

## Do the Science

Day 1

Transition 1 minute

1. **Intro: Quickwrite:**

Sometimes solids turn into liquids. How does that happen? Some people tell me solids become liquids by dissolving; others tell me solids become liquids by melting.

- What is dissolving and what makes it happen?
- What is melting and what makes it happen?

Give students 4 minutes.

Today we are going to explore the difference between melting and dissolving.

1. Hand out lab worksheet: Dissolving and Melting.
2. Go through materials and procedures.
3. Complete experiment and clean up.

Day 2

1. Review experiment questions in a discussion format.

2. Define dissolving:

- a. What happened to the colored coating?
- b. Where did the colored coating go?
- c. Ask students to use the dots to explain what they think happened to the particles.
- d. Model dissolving at the particle level: blue pieces of construction paper to represent water, green to represent the colored candy coating, white to represent layer between, and brown to represent the chocolate.
- e. Then have them draw that and label it in their journal.
- f. Tell students: when a solid substance is placed in a liquid, and the solid appears to disappear into the liquid, we say the solid dissolved. When a solid substance is placed in water or another liquid, particles of the solid substance break away and move into the liquid. This process is called dissolving. The liquid with the substance dissolved in it is a solution. A solution of a substance is made of particles of that substance mixed evenly with particles of the liquid in which it is dissolved.

**Comment [F1]:** Do day before to save time.

**Comment [F2]:** Each pair should get one envelope of "particles" labeled dissolving.

**Comment [F3]:** Follow with a "TEACH".

## Do the Science

- g. Discuss
  - i. Did anything dissolve?
  - ii. Did the colored coating dissolve at the same rate in both cups of water?
  - iii. What was left after the colored coating dissolved?
  - iv. Did the chocolate dissolve?

### 3. Define melting:

- a. What happened to the two candies in the foil cups?
- b. What happened to the chocolate in the water after the colored coating dissolved?
- c. Ask students to use the dots to explain what they think happened to the particles.
- d. Model melting at the particle level: green to represent the colored candy coating, white to represent layer between, and brown to represent the chocolate.
- e. Have students draw their model in their journal.
- f. Tell students: When a substance changes from a solid to liquid due to heat, it is called melting. When a solid substance melts, it changes state from solid to liquid. The change is caused by heat. Heat changes the kinetic energy of the particles of the substance. When the particles have enough kinetic energy, they start to move past one another as a liquid. **A melted substance is still made only of particles of that substance.**
- g. Discuss
  - i. Did anything melt?
  - ii. Why didn't the chocolate melt in the cold air or cold water?

**Comment [F4]:** Each pair should get one envelope of "particles" labeled melting with red flame to represent heat.

**Comment [F5]:** Follow this with a "TEACH."

### 4. Comparing Melting and Dissolving Discussion

- a. Did the M&Ms dissolve or melt?
- b. What was needed for the colored coating to dissolve?
- c. What was needed for the chocolate to melt?
- d. When the colored coating dissolved, where did it go?
- e. What happened to the colored coating at the particle level when it dissolved?
- f. What was between the particles of colored coating after it dissolved?

## Do the Science

- g. When the chocolate melted, where did it go?
- h. What was between the particles of chocolate after it melted?
- i. What happened to the chocolate at the particle level as the chocolate melted?
- j. What caused the colored coating of the candies in the foil cup over hot water to crack?

5. Self-Reflection: Go back to your quick write from yesterday. Draw a line of learning.

- a. Were you correct? If so, write why you think you knew the difference before we did the experiment.
- b. If you were not correct, make sure you write the correction below your line of learning.

6. **Assessment:** Summarize melting and dissolving. Have students respond to the following questions on paper.

- a. Circle the location(s) where melting occurred.

Hot air                      hot water                      cold air                      cold water

- b. Circle the location(s) where dissolving occurred.

Hot air                      hot water                      cold air                      cold water

- c. Circle the process that needs a liquid in order to occur.

Melting                      Dissolving

- d. Circle the process that needs heat in order to occur.

Melting                      Dissolving

**Comment [F6]:** Alternately, add sugar to a beaker of water and stir. Did this melt or dissolve? Explain your reasoning.

## Do the Science

Name: \_\_\_\_\_

### Dissolving or Melting

**Question: What is the difference between melting and dissolving?**

#### Materials: Per Partnership

- 2 plastic cups
- 2 aluminum foil cups
- Hot water
- Cold water
- 6 M&Ms same color
- Clock

## Do the Science

### Procedures:

1. Put about 150 mL of hot water in one plastic cup; put about 150 mL of cold water in the other plastic cup.
2. Put an aluminum foil cup in each cup of water.
3. Get six candies, all one color. Put one candy in each aluminum foil cup and one in the bottom of each of the cups of water.
4. Don't stir, poke, or shake the candies or the cups. Observe to see if anything melts or anything dissolves.
5. Bite an M&M in half. Draw below and label the candy coating and the chocolate center.

Predict where in our systems that melting and dissolving will occur:

Melting \_\_\_\_\_

Dissolving \_\_\_\_\_

Answer the questions on the back and make observations while you are waiting.

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1. How are melting and dissolving alike? Different? \_\_\_\_\_  
\_\_\_\_\_
2. How would you melt a substance? \_\_\_\_\_  
\_\_\_\_\_
3. How would you dissolve a substance? \_\_\_\_\_  
\_\_\_\_\_
4. What happens to the colored coating in the water? \_\_\_\_\_  
\_\_\_\_\_
5. What is under the colored coating? \_\_\_\_\_
6. What happens to the chocolate in the center in hot water? In cold water? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
7. What happens to the candies that are not in water? Hot air? Cold air? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
8. Record your observations below.

| Material      | Hot water | Hot Air | Cold Water | Cold Air |
|---------------|-----------|---------|------------|----------|
| Candy Coating |           |         |            |          |
| Chocolate     |           |         |            |          |

9. Where did melting occur? What is your evidence? \_\_\_\_\_  
\_\_\_\_\_
10. Where did dissolving occur? What is your evidence? \_\_\_\_\_  
\_\_\_\_\_



**Northwest Educational  
Service District 189**

*Together We Can*

**Math & Science Collaborative Inquiry Project**

## **Do the Science**

11. What is needed for melting to occur? \_\_\_\_\_ Dissolving? \_\_\_\_\_