### Background

This probe helps students understand the conservation of matter, a principle that states that matter cannot be created or destroyed. A change in a state of matter (solid to liquid) is a change in the average motion and arrangement of the molecules, not the number of molecules. Since the cup covered with plastic wrap is closed, no new matter can get in or out of the cup. For elementary students, this is an easy activity to demonstrate that a change in a state of matter (ice) does not change its weight or mass.

### Materials

**Per Team:**
- 1 plastic cup
- 1 piece of plastic wrap
- 2 ice cubes
- 1 timer
- 1 or more weight scales per class

### Directions

1. Place 2 ice cubes in a cup and cover it with plastic wrap.
2. Weigh the cup of ice cubes on a scale. Record the weight.
3. Set the timer for 15 minutes.
4. Place the cup on a sunny window or under a lamp.
5. Choose a prediction:
   - The melted ice in the cup will weigh more than the frozen ice cubes.
   - The melted ice in the cup will weigh less than the frozen ice cubes.
   - The melted ice in the cup will weigh the same as the frozen ice cubes.
6. Once the timer goes off, weigh the cup of melted ice cubes. Did your prediction prove correct?

### Discussion

- What were your results?
- Why did the cups weigh the same?
- Is the cup with plastic wrap an open or closed system? *(Can anything be added or subtracted in the bag?)*
- What are both ice and melted ice made of?

### Assessment

Use **Exit Ticket 3.3** to answer the following question: *Does a melted ice cube weight more, less, or the same as a frozen ice cube?*

### Extension

Try the same activity with colored or Kool aid ice cubes to test students’ understanding.

### Related Activities

Weigh a whole chocolate chip cookie. Remove the chocolate chips. How will the weight of cookie crumbs compare to the whole cookie’s weight?

### Vocabulary

- **Mass:** a measure of the amount of matter in a substance.
- **Matter:** A material of a particular kind.
- **Molecule:** the smallest part of substance, which is made of atoms.

### ALIGNMENT TO NGSS:

**Scientific and Engineering Practices**
- Asking questions
- Planning and carrying out investigations
- Constructing explanations
- Engaging in argument from evidence
- Obtaining, evaluating, and communicating information

**Crosscutting Concepts**
- Cause and effect

**Disciplinary Core Ideas**
- K-5: PS1.A
- 6-8: PS1.A