Introduction

Formative Assessment Exemplar - K.1.3

Introduction:

The following formative assessment exemplar was created by a team of Utah educators to be used as a resource in the classroom. It was reviewed for appropriateness by a Bias and Sensitivity/Special Education team and by state science leaders. While no assessment is perfect, it is intended to be used as a formative tool that enables teachers to obtain evidence of student learning, identify gaps in that learning, and adjust instruction for all three dimensions (i.e., Science and Engineering Practices, Crosscutting Concepts, Disciplinary Core Ideas) included in a specific Science and Engineering Education (SEEd) Standard.

In order to fully assess students' understanding of all three dimensions of a SEEd standard, the assessment is written in a format called a cluster. Each cluster starts with a phenomenon, provides a task statement, necessary supporting information, and a sequenced list of questions using the gather, reason, and communicate model (Moulding et al., 2021) as a way to scaffold student sensemaking. The phenomenon used in an assessment exemplar is an analogous phenomenon (one that should not have been taught during instruction) to assess how well students can transfer and apply their learning in a novel situation. The cluster provides an example of the expected rigor of student learning for all three dimensions of a specific standard. In order to serve this purpose, this assessment is NOT INTENDED TO BE USED AS A LESSON FOR STUDENTS.

Because this assessment exemplar is a resource, teachers can choose to use it however they want for formative assessment purposes. It can be adjusted and formatted to fit a teacher's instructional needs. For example, teachers can choose to delete questions, add questions, edit questions, or break the tasks into smaller segments to be given to students over multiple days.

Of note: All formative assessment clusters were revised based on feedback from educators after being utilized in the classroom. During the revision process, each cluster was specifically checked to make sure the phenomena was authentic to the DCI, supporting information was provided for the phenomena, the SEPs, CCCs, and DCIs were appropriate for the learning progressions, the cluster supported student sensemaking through the Gather, Reason, and Communicate instructional model, and the final communication prompt aligned with the cluster phenomena. As inconsistencies were found, revisions were made to support student sensemaking. If other inconsistencies exist that need to be addressed, please email the current Utah State Science Education Specialists with feedback.

General Format:

Each formative assessment exemplar contains the following components:

1. Teacher Facing Information: This provides teachers with the full cluster as well as additional information including the question types, alignment to three dimensions, and answer key. Additionally, an example of a proficient student answer and a proficiency scale for all three dimensions are included to support the evaluation of the last item of the assessment.
2. Students Facing Assessment: This is what the student may see. It is in a form that can be printed or uploaded to a learning platform. (Exception: Questions including simulations will need technology to utilize during assessment.)

Accommodation Considerations:

Teachers should consider possible common ways to provide accommodations for students with disabilities, English language learners, students with diverse needs or students from different cultural backgrounds. For example, these accommodations may include: Providing academic language supports, presenting sentence stems, or reading aloud to students. All students should be allowed access to a dictionary.

References:

Moulding, B., Huff, K., & Van der Veen, W. (2021). *Engaging Students in Science Investigation Using GRC*. Ogden, UT: ELM Tree Publishing.

Teacher Facing Info

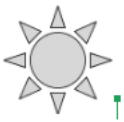
Teacher Facing Information

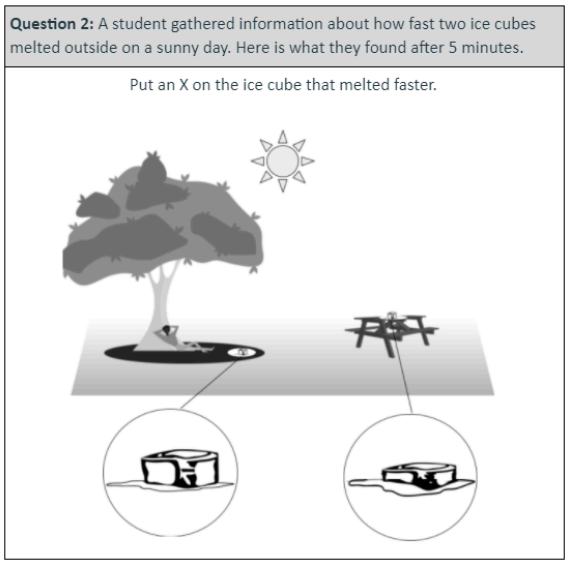
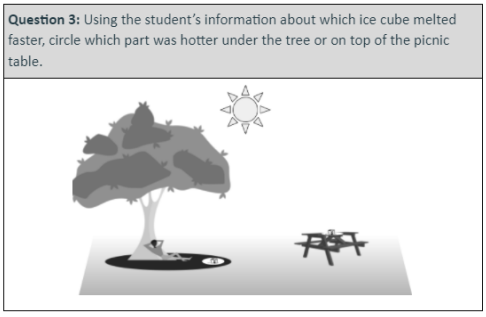
Standard: K.1.3

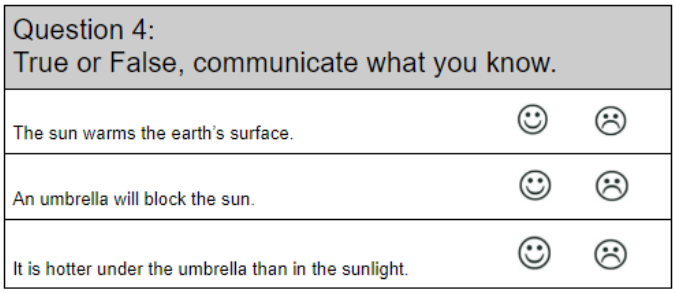
Carry out an investigation using the five senses, to determine the effect of sunlight on different surfaces and materials. Examples could include measuring temperature, through touch or other methods, on natural and man-made materials in various locations throughout the day. (PS3.B)

Assessment Format: Printed

Phenomenon	
On a hot day people will sometimes use umbrellas or tents to sit under.  https://commons.wikimedia.org/wiki/File:Man_sitting_under_beach_umbrella.JPG	Proficient Student Explanation of Phenomenon: The sun warms the earth's surface.
Cluster Task Statement	
Use the questions below to investigate what would cause someone to sit under an umbrella on a hot day.	
Supporting Information	
N/A	
Cluster Questions	

Gather: Cluster Question #1 Question Type: Multiple Choice Addresses: x__ DCI: PS3.B x__ SEP - Asking Questions x__ CCC - Cause and effect Answer: Is it warmer in the sun or the shade?	Question 1 Which question would help you understand why people might use umbrellas or tents on a hot summer day? **Question 1** Which question would help you understand why people might use umbrellas or tents on a hot summer day? Is it warmer to sit in the sun or the shade?  created by Annette Fonnesbeck Where are the dogs playing?  https://pixabay.com/illustrations/dog-animal-playing-catch-vector-2329172/ Will there be a treat?  https://www.maxpixel.net/Confectionery-Sweet-Treat-Candy-Eat-Sugar-Pieces-25390

Gather: Cluster Question #2 Question Type: Addresses: x__ DCI - PS3.B x__ SEP - Carrying out an investigation x__ CCC - Cause and Effect Answer:	Question 2 A student gathered information about how fast two ice cubes melted outside on a sunny day. Here is what they found after 5 minutes.  **Question 2:** A student gathered information about how fast two ice cubes melted outside on a sunny day. Here is what they found after 5 minutes. Put an X on the ice cube that melted faster. created by Annette Fonnesbeck
Reason: Cluster Question #3 Question Type: Addresses: x__ DCI - PS3.B x__ SEP - Carrying out an investigation x__ CCC - Cause and Effect Answer: The student should circle the spot without the tree.	Question 3 Using the student's information about which ice cube melted faster. Circle which part was hotter under the tree or on top of the picnic table.  **Question 3:** Using the student's information about which ice cube melted faster, circle which part was hotter under the tree or on top of the picnic table. created by Annette Fonnesbeck

Communicate: Cluster Question #4 Question Type: true/false Addresses: x__ DCI - PS3.B x__ SEP - Carrying out an investigation x__ CCC - Cause and Effect Answer: ☺ ☺ ☹	Question 4 True or False, communicate what you know. 
Proficiency Scale	
Proficient Student Explanation: The sun warms the earth's surface.	

Level 1 - Emerging	Level 2 - Partially Proficient	Level 3 - Proficient	Level 4 - Extending
SEP: Does not meet the minimum standard to receive a 2.	**SEP:** With guidance, plan and conduct an investigation in collaboration with peers (Grades 1-2). Identify different ways of observing and/or measuring a phenomenon to determine which way can answer a question. With guidance, make observations (firsthand or from media) and/or measurements to collect data that can be used to make comparisons. With guidance, make observations (firsthand or from media) and/or measurements of a proposed object or tool or solution to determine if it solves a problem or meets a goal. Identifies similar prior experiences.	**SEP:** Evaluate different ways of observing and/or measuring a phenomenon to determine which way can answer a question. Make observations (firsthand or from media) and/or measurements to collect data that can be used to make comparisons. Make observations (firsthand or from media) and/or measurements of a proposed object or tool or solution to determine if it solves a problem or meets a goal. Make predictions based on prior experiences.	**SEP:** Extends beyond proficient in any way.
CCC: Does not meet the minimum standard to receive a 2.	**CCC:** With support, identify observable patterns to	**CCC:** Identify observable patterns to describe the causes of events.	**CCC:** Extends beyond proficient in any way.

	describe the causes of events. With guidance, designs simple tests to gather evidence to support or refute ideas about causes.	Designs simple tests to gather evidence to support or refute ideas about causes.	
DCI: Does not meet the minimum standard to receive a 2.	**DCI:** The sun is warm.	**DCI:** Sunlight warms Earth's surface.	**DCI:** Extends beyond proficient in any way.

(Student Facing Format on following page)

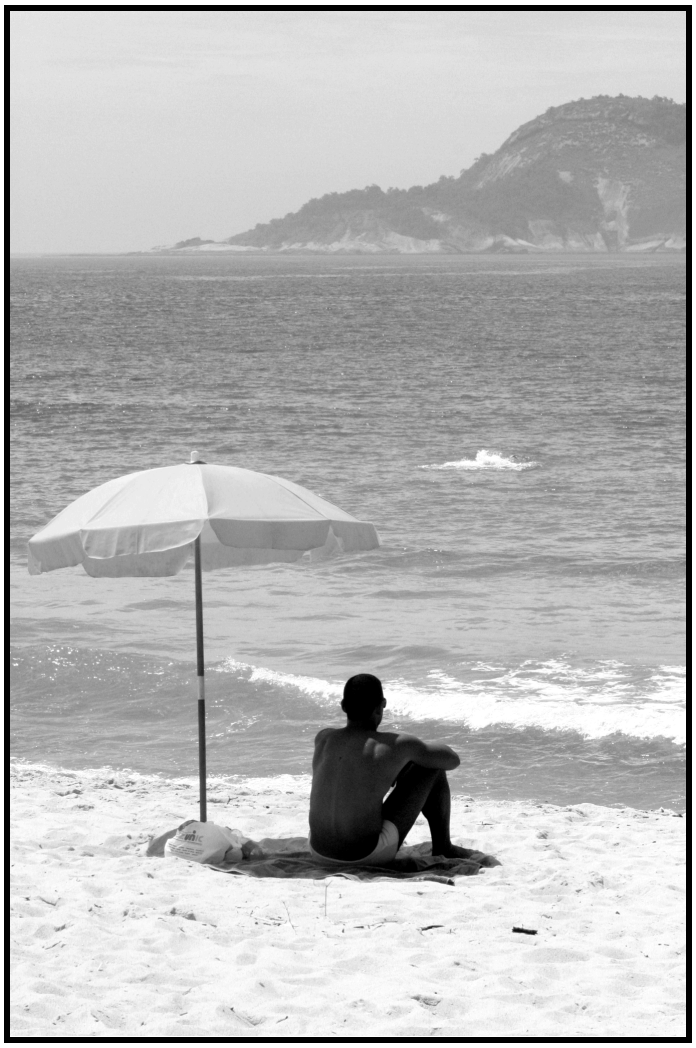
Student Assessment

Name _____Date_____

Stimulus

On a hot day people will sometimes use umbrellas or tents to sit under.

Figure 1: Person on the beach



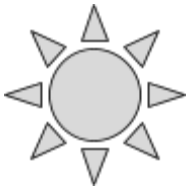
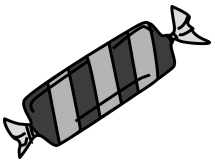
https://commons.wikimedia.org/wiki/File:Man_sitting_under_beach_umbrella.JPG

Your Task

Use the questions below to investigate what would cause someone to sit under an umbrella on a hot day.

Question 1

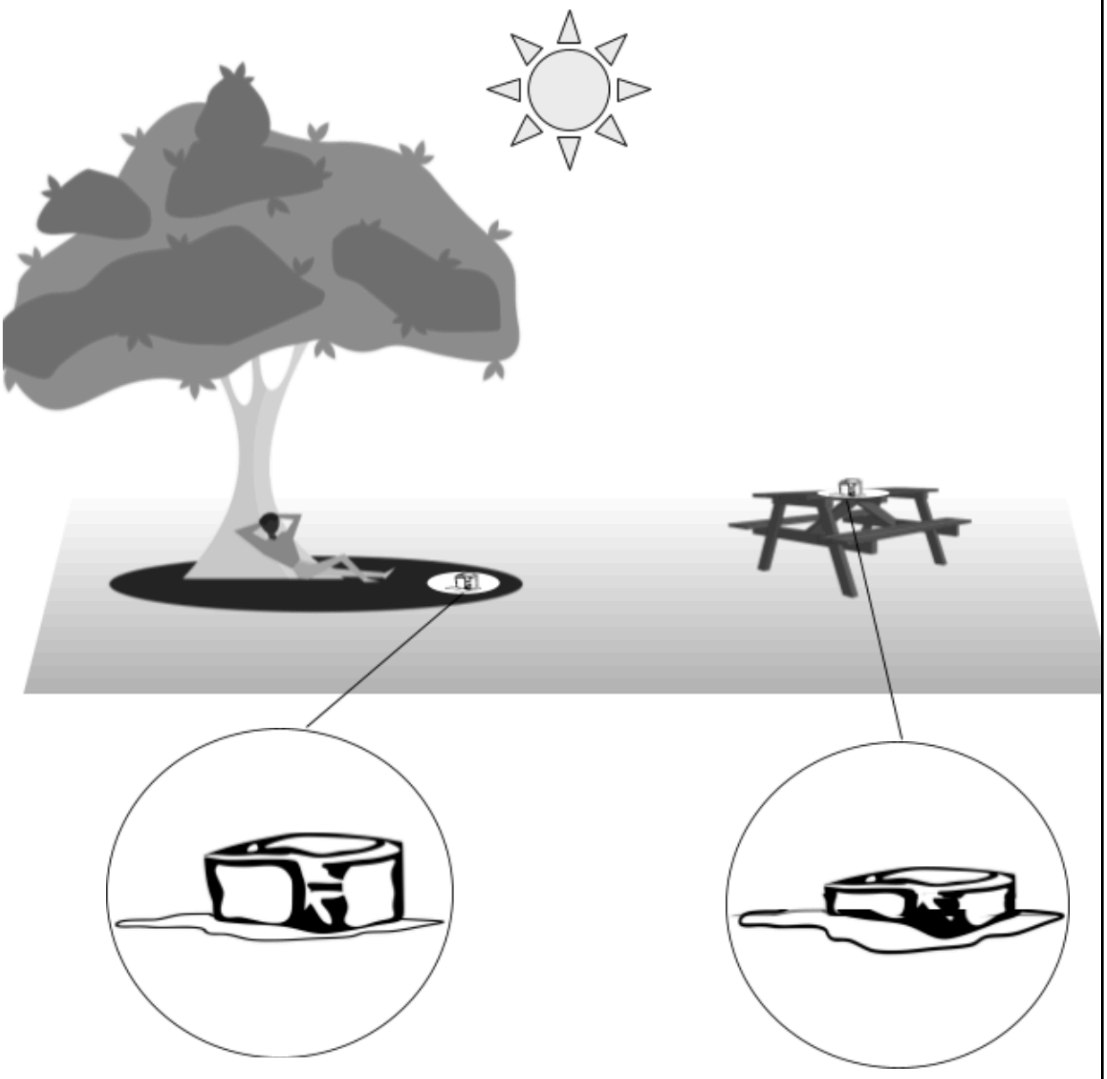
Which question would help you understand why people might use umbrellas or tents on a hot summer day?

Is it warmer to sit in the sun or the shade?  created by Annette Fonnesbeck	Where are the dogs playing?  https://pixabay.com/illustrations/dog-animal-playing-catch-vector-2329172/	Will there be a treat?  https://www.maxpixel.net/Confectionery-Sweet-Treat-Candy-Eat-Sugar-Pieces-25390

Question 2

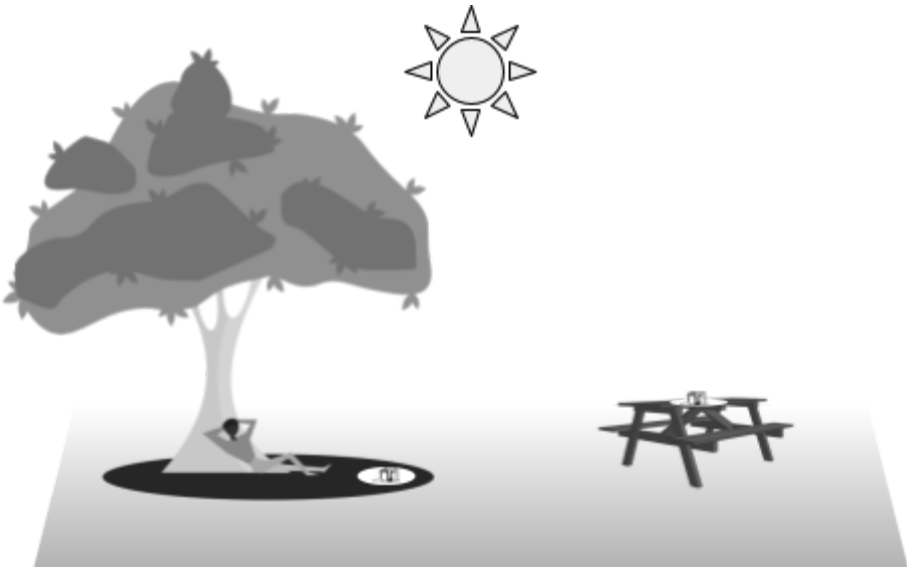
A student gathered information about how fast two ice cubes melted outside on a sunny day. Here is what they found after 5 minutes.

Put an X on the ice cube that melted faster.



Question 3

Using the student's information about which ice cube melted faster, circle which part was hotter under the tree or on top of the picnic table.



Question 4: True or False, communicate what you know.		
The sun warms the earth's surface.	☺	☹
An umbrella will block the sun.	☺	☹
It is hotter under the umbrella than in the sunlight.	☺	☹