OVERVIEW

This supplemental document is designed to provide guidance for New York City kindergarten teachers and science specialists as the New York City Department of Education moves from the New York City K–5 Science Scope and Sequence 2015-2016 (*based on the New York State Elementary/Intermediate Core Curriculum*) to the New York City Pre-K–8 Science Scope and Sequence 2018 (*based on the New York State P–12 Science Learning Standards*) and the implementation of the Amplify Science Curriculum in the 2018-2019 school year.

This supplemental document bridges the gap between what kindergarten students learn within the new Amplify Science curriculum and the Performance Expectations in the NYC PK–8 Science Scope and Sequence 2018 for kindergarten. These lessons are designed to address the Performance Expectation: *K-PS1-1 Plan and conduct an investigation to test the claim that different kinds of matter exist as either solid or liquid, depending on temperature (Cause and Effect/Energy and Matter)*. This is the only Performance Expectation that is not addressed in the Amplify Science curriculum for kindergarten.

Kindergarten teachers and science specialists teaching Amplify Science are encouraged to implement these supplementary lessons between the first and second Amplify Science units. This supplemental document is broken down into four lessons. By the end of these four lessons students will develop and construct an understanding of the following key concepts:

- Identify and sort solid and liquid matter by observing patterns.
- Identify and classify matter as hot, warm, cool, and cold.
- Observe that liquids can change to solids and that solids can change to liquids and identify the cause of these changes. Students will conduct investigations to make these determinations.
- Explain that solids and liquids have properties, and some properties are based upon the temperature of the material, and explain how temperature (energy) affects matter.

Each lesson is approximately 50 minutes.

The Amplify Science curriculum in addition to this addendum will address and support instruction aligned with the Performance Expectations for kindergarten.

KINDERGARTEN
SOLIDS & LIQUIDS

<table>
<tr><th colspan="3">Performance Expectation</th></tr>
<tr><td colspan="3">K-PS1-1. Plan and conduct an investigation to test the claim that different kinds of matter exist as either solid or liquid, depending on temperature (Cause and Effect/Energy and Matter). [Clarification Statement: Emphasis should be on solids and liquids at a given temperature and that a solid may be a liquid at a higher temperature and a liquid may be a solid at a lower temperature.] [Assessment Boundary: Only a qualitative description of temperature, such as hot, warm, and cool, is expected.]

KEY
Science and Engineering Practices
Disciplinary Core Ideas
Crosscutting Concepts

➢ Recommended instruction between the first and second Amplify units
➢ Maintain a portfolio of student work to be used in Lesson 4</td></tr>
<tr><th colspan="3">Lesson Framework</th></tr>
<tr><td rowspan="2">Recommended time frame: 4 Days

Mid-December (after Amplify Unit 1 is complete)</td><td>Lesson 1</td><td>Lesson Objective/Teaching Point: I can identify and describe a solid and a liquid.
Students will be able to identify and describe solids and liquids. Students will begin to observe the patterns they notice and use them as evidence to classify.

Amplify Modalities: Do, Talk, Write

Vocabulary:
Solid, Liquid
Begin using the word “properties” in the teacher’s vocabulary to introduce this to the students. It is not an assessment word in this unit.</td></tr>
<tr><td>Lesson 2</td><td>Lesson Objective/Teaching Point: I can identify hot, warm, and cool.
Students will be able to identify and classify examples of warm, hot, and cool objects. They will use qualitative words to describe and compare temperature.

Amplify Modalities: Do, Talk, Write

Vocabulary:</td></tr>
</table>

		Temperature, Hot, Warm, Cool *Continue using the word "properties" in the teacher's vocabulary to introduce this to the students. It is not an assessment word in this unit.*
	Lesson 3	**Lesson Objective/Teaching Point: I can observe that liquids can change to solid and that solids can change to liquids.** Students will be able to observe, identify, and describe that the changes to and from liquids and solids are based upon different temperatures. Students will conduct investigations to gather evidence to make these determinations. **Amplify Modalities:** Do, Talk, Write **Vocabulary:** Temperature, Solid, Liquid, Hot, Warm, Cool *Continue using the word "properties" in the teacher's vocabulary to introduce this to the students. It is not an assessment word in this unit.*
	Lesson 4	**Lesson Objective/Teaching Point: I can explain that solids and liquids have properties, and some properties are based upon the temperature of the material.** Students will be able to identify and apply changes in states of matter (i.e. solid to liquid) within a fictional story. Students will explain that solids and liquids have properties, some are based upon the temperature of the material, and be able to explain how temperature affects matter. **Amplify Modalities:** Talk, Write, Read, Visualize **Vocabulary:** Temperature, Solid, Liquid, Hot, Warm, Cool *Continue using the word "properties" in the teacher's vocabulary to introduce this to the students. It is not an assessment word in this unit.*

Unit: K **Lesson 1 of 4**	**Solids and Liquids** (for unit overview see NYC PK-8 Scope and Sequence 2018, p.37)
Unit-level 3-D Statement: Students will plan and conduct an investigation to test the claim that different kinds of matter exist as either solid or liquid, depending on temperature (Cause and Effect/Energy and Matter) **Key** Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts	
Anchoring Phenomenon: We can observe water as a solid and as a liquid.	
Investigative Phenomenon: Some objects keep their shape and some objects change their shape.	
Lesson Objective/Teaching Point: I can identify and describe a solid and a liquid.	**Sequence:** **Amplify Modalities: Do, Talk, Write**
Students will be able to identify and describe solids and liquids. Students will begin to observe the patterns they notice and use them as evidence to classify. **Vocabulary:** Solid Liquid *Begin using the word "properties" in the teacher's vocabulary to introduce this to the students. It is not an assessment word in this unit.*	1. **Engage**: Students examine and explore materials. 2. **Do**: Students describe, sort and identify examples of solids and liquids. 3. **Talk**: Facilitate student identification and classification of matter as solids or liquids. 4. **Write**: Students sort images on a worksheet. **Assessment:** Sorting activity

Standards Content:		
Performance Expectations K-PS1-1. Plan and conduct an investigation to test the claim that different kinds of matter exist as either solid or liquid, depending on temperature. [Clarification Statement: Emphasis should be on solids and liquids at a given temperature and that a solid may be a liquid at a higher temperature and a liquid may be a solid at a lower temperature.] [Assessment Boundary: Only a qualitative description of temperature, such as hot, warm, and cool, is expected.]		
SCIENCE AND ENGINEERING PRACTICES	DISCIPLINARY CORE IDEAS	CROSSCUTTING CONCEPTS
Planning and Carrying Out Investigations Planning and carrying out investigations to answer questions or test solutions to problems in K–2 builds on prior experiences and progresses to simple investigations, based on fair tests, which provide data to support explanations or design solutions. With guidance, plan and conduct an investigation in collaboration with peers. (K-PS1-1) **Analyzing and Interpreting Data** Analyzing data in K–2 builds on prior experiences and progresses to collecting, recording, and sharing observations. ● Record information (observations, thoughts, and ideas). (K-PS1-1)	**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. (K-PS1-1)	**Patterns** Patterns in the natural and human designed world can be observed and used as evidence. **Cause and Effect** Simple tests can be designed to gather evidence to support or refute student ideas about causes. (K-PS1-1) **Energy and Matter** Students observe objects may break into smaller pieces, be put together into larger pieces or change shapes. (K-PS1-1)

● Analyze data from tests of an object or tool to determine if it works as intended. (K-PS1-1) ***Connections to Nature of Science*** **Scientific Investigations Use a Variety of Methods** Scientists use different ways to study the world. (K-PS1-1)		

Resources/Materials

- Anchor text: *A Snowy Day* by Ezra J. Keats (anchor text to be read during lesson 4)
- Jars of materials: six wide mouth jars with lids per group of 3-6 students (clean mayonnaise, peanut butter **[check for allergies]**, deli containers, etc.)
- Assorted solid objects to fit in jars (blocks, markers, toy cars, marbles, etc.)
- Jars of three different color liquids, or use water with food coloring (3 colors)
- Chart/graphic organizer for student examples
- Solids and Liquids Sorting Cards worksheet
- Scissors and glue sticks
- Folder/portfolio for collecting student work

Introduce the Lesson/Motivate Students (5 Minutes)

1. Teacher distributes the solids and liquids that were previously placed into sealed jars.
2. Students observe these various examples of solid and liquid matter.
3. The motivation for this activity will be a self-directed introduction of the task: Observe, think about, and discuss the materials provided.
4. The students explore the materials on their own, and share observations within the group. Remind students not to open the jars.

Model/Teach (10 Minutes)

Small Group Work: Instruct students to talk in their groups about the different things they noticed about the jars.

Whole-class:

1. Encourage students to share out what they noticed (within their group).
2. Groups then explain their noticings to the whole class.
3. Teacher elaborates on and records student responses. Elicit responses to ensure student understanding that some objects change shape (liquids*) and some do not (solids*).

*Lesson vocabulary

Group/Independent Work (10 Minutes)

1. Student groups continue to observe the content of their jars and sort them into two groups on their tables/desks. Groups must explain their rationale for their choices. Teacher questions students until the two categories are solids and liquids. Teacher observes and records student mastery.

2. Teacher models how to complete a T-chart or graphic organizer for the students. Each student creates a T-chart from a folded paper and draws examples of solid objects on one side of the paper (labeled solids), and examples of liquids on the other side (labeled liquids). Teacher observes and records student mastery. Teacher can prepare the labeled T-chart for students in advance.

Assessment/Summary Discussion (20 Minutes)

- ➢ Teacher instructs students to share learning from today's lesson and asks: "What did we learn today?" "What properties did we observe and discuss today?" (Day 1: Solid and Liquid.) Teacher engages students in whole class construction of a summary statement based on their investigations from the lesson. Summary statement is modeled after the "I can" statement.

- ➢ **Maintain a portfolio of all student work to be used in Lesson 4.**

Student understanding can be assessed through:

- Observation of physical sorting/classifying activity
- Student illustrations of solids and liquids (T-chart)
- Sorting images/clip art activity
- Observation of interactive whiteboard sorting
- Student discussion and responses (ability to define, explain, provide examples of solids and liquids and explanations of evidence for their classifications)

Interactive Whiteboard Activity (optional):

1. Teacher shows images of solids and liquids.
2. Students respond if the object is a solid or liquid.
3. Allow each student to respond at least two times to master concept.
4. Teacher observes and records student responses to identify mastery.

Worksheet:

1. Each student receives two sheets of paper, one sheet labeled solid and one sheet labeled liquid.
2. Students have a picture of solid (on the solid labeled sheet) and picture of liquid (on the liquid labeled sheet).
3. Distribute "Solids and Liquids Sorting Cards" worksheet, one per student. Students cut out images, sort, and glue them to their solid/liquid sheet (on the appropriate page). (Time Saver: teacher can pre-cut the images beforehand.)
4. Students report their results to the class.
5. Teacher observes and records student responses to identify mastery.

Addressing Student Pre-Conceptions/Alternate Conceptions

If student is unable to identify a liquid or solid:

- Have a bin available with actual solids and liquids (water bin, bin with balls, solid 3D shapes) for students to explore using their sense of sight and touch to help students deepen their understanding of these properties.
- Provide photos of solids and liquids. Prompt students to tell a story about a time when they interacted with a liquid/solid using the photo (shower, bath, rain, seesaw, ball or jump-rope) to further activate their prior knowledge and connect this knowledge to the lesson content.
- During the picture sort activity, students may unintentionally sort the containers with liquids into the solids group because the liquids cannot be actually seen. Teacher should inform students to sort the pictures into groups of solids and things that hold/show liquids.

Teacher Notes:

Teacher will be able to use student work and student talk throughout the lesson sequence to assess both content and three-dimensional learning.

Solids and Liquids Sorting Cards

Unit: K **Lesson 2 of 4**	**Solids and Liquids** (for unit overview see NYC PK-8 Scope and Sequence 2018, p.37)
Unit-level 3-D Statement: Students will plan and conduct an investigation to test the claim that different kinds of matter exist as either solid or liquid, depending on temperature (Cause and Effect/Energy and Matter) **Key** Science and Engineering Practices Disciplinary Core Ideas Crosscutting Concepts	
Anchoring Phenomenon: We can observe water as a solid and as a liquid.	
Investigative Phenomenon: Objects frequently have different temperatures.	
Lesson Objective/Teaching Point: I can identify hot, warm, cool, and cold.	**Sequence:** **Amplify Modalities: Do, Talk, Write**
Students will be able to identify and classify examples of warm, hot, cool, and cold objects. They will use qualitative words to describe and compare temperature. **Vocabulary:** Temperature Hot/Warm Cool *Continue using the word "properties" in the teacher's vocabulary to introduce this to the students. It is not an assessment word in this unit.*	1. **Engage**: Students will put their hands on their cheeks to get a baseline of the relative temperature of their hands. 2. **Do**: Students touch cool objects and then rub their hands together vigorously to create a hotter temperature for comparison. 3. **Talk**: Discuss observations. Question students about their discoveries. 4. **Write**: Students draw examples of hot, warm, cool, and cold matter on a foldable or graphic organizer. **Assessment:** Students will demonstrate their understanding by sorting images to show foods eaten at different temperatures.

Standards Content:		
Performance Expectations K-PS1-1. Plan and conduct an investigation to test the claim that different kinds of matter exist as either solid or liquid, depending on temperature. [Clarification Statement: Emphasis should be on solids and liquids at a given temperature and that a solid may be a liquid at a higher temperature and a liquid may be a solid at a lower temperature.] [Assessment Boundary: Only a qualitative description of temperature, such as hot, warm, and cool, is expected.]		
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● Analyze data from tests of an object or tool to determine if it works as intended. (K-PS1-1) ***Connections to Nature of Science*** **Scientific Investigations Use a Variety of Methods** Scientists use different ways to study the world. (K-PS1-1)		

Resources/Materials

- Anchor text: *A Snowy Day* by Ezra J. Keats (anchor text to be read during lesson 4)
- Prepare cool objects in a plastic bag (small metal objects such as washers)
- Refrigerator/freezer to keep objects cool
- Foldable graphic organizer for student examples
- Supermarket circulars (one copy per student, plus additional copies)
- Scissors and glue sticks

Introduce the Lesson/Motivate Students (5 Minutes)

1. Students put their hands on their cheeks to get a baseline of the relative temperature of their hands.
2. Teacher distributes cool objects from refrigerator or freezer for students to feel.
3. Students put their hands together and rub vigorously to create hotter hands.
4. Students discuss and compare the experiences of temperature differences.

Model/Teach (10 Minutes)

Small Group Work:

1. Students talk within their groups about the different kinds of things they eat.
2. Teacher instructs students to think about the temperature of these foods: What is hot, warm, and cool?

Whole-class:

1. Teacher introduces the concept of temperature as a property describing how hot an object is.
2. Class brainstorms examples of hot, warm, and cool objects together.
3. Teacher shares and displays some examples for student reference on a labeled class chart.
4. Teacher models putting examples in each column.

Group/Independent Work (15 Minutes)

1. Students think of an example of a hot, warm, and cool food item and draw them on their graphic organizer/menu.
2. Student groups continue to explore the concept and identify examples by analyzing supermarket circulars and cutting out examples of cool, warm, and hot foods.
3. Teacher questions students until they have foods that are hot, warm, and cool.
4. Students paste food images appropriately on their foldable.
5. Teacher observes and records student mastery.

Assessment/Summary Discussion (20 Minutes)

- ➢ Teacher instructs students to share work from this lesson and asks:
  - "What did we learn today?"
  - "What properties did we observe and discuss today?"
- ➢ (Day 2: Hot, Warm, and Cool.) Teacher engages students in whole class construction of a summary statement based on their investigations from the lesson that. Summary statement is modeled after the "I can" statement.
- ➢ **Maintain a portfolio of all student work to be used in Lesson 4.**

Student understanding can be assessed through teacher observation of:

- Sorting/classifying supermarket circular activity.

- Written response of hot, warm, and cool menu items on foldable.
- Discussion and responses (ability to define, explain, provide examples of hot, warm, and cool).

Interactive Whiteboard Activity (optional):

1. Teacher displays images of hot, warm, and cool objects.
2. Students respond to whether the foods are served hot, warm, or cool.
3. Teacher allows each student to respond at least twice to master concept.
4. Teacher observes and records student responses to identify mastery.

Worksheet:

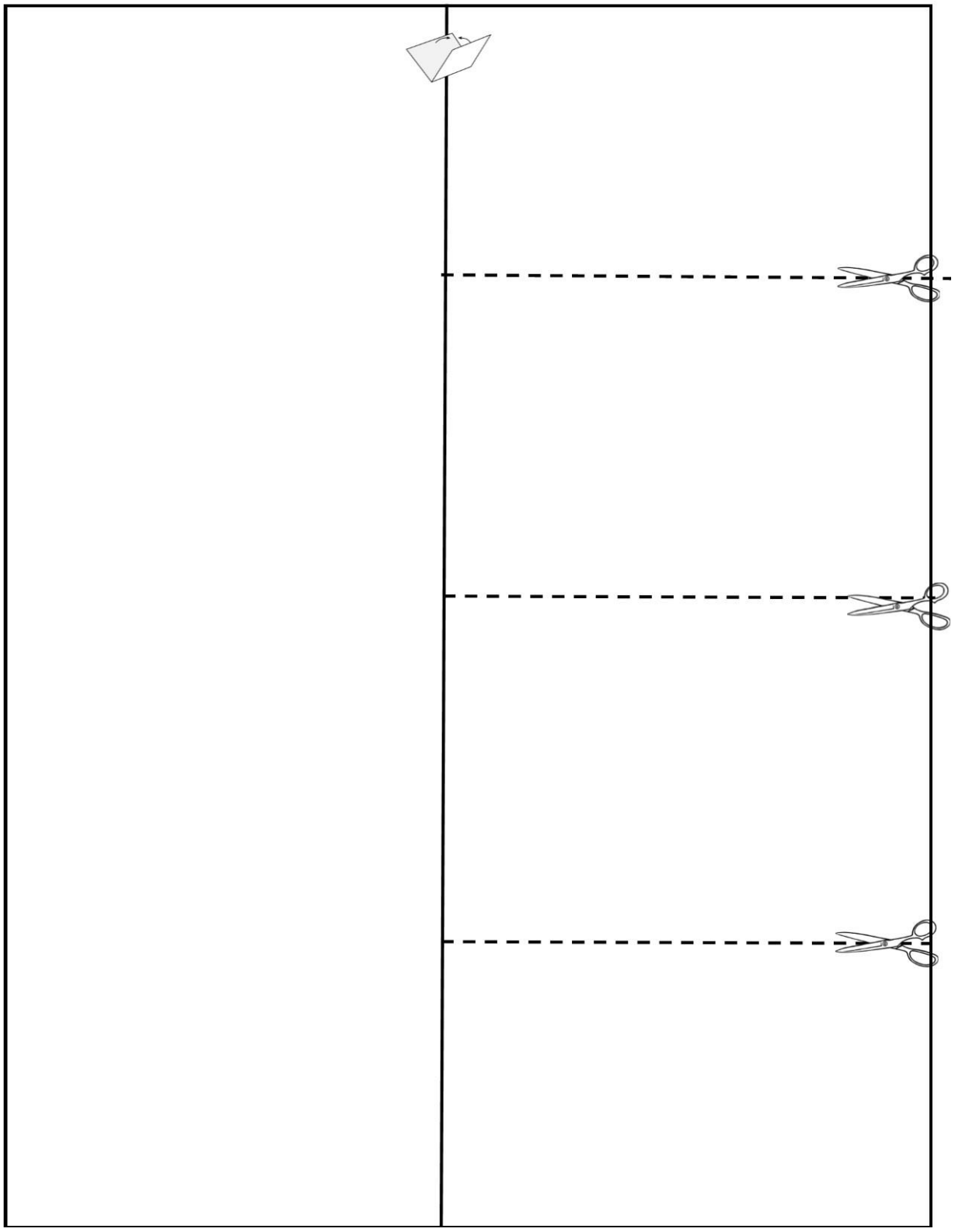
1. Teacher models set up of foldable worksheet and distributes one to each student.
2. Students draw examples of hot, warm and cool food items in the appropriate column/section of the foldable worksheet.
3. Students add to their foldable worksheet by cutting, sorting, and gluing pictures of additional food items from a supermarket circular.
4. Students share their results with the class/group.
5. Teacher observes and records student responses to identify student mastery of the concept of hot, warm, and cool.

Addressing Student Pre-Conceptions/Alternate Conceptions

If student is unable to distinguish between hot, warm, and cool:

- Provide photos of a hot food (soup, hot chocolate), a warm food (hot dog, hamburger, spaghetti), cool food (salad, ice cream). Prompt students to tell a story about a time when they ate or interacted with one of the things in each temperature category using the photos. Guide students to think about whether each thing would feel hot, warm, or cool in their mouths and to understand that we do not eat or touch things that are hot but that are warm or cool.
- Read the *Goldilocks and the Three Bears* or review the science ideas from the book with the students. Connect the terms hot, warm, and cool with the terms from the book.

Example of foldable:



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Lesson 3 of 4</td><td colspan="2">Solids and Liquids (for unit overview see NYC PK-8 Scope and Sequence 2018, p.37)</td></tr>
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KEY
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Disciplinary Core Ideas
Crosscutting Concepts</td></tr>
<tr><td colspan="3">Anchoring Phenomenon: We can observe water as a solid and as a liquid.</td></tr>
<tr><td colspan="3">Investigative Phenomenon: Objects can change from solids to liquids and from liquids to solids.</td></tr>
<tr><td>Lesson Objective/Teaching Point: I can observe that liquids can change to solids and that solids can change to liquids.</td><td colspan="2">Sequence:
Amplify Modalities: Do, Talk, Write</td></tr>
<tr><td>Students will be able to observe, identify, and describe that the changes to and from liquids and solids are based upon different temperatures. Students will conduct investigations to gather evidence to make these determinations.

Vocabulary:

Temperature
Solid
Liquid
Hot
Warm
Cool
Continue using the word “properties” in the teacher’s vocabulary to introduce this to the students. It is not an assessment word in this unit.</td><td colspan="2">1. Engage: Students examine a material (chocolate or coconut oil) that can be solid or liquid depending on temperature.
2. Do: Students melt their material, observe, and cool the material to watch it return to a solid.
3. Talk: Discussion of observations.
4. Write: Students draw pictures to depict the material changing from solid to liquid (warming) and changing from liquid to solid (cooling).

Assessment:
● Student written response of observable changes of material based on temperature.</td></tr>
<tr><td colspan="3">Standards Content:</td></tr>
<tr><td colspan="3">Performance Expectations</td></tr>
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K-PS1-1. Plan and conduct an investigation to test the claim that different kinds of matter exist as either solid or liquid, depending on temperature. [Clarification Statement: Emphasis should be on solids and liquids at a given temperature and that a solid may be a liquid at a higher temperature and a liquid may be a solid at a lower temperature.] [Assessment Boundary: Only a qualitative description of temperature, such as hot, warm, and cool is expected.]

SCIENCE AND ENGINEERING PRACTICES	DISCIPLINARY CORE IDEAS	CROSSCUTTING CONCEPTS
Planning and Carrying Out Investigations Planning and carrying out investigations to answer questions or test solutions to problems in K–2 builds on prior experiences and progresses to simple investigations, based on fair tests, which provide data to support explanations or design solutions. With guidance, plan and conduct an investigation in collaboration with peers. (K-PS1-1) **Analyzing and Interpreting Data** Analyzing data in K–2 builds on prior experiences and progresses to collecting, recording, and sharing observations. ● Record information (observations, thoughts, and ideas). (K-PS1-1) ● Analyze data from tests of an object or	**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. (K-PS1-1)	**Cause and Effect** Simple tests can be designed to gather evidence to support or refute student ideas about causes. (K-PS1-1) **Energy and Matter** Students observe objects may break into smaller pieces, be put together into larger pieces, or change shapes. (K-PS1-1)

tool to determine if it works as intended. (K-PS1-1) ***Connections to Nature of Science*** **Scientific Investigations Use a Variety of Methods** Scientists use different ways to study the world. (K-PS1-1)		

Resources/Materials

- Anchor text: *A Snowy Day* by Ezra J. Keats (anchor text to be read in lesson 4)
- Resealable bags with coconut oil (or easily meltable chocolate) labeled for each group
- Bucket of ice water (for cooling)
- Bin that is large enough to hold all group baggies. Bin to be placed near a radiator or sunny window or a metal cookie sheet (best!) to be placed on the radiator or in the sun, or a hot water bath, or an alternative method that will melt the oil/chocolate quickly and safely.
- Video resource: Ice Cube Melting - YouTube (https://youtu.be/rEIpewOvAMc)
    - (Teacher may want to download ahead of time)

Introduce the Lesson/Motivate Students (5 Minutes)

1. Class discusses prior knowledge about solids, liquids, hot, warm, and cool.
2. Class discusses what happens when you leave ice cream out of the freezer for a long time. Teacher can elaborate.
3. Teacher shows the ice cube melting video, and students discuss observations.

Model/Teach (10 Minutes)

1. Teacher explains and demonstrates, step by step, the student tasks during group work time.
2. Teacher instructs students to predict what will happen when their baggie goes into the warm bin and the cool bath.
3. Teacher records predictions.
4. Students indicate if they all understand what they will be doing and teacher, if necessary, clarifies.

Group/Independent Work (15 Minutes)

1. Teacher tells students to talk in their groups about why the ice cube melted, and where they have seen melting happen before. Teacher charts various answers to record the groups' responses.
2. Groups observe the baggies they are handed.
3. Each group places the labeled baggie into a bin to be placed on the warm radiator/sunny window/hot bath for 10 minutes. A student volunteer can check and report back to the class that the area is indeed hot/warm.
4. While the baggie contents are melting, students record observations of the material with a quick draw. Students share observations while teacher charts them.
5. After 10 minutes*, the teacher distributes the baggies back to each group of students. Students observe that their solid has become liquid.
6. Students discuss why and how the solid has become a liquid.
7. Next each group places their baggies into an ice water bath for 10 minutes*. Students may touch the water so they are fully aware that it is cool.
8. While baggies sit in the ice bath, students record observations of the material as a liquid and do a quick draw. Students share observations while teacher charts them.
9. After 10 minutes*, the teacher distributes the baggies back to each group of students. Students observe that now the liquid has returned to solid.
10. Students will discuss why and how the material returned to a solid, while the teacher adds to the charted responses.
11. Student discussion continues by comparing both parts of the investigation and reflecting on their predictions.

* approximate time - teacher needs to check status of the materials during the cooling and heating process.

Assessment/Summary Discussion (20 Minutes)

- ➢ Teacher instructs students to share learning from this lesson and asks: "What did we learn today?" "What properties did we observe and discuss today?" (Day 3: Solids to Liquids, and Liquids to Solids.) Teacher engages students in whole class construction of a summary statement based on their investigations from the lesson. Summary statement is modeled after the "I can" statement.

- ➢ **Maintain a portfolio of all student work to be used in Lesson 4**

Student understanding will be assessed through:

- Student written response of observable changes in material based on temperature.
- Student discussion and responses (ability to define, explain, provide examples of changes in materials based on temperature, and how they conducted investigations to gather evidence to make these determinations).

Alternate Assessment:

1. Each student receives two sheets of paper, labeled “Material Warmed” and “Material Cooled” (teacher option as to whether completed one at a time or simultaneously) to create a two-page book.
2. Students draw what happened to a solid when it was warmed and what happened to a liquid when it cooled.
3. Students share their book/observations with the class/group.
4. Teacher observes and records student responses to identify student mastery of the concept of “changes based on temperature.”

Addressing Student Pre-Conceptions/Alternate Conceptions

- Provide photos of objects melting. Prompt students to tell a story about a time when they interacted with something melting using the photos. Guide students to connect their story to the photo. Teacher can ask: “How did the _____ feel before it melted? Was it hot or cool?”
- Read the *story Should I Share My Ice Cream* by Mo Willems and/or the book *Melting* by Mondo Publishing. Review the science ideas from the books about melting with the students. Teacher can ask: “What does something melting look and feel like?”

Teacher Notes:

- First/top flap of foldable will serve as the title flap of the foldable. Students will glue title onto flap or teacher can pre-write title before copying.

Unit: K **Lesson 4 of 4**	**Solids and Liquids** (for unit overview see NYC PK-8 Scope and Sequence 2018, p.37)
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Anchoring Phenomenon: We can observe water as a solid and as a liquid.	
Investigative Phenomenon: Solids and liquids may have different physical properties.	
Lesson Objective/Teaching Point: I can reflect on the lessons completed with the understanding that solids and liquids have properties and some properties are based upon the temperature of the material.	**Sequence:** **Amplify Modalities: Talk, Write, Read, Visualize**
Students will be able to identify and apply changes in states of matter (i.e.: solid to liquid) within a fictional story. Students will explain that solids and liquids have properties, some are based upon the temperature of the material, and be able to explain how temperature affects matter. **Vocabulary:** Temperature Solid Liquid Hot Warm Cool *Continue using the word "properties" in the teacher's vocabulary to introduce this to the students. It is not an*	1. **Engage**: Teacher reads aloud from the anchor text: *A Snowy Day* by Ezra J. Keats. 2. **Talk**: Students reflect on their learning and define the **properties** explored in previous lessons. 3. **Write**: Teacher distributes portfolio work for students to compile their work and create a cover at the end of the lesson. 4. **Read**: Read anchor text to explore the properties found in the story. Snow can be squashed (compressed), molded, and sculpted. Snow is a solid that can melt into a liquid. 5. **Visualize**: Students use vocabulary and drawings to create a book cover and then share their books with the class. **Summative Assessment:**

assessment word in this unit.	• Oral and written work will be assessed.

Standards Content:

Performance Expectations
K-PS1-1. Plan and conduct an investigation to test the claim that different kinds of matter exist as either solid or liquid, depending on temperature. [Clarification Statement: Emphasis should be on solids and liquids at a given temperature and that a solid may be a liquid at a higher temperature and a liquid may be a solid at a lower temperature.] [Assessment Boundary: Only a qualitative description of temperature, such as hot, warm, and cool is expected.]

SCIENCE AND ENGINEERING PRACTICES	DISCIPLINARY CORE IDEAS	CROSSCUTTING CONCEPTS
Planning and Carrying Out Investigations Planning and carrying out investigations to answer questions or test solutions to problems in K–2 builds on prior experiences and progresses to simple investigations, based on fair tests, which provide data to support explanations or design solutions. With guidance, plan and conduct an investigation in collaboration with peers. (K-PS1-1) **Analyzing and Interpreting Data** Analyzing data in K–2 builds on prior experiences	**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. (K-PS1-1)	**Cause and Effect** Simple tests can be designed to gather evidence to support or refute student ideas about causes. (K-PS1-1) **Energy and Matter** Students observe objects may break into smaller pieces, be put together into larger pieces, or change shapes. (K-PS1-1)

and progresses to collecting, recording, and sharing observations. ● Record information (observations, thoughts, and ideas). (K-PS1-1) ● Analyze data from tests of an object or tool to determine if it works as intended. (K-PS1-1) ***Connections to Nature of Science*** **Scientific Investigations Use a Variety of Methods** Scientists use different ways to study the world. (K-PS1-1)		

Resources/Materials

- Anchor text: *A Snowy Day* by Ezra J. Keats
- An example book of student portfolio work
- Vocabulary words printed and cut out for students to use on the cover of their properties books

Introduce the Lesson/Motivate Students (5 Minutes)

1. Read aloud the anchor text: *A Snowy Day*, emphasizing when the snowball melts in the pocket of the character's pants (four pages from the end of the book).

Model/Teach (10 Minutes)

1. Teacher distributes portfolios to students that include work from previous three lessons.
2. Teacher instructs students to share work from their first lesson (and then subsequent lessons) and asks: “What did we learn on this day?” “What properties did we observe and discuss on that day?” (Day 1: Solid and Liquid. Day 2: Hot, Warm and Cool. Day 3: Solids to Liquids, and Liquids to Solids.)
3. Teacher explains to students that they are creating a book with all of their work. Have a model book made to show as an example.

Group/Independent Work (15 Minutes)

1. Teacher reads *A Snowy Day* a second time, going page by page and closely looking at each property of solid snow, and later, melted snow. Students identify and discuss these properties with a partner, and then share with the whole class.
2. Teachers ask students the meaning of the word **property.** This is an ongoing vocabulary word, but it is not being assessed at this time. It can, however, be explored as a class.
3. Students will now compile their portfolio work into a four-page book that includes a cover and discuss with their groups the properties represented in their work.
4. Students will start to make their four-page book by creating a book cover. Depending on their abilities, students may title the book, “My Book of Properties” and then illustrate the cover. Other students may use vocabulary words from the word wall to illustrate their covers or draw examples of properties they learned about on their cover. Teachers may even have vocabulary words cut out already that students can glue onto their covers and then illustrate the words.
5. Students will illustrate the different properties they learned within their individual books. One property can be illustrated on each page of their book.

Assessment/Summary Discussion (20 Minutes)

1. Students will share and explain their books and learning, including any new thinking made visible by their book, to the class. The work will be assessed based on their understanding (oral and written) of properties of matter and how temperature affects matter.

Teacher Notes:

- The final properties book constructed by the students can serve as part of the teacher’s ongoing assessment. Therefore, students should be encouraged to independently choose the amount of properties they illustrate in the final properties book. For example, some students will illustrate 1 while others may illustrate more than 3.

- If weather permits, teacher may choose to conduct this lesson on a day when it snows. Teacher could then collect snow and conduct a real-life demonstration of snow melting with the higher temperature inside.