

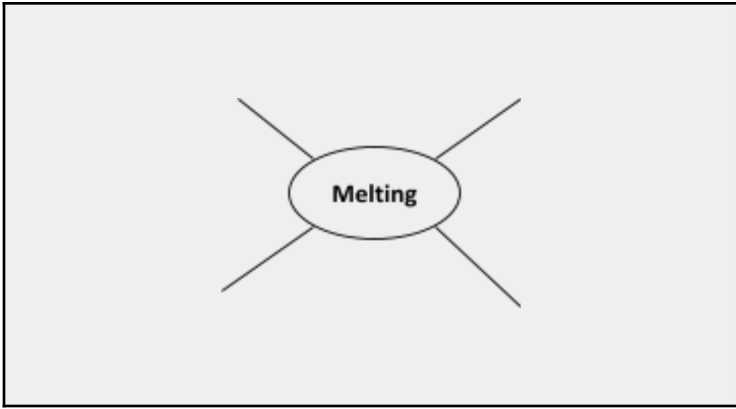
Unit 3: Connecting Places, Connecting People

WEEK 2 Lesson 1

Science and Engineering: Physical Science

Matter and Its Interactions: Reversible and Irreversible Changes (Melting)

S & E Big Ideas	Matter changes states when we cool it or heat it. Some changes of matter are reversible, some are not.
S & E Guiding Questions	How can water change? Can a solid be changed to a liquid?
Content Objective	I can make predictions and collect data about how long it will take a cube of ice to melt in different parts of the classroom. (2-PS1-4, Practice 3)
Language Objective	I can listen and add to my classmates' ideas about what makes a solid turn into a liquid. (SL.1.2.b)
Vocabulary	melt: to turn matter that is solid into a liquid
Materials and Preparation	<p>Children will work in groups of four to five. Strategically assign them.</p> <ul style="list-style-type: none">● ice tray filled with ice cubes● small ziplock plastic bag● Science and Engineering packets● writing tools● Role Cards, one set for each group, cut apart● Group Cards, one numbered pair for each group, cut apart <p>Clip the Role Cards and Group Cards together (or place sets in envelopes) for each group.</p> <p>Note: The roles are: Materials Manager A and B and Recorder A and B. In a group of 5, three children will share the two Materials Manager roles. The Materials Managers (A and B) will collect ice cubes and petri dishes for their groups.</p> <ul style="list-style-type: none">● petri dishes, 2 for each group● digital clock● magnifiers (optional)● chart paper and markers <p>Prepare the following two charts, Melting and Melting Ice Data.</p>



Melting Ice Data				
Group #	Location	Start Time	End Time	Elapsed Time <i>How long did it take to melt?</i>
1A				
1B				
2A				
2B				
3A				
3B				
4A				
4B				

Opening
9 minutes

Last week we learned that matter can exist in three different states: solid, liquid, and gas. Today, we will explore how one kind of matter that exists as a solid can change into a liquid. The solid we'll begin with is ice.

Put an ice cube inside a bag and hold it up. Facilitate a conversation to elicit children's experiences with melting:

- Have you seen ice melting? What have you noticed?*
- Have you seen anything else melting? What can you tell us about what you observed?*
- How do you think melting happens?*

	<p>As children share their experiences, record them on the Melting web, organizing their ideas into categories, as appropriate.</p> <p><i>Today we will explore melting through an investigation. Your challenge is to get an ice cube to melt as quickly as possible by placing it in different areas of the classroom. Think silently for a moment about where you might put an ice cube to make it melt quickly.</i></p> <p><i>You can share your ideas once you get into your groups. Each group will experiment with two different locations in the classroom and record your findings in your packets.</i></p> <p>Show the corresponding page in the packet.</p> <p><i>Today, each person in your group will have a job, or role.</i></p> <p>Explain each role, and refer to the cards.</p> <p><i>Each group has As and Bs who will work together. As will set up one ice cube in a petri dish in one location, and Bs will set up the other ice cube in the other location. Each Recorder will tell the start time to record in your packets—the time when you put your ice cubes in their locations. [Indicate the clock children will use.]</i></p> <p><i>Stay by your petri dish and observe what happens to the ice cube. While your ice cube melts, talk about what you observe and make predictions. Sketch what is happening in your packet.</i></p> <p><i>When your ice cube has melted completely, Recorders will tell the end time to record in your packets and record that time on the chart.</i></p> <p>Assign children to their groups, distribute Group Cards and Roles Cards, and assign or have children choose roles. Send groups to their work spaces.</p>
<p>Investigation 20 minutes</p>	<p>Once children are established in their work spaces, give directions to the whole group from a central location in the classroom.</p> <p><i>In your groups, discuss different locations in the classroom where you could put an ice cube so it melts as quickly as possible. Explain to your group why you think a certain location will work best.</i></p> <p><i>At the end of the investigation, Recorders will fill in each group’s data on the Class Data Chart, next to your group numbers.</i></p> <p>Note: If children don’t select the coolest and/or the warmest places in the classroom, set additional ice cubes in these places in order to have them available for comparison in the whole group discussion.</p>

	<p>As groups work, circulate to listen in to children’s discussions about how to melt the ice cube most quickly. Observe children’s process. Encourage children to consider a variety of locations based on the classroom’s most differing conditions: <i>What do you think might happen if you put it by the sunny window? By the open window? Next to the radiators?</i></p> <p>Support Recorders to record data on the class chart. Remind Materials Managers to put away all materials and pour the water in a sink or bowl.</p> <p>As children are finishing their investigations, refer them to the self-assessment questions in their packets. Support them in talking with group members about how they used the Science and Engineering Practices and identifying specific examples.</p> <p>Even though the ice cubes are quite small, some may fail to melt in the time allotted for the lesson. In this case, allow pairs of children to stay close to a given ice cube, if possible, to complete the observation.</p>
Discussion	<i>Discussion about this experience happens in Lesson 2.</i>
Closing 1 minute	<i>Today you tested how quickly you can change the state of matter from a solid to a liquid. Tomorrow we will discuss what you observed.</i>
Standards and Practices	<p>SL.1.2.b Build on others' talk in conversations by linking their comments to the remarks of others.</p> <p>2-PS1-1. Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties.</p>
Ongoing assessment	<p>Observe and listen in as children work in their small groups.</p> <p>How do they talk about their ideas about different areas around the classroom?</p> <p>What reasoning do they give to convince their group members to use a particular location?</p> <p>What language do they use?</p> <p>What experiences do they draw upon?</p> <p>How do children consider the ideas expressed by group members?</p> <p>Observe how children work together. How do they take on the responsibilities of their various roles?</p>