance occurs, it can be classified as either chemical or physical. (Clarification statement: Evidence could include ability to separate mixtures, development of a gas, formation of a precipitate, change in energy, color, and/or form.)	● Design a Filtration System for Clean Water (Design A-D)	
S8P1. Obtain, evaluate, and communicate information about the structure and properties of matter. f. Construct an explanation based on evidence to describe conservation of matter in a chemical reaction including the resulting differences between products and reactants. (Clarification statement: Evidence could include models such as balanced chemical equations.)	● Law of Conservation of Matter Practice: Identifying Balanced and Unbalanced Equations ● Lab: Chemical Reactions and the LOCOM	
Content Resources		

Georgia Grade 8 Science: Structure and Properties of Matter Instructional Segment: Dinner is Ready

Discovery Education Grade 8 Science Techbook
Unit 1: Matter
Concept 1.1: Combining and Separating

Argument-Driven Inquiry in Physical Science: Conservation of Mass: How Does the Total Mass of a Substance Formed as a Result of a Chemical Change Compare with the Total Mass of the Original Substances?