



**Grade 5 Science**  
**Unit # 1- Physical Science**  
**Topic 2 Changes in Matter – 21 Days**

**Unit Overview:** In Topic 1, Students will learn there are different states of matter and matter has different properties in each of the states. Students will perform investigations that demonstrate how properties of matter either change or remain the same after certain types of reactions. In **Topic 2** students will learn how to identify a chemical change. Students will also investigate the principle of matter conservation. Students will discover that matter might change but the amount of matter does not.

**Topic Essential Question:** What evidence do we have that matter changes?

**Lessons**

- Topic Launch/Quest Kickoff
- Lesson 1 States of Matter
- Lesson 2 Physical Changes
- Lesson 3 Chemical Changes
- Lesson 4 Mixtures and Solutions
- Topic Close –Assessment, Quest Findings

**NYSSLS Performance Expectations**

**5-PS1-2. Measure and graph quantities to provide evidence that regardless of the type of change that occurs when heating, cooling, or mixing substances the total amount of matter is conserved. [Clarification Statement: Examples of reactions or changes could include phase changes, dissolving, and mixing that form new substances. Assume that reactions with any gas production are conducted in a closed system.] [Assessment Boundary: Assessment does not include distinguishing between mass and weight.]**

**5-PS1-4. Conduct an investigation to determine whether the mixing of two or more substances results in new substances. [Clarification Statement: Examples could include mixing baking soda and water compared to mixing baking soda and vinegar.]**

**3-5-ETS1-2. Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.**

**3-5-ETS1-3. Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.**

**Topic Opener**

**PE:** 5-PS1-2; 5-PS1-4

**SEP:** Planning and Carrying Out Investigations; Using Mathematics and Computational Thinking

**DCI:**

**PS1.B – Chemical Reactions**

- When two or more different substances are mixed, a new substance with different properties may be formed. (5-PS1-4)
- No matter what reaction or change in properties occurs, the total weight of the substances does not change. (Boundary: Mass and weight are not distinguished at this grade level.) (5-PS1-2)

Savvas

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

- **uConnect Lab – What happens to mass when objects are mixed?**
- Quest Kickoff – Find the Right Mix and Step on It!
- Leveled Readers
- STEM Engineering Reader
- Reading Check – Use Evidence From Text

<p><b><u>Lesson 1 – States of Matter</u></b>  <b>PE:</b> 5-PS1-2  <b>SEP:</b> Using Mathematics and Computational Thinking; constructing Explanations and Designing Solutions  <b>DCI:</b>  <b>PS1.A - Structure and Properties of Matter</b></p> <ul style="list-style-type: none"> <li>Matter of any type can be subdivided into particles that are too small to see, but even then the matter still exists and can be detected by other means. A model showing that gases are made from matter particles that are too small to see and are moving freely around in space can explain many observations, including the inflation and shape of a balloon and the effects of air on larger particles or objects. (5-PS1-1)</li> <li>Measurements of a variety of properties can be used to identify materials. (Boundary: At this grade level, mass and weight are not distinguished, and no attempt is made to define the unseen particles or explain the atomic-scale mechanism of evaporation and condensation.) (5-PS1-3)</li> </ul> <p><b>PS1.B – Chemical Reactions</b></p> <ul style="list-style-type: none"> <li>No matter what reaction or change in properties occurs, the total weight of the substances does not change. (Boundary: Mass and weight are not distinguished at this grade level.) (5-PS1-2)</li> </ul> <p><b>CCC:</b> Scale, Proportion, and Quantity</p>	<p><b>Savvas</b>  <b>Guiding Objective</b></p> <ul style="list-style-type: none"> <li>Students will identify the differences among the three states of matter.</li> </ul> <p><b>Literacy Skill</b></p> <ul style="list-style-type: none"> <li>Use Evidence From Text</li> </ul> <p><b>Vocabulary</b></p> <ul style="list-style-type: none"> <li>solid</li> <li>liquid</li> <li>gas</li> </ul> <p><b>Academic Vocabulary</b></p> <ul style="list-style-type: none"> <li>differentiate</li> </ul> <p><b>Connect - TE/SB p. 48</b></p> <ul style="list-style-type: none"> <li>Local to Global Connection</li> </ul> <p><b>Investigate - TE/SB pp. 48-53</b></p> <ul style="list-style-type: none"> <li><b><i>u</i>Investigate Lab – Is goop solid or liquid?</b></li> <li>Video – States of Matter</li> <li><i>u</i>Be a Scientist</li> <li>Reading check – Use Evidence from Text</li> <li>Visual Literacy Connection – What states of matter do you see?</li> </ul> <p><b>Synthesize - TE/SB pp. 53-55</b></p> <ul style="list-style-type: none"> <li>Interactivity – The States of Matter</li> <li>Quest Check-In- It’s a Matter of Materials</li> <li>Science Practice Toolbox – Designing Solutions</li> </ul> <p><b>Demonstrate – TE/SB p. 54</b></p> <ul style="list-style-type: none"> <li>Lesson 1 Check</li> <li>Lesson Quiz 1</li> </ul>
<p><b><u>Lesson 2 – Physical Changes</u></b>  <b>PE:</b> 5-PS1-2  <b>SEP:</b> Using Mathematics and Computational Thinking  <b>DCI:</b>  <b>PS1.A - Structure and Properties of Matter</b></p> <ul style="list-style-type: none"> <li>Matter of any type can be subdivided into particles that are too small to see, but even then the matter still exists and can be detected by other means. A model showing that gases are made from matter particles that are too small to see and are moving freely around in space can explain many observations, including the inflation and shape of a balloon and the effects of air on larger particles or objects. (5-PS1-1)</li> <li>Measurements of a variety of properties can be used to identify materials. (Boundary: At this grade level, mass and weight are not distinguished, and no attempt is made to define the unseen particles or explain the atomic-scale mechanism of evaporation and condensation.) (5-PS1-3)</li> </ul>	<p><b>Savvas</b>  <b>Guiding Objective:</b></p> <ul style="list-style-type: none"> <li>Students will use evidence to show that matter is conserved during a physical change.</li> <li>Students will explain how temperature can affect a physical change</li> </ul> <p><b>Vocabulary</b></p> <ul style="list-style-type: none"> <li>physical change</li> </ul> <p><b>Academic Vocabulary</b></p> <ul style="list-style-type: none"> <li>establish</li> </ul> <p><b>Connect - TE/SB p. 56</b></p> <ul style="list-style-type: none"> <li>STEM Connection</li> </ul> <p><b>Investigate - TE/SB pp. 57-58</b></p> <ul style="list-style-type: none"> <li>Video – Physical Changes</li> <li><b><i>u</i>Investigate Lab – Which properties are affected by temperature?</b></li> <li>Quest Connection</li> </ul>

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<p><b>PS1.B – Chemical Reactions</b></p> <ul style="list-style-type: none"> <li>No matter what reaction or change in properties occurs, the total weight of the substances does not change. (Boundary: Mass and weight are not distinguished at this grade level.) (5- PS1-2)</li> </ul> <p>CCC: Cause and Effect; Scale, Proportion, and Quantity</p>	<p><b>Synthesize</b> - TE/SB pp. 59-62</p> <ul style="list-style-type: none"> <li>Interactivity – Physical Changes in Matter</li> <li>Science Practice Toolbox – Construct Explanations</li> <li>uBe a Scientist</li> <li>Reading Check – Use Evidence from Text</li> <li>Quest Check-In – Stepping Stone Properties</li> </ul> <p><b>Demonstrate</b> – TE/SB p. 61</p> <ul style="list-style-type: none"> <li>Lesson 2 Check</li> <li>Lesson 2 Quiz</li> </ul>
<p><b>Lesson 3 – Chemical Changes</b></p> <p><b>PE:</b> 5-PS1-2; 5-PS1-4</p> <p><b>SEP:</b> Developing and Using Models; Planning and Carrying Out Investigations; Using Mathematics and Computational Thinking</p> <p><b>DCI:</b></p> <p><b>PS1.A</b> - Structure and Properties of Matter</p> <ul style="list-style-type: none"> <li>Matter of any type can be subdivided into particles that are too small to see, but even then the matter still exists and can be detected by other means. A model showing that gases are made from matter particles that are too small to see and are moving freely around in space can explain many observations, including the inflation and shape of a balloon and the effects of air on larger particles or objects. (5-PS1-1)</li> <li>Measurements of a variety of properties can be used to identify materials. (Boundary: At this grade level, mass and weight are not distinguished, and no attempt is made to define the unseen particles or explain the atomic-scale mechanism of evaporation and condensation.) (5-PS1-3)</li> </ul> <p><b>PS1.B</b> - Chemical Reactions</p> <ul style="list-style-type: none"> <li>When two or more different substances are mixed, a new substance with different properties may be formed. (5-PS1-4)</li> <li>No matter what reaction or change in properties occurs, the total weight of the substances does not change. (Boundary: Mass and weight are not distinguished at this grade level.) (5- PS1-2)</li> </ul> <p><b>ETS1.A</b> - Defining and Delimiting Engineering Problems</p> <ul style="list-style-type: none"> <li>Possible solutions to a problem are limited by available materials and resources (constraints). The success of a designed solution is determined by considering the desired features of a solution (criteria). Different proposals for solutions can be compared on the basis of how well each one meets the specified criteria for success or how well each takes the constraints into account. (3-5-ETS1-1)</li> </ul> <p>CCC: Scale, Proportion, and Quantity</p>	<p><b>Savvas</b></p> <p><b>Guiding Objective:</b></p> <ul style="list-style-type: none"> <li>Students will use evidence to show that matter is conserved during a chemical change.</li> </ul> <p><b>Vocabulary</b></p> <ul style="list-style-type: none"> <li>chemical change</li> <li>conservation of matter</li> <li>chemical reaction</li> </ul> <p><b>Academic Vocabulary</b></p> <ul style="list-style-type: none"> <li>support</li> </ul> <p><b>Connect</b> - TE/SB p. 64</p> <ul style="list-style-type: none"> <li>Stem Connection</li> </ul> <p><b>Investigate</b> - TE/SB pp. 65-72</p> <ul style="list-style-type: none"> <li>uInvestigate – How can you identify chemical changes?</li> <li>Video – Chemical Changes</li> <li>Reading Check – Use Evidence from Text</li> <li>Math Toolbox – Use Models</li> <li>Literacy Toolbox – Use Evidence from Text</li> <li>Visual Literacy – Is matter conserved?</li> <li>uBe a Scientist</li> </ul> <p><b>Synthesize</b> - TE/SB pp. 69, 71</p> <ul style="list-style-type: none"> <li>Interactivity – Chemical Changes</li> <li>Quest Connection</li> </ul> <p><b>Demonstrate</b> – TE/SB pp. 73-75</p> <ul style="list-style-type: none"> <li>Quest Check-In Lab - How can you make modeling dough?</li> <li>Lesson 3 Check</li> <li>Lesson 3 Quiz</li> </ul>

### **Lesson 4 – Mixtures and Solutions**

**PE:** 5-PS1-2; 5-PS1-4, 3-5 ETS1-3

**SEP:** Planning and Carrying Out Investigations

**DCI:**

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

- Matter of any type can be subdivided into particles that are too small to see, but even then the matter still exists and can be detected by other means. A model showing that gases are made from matter particles that are too small to see and are moving freely around in space can explain many observations, including the inflation and shape of a balloon and the effects of air on larger particles or objects. (5-PS1-1)
- Measurements of a variety of properties can be used to identify materials. (Boundary: At this grade level, mass and weight are not distinguished, and no attempt is made to define the unseen particles or explain the atomic-scale mechanism of evaporation and condensation.) (5-PS1-3)

**PS1.B - Chemical Reactions**

- When two or more different substances are mixed, a new substance with different properties may be formed. (5-PS1-4)
- No matter what reaction or change in properties occurs, the total weight of the substances does not change. (Boundary: Mass and weight are not distinguished at this grade level.) (5-PS1-2)

**ETS1.B - Developing Possible Solutions**

- Research on a problem should be carried out before beginning to design a solution. Testing a solution involves investigating how well it performs under a range of likely conditions. (3-5-ETS1-2)
- At whatever stage, communicating with peers about proposed solutions is an important part of the design process, and shared ideas can lead to improved designs. (3-5-ETS1-2)
- Tests are often designed to identify failure points or difficulties, which suggest the elements of the design that need to be improved. (3-5-ETS1-3)

**ETS1.C: Optimizing the Design Solution**

- Different solutions need to be tested in order to determine which of them best solves the problem, given the criteria and the constraints. (3-5-ETS1-3)

**CCC – Cause and Effect; Scale, Proportion, and Quantity**

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**Guiding Objective:**

- Students will explain what happens when different substances are mixed.
- Students will explain how to slow down or speed up the dissolving process when mixing materials in water.
- Students will demonstrate that mixtures of solids can be separated.

**Vocabulary**

- mixture
- solution

**Academic Vocabulary**

- component

**Connect - TE/SB p. 78**

- Curriculum Connection

**Investigate - TE/SB pp. 79-82**

- ***Investigate – How can you separate a mixture?***
- Video – Mixtures and Solutions
- Virtual Lab – Special Effects with Matter
- Model It! – Teach with Visuals
- Reading Check – Use Evidence from Text
- Visual Literacy Connection – When is a mixture also a solution?

**Synthesize - TE/SB pp. 81-84**

- Engineering Practice Toolbox – Construct Explanations
- Quest Connection
- Interactivity – Mixture and Solutions
- Plan It!
- *Be a Scientist*

**Demonstrate – TE/SB pp. 85-87**

- ***Quest Check-In Lab - How can you make a new and improved formula?***
- Lesson 4 Check
- Lesson 4 Quiz

<p><b>Topic Close</b></p> <ul style="list-style-type: none"> <li>• Topic Assessment and Remediation TE/SB pp. 90-93</li> <li>• Quest Finding and Reflection TE/SB p. 88</li> </ul>	<p><b>Topic 2 Enrichment</b></p> <p><b>Topic 2 - Lesson 1 Enrichment</b></p> <ul style="list-style-type: none"> <li>• Enrichment Activity TE p. 53</li> </ul> <p><b>Topic 2 - Lesson 2 Enrichment</b></p> <ul style="list-style-type: none"> <li>• Enrichment Activity TE p. 59</li> <li>• Extreme Science TE p. 63</li> </ul> <p><b>Topic 2 - Lesson 3 Enrichment</b></p> <ul style="list-style-type: none"> <li>• Enrichment Activity TE p. 71</li> </ul> <p><b>Topic 2 – Lesson 4 Enrichment</b></p> <ul style="list-style-type: none"> <li>• Enrichment Activity – TE p.81</li> <li>• Career Connection – Materials Scientist p.89</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>Cross- Linguistic Practices:</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>Activating Prior Knowledge</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>Visuals</b> - GIFs, pictures- will assist students in understanding what they are listening to. Use <b>visual thinking strategies</b> to set the lens for learning.</li> <li>• Video to review or introduce a topic – use <b>closed captioning</b> to help students see the words and pronunciations while they listen to the content.</li> <li>• <b>Word stretching / Vowel stretching</b> when instructing allows student to listen closely to the pronunciation of the word.</li> <li>• <b>Performance Level Descriptors</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 5.</li> </ul> <p><b>Speaking</b></p> <ul style="list-style-type: none"> <li>• <b>Sentence Stems/Frames</b> - to begin a sentence - such as <i>Evolution is...</i> or <i>I think that evolution is...</i></li> <li>• <b>Academic Conversation Starters:</b> Have a visual of a list of academic sentence starters that students can refer to in a discussion.</li> <li>• <b>Choral Reading</b> - To build fluency, self-confidence and motivation with <a href="#">reading/speaking</a>.</li> <li>• Create <b>movement</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>Performance Level Descriptors</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 5.</li> </ul>

	<p><b>Reading</b></p> <ul style="list-style-type: none"> <li>● Supplementary Text to help reinforce concepts.</li> <li>● <b>Visual Aids</b> - Pictures or models to support vocabulary words and concepts</li> <li>● Video to review or introduce a topic - use <b>closed captioning</b> to help students read along while they listen to the content.</li> <li>● <b>4 Square / Frayer models</b> to help students gain a deeper understanding of vocabulary.</li> <li>● <b>Highlighting</b> important text to assist students in answering questions after the reading.</li> <li>● <b>Chunking</b>-Break reading of text into chunks or paragraphs</li> <li>● <b>Vocabulary Morphology</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>Performance Level Descriptors</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 5.</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>approved bilingual glossaries</b> from NYS in each subject</li> </ul>
<p><b>Special Education Modifications</b></p> <p>Special Education students must have accommodations as per Individual Educational Plan (IEP)</p>	<p><b>Instructional</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> <p><b>Technology:</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> <p><b>In Class Assessments</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>

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<p><b>Step Up to Writing</b> Step Up to Writing Materials can be found in BPS Science K-12 Schoology Folder Grade 5 Resources Grade 5 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>● <a href="#">Performance Level Descriptors</a> 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 5.</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>