Grade 2 Science
Unit 1 Physical Science
Topic 2 Changing Matter - 28 days

Unit Overview: In this unit students will practice identifying the three states of matter and recognize that solids have their own shape while liquids and gases take the shapes of their container. Students will learn about object properties and discover that some objects can serve a purpose better than others. Students will then expand on their knowledge of matter and consider various ways to change the properties of matter. Students will explore the heating or cooling of matter occurs when the temperature of matter changes and this may or may not be reversible. Students will then learn that objects can be made of parts and explore how the properties of the parts make them useful.

Topic Essential Question: How do you change materials?

Lessons

- Topic Launch/Quest Kickoff
- Lesson 1 Observe Changes in Matter
- Lesson 2 Temperature and Matter
- Lesson 3 Matter Within Objects
- Topic Close - Assessment, Quest Findings

NYSSLS Performance Expectations (PE)

2-PS1-1. Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties. [Clarification Statement: Observations could include color, texture, hardness, and flexibility. Patterns could include the similar properties that different materials share.]

2-PS1-3. Make observations to construct an evidence-based account of how an object made of a small set of pieces can be disassembled and made into a new object. [Clarification Statement: Examples of pieces could include blocks, building bricks, or other assorted small objects.]

2-PS1-4. Construct an argument with evidence that some changes caused by heating or cooling can be reversed and some cannot. [Clarification Statement: An example of a reversible change could include freezing and melting. An example of an irreversible change could include cooking an egg.]

K-2-ETS1-1. Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.
K-2-ETS1-2. Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem

Higher Order Thinking Skills (HOTS)

Higher Order Thinking Skills (HOTS) will be identified within each topic plan. Grade 2 HOTS include:

- sequencing
- categorizing
- identifying patterns
- cause and effect
- researching
- brainstorming
- logic
- reasoning
- inferencing
- scientific method
- academic vocabulary

Topic Opener **PE:** 2-PS1-1, 2-PS1-3, 2-PS1-4 **SEP:** Planning and Carrying Out Investigations* Constructing Explanations and Designing Solutions* **DCI:** **PS1.A** – Structure and Properties of Matter ● Different kinds of matter exist and many of them can be either solid or liquid, depending on temperature. Matter can be described and classified by its observable properties. ● Different properties are suited to different purposes. ● A great variety of objects can be built up from a small set of pieces. **PS1.B** – Chemical Reactions ● Heating or cooling a substance may cause changes that can be observed. Sometimes these changes are reversible, and sometimes they are not. **CCC:** Cause and Effect* Energy and Matter* ***Denotes Higher Order Thinking Skill**	**Savvas** **Highlighted labs are important to the understanding of the instructional concepts in this lesson and must be completed during Science instructional time.** ● *u*Connect Lab – How can you use all of the materials? * ● Quest Kickoff- Building Bridges* ● Leveled Readers ● STEM Engineering Reader ● Science Song – The Crayon
Lesson 1- Observe Changes in Matter **PE:** 2-PS1-1 **SEP:** Planning and Carrying Out Investigations* **DCI:** **PS1.A** – Structure and Properties of Matter ● Different kinds of matter exist and many of them can be either solid or liquid, depending on temperature. Matter can be described and classified by its observable properties. ● Different properties are suited to different purposes. ● A great variety of objects can be built up from a small set of pieces. **CCC:** Cause and Effect* ***Denotes Higher Order Thinking Skill**	**Savvas** **Guiding Objective** ● Students will explore different ways matter can change **Vocabulary** ● matter **Connect** ● TE/SB p. 48 ● Jumpstart Discovery **Investigate** ● TE/SB pp. 49-51 ● *u*Investigate Lab – How can you change objects?* ● Video – Matter Can Change ● Reading Check – Sequence* ● Quest Connection* **Synthesize** ● TE/SB pp. 52-53 ● Interactivity- Time for a Change ● Quest Check-In – Matter Can Change* **Demonstrate** ● TE/SB p. 52 ● Lesson 1 Quiz

Lesson 2 Temperature and Matter **PE:** 2-PS1-4 **SEP:** Engaging in Argument from Evidence* **DCI** **PS1.B –** Chemical Reactions ● Heating or cooling a substance may cause changes that can be observed. Sometimes these changes are reversible, and sometimes they are not. **CCC:** Cause and Effect* ***Denotes Higher Order Thinking Skill**	**Savvas** **Guiding Objective** ● Students will explain whether a change is caused by heating or cooling of matter is reversible. Students will explain whether a change caused by heating or cooling is not reversible. **Vocabulary** ● property ● reversible **Connect** ● TE/SB p.54 ● Jumpstart Discovery **Investigate** ● TE/SB pp. 55-57 ● Video – Temperature Matters ● *u*Investigate Lab – How does heating and cooling change matter?* ● Math Toolbox – Analyzing Data* ● Quest Connection* **Synthesize** ● TE/SB pp. 58-59 ● Interactivity – Turn Up the Heat and Chill Out* ● Quest Check-In – How does temperature change matter overtime?* **Demonstrate** ● TE/SB pp.58 ● Lesson 2 Quiz
Lesson 3 Matter Within Objects **PE:** 2-PS1-3, K-2ETS1-1, K-2ETS1-2 **SEP:** Constructing Explanations and Designing Solutions* **DCI:** **PS1.A -** Structure and Properties of Matter ● Different kinds of matter exist and many of them can be either solid or liquid, depending on temperature. Matter can be described and classified by its observable properties. ● Different properties are suited to different purposes. ● A great variety of objects can be built up from a small set of pieces. **ETS1.A -** Defining and Delimiting Engineering Problems ● A situation that people want to change or create can be approached as a problem to be solved through engineering. ● Asking questions, making observations, and gathering information are helpful in thinking about problems. ● Before beginning to design a solution, it is important to clearly understand the problem. **CCC:** Energy and Matter* ***Denotes Higher Order Thinking Skill**	**Savvas** **Guiding Objectives** ● Students will explain that objects can be built using smaller materials. Students will explain that objects are built using materials that have certain properties. **Vocabulary** ● assemble **Connect** ● TE/SB p. 60 ● Jumpstart Discovery **Investigate** ● TE/SB pp. 61-62 ● Video – Build It! ● *u*Investigate Lab– What can you build?* ● Visual Literacy – Toolbox - Sequence* **Synthesize** ● TE/SB p. 62-63 ● Interactivity – Choices Matter ● Quest Connection **Demonstrate** ● TE/SB pp.63 ● Quest Check-In Lab – What materials make a bridge strong? * ● Lesson 3 Quiz

Topic Close	**Topic 2 Enrichment**
• Assessment and Remediation TE/SE pp.70-75 • Quest Finding p.68 **CLRI Literacy Connections:** **Enrichment: Independent Reading** "Cosmo and the Robot" by Brian Pinkney **Synopsis:** Travel to Mars where Cosmos (and his sister Jewel) live. Go on his adventure across the treacherous terrain and encounter how he fixes his robot, Rex, just in time to save Jewel.	**Topic 2- Lesson 1 Enrichment -** TE p. 52 - This activity extends student understanding of the lesson by providing opportunities for students to compare changes in matter. **Enrichment Skill - Reasoning** **Topic 2- Lesson 2 Enrichment -** TE p. 58 - This activity extends student understanding of the lesson by providing opportunities for students to compare how heating and cooling can change matter. **Enrichment Skill - Reasoning**

English Language Learners (ELL) Enhancements To access hyperlinked material, you must be logged into your BPS Google Drive	**Listening** • **Cross- Linguistic Practices:** 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). • **Activating Prior Knowledge** 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. • **Activating Prior Knowledge** • **Visuals** - GIFs, pictures- will assist students in understanding what they are listening to. Use **visual thinking strategies** to set the lens for learning. • Video to review or introduce a topic – use **closed captioning** to help students see the words and pronunciations while they listen to the content. • **Word stretching / Vowel stretching** when instructing allows student to listen closely to the pronunciation of the word. • **Performance Level Descriptors** 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 2.
	Speaking • **Sentence Stems/Frames** - to begin a sentence - such as *Evolution is…* or *I think that evolution is…* • **Academic Conversation Starters:** Have a visual of a list of academic sentence starters that students can refer to in a discussion. • **Choral Reading** - To build fluency, self-confidence and motivation with reading/speaking • Create **movement** 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 • **Performance Level Descriptors** 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 2.
	Reading • Supplementary Text to help reinforce concepts. • **Visual Aids** - Pictures or models to support vocabulary words and concepts • Video to review or introduce a topic - use **closed captioning** to help students read along while they listen to the content. • **4 Square / Frayer models** to help students gain a deeper understanding of vocabulary. • **Highlighting** important text to assist students in answering questions after the reading. • **Chunking**-Break reading of text into chunks or paragraphs • **Performance Level Descriptors** 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 2.

	• **Vocabulary Morphology**- 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.
	Instructional Accommodations (depending on the student's needs) • **Extended time** for tests in class, projects and assignments • **Directions read.** Broken down as necessary • **Model** how to complete the activity in the lesson • **Oral simplification** of directions or questions • **Translated version** of test when available. Student may have both version English and native language version • Use of **approved bilingual glossaries** from NYS in each subject

Special Education Modifications Special Education students must have accommodations as per Individual Educational Plan (IEP)	**Instructional** • **Pre-teach** vocabulary • Use **picture vocabulary** • Scaffold **Depth of Knowledge** questions • Provide copy of notes/**notes in "cloze"** form • Use of **Think, Pair, and Share** strategy to help process information • **Scaffold** written assignments with the use of **graphic organizers** • Allow for **multiple ways to respond** (verbal, written, response board) • Provide **model of performance task** • **Modify informational text** to fit the needs of the students • Provide a digital or paper i**nteractive notebook** • Present complex **tasks in multiple ways** • Provide **mnemonic strategies** for scientific concepts
	Technology: • **Audio** reading of text • **Text to type** functions • **Videos** to clarify/visualize science concepts • **Record class lecture/discussions** and make accessible to student • **Nearpod**- interactive presentations of notes
	In Class Assessments • Provide **multiple options** for projects • **Use of timer** in class • Break all complex tasks into chunks
Step Up to Writing Step Up to Writing materials can be found in BPS Science K-12 Schoology Folder Grade 2 Resources Grade 2 Curriculum Materials SUTW materials	• Easy Two-Column Notes • Breaking Down Definitions • Paragraph Frame- What I Learned • **Performance Level Descriptors** 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 2.

Culturally and Linguistically Responsive Teaching (CLRT) in the Science Classroom	● Materials, resources, and/or discussions address diverse cultural backgrounds and real-world applications ● Artifacts (posters, charts, etc.) in the science classroom are representative of the cultures of the student population ● All students are given an opportunity to engage in science discourse ● Teacher demonstrates high expectations for all students