CCPS Science Unit Plan

McGraw Hill Textbook - Unit 4: Interactions of Matter

Grade	8	**Subject**	Science	**Unit #**	1
Unit Name	Matter		**Timeline**	6 weeks	
How to Use the Framework	This Framework should be used to implement daily science instruction. The resources and instructional strategies reflected in the Framework will provide a foundation for effective implementation and student mastery of standards. Please see the hyperlinked abbreviation document to ensure understanding of all abbreviations used with this framework.				
Unit Overview	Students will delve into the universe's fundamental building blocks and develop a conceptual understanding of the nature of matter during this unit. They will explore the structure of matter, learning about atoms and molecules and how they combine to form different substances. Through hands-on experiments and engaging activities, students will investigate the properties of matter, such as mass, volume, density, and states of matter (solid, liquid, gas). They will also learn about physical and chemical changes, understanding how matter can transform while its fundamental properties remain constant or change. Additionally, students will continue to develop their skills in communicating scientific ideas and activities clearly by writing laboratory reports. By the end of the unit, students will have a comprehensive understanding of the structure and properties of matter, laying a solid foundation for further exploration in chemistry and physics.				

3-Dimensional Instruction

GSE	Science and Engineering Practices	Crosscutting Concepts
S8P1. Obtain, evaluate, and communicate information about the structure and properties of matter. **S8P1.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.) **S8P1.B.** Develop and use models to describe the movement of particles in solids, liquids, gases, and plasma states when thermal energy is added or removed. **S8P1.C.** Plan and carry out investigations to compare and contrast chemical (i.e., reactivity, Combustibility) and physical (i.e., density, melting point, boiling point) properties of matter. **S8P1.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 the ability to separate mixtures, development of	• Develop and use Models • Engage in Arguments from Evidence • Asking Questions and Defining Problems • Planning and Carrying Out Investigations • Analyzing and Interpreting Data • Using Mathematical and Computational Thinking • Constructing Explanations and Designing Solutions • Obtaining, Evaluating, and Communicating Information	• Patterns • Cause and Effect • Systems and System Models • Energy and Matter • Stability and Change

	a gas, formation of a precipitate, change in energy, color, and/or form.) **S8P1.E.** Develop models (e.g., atomic-level models, including drawings, and computer representations) by analyzing patterns within the periodic table that illustrate the structure, composition, and characteristics of atoms (protons, neutrons, and electrons) and simple molecules. **S8P1.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.)		
NGSS Alignment	NGSS Alignment to Disciplinary Core Ideas		

Weekly Lesson Tasks

Week 1					
GSE: S8P1. Obtain, evaluate, and communicate information about the structure and properties of matter. **S8P1.A.** Develop and use a model to compare and contrast pure substances (elements and compounds) and mixtures.	**Focused Concept:** The focus concept for Element A is for students to understand that pure substances exist as elements and compounds with unique properties and can not be separated using physical means. Mixtures can be heterogeneous or homogeneous, have the properties of their components, and can be separated using physical means.				
SEP: Develop and use a model			**CCC:** Energy and Matter		
Phenomenon: Have various materials for observation and ask students to classify them based on whether they are pure substances or mixtures. (This could be the actual items or a Google Slide with images.) Examples for Observation Pure Substances: Sulfur, Table Salt, Sugar, Aluminum, Copper, Gold Mixtures: Apple Juice/Grape Juice, sand, steel, trail mix,			**DQ:** • How are pure substances different from mixtures? How are they alike? • How are elements different from compounds? • How are heterogeneous mixtures different from homogeneous mixtures?		
	Day 1	**Day 2**	**Day 3**	**Day 4**	**Day 5**

Learning Targets **The students will be able to (SWBAT)**	SWBAT differentiate between elements and compounds. SWBAT differentiate between heterogeneous and homogeneous mixtures. SWBAT develop and use a model to compare and contrast pure substances and mixtures.	SWBAT differentiate between elements and compounds. SWBAT differentiate between heterogeneous and homogeneous mixtures. SWBAT develop and use a model to compare and contrast pure substances and mixtures.	SWBAT differentiate between elements and compounds. SWBAT differentiate between heterogeneous and homogeneous mixtures. SWBAT develop and use a model to compare and contrast pure substances and mixtures.	SWBAT differentiate between elements and compounds. SWBAT differentiate between heterogeneous and homogeneous mixtures. SWBAT develop and use a model to compare and contrast pure substances and mixtures.	SWBAT differentiate between elements and compounds. SWBAT differentiate between heterogeneous and homogeneous mixtures. SWBAT develop and use a model to compare and contrast pure substances and mixtures.
Opening	Unit Pre-test - Illuminate *Has been shared with Ms. Muhammad Teacher Version - Pretest Student Version - Pretest	Discuss the unit phenomenon and use it to introduce today's lesson and phenomenon - classifying materials as pure substances or mixtures (see above). Link to Unit Phenomenon Present lesson phenomenon to the class and have them classify the materials in a T-Chart. T-Chart Template	Refer to the lesson phenomenon and ask students to review their T-chart from yesterday. Ask students to revise their charts by breaking pure substances into elements & compounds, and mixtures in heterogeneous & homogeneous substances.	Discuss unit phenomenon and lesson phenomenon. Ask students what they can add to their initial understanding of the unit phenomenon. Do they need to revise their T-Chart for this week's lesson?	Students will make final revisions to their T-Charts. Facilitate a class discussion on the correct classification of each substance from Day 2.
Guided Practice/ Transition	Introduce Unit Phenomenon *Create a Graphic organizer on chart paper (mind map - thinking map) to update throughout the unit as students gain evidence to support a claim explaining the phenomenon and how they classified their meal.	Choose one of the videos on elements, compounds, and mixtures to show to the class. Have students take notes using a graphic organizer. Graphic Organizer Elements vs Comp… Pure Substance vs … Elements, Compounds, Mixtures Song	Q & A Provide time for students to ask questions, discuss challenges, and create solutions to finish their model by the end of class.	Model Gallery Walk Have groups present their models to the class via a gallery walk. Two students remain with the model and visit at least two other groups' models. Groups will give and receive feedback using the provided feedback form or accountable talk stems. Peer Feedback Form Peer Feedback Starters	Elements, Compounds, Mixtures PPT notes, and sorting activity. elements-compound… *Update graphic organizer from Day 2 where needed Review for quiz

	Vocabulary Matter Atom Pure Substance Element Compound Mixture Heterogeneous Mixture Suspension Homogeneous Mixture Solution Solvent Solute Colloid	Vocabulary Matter Atom Pure Substance Element Compound Mixture Heterogeneous Mixture Suspension Homogeneous Mixture Solution Solvent Solute Colloid	Vocabulary Matter Atom Pure Substance Element Compound Mixture Heterogeneous Mixture Suspension Homogeneous Mixture Solution Solvent Solute Colloid	Vocabulary Matter Atom Pure Substance Element Compound Mixture Heterogeneous Mixture Suspension Homogeneous Mixture Solution Solvent Solute Colloid	Vocabulary Matter Atom Pure Substance Element Compound Mixture Heterogeneous Mixture Suspension Homogeneous Mixture Solution Solvent Solute Colloid
Independent Practice	Introduce unit vocabulary and the Frayer Model (FM) template for new terms. (Frayer Models can be done as homework or during independent work when learning tasks are completed.) Printable FM Template Digital FM Template	Small Group Work: Model Development Introduction Introduce the project and ask students what they think makes something a model. Facilitate discussion on types of models and uses in science. Divide students into small groups and have them create models of elements, compounds, and mixtures that can be used to classify matter. Provide materials for students to use or allow them to create a digital model. Brainstorming Sheet Rubric for Model	Small Group Work: Students will continue to work on their models for elements, compounds, and mixtures.	Students will use the provided materials (choose 3-4 substances such as trail mix, dirt, water, copper, etc.) to test their models and see if they can accurately classify them as pure substances or mixtures.	Quiz on Element A *3-5 questions from Illuminate S8P1.A. Common Assessment - Student S8P1.A. Common Assessment - Teacher
Assessment Summary	Review pre-test results and set goals for unit 1	TOTD: Compare and contrast a pure substance	TOTD: Differentiate between heterogeneous	TOTD: Evaluate the effectiveness of your	Journal Prompt: What new learning can you add

	post-assessment. SMART Goal Template	and a mixture.	and homogeneous mixtures.	model when you classified the provided materials. (Did it help in the classification process? How could you improve upon it?)	to the classification of your dinner from the unit phenomenon on Day 1? Cite specific evidence of how pure substances and mixtures apply to the phenomenon.
Small Group Tasks (TBA)					

Week 2					
GSE: **S8P1.** Obtain, evaluate, and communicate information about the structure and properties of matter. **S8P1.B.** Develop and use models to describe the movement of particles in solids, liquids, gases, and plasma states when thermal energy is added or removed.	**Focused Concept:** ● The focus concept for element B is how particle motion changes when thermal energy is added or removed. Students should be familiar with the primary states of matter (solid, liquid, gas) and understand how energy changes affect these states. They will also discover the fourth state of matter, plasma, and how energy changes impact it.				
SEP: ● Develop and Use Models			**CCC:** ● Energy and matter ● Patterns		
Phenomenon: Supercooled Water Show video and complete STW protocol with students. Questions to consider: Describe the motion of the particles in the water. How does liquid water become solid water? How does temperature affect particle motion?			**DQ:** ● How does energy determine the state of matter of a substance? ● How do particles behave when energy is added or removed from them? ● What is temperature, and how is it measured?		
	Day 6	**Day 7**	**Day 8**	**Day 9**	**Day 10**
Learning Targets **The students will be able to (SWBAT)**	SWBAT differentiate between the four states of matter (solid, liquid, gas, or plasma). SWBAT develop and use a model to explain the movement of particles in	SWBAT differentiate between the four states of matter (solid, liquid, gas, or plasma). SWBAT develop and use a model to explain the movement of particles in	SWBAT differentiate between the four states of matter (solid, liquid, gas, or plasma). SWBAT develop and use a model to explain the movement of particles in	SWBAT differentiate between the four states of matter (solid, liquid, gas, or plasma). SWBAT develop and use a model to explain the movement of particles in	SWBAT differentiate between the four states of matter (solid, liquid, gas, or plasma). SWBAT develop and use a model to explain the movement of particles in

	each state as thermal energy (heat energy) is added or removed.	each state as thermal energy (heat energy) is added or removed.	each state as thermal energy (heat energy) is added or removed.	each state as thermal energy (heat energy) is added or removed.	each state as thermal energy (heat energy) is added or removed.
Opening	Show the phenomenon video and have students complete the STW (See-Think-Wonder) protocol. STW Template *This could be done digitally using a Canvas Discussion Post or Digital Whiteboard.	Review lab phenomenon - determine what new learning can be added to student thinking.	Think-Pair-Share What does your group need to do today to conclude your data collection and analyze your data?	**ADI Stages 5 & 6** CER Introduction Show students the video of the little girl who thinks her dad is an alien or the footage of the Mars Rover Curiosity. Have students complete a CER Bubble Organizer.	Think-Pair-Share How does your investigation help explain the "Super Cooled Water phenomenon?" How does this week's lesson help us figure out our unit phenomenon? (Meal time)
Guided Practice/Transition	Introduce ADI Lab 1: What Happens at the Molecular Level When Thermal Energy Is Added to a Substance? Stages of ADI **ADI Stages 1 and 2** Teacher Handout for Lab 1 Student Lab Handout for Lab 1 Close Read and Annotation of Student Lab Handout Discuss: • Tool Talk (Materials) • Lab Safety Talk • Group Norms & Roles Preview Investigative Proposal Vocabulary: Solid Liquid Gas Plasma	Have students review their investigative proposals. Have a Quick Q&A session on safety, etc. Then, students will gather materials and begin data collection. Vocabulary: Solid Liquid Gas Plasma	**ADI Stage 4** Discuss the day's goals and instruct students to conclude their investigations and data analysis before the end of class. Vocabulary: Solid Liquid Gas Plasma	Discuss how students will develop their CER based on their investigations. During this portion of the lesson, teachers will discuss DCIs, SEPS, and CCCs used in the investigation. Students will take notes using a graphic organizer to help them with the reasoning portion of the CER. PPT for Notes (Video included) Vocabulary: Solid Liquid Gas Plasma	Students will share their CER with two classmates for feedback. Students will complete the checklist for CER. CER Student Checklist Vocabulary: Solid Liquid Gas Plasma

	Thermal Energy Melting Boiling Freezing Condensation Evaporation Sublimation Deposition	Thermal Energy Melting Boiling Freezing Condensation Evaporation Sublimation Deposition	Thermal Energy Melting Boiling Freezing Condensation Evaporation Sublimation Deposition	Thermal Energy Melting Boiling Freezing Condensation Evaporation Sublimation Deposition	Thermal Energy Melting Boiling Freezing Condensation Evaporation Sublimation Deposition
Independent Practice	**ADI Stage 3:** Students will create an investigative proposal with their lab group. The teacher should review and sign off on proposals before the investigation. *Students can add new vocabulary to their Frayer Model Templates from Week 1.	**ADI Stage 4** Students will collect data with their lab group. *Students can add new vocabulary to their Frayer Model Templates from Week 1.	Students will finalize data collection and analyze their data. *Students can add new vocabulary to their Frayer Model Templates from Week 1.	Students will create an initial claim that answers the guiding question based on the evidence they collected during their investigations. CER Pre-Write Template *Students can add new vocabulary to their Frayer Model Templates from Week 1.	**ADI Stage 7** Students will create a CER to show how their claim answers the guiding question. CER Template 1 CER Template 2 *Students can add new vocabulary to their Frayer Model Templates from Week 1.
Assessment/Summary	Writing Prompt: Why is planning an essential part of the investigative process?	Writing Prompt: What successes and challenges did your group have during data collection? How will you improve upon your challenges to finish data collection on time?	Writing Prompt: What would your group do differently when planning and carrying out subsequent investigations?	TOTD: Give one specific example of something you learned from your group members that you probably would not have learned working individually.	Writing Prompt: Why is communicating your findings important to science research?
Small Group Tasks (TBA)					

Week 3	
GSE: **S8P1.** Obtain, evaluate, and communicate information about the structure and properties of matter. **S8P1.C.** Plan and carry out investigations to compare and contrast chemical and physical properties of matter.	**Focused Concept:** • The focus concept for this element is understanding that physical properties of matter describe matter in terms of your five senses. Chemical properties of matter describe the ability of matter to create a new substance as it reacts with another substance.
SEP:	**CCC:**

• Plan and Carry Out Investigations	• Energy and matter • Patterns
Phenomenon: Dead Sea | Science Phenomena - Information Photo of Phenomenon Questions to facilitate STW What do you observe in the photo? Why do you think the body of water is called The Dead Sea? What physical and chemical properties of the Dead Sea make it unique to Earth? How is the man able to float without a flotation device?	**DQ:** • How do you differentiate between the chemical and physical properties of matter? How can you investigate these properties? • How do matter's chemical and physical properties interact to determine matter's behavior in various environments? • How can you use the properties of matter to identify a substance?

	Day 11	**Day 12**	**Day 13**	**Day 14**	**Day 15**
Learning Targets **The students will be able to (SWBAT)**	SWBAT plan and investigate the difference between matter's chemical and physical properties. SWBAT classify matter's properties as either chemical or physical (reactivity, combustibility, density, melting point, boiling point, etc.).	SWBAT plan and investigate the difference between matter's chemical and physical properties. SWBAT classify matter's properties as either chemical or physical (reactivity, combustibility, density, melting point, boiling point, etc.).	SWBAT plan and investigate the difference between matter's chemical and physical properties. SWBAT classify matter's properties as either chemical or physical (reactivity, combustibility, density, melting point, boiling point, etc.).	SWBAT plan and investigate the difference between matter's chemical and physical properties. SWBAT classify matter's properties as either chemical or physical (reactivity, combustibility, density, melting point, boiling point, etc.).	SWBAT plan and investigate the difference between matter's chemical and physical properties. SWBAT classify matter's properties as either chemical or physical (reactivity, combustibility, density, melting point, boiling point, etc.).
Opening	Show the image of the Dead Sea Students will engage in the STW protocol with their tablemates. STW Template After sharing out their group's STW, have students create a T-chart listing the potential physical & chemical properties of the Dead Sea.	Discuss any revisions that students need to make to their T-charts on the properties of The Dead Sea. Preview today's lab: tool talk, lab safety, timeframe	Discuss any revisions that students need to make to their T-charts on the properties of The Dead Sea. Preview today's lab: tool talk, lab safety, timeframe	Discuss any revisions that students need to make to their T-charts on the properties of The Dead Sea. Preview today's lab: tool talk, lab safety, timeframe	Show the image of the man floating in the Dead Sea and have students discuss why he can float. Have students discuss and construct a final explanation for the Dead Sea phenomenon. How does this week's lesson help us figure out our unit phenomenon? (Meal time).
Guided Practice/Transition	Mystery Substance Probe - Textbook page 5 Why is she biting her	Inquiry: Big Enough - How can a substance's properties be measured?*	Inquiry Part 1: More Mass vs More Volume - How might mass and volume be related?	Inquiry: Don't Go Changing - How can chemical properties be used to identify a substance?	Inquiry: Be a Detective - How can we use chemical and physical properties to identify a mystery

	medal? Textbook Pages 7 - 9 (CER in the textbook will be completed throughout the lesson.) <u>Vocabulary:</u> Physical Property Chemical Property	*Textbook Pages 10 - 11 Reading, Discussion, Notetaking - Textbook Pages 12-14 <u>Vocabulary</u>: Mass Weight Volume Quantitative Property Qualitative Property	Inquiry Part 2: Determining Density - How can we compare the densities of substances? Reading, Discussion, Notetaking - Textbook Pages 15 - 21 <u>Vocabulary:</u> Density	Tips for Lab: *Do the splint test as a demonstration Reading, Discussion, Notetaking - Textbook Pages 22-24 <u>Vocabulary:</u> Flammability Oxidation Reactivity	substance? Tips for Lab: *Make your own red cabbage indicator *Use small, glass beakers instead of watch glasses <u>Vocabulary:</u> Conductivity Solubility
Independent Practice	Have students generate a claim that answers the guiding question - Textbook page 7 *Students can add new vocabulary to their Frayer Model Templates from Week 1.	Line of Evidence added to CER - Textbook page 7 *Students can add new vocabulary to their Frayer Model Templates from Week 1.	Line of Evidence added to CER - Textbook page 7 *Students can add new vocabulary to their Frayer Model Templates from Week 1.	Line of Evidence added to CER - Textbook page 8 Revise Claim if needed *Students can add new vocabulary to their Frayer Model Templates from Week 1.	Create the Reasoning portion of CER. *Students can add new vocabulary to their Frayer Model Templates from Week 1.
Assessment/Summary	TOTD: Differentiate between physical and chemical properties.	TOTD: Describe the properties of a red apple. How can it be measured quantitatively and qualitatively?	TOTD: How do mass and volume affect an object's density? Explain whether density is a physical or chemical property of matter.	Canvas Discussion Post: Describe how chemical properties could help a forensic scientist identify a substance at a crime scene. For homework, comment on two classmates' posts.	Quiz in Illuminate - has been shared with Ms. Muhammad. Teacher Version Quiz Student Version Quiz
Small Group Tasks (TBA)					

Week 4	
GSE: **S8P1.** Obtain, evaluate, and communicate information about the structure and properties of matter.	**Focused Concept:** • The focus concept for this element is to understand that changes to matter can be physical or chemical. Physical changes do not create new substances; chemical changes create new substances through chemical reactions.

S8P1.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.					
SEP: • Constructing Arguments from Evidence			**CCC:** • Energy and matter • Patterns		
Phenomenon: Show students images of various everyday substances and have them classify them as physical or chemical changes. *Option 1: Google Slideshow of Images *Option 2: Show actual substances Questions to facilitate discussion: What did you notice about the images? How did you classify them (what criteria did you use to sort them)? How did the substances change in each image?			**DQ:** • How do atoms change during physical changes? • How do atoms change during chemical reactions? • How do you know a chemical reaction has occurred? • How is matter conserved during a chemical reaction?		
	Day 16	**Day 17**	**Day 18**	**Day 19**	**Day 20**
Learning Targets **The students will be able to (SWBAT)**	SWBAT construct an argument based on evidence to support that changes in substances are either chemical or physical. SWBAT explain chemical changes as a reaction that creates a new substance with different properties from the original substance.	SWBAT construct an argument based on evidence to support that changes in substances are either chemical or physical. SWBAT explain chemical changes as a reaction that creates a new substance with different properties from the original substance.	SWBAT construct an argument based on evidence to support that changes in substances are either chemical or physical. SWBAT explain chemical changes as a reaction that creates a new substance with different properties from the original substance.	SWBAT construct an argument based on evidence to support that changes in substances are either chemical or physical. SWBAT explain chemical changes as a reaction that creates a new substance with different properties from the original substance.	SWBAT construct an argument based on evidence to support that changes in substances are either chemical or physical. SWBAT explain chemical changes as a reaction that creates a new substance with different properties from the original substance.
Opening	Image Sort - lesson phenomenon Students will classify images as examples of chemical or physical changes and share with classmates the criteria they used to sort the images.	Show Study Jams Physical and Chemical Changes Video and have students complete a graphic organizer for their notes.	Teacher demo (mixing two substances) and students engage in STW Questions to facilitate discussion: *How are the powders similar? How are they different?? *Are these changes physical, chemical, or both?	Think-Pair-Share: Compare and contrast physical and chemical changes. Review lab and safety talk.	Discuss the phenomenon from this week and have students revise their initial classifications where needed. Review CER components

			Lesson Link from American Chemical Society Student Journal Link Student Journal ANSWER KEY		
Guided Practice/Transition	**This lesson will take 2 class periods to complete. Inquiry: Students will observe and complete quick inquiry activities related to chemical and physical changes. Teacher Instructions & Guide Student Reading (Do this before the stations) Inquiry Stations Cards Inquiry Stations Student Journal Vocabulary: Chemical Change Physical Change	**Day 2 of lesson Finish stations from the previous day Vocabulary: Chemical Change Physical Change	*This lesson will take 2 class periods to complete. Lab preview and safety discussion Guiding Question: Can you use the characteristic ways substances react to identify a mystery substance? Students will work with their lab groups to test known substances and collect data about their observations. Students will repeat the test on an unknown substance and attempt to identify it based on its physical and chemical properties. Vocabulary: Chemical Change Physical Change	**Day 2 of lesson Students will finish collecting data and identifying their mystery substances. Guiding Question: Can you use the characteristic ways substances react to identify a mystery substance? Students will work with their lab groups to test known substances and collect data about their observations. Students will repeat the test on an unknown substance and attempt to identify it based on its physical and chemical properties. Vocabulary: Chemical Change Physical Change	Students will create a CER to answer the guiding question: Can you use the characteristic ways substances react to identify a mystery substance? CER Pre-Write Template CER Template 1 CER Template 2 Vocabulary: Chemical Change Physical Change
Independent Practice	Identifying Physical and Chemical Properties / Changes (page 1) Phy and Chem Worksheet *Students can add new vocabulary to their Frayer Model Templates from Week 1.	Classifying Scenarios as Physical or Chemical Changes (page 2) Phy and Chem Worksheet *Students can add new vocabulary to their Frayer Model Templates from Week 1.	Plan for tomorrow: What steps must your group take to complete the task on time? *Students can add new vocabulary to their Frayer Model Templates from Week 1.	Student Reading with Comprehension Questions *Students can add new vocabulary to their Frayer Model Templates from Week 1.	Finalize CER for submission. *Students can add new vocabulary to their Frayer Model Templates from Week 1.

Assessment/Summary	TOTD: How are physical and chemical properties helpful when determining whether a change in matter is physical or chemical?	TOTD: Compare and contrast chemical changes and physical changes.	Discussion Post in Canvas: How do you think identifying a mystery substance works in a forensic lab?	Writing Prompt: Discuss the observations or tests that you believe were most helpful in identifying your mystery substance.	Post to Jamboard or other digital platform: Why is communicating your findings important to our Science and Engineering Practices?
Small Group Tasks (TBA)					

Week 5

GSE:
S8P1. Obtain, evaluate, and communicate information about the structure and properties of matter.
S8P1.E. Develop models (e.g., atomic-level models, including drawings and computer representations) by analyzing patterns within the periodic table that illustrate the structure, composition, and characteristics of atoms (protons, neutrons, and electrons) and simple molecules.

Focused Concept:
- The focus concepts for this element are patterns in the periodic table, atomic structure, and molecular structure (for simple molecules).

SEP:
- Develop and Use Models
- Analyzing and Interpreting Data

CCC:
- Energy and Matter
- Patterns

Phenomenon: Revisit unit phenomenon
What element did you eat for breakfast/dinner?
(Link to Breakfast Slide) (Link to Dinner Slide)

- Have students discuss what they ate for breakfast/dinner and record data on chart paper.
- Have students make predictions about what elements they think are in those foods. Record data on chart paper.

Alkali Metals in Water - Use with STW protocol.

Alkali metals:brainiac, open university and Francium clips

DQ:
- How are elements arranged on the periodic table?
- What are the main trends on the periodic table, and what do those trends tell us about the elements? (Periods, Groups, Atomic Mass, Atomic Number, Properties within a Group, State of Matter, Metals/Non-Metals)
- Where are protons, neutrons, and electrons located?
- What is the difference between an element and a molecule?
- How are molecules formed?

	Day 21	Day 22	Day 23	Day 24	Day 25
Learning Targets **The students will be able to (SWBAT)**	SWBAT identify the components of an atom. SWBAT develop a model that illustrates atoms' and simple molecules' structure,	SWBAT identify the components of an atom. SWBAT develop a model that illustrates atoms' and simple molecules' structure,	SWBAT identify the components of an atom. SWBAT develop a model that illustrates atoms' and simple molecules' structure,	SWBAT identify the components of an atom. SWBAT develop a model that illustrates atoms' and simple molecules' structure,	SWBAT identify the components of an atom. SWBAT develop a model that illustrates atoms' and simple molecules' structure,

	composition, and characteristics. SWBAT analyze patterns in the periodic table to describe general trends such as groups, periods, reactivity, metals, nonmetals, and state of matter.	composition, and characteristics. SWBAT analyze patterns in the periodic table to describe general trends such as groups, periods, reactivity, metals, nonmetals, and state of matter.	composition, and characteristics. SWBAT analyze patterns in the periodic table to describe general trends such as groups, periods, reactivity, metals, nonmetals, and state of matter.	composition, and characteristics. SWBAT analyze patterns in the periodic table to describe general trends such as groups, periods, reactivity, metals, nonmetals, and state of matter.	composition, and characteristics. SWBAT analyze patterns in the periodic table to describe general trends such as groups, periods, reactivity, metals, nonmetals, and state of matter.
Opening	Show the images from Google Slide and have students engage in a Think-Pair-Share. Record the elements they "ate" for breakfast on chart paper as they share. Questions to facilitate discussion: *Where do we find the elements that we "ate"? *Describe the composition of an element. *How are elements different from compounds and mixtures?	This is a 2-day lesson. Think Pair Share: How large/small are atoms? Provide student discussion and sharing time, then show one or both interactives. Scale of an Atom *Show in fullscreen *Discuss connections to cells in life science Cell Size and Scale - Carbon Questions to facilitate discussion: *What cell structures do you see as we zoom in? *What is the composition of a cell and its organelles? *How would you classify this cell? (Plant, animal, bacteria, eukaryote, prokaryote) **The big idea is to get students to see that while cells are the building blocks of life, they are made from atoms at the most basic level.	Day 2 of Lesson Think Pair Share: Ask students the same question from yesterday: How large/small is an atom? Provide student discussion and sharing time, and then show the TedEd video. Just How Small is an… We will follow the video with a discussion on scale and proportion (Cross-Cutting Concept) and how it was used to help us visualize an atom in the video.	This is a 2-day lesson. Ask: How is the Periodic Table organized? Introduction to Periodic Table - Periodic People Mystery Tips for Implementing: *Print the people so students can work in groups of 2-3. *Do not print the entire activity—ask the questions as students work and facilitate small and whole group discussions. Review the parts of an atom and the atom builder simulation. Connect this learning to today's lesson—atomic number and atomic mass and their roles in determining the location of elements on the table.	Day 2 of Lesson Ptable Students will navigate to the Ptable website and create a list of patterns they observe in the table. (Try to get students to find 3-5 patterns/trends.) Questions to facilitate inquiry: *Describe the atomic number's location and the elements' atomic mass on the element tile. *What do you notice as you move down a column? *What do you notice as you move across a row? Discuss the importance of patterns in science. Connect this to a discussion of Cross-Cutting Concepts.
Guided	PBS Learning Simulation	Students will use the	Students will use the	TedEd Video on	TedEd Video on

Practice/Transition	(Alternate Link) Students will work through the simulation to introduce themselves to atomic structure. As they progress through the simulation, students should complete the graphic organizer. Graphic Organizer PBS Learning Article Comprehension Questions <u>Vocabulary:</u> Atom Nucleus Electron Cloud Proton Neutron Electron	simulation to create models for elements on the periodic table and investigate how protons, neutrons, and electrons influence an atom's type and charge. *Links to Pivot Learning will be shared when the platform is active: Part 1 - Pivot Learning: Atom Builder Simulation - Atomic Number Part 2 - Pivot Learning: Atom Builder Simulation - Mass Number Part 3 - Pivot Learning: Atom Build Simulation - Ions <u>Vocabulary:</u> Periodic Table Atomic Number Atomic Mass Ion	simulation to create models for elements on the periodic table and investigate how protons, neutrons, and electrons influence an atom's type and charge. Part 1 - Pivot Learning: Atom Builder Simulation - Atomic Number Part 2 - Pivot Learning: Atom Builder Simulation - Mass Number Part 3 - Pivot Learning: Atom Build Simulation - Ions <u>Vocabulary:</u> Periodic Table Atomic Number Atomic Mass Ion	Mendeleev's Periodic Table *Create questions or use EdPuzzle Version Have students share their learning and the questions they have - facilitate discussion. Discuss the importance of patterns in science. Connect this to a discussion of Cross-Cutting Concepts. Notes on Periodic Table Trends Learning The Period… Graphic Organizer for Notes <u>Vocabulary:</u> Groups Periods Metals Nonmetals Alkali Metals Alkali Earth Metals Transition Metals Lanthanides Actinides Post-Transition Metals Metalloids Reactive Nonmetals Halogens Noble Gases	Mendeleev's Periodic Table *Create questions or use EdPuzzle Version Have students share their learning and the questions they have - facilitate discussion. Discuss the importance of patterns in science. Connect this to a discussion of Cross-Cutting Concepts. Notes on Periodic Table Trends Learning The Period… Graphic Organizer for Notes <u>Vocabulary:</u> Groups Periods Metals Nonmetals Alkali Metals Alkali Earth Metals Transition Metals Lanthanides Actinides Post-Transition Metals Metalloids Reactive Nonmetals Halogens Noble Gases
Independent Practice	Students will watch the video and take notes in the graphic organizer from the guided practice section. Atoms: StudyJams! Science | Scholastic.com *Students can add new	Notetaking in a science journal from PPT on Atomic Structure *Students can add new	Notetaking in a science journal from PPT on Atomic Structure *Students can add new	Students will watch the video and take notes in the graphic organizer from the guided practice section. Periodic Table: StudyJams! Science | Scholastic.com *Students can add new	Anchor Chart - Students will create an anchor chart for the trends on the Periodic Table. Element Tile Example PT Example *Students can add new

	vocabulary to their Frayer Model Templates from Week 1.	vocabulary to their Frayer Model Templates from Week 1.	vocabulary to their Frayer Model Templates from Week 1.	vocabulary to their Frayer Model Templates from Week 1.	vocabulary to their Frayer Model Templates from Week 1.
Assessment/Summary	Quiz in Study Jams on video: Students will take the quiz at the end of the video and share their score via screenshot with Canvas or Google Forms.	On a sticky note, create a model for an atom of Helium. Remember that helium has 2 protons, 2 electrons, and two neutrons. Label the regions of the atom and the subatomic particles.	Quiz in Pivot Learning - have students log in to the platform and take the 14-question quiz.	Quiz in Study Jams on video: Students will take the quiz at the end of the video and share their score via screenshot with Canvas or Google Forms.	Quiz in Illuminate - has been shared with Ms. Muhammad. Teacher Version Student Version
Small Group Tasks (TBA)					

Week 6	
GSE: **S8P1.** Obtain, evaluate, and communicate information about the structure and properties of matter. **S8P1.F.** Construct an explanation based on evidence to describe conservation of matter in a chemical reaction including the resulting differences between products and reactants.	**Focused Concept:** • The focus concept for this element is how matter is conserved during chemical reactions. Students should be able to demonstrate that the number of atoms for each element in the reactants is equal to the number of atoms for each element in the products.
SEP: • Constructing Explanations • Engage in Arguments from Evidence	**CCC:** • Energy and Matter • Using Mathematics and Computational Thinking
Phenomenon: Burning Steel Wool - Wonders of Science You can show the video or do this as a demonstration. If you do the demonstration, use 100% steel wool, not synthetic steel wool. Do the demo in a safe area and not near flammable materials. Have students complete the STW protocol as they observe the reaction. TIP: Have steel wool for students to see and feel - quickly discuss its uses in real life. Questions to consider: How is the mass changing on the scale? Describe what is happening to the steel wool. Is mass being created, destroyed, or conserved? How do you know?	**DQ:** • How is matter conserved during chemical reactions? • What is the relationship between products and reactants?

	Day 26	Day 27	Day 28	Day 29	Day 30
Learning Targets **The students will be able to (SWBAT)**	SWBAT differentiate between products and reactants in a chemical equation. SWBAT identify a balanced chemical equation. SWBAT construct an explanation based on evidence to describe conservation of matter in a chemical reaction including the resulting differences between products and reactants.	SWBAT differentiate between products and reactants in a chemical equation. SWBAT identify a balanced chemical equation. SWBAT construct an explanation based on evidence to describe conservation of matter in a chemical reaction including the resulting differences between products and reactants.	SWBAT differentiate between products and reactants in a chemical equation. SWBAT identify a balanced chemical equation. SWBAT construct an explanation based on evidence to describe conservation of matter in a chemical reaction including the resulting differences between products and reactants.	Unit Test Review Teacher Version Unit Assessment Student Version Unit Assessment SWBAT develop and use a model to compare and contrast pure substances and mixtures. SWBAT develop and use models to describe the movement of particles in solids, liquids, gases, and plasma states when thermal energy is added or removed. SWBAT plan and carry out investigations to compare and contrast chemical and physical properties of matter. SWBAT 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. SWBAT develop models by analyzing patterns within the periodic table that illustrate the structure, composition, and characteristics of atoms and simple molecules.	Take Unit Test Teacher Version Unit Assessment Student Version Unit Assessment SWBAT develop and use a model to compare and contrast pure substances and mixtures. SWBAT develop and use models to describe the movement of particles in solids, liquids, gases, and plasma states when thermal energy is added or removed. SWBAT plan and carry out investigations to compare and contrast chemical and physical properties of matter. SWBAT 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. SWBAT develop models by analyzing patterns within the periodic table that illustrate the structure, composition, and characteristics of atoms and simple molecules.

				SWBAT construct an explanation based on evidence to describe conservation of matter in a chemical reaction including the resulting differences between products and reactants.	SWBAT construct an explanation based on evidence to describe conservation of matter in a chemical reaction including the resulting differences between products and reactants.
Opening	Science Probe - textbook page 33 Introduce Lesson: Use the phenomenon above or use the phenomenon from the textbook. Introduce the lesson phenomenon - Textbook pages 34 - 35	What happens to the mass of substances when they are chemically combined? Have students construct an explanation for the mass of the reactants from yesterday's inquiry lab. Preview today's lab: tool talk, lab safety, timeframe	Review phenomena from lesson and unit - ask students what learning can be added or revised based on their new learning.	Unit Test Review - See Assessment Prep at the bottom of the unit plan	Unit Post Test *Shared in Illuminate with Ms. Muhammad
Guided Practice/Transition	Create a claim for the lesson's CER - page 36 textbook Inquiry - Positive Reaction - What happens when substances interact? Textbook pages 38 - 39 Reading, Discussion, Note Taking - (Textbook page 40) <u>Vocabulary:</u> Reactants Yield(s) Products Law of Conservation of Matter	Inquiry - Reapproaching Reactions - What happens to atoms during a chemical change? Students will measure the mass of reactants and products before and after a chemical reaction. (Textbook pages 41-42) Broken Bonds—Students will watch a video on breaking and forming bonds and record their data in a graphic organizer. (Textbook page 43) <u>Vocabulary:</u> Reactants Yield(s) Products Law of Conservation of Matter	Investigation: Students will determine the pattern in the number of atoms before and after a chemical reaction. Phet Simulation (Textbook pages 44-46) Students will take notes on the Law of Conservation of Matter and balancing chemical equations in a graphic organizer. PPT Balancing Equations <u>Vocabulary:</u> Reactants Yield(s) Products Law of Conservation of Matter	Unit Test Review - See Assessment Prep	Unit Post Test *Shared in Illuminate with Ms. Muhammad

Independent Practice	Complete evidence A in CER - Textbook page 36 *Students can add new vocabulary to their Frayer Model Templates from Week 1.	Complete evidence B in CER - Textbook page 36 *Students can add new vocabulary to their Frayer Model Templates from Week 1.	Complete evidence C in CER - Textbook page 36 *Students can add new vocabulary to their Frayer Model Templates from Week 1.	Unit Test Review - See Assessment Prep	Unit Post Test *Shared in Illuminate with Ms. Muhammad
Assessment/Summary	Describe the physical and chemical changes that occurred in today's lab.	How are new substances formed during a chemical reaction?	How do you know matter is conserved during a chemical reaction?	How will you prepare for tomorrow's unit assessment?	Unit Post Test *Shared in Illuminate with Ms. Muhammad
Small Group Tasks (TBA)					

Assessment Prep

Prepare students for assessment by reviewing the following Assessment Prep Presentation.

Unit 1 Assessment Prep

Provide the following guidance:
Ask the students to use what they know about the tasks completed to answer the provided assessment prep question.

- What is the question asking you?
- What do you know about the vocabulary or concept in the question?
- Is this question similar to any investigations or tasks we've completed?
- How can what you've done help you answer this question?
- Just view the assessment question: What is the question asking you?

Guide students to think about how their experience connects to the question.
Using the answer choices provided, ask the students the following:

- Identify a wrong answer: How do I know this answer is incorrect?
- Identify the correct answer: How do we know this answer is correct?

Allow the students time to discuss in collaborative groups.

TEACHER NOTE: If students struggle with the question, review it the next day. Do not rush to the next question; instructional time is the only time they have to prepare for the end-of-year assessment.

Following the Unit Test:

- Have students correct any missed test items using one of the test correction templates: Template Option 1 Template Option 2

- Have students create goals for review and remediation of material
- Have students set goals for the next unit

Labs / Investigations

Mandatory Labs	Explore Learning Gizmo	Pivot Interactives/Phet
Identify Mystery Substance Conservation of Mass	S8P1.B. ● Phase Changes ● Temperature and Particle Motion S8P1.C. ● Density Experiment: Slice and Dice ● Density Laboratory ● Melting Points ● Mineral Identification S8P1.D. ● Chemical Changes S8P1.E. ● Element Builder S8P1.F. ● Chemical Equations	Atom Builder - Pivot Learning Phet: Build a Molecule Phet: State of Matter and Phase Changes Phet: Isotopes and Atomic Mass Phet: Balancing Chemical Equations

Additional Resources/Tasks

Supplemental Resources

GADOE 8th Grade Self Evaluation Checklist

S8P1.A.
- Atoms, Ions, and Isotopes Classification
- Atoms, Molecules, Mixtures Simulation CK12
- Elements, Compounds, Mixtures Classification
- Elements, Compound, Mixtures Homework Sheet

S8P1.B.
- Phase Changes Homework Sheet (Key Included)

S8P1.C.
- Properties of Matter PPT

S8P1.D.
Physical and Chemical Changes Homework Sheet

S8P1.E.

	• Ptable • Photographic Periodic Table • Periodic Table Homework Sheet S8P1.F. • SimPop Balancing Equations Simulator • CK12 Chemical Reaction Simulation CCPS Lesson Plan Template (Daily View) CCPS Lesson Plan Template (Week View) Department of Science CCPS Lesson Plan Guidance Document .pdf Science SBC Instructional Framework.pdf