

TCSS Physical Science

Unit 1 – Matter Information

Milestones Domain/Weight: Chemical Reactions and Properties of Matter 25%

Georgia Performance Standards:

SPS2. Students will explore the nature of matter, its classifications, and its system for naming types of matter.

a. Calculate density when given a means to determine a substance's mass and volume.

SPS5. Students will compare and contrast the phases of matter as they relate to atomic and molecular motion.

a. Compare and contrast the atomic/molecular motion of solids, liquids, gases and plasmas.

b. Relate temperature, pressure, and volume of gases to the behavior of gases.

SPS7. Students will relate transformations and flow of energy within a system.

d. Explain the flow of energy in phase changes through the use of a phase diagram.

Purpose/Goal(s):

- Students will understand the nature of matter, its classifications, and its system for naming types of matter.
- Students will be able to calculate density.
- Students will compare and contrast the atomic/molecular motion of solids, liquids, gases, and plasmas.
- Students will be able to relate temperature, pressure, and volume to the behavior of gases.
- Students will be able to explain the flow of energy in a phase change diagram.

Content Map: [Unit 1 – Matter Content Map](#)

Prerequisites: [Unit 1 – Matter Middle School Standards](#)

Unit Length: Approximately 20 days

Click on the links below for resources by Concept:

[Concept 1: Classification of Matter](#)

[Concept 2: Properties of Matter](#)

[Concept 3: States of Matter/Phase Changes](#)

[Concept 4: Gases](#)

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Concept, Essential Question(s), and Standard(s)	Vocabulary	Resources [Back to Top]	Assessment
<p><u>Concept 1</u>: Classification of Matter</p> <p><u>EQ1</u>: How is matter classified?</p> <p><u>EQ2</u>: What is the difference between an element, compound, and mixture?</p> <p><u>SPS2</u>. Students will explore the nature of matter, its classifications, and its system for naming types of matter.</p>	<p><u>Essential*</u> Matter</p> <p><u>Supplemental**</u> Atom Compound Element Heterogeneous Mixture Homogeneous Mixture Mixture Pure Substance</p> <p>*Essential vocabulary listed in the GPS Standards</p> <p>**Supplemental vocabulary listed in the state frameworks and/or other state document</p>	<p><u>Animations/Videos</u> Classifying Types of Matter (6:21) – Video that explains the different types of matter</p> <p><u>Notes</u> Matter-Mart – Students draw a map of Wal-Mart or another store and compare their map to how matter is organized Classifying Matter Part 1 – PowerPoint explaining the different types of matter. This PowerPoint is used with the Matter-Mart graphic organizer. Matter-Mart Graphic Organizer – Graphic organizer for Classifying Matter Part 1 PowerPoint. Classifying Matter Part 2 – Review PowerPoint for the different types of matter. The PowerPoint also includes practice questions that the students can use whiteboards to answer.</p> <p><u>Practice/Worksheets/Labs</u> Matter Examples – Students create a graphic organizer of the different types of matter on their own paper. Then the students cut out the different types of matter and paste them under the correct category. Classifying Matter Foldable – Instructions on how to complete a foldable on matter Classifying Matter Formative – Four different formative assessments for classifying matter</p>	<p>Concept 1: Sample Assessment Items</p>

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Concept, Essential Question(s), and Standard(s)	Vocabulary	Resources [Back to Top]	Assessment
<p><u>Concept 2</u>: Properties of Matter</p> <p><u>EQ1</u>: What floats your boat?</p> <p><u>EQ2</u>: How are mass and volume related to density?</p> <p><u>SPS2a</u>: Calculate density when given a means to determine a substance's mass and volume.</p>	<p><u>Essential*</u> Density Mass Volume</p> <p><u>Supplemental**</u> Meniscus</p> <p>*Essential vocabulary listed in the GPS Standards</p> <p>**Supplemental vocabulary listed in the state frameworks and/or other state document</p>	<p><u>Animations/Videos</u> PhET Density Simulation Density (time 3:12) – Video explaining how to calculate the density of water by first determining the mass and volume of the water and explains why different items float and sink in water. What is Density? (time 5:42)– Learn how to find the density of objects when given the mass and volume of an object.</p> <p><u>Notes</u> Density PowerPoint – This PowerPoint is used with the density graphic organizer. The PowerPoint also contains example density problems, activators and summarizers. Density Graphic Organizer – Graphic organizer for the Density PowerPoint Density Triangle Organizer – Triangular shaped graphic organizer for the density equation Density Review – PowerPoint with review word problems for density Density Study Cards – Study cards for density</p> <p><u>Practice/Worksheets/Labs</u> Density, Mass, & Volume Investigation – Lab for calculating density Density Practice #1 – Word document with 6 practice word problems Density Practice #2 – Word document with 11 practice word problems Density Practice #3 – Word document with 8 practice word problems</p>	<p>Concept 2: Sample Assessment Items</p>

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Concept, Essential Question(s), and Standard(s)	Vocabulary	Resources [Back to Top]	Assessment
<p><u>Concept 3:</u> States of Matter / Phase Changes</p> <p><u>EQ1:</u> How does the arrangement and energy of particles determine the phases of matter?</p> <p><u>EQ2:</u> How do you interpret a phase change diagram and phase change graph?</p> <p><u>SPS5a:</u> Compare and contrast the atomic/molecular motion of solids, liquids, gases and plasmas.</p> <p><u>SPS7d:</u> Explain the flow of energy in phase changes through the use of a phase diagram.</p>	<p><u>Essential*</u> Molecular Motion Solid Liquid Gas Plasma Phase Diagram</p> <p><u>Supplemental**</u> Boiling Point Condensation Deposition Evaporation Freezing Point Kinetic Theory Melting Point Sublimation Vaporization</p> <p>*Essential vocabulary listed in the GPS Standards</p> <p>**Supplemental vocabulary listed in the state frameworks and/or other state document</p>	<p><u>Animations/Videos</u> Energy and the Four States of Matter (time 3:39) – Discovery Education video that describes the four states of matter. States of Matter (time 4:52) – Video that discusses misconceptions and describes the differences between solids, liquids, and gases. Plasma, The Most Common Phase of Matter in the Universe (time 3:32) – Get to know plasma, the most common, but probably least understood, phase of matter in the universe. 4 States of Matter Song (time 3:34) – A video using “In the End” by Linkin Park to discuss the four states of matter. PhET States of Matter – Simulation for the molecular motion of states of matter.</p> <p><u>Notes</u> Phases of Matter – This PowerPoint is used with the phases of matter graphic organizer. Also, the PowerPoint contains a writing activity for the phases of matter. Phases of Matter Graphic Organizer – Graphic organizer for the phases of matter PowerPoint. Heating Curve – This PowerPoint is used with the heating curve graphic organizer. Heating Curve Graphic Organizer – Graphic organizer for the heating curve PowerPoint</p> <p><u>Practice/Worksheets/Labs</u> Phases of Matter Writing Assignment – The students pretend that they are a water molecule at various temperatures and they describe their molecular motion at each temperature. Heating Curve Activity – Students answer the questions on the heating curve. Heating Curve of Water Lab – Lab activity where the students construct a heating curve for water.</p>	<p>Concept 3: Sample Assessment Items</p>

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Concept, Essential Question(s), and Standard(s)	Vocabulary	Resources [Back to Top]	Assessment
<p><u>Concept 4:</u> Gases</p> <p><u>EQ1:</u> How can temperature, pressure, and volume be used to determine the behavior of gases?</p> <p><u>EQ2:</u> How do changes in pressure, volume, or temperature of a gas relate to each other?</p> <p><u>SPS5b.</u> Relate temperature, pressure, and volume of gases to the behavior of gases.</p>	<p><u>Essential*</u> Pressure Temperature Volume</p> <p><u>Supplemental**</u></p> <p>*Essential vocabulary listed in the GPS Standards</p> <p>**Supplemental vocabulary listed in the state frameworks and/or other state document</p>	<p><u>Animations/Videos</u> Behavior of Gases (6:47) – Video describing the relationship between temperature & pressure, and temperature & volume. Gas Properties – PhET simulation for the behavior of gases.</p> <p><u>Notes</u> Behavior of Gases – PowerPoint with notes and lab on the behavior of gases.</p> <p><u>Practice/Worksheets/Labs</u> Behavior of Gases Pressure and Volume – Notes and lab sheet for the behavior of gases PowerPoint Behavior of Gases Temperature and Volume – Notes and lab sheet for the behavior of gases PowerPoint</p>	<p>Concept 4: Sample Assessment Items</p>