

S'MORES (MODIFIED FOR ADEED)



Science Concept:

A solid may change to a liquid.

Objectives:

The student will:

- describe how a solid changes to a liquid;
- make a prediction about how a solid changes to a liquid; and
- create a poster about matter.

GLEs Addressed:

Science

[3] SB3.1 The student demonstrates an understanding of the interactions between matter and energy and the effects of these interactions on systems through recognition that temperature changes cause changes in phase of substances (e.g., ice changing to liquid, water changing to water vapor, and vice versa).

[3] SA1.1 The student demonstrates an understanding of the processes of science by asking questions, predicting, observing, describing, measuring, classifying, making generalizations, inferring, and communicating.

Writing

[K] W1.1.1 The student writes about a topic by writing to express personal ideas using drawings, symbols, letters, or words.

Vocabulary:

liquid – does not have set shape

solid – shape that is firm and strong

Materials:

- Solid food examples (five examples each for two groups)
- Liquid food examples (five examples each for two groups)
- Graham crackers (four squares per pair)
- Mini marshmallows (eight per pair)
- Milk chocolate candy bars (two quarters per pair)
- Glass baking pan, 8-inch" by 11-inch", with glass lid (one per pair)
- Aluminum foil (one piece per pair of students)
- Wax paper (one piece per pair of students)
- Black paper (one piece per pair of students)
- White paper (one piece per pair of students)
- Poster paper (one piece per student)
- Crayons
- STUDENT WORKSHEET: "S'mores!" (one per student)

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Activity Procedure:

Please refer to the assessment task and scoring rubric located at the end of these instructions. Discuss the assessment descriptors with the class before teaching this lesson.

Gear up

Process Skills: classifying and communicating

1. Ask students how a solid can change to a liquid. Record student responses on the board, and place student's initial next to his or her response.
2. Introduce vocabulary words.
3. Divide the class into two groups. Distribute five solid items and five liquid items to each group. Ask students to group all the liquids together and group all the solids together and discuss their reasoning. As a class, generate a list of additional solid and liquid foods and post on the board.

Explore

Process Skills: investigating and observing

4. Tell students they are going to learn about how a food changes from a solid to a liquid. Today they are going to make S'mores!
5. Divide students into pairs. Work through the following steps together as a class:
 - a. Put four graham crackers side by side in the bottom of the glass baking pan.
 - b. Place chunks of chocolate bar on top of two of the graham crackers.
 - c. Place eight mini-marshmallows on top of the other two graham crackers.
 - d. Cover the baking pan with the clear glass lid.
 - e. Choose a sheet of aluminum foil, wax paper, black paper, or white paper to place on top of the glass baking lid.
 - f. Place the pan in a sunny spot outside.
 - g. Let the pan sit until the chocolate bars and marshmallows melt.
6. Distribute STUDENT WORKSHEET: "S'mores!" and instruct students to complete the worksheet while waiting for the chocolate and marshmallows to melt.
7. Once the chocolate and marshmallows are melting, ask students to observe what materials seem to help the chocolate and marshmallow melt faster. Put one chocolate and one marshmallow graham cracker together to make a sandwich. Eat and enjoy!

Generalize

Process Skills: describing, making generalizations, and communicating

8. As a class, discuss the following questions:
 - a. What did you observe happening to the chocolate?
 - b. What did you observe happening to the marshmallow?
 - c. How did the solid chocolate and the solid marshmallow turn into liquid?
 - d. What happened to the graham cracker?
 - e. What kind of material (aluminum foil, wax paper, white paper, or black paper) helped melt the chocolate faster?
 - f. What would happen if you put your pan in the shade?
 - g. What would happen if you put the different kinds of materials (aluminum foil, wax paper, white paper, or black paper) under the pan?

Apply

Process Skills: describing, observing, generalizing, and communicating

9. Give each student a piece of white paper. As a class, discuss what would happen to butter if you put it outside on a warm day. Ask students to illustrate what they think would happen.

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Answers to Student Worksheet:

1. picture of melting or melted chocolate
2. picture of melting or melted marshmallow

Extension Idea:

Find other items to melt, such as an ice cube, crayon, or birthday candle. Investigate and record the time it takes for each item to melt.

Source:

Mogilner, A., and Mogilner, T. (2006). *Children's writer's word book*. 2nd ed. Cincinnati, OH: Writer's Digest Books.

Assessment Task:

Write the word "Melting" on the board. Pass out poster paper to each student. Ask students to copy the title "Melting" on their poster. Ask students to make at least one prediction about how ice cream can change from a solid to a liquid by telling an adult who will write the prediction on poster paper. Instruct students to create a poster with two or more pictures that illustrates how ice cream changes from a solid to a liquid.

Rubric

Objective	GLE	Below Proficient	Proficient	Above Proficient
The student describes how a solid changes to a liquid.	[3] SB3.1	The student describes how ice cream can change from a solid to a liquid by including one or fewer details.	The student describes how ice cream can change from a solid to a liquid by including two details.	The student describes how ice cream can change from a solid to a liquid by including three or more details.
The student makes a prediction about how a solid changes to a liquid.	[3] SA1.1	The student makes no prediction about how ice cream can change from a solid to a liquid.	The student makes at least one prediction about how ice cream can change from a solid to a liquid.	The student makes two or more predictions about how ice cream can change from a solid to a liquid.
The student creates a poster about matter.	[K] W1.1.1	The student creates a poster relating to temperature change by copying a title and drawing one picture.	The student creates a poster relating to temperature change by copying a title and drawing two pictures including color.	The student creates a poster relating to temperature change by copying a title and drawing three or more pictures including color.

NAME: _____
S'MORES!

Draw a picture to answer the questions.

1. What happened to the chocolate?



2. What happened to the marshmallow?

