



**Grade 6 Science**  
**Unit # 1- Physical Science**  
**Topic 2 Solids, Liquids, and Gasses – 15 Days**

**Unit Overview:** Students make sense of phenomena as they explore the disciplinary core ideas through the lens of crosscutting concepts, such as Systems and System Models, Cause and Effect, and Matter and Energy. Students begin their discovery of the physical world with models and observable phenomena and move to explore the concept of energy and how it is needed to change matter. This leads to the study of thermal energy and heat transfer.

**Topic Essential Question:** What causes matter to change from one state to another?

**Lessons**

- Topic Launch/Quest Kickoff
- Lesson 1 States of Matter
- Lesson 2 Changes of State
- Lesson 3 Gas Behavior
- Topic Close –Assessment, Quest Findings

**NYSSLS Performance Expectations**

**MS-PS1-4. Develop a model that predicts and describes changes in particle motion, temperature, and phase (state) of a substance when thermal energy is added or removed. [Clarification Statement: Emphasis is on qualitative particulate level models of solids, liquids, and gases to show that adding or removing thermal energy increases or decreases kinetic energy of the particles until a change of phase occurs. Examples of models could include drawings and diagrams. Examples of particles could include ions, molecules, or atoms. Examples of substances could include sodium chloride, water, carbon dioxide, and helium.]**

**MS-ETS1-2. Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.**

**MS-ETS1-1. Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.**

**MS-ETS1-4. Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.**

**Topic Opener**

**PE:** MS-PS1-4

**SEP:** Developing and Using Models

**DCI:**

**PS1.A - Structure and Properties of Matter**

- (NYSED) In a solid, the particles are closely spaced and vibrate in position but do not change their relative locations. In a liquid, the particles are closely spaced but are able to change their relative locations. In a gas, the particles are widely spaced except when they happen to collide and constantly change their relative locations. (MS-PS1-4)
- (NYSED) The changes of state that occur with variations in temperature and/or pressure can be described and predicted using these models of matter. (MS-PS1-4)

**CCC:** Cause and Effect; Systems and System Models; Stability and Change

**Savvas**

**Highlighted labs are important to the understanding of the instructional concepts in this lesson and must be completed during Science instructional time.**

- Topic Readiness Test
- **uConnect Lab – Solid, Liquid, or Gas?**
- Quest Kickoff Video – How can you use solids, liquids, and gasses to lift a car?

**Lesson 1 – States of Matter**

**PE:** MS-PS1-4

**SEP:** Developing and Using Models

**DCI:**

**PS1.A - Structure and Properties of Matter**

- (NYSED) In a solid, the particles are closely spaced and vibrate in position but do not change their relative locations. In a liquid, the particles are closely spaced but are able to change their relative locations. In a gas, the particles are widely spaced except when they happen to collide and constantly change their relative locations. (MSPS1-4)
- (NYSED) The changes of state that occur with variations in temperature and/or pressure can be described and predicted using these models of matter. (MS-PS1-4)

**CCC:** Cause and Effect

**Savvas**

**Guiding Objectives:**

- Students will write informative texts to explain: similarities and differences between solids, liquids, and gasses; similarities and differences between high-viscosity liquids and low-viscosity liquids; the relationship between particle motion and the state of matter.
- Students will develop and use models to demonstrate how arrangement and movement of particles compare in solids, liquids, and gasses.

**Literacy Connection**

- Write Informative Texts

**Vocabulary**

- solid
- liquid
- surface tension
- viscosity
- gas

**Academic Vocabulary**

- vibrate

**Connect - TE/SB p. 46**

- Connect It!
- Poll – Determining the State of Matter
- Quest Connection

**Investigate - TE/SB pp. 47-52**

- **Investigate Lab – Properties of Matter**
- Video – States of Matter
- Interactivity – Particles and States of Matter
- Reading Checks (p. 52)
- Literacy Connection – Write Informative Texts
- Model It!

**Synthesize - TE/SB pp. 53-54**

- Interactivity – Properties of Solids, Liquids, and Gases
- Quest Check-In Interactivity – Design Your Lift
- Reading Check (p.53)
- Quest Check-In

**Demonstrate – TE/SB pp. 54**

- Lesson 1 Check
- Lesson Quiz 1

## **Lesson 2 – Changes of State**

**PE:** MS-PS1-4

**SEP:** Developing and Using Models

**DCI:**

**PS1.A - Structure and Properties of Matter**

- (NYSED) In a solid, the particles are closely spaced and vibrate in position but do not change their relative locations. In a liquid, the particles are closely spaced but are able to change their relative locations. In a gas, the particles are widely spaced except when they happen to collide and constantly change their relative locations. (MSPS1-4)
- (NYSED) The changes of state that occur with variations in temperature and/or pressure can be described and predicted using these models of matter. (MS-PS1-4)

**CCC:** Cause and Effect

## **Savvas**

### **Guiding Objectives:**

- Students will describe cause and effect relationships related to: the role thermal energy plays in particle motion; the role of thermal energy plays in changes of state.
- Students will use text information to explain how pressure affects a change of state from a liquid to a gas.
- Students will develop and use models to describe what happens to particles of matter during changes of state between solids, liquids, and gases.

### **Literacy Connection**

- Use Information

### **Vocabulary**

- thermal energy
- temperature
- melting point
- freezing point
- vaporization
- boiling point
- evaporation
- condensation
- sublimation

### **Academic Vocabulary**

- suspend

### **Connect - TE/SB p. 56**

- Connect It!
- Write: Changing States
- Quest Connection

### **Investigate - TE/SB pp. 57-62**

- Video – Changes of State
- **Investigate Lab – Mirror, Mirror**

- Interactivity – Particle Motion and States of Matter
- Interactivity – States of Matter
- Literacy Connection
- Reading Check (pp.57; 59; 62)
- Math Toolbox ( pp.59)

### **Synthesize - TE/SB pp. 63-64**

- Interactivity – Thermal Energy and Changes of State
- Quest Check In
- Quest Check-In Interactivity: Life Your Car
- Model It!

### **Demonstrate – TE/SB p. 64**

- Lesson 2 Check
- Lesson 2 Quiz

<p><b><u>Lesson 3 – Gas Behavior</u></b>  <b>PE:</b> MS-PS1-4  <b>SEP:</b> Developing and Using Models  <b>DCI:</b></p> <ul style="list-style-type: none"> <li>• (NYSESED) In a solid, the particles are closely spaced and vibrate in position but do not change their relative locations. In a liquid, the particles are closely spaced but are able to change their relative locations. In a gas, the particles are widely spaced except when they happen to collide and constantly change their relative locations. (MSPS1-4)</li> <li>• (NYSESED) The changes of state that occur with variations in temperature and/or pressure can be described and predicted using these models of matter. (MS-PS1-4)</li> </ul>	<p><b>Savvas</b>  <b>Guiding Objectives:</b></p> <ul style="list-style-type: none"> <li>• Students will comprehend text by summarizing: how Charles’s Law relates temperature and volume of gasses; how Boyle’s Law relates pressure and volume in gasses.</li> <li>• Students will construct graphs to illustrate: the directly proportional relationship between volume and temperature; the inversely proportional relationship between volume and pressure</li> </ul> <p><b>Literacy Connection</b></p> <ul style="list-style-type: none"> <li>• Read and Comprehend</li> </ul> <p><b>Vocabulary</b></p> <ul style="list-style-type: none"> <li>• pressure</li> <li>• Charles’s Law</li> <li>• Boyle’s Law</li> </ul> <p><b>Academic Vocabulary</b></p> <ul style="list-style-type: none"> <li>• proportional</li> </ul> <p><b>Connect</b> - TE/SB pp. 66-67</p> <ul style="list-style-type: none"> <li>• Connect It!</li> <li>• Inquiry Warm-Up Lab – How Can Air Keep Chalk from Breaking?</li> <li>• Quest Connection</li> </ul> <p><b>Investigate</b> - TE/SB pp. 67-72</p> <ul style="list-style-type: none"> <li>• <b>Investigate Lab – Testing Charles’s and Boyle’s Gas Laws</b></li> <li>• Interactivity: The Gas Laws</li> <li>• Video – Gas Behavior</li> <li>• Model It!</li> <li>• Reading Check (pp. 68; 70)</li> <li>• Math Toolbox (pp. 70; 72)</li> <li>• Literacy Connection</li> </ul> <p><b>Synthesize</b> - TE/SB pp. 73-75</p> <ul style="list-style-type: none"> <li>• Interactivity – Hot Air Balloon ride</li> <li>• Quest Check-In Lab – Phases of Matter</li> <li>• Quest Check-In</li> </ul> <p><b>Demonstrate</b> – TE/SB p.75</p> <ul style="list-style-type: none"> <li>• Lesson 3 Check</li> <li>• Lesson 3 Quiz</li> </ul>
<p><b>Topic Close</b></p> <ul style="list-style-type: none"> <li>• Topic 2 Assessment and Remediation TE/SB pp. 78-81</li> <li>• Quest Finding and Reflection TE/SB p. 81</li> </ul>	<p><b><u>Topic 2 Enrichment</u></b>  <b>Topic 2 - Lesson 1 Enrichment</b></p> <ul style="list-style-type: none"> <li>• Enrichment Activity – Lava Viscosity</li> <li>• <i>Investigate</i> Engineer It – From “Ink” to Objects: 3D Printing– TE/SB p.55</li> <li>• Engineering Design Notebook – Printing in Space</li> </ul> <p><b>Topic 2 - Lesson 2 Enrichment</b></p> <ul style="list-style-type: none"> <li>• Enrichment Activity – Cooling Curves</li> <li>• Extraordinary Science – Freeze that Scalpel- p.65</li> </ul> <p><b>Topic 2 - Lesson 3 Enrichment</b></p> <ul style="list-style-type: none"> <li>• Enrichment Activity – Gas Behavior in Daily Life</li> <li>• Case Study-Rising to the Occasion: Charles’s Law in the Oven pp. 76-77</li> </ul>

<p><b>English Language Learners (ELL) Enhancements</b> To access <a href="#">hyperlinked</a> material, you must be logged into your BPS Google Drive</p>	<p><b>Listening</b></p> <ul style="list-style-type: none"> <li>● <b><a href="#">Cross- Linguistic Practices</a></b>: Gives students opportunities to make connections between what they hear and their home language (For example, allow students to listen to a passage and identify cognates).</li> <li>● <b><a href="#">Activating Prior Knowledge</a></b> Activating prior knowledge means both eliciting from students what they already know and building initial knowledge that they need in order to access upcoming content.</li> <li>● <b><a href="#">Visuals</a></b> - GIFs, pictures- will assist students in understanding what they are listening to. Use <b><a href="#">visual thinking strategies</a></b> to set the lens for learning.</li> <li>● Video to review or introduce a topic – use <b><a href="#">closed captioning</a></b> to help students see the words and pronunciations while they listen to the content.</li> <li>● <b><a href="#">Word stretching / Vowel stretching</a></b> when instructing allows student to listen closely to the pronunciation of the word.</li> <li>● <b><a href="#">Performance Level Descriptors</a></b> this document provides teachers with a description of what output they can expect from students based on earned NYSESLAT levels in the modality of listening. Scroll for grade 6.</li> </ul>
	<p><b>Speaking</b></p> <ul style="list-style-type: none"> <li>● <b><a href="#">Sentence Stems/Frames</a></b> - to begin a sentence - such as <i>Evolution is...</i> or <i>I think that evolution is...</i></li> <li>● <b><a href="#">Academic Conversation Starters</a></b>: Have a visual of a list of academic sentence starters that students can refer to in a discussion.</li> <li>● <b><a href="#">Choral Reading</a></b> - To build fluency, self-confidence and motivation with <b><a href="#">reading/speaking</a></b>.</li> <li>● Create <b><a href="#">movement</a></b> to go with the word. Movement can be a motivating factor, as well as a kinesthetic tool for conceptualizing the rhythm and flow of fluent reading while triggering brain function for optimal learning.</li> <li>● <b><a href="#">Performance Level Descriptors</a></b> This document provides teachers with a description of what output they can expect from students based on earned NYSESLAT levels in the modality of speaking. Scroll for grade 6.</li> </ul>
	<p><b>Reading</b></p> <ul style="list-style-type: none"> <li>● Supplementary Text to help reinforce concepts.</li> <li>● <b><a href="#">Visual Aids</a></b> - Pictures or models to support vocabulary words and concepts</li> <li>● Video to review or introduce a topic - use <b><a href="#">closed captioning</a></b> to help students read along while they listen to the content.</li> <li>● <b><a href="#">4 Square / Frayer models</a></b> to help students gain a deeper understanding of vocabulary.</li> <li>● <b><a href="#">Highlighting</a></b> important text to assist students in answering questions after the reading.</li> <li>● <b><a href="#">Chunking</a></b>-Break reading of text into chunks or paragraphs</li> <li>● <b><a href="#">Vocabulary Morphology</a></b>- Morphology relates to the segmenting of words into affixes (prefixes and suffixes) and roots or base words, and the origins of words. Understanding that words connected by meaning can be connected by spelling can be critical to expanding a student’s vocabulary.</li> <li>● <b><a href="#">Performance Level Descriptors</a></b> this document provides teachers with a description of what output they can expect from students based on earned NYSESLAT levels in the modality of reading. Scroll for grade 6.</li> </ul>
	<p><b>Instructional Accommodations (depending on the student’s needs)</b></p> <ul style="list-style-type: none"> <li>● <b>Extended time</b> for tests in class, projects and assignments</li> <li>● <b>Directions read.</b> Broken down as necessary</li> <li>● <b>Model</b> how to complete the activity in the lesson</li> <li>● <b>Oral simplification</b> of directions or questions</li> <li>● <b>Translated version</b> of test when available. Student may have both version English and native language version</li> <li>● Use of <b><a href="#">approved bilingual glossaries</a></b> from NYS in each subject</li> </ul>

Grade 6 Unit 1 Physical Science

<p><b>Special Education Modifications</b></p> <p>Special Education students must have accommodations as per Individual Educational Plan (IEP)</p>	<p><b><u>Instructional</u></b></p> <ul style="list-style-type: none"> <li>● <b>Pre-teach</b> vocabulary</li> <li>● Use <b>picture vocabulary</b></li> <li>● Scaffold <b>Depth of Knowledge</b> questions</li> <li>● Provide copy of notes/<b>notes in “cloze”</b> form</li> <li>● Use of <b>Think, Pair, and Share</b> strategy to help process information</li> <li>● <b>Scaffold</b> written assignments with the use of <b>graphic organizers</b></li> <li>● Allow for <b>multiple ways to respond</b> (verbal, written, response board)</li> <li>● Provide <b>model of performance task</b></li> <li>● <b>Modify informational text</b> to fit the needs of the students</li> <li>● Provide a digital or paper <b>interactive notebook</b></li> <li>● Present complex <b>tasks in multiple ways</b></li> <li>● Provide <b>mnemonic strategies</b> for scientific concepts</li> </ul> <hr/> <p><b><u>Technology:</u></b></p> <ul style="list-style-type: none"> <li>● <b>Audio</b> reading of text</li> <li>● <b>Text to type</b> functions</li> <li>● <b>Videos</b> to clarify/visualize science concepts</li> <li>● <b>Record class lecture/discussions</b> and make accessible to student</li> <li>● <b>Nearpod-</b> interactive presentations of notes</li> </ul> <hr/> <p><b><u>In Class Assessments</u></b></p> <ul style="list-style-type: none"> <li>● Provide <b>multiple options</b> for projects</li> <li>● <b>Use of timer</b> in class</li> <li>● Break all complex tasks into chunks</li> </ul>
<p><b>Step Up to Writing</b></p> <p>Step Up to Writing Materials can be found in BPS Science K-12 Schoology Folder Grade 6 Resources Grade 6 SUTW materials</p>	<ul style="list-style-type: none"> <li>● Easy Two-Column Notes</li> <li>● Breaking Down Definitions</li> <li>● Paragraph Frame- What I Learned</li> <li>● <b><u>Performance Level Descriptors</u></b> this document provides teachers with a description of what output they can expect from students based on earned NYSESLAT levels in the modality of writing. Scroll for grade 6.</li> </ul>
<p><b>Culturally and Linguistically Responsive Teaching (CLRT) in the Science Classroom</b></p>	<ul style="list-style-type: none"> <li>● Materials, resources, and/or discussions address diverse cultural backgrounds and real-world applications</li> <li>● Artifacts (posters, charts, etc.) in the science classroom are representative of the cultures of the student population</li> <li>● All students are given an opportunity to engage in science discourse</li> <li>● Teacher demonstrates high expectations for all students</li> </ul>