

STATES OF MATTER

Name: _____ **Date:** _____

The three states, or phases, of matter are liquids, gases, and solids. Each state or phase of matter is determined by mass, shape, and volume. Mass is a body of matter that does not have a specific shape. When an item has shape, it has a definite outline or form. Volume is the amount of space in a substance or an object. A solid has a definite mass, shape, and volume. They are not hollow. Gases are present in the air. A gas does not have a specific mass, shape, or volume. A liquid does not have a specific shape, but it does have a specific mass and volume.

Objects can move through the phases of matter. This generally happens due to temperature changes. Temperature change is a result of adding or decreasing energy. When something freezes, energy has been removed. If the temperature increases, energy has been added.

Let's think about this. When a liquid reaches the freezing point, it changes to a solid. Energy has been taken away. When the temperature increases, a solid can become a liquid. Energy has been added. Additionally when the temperature increases, a liquid can become a gas. Energy has a vital role in phase changes.

Directions: You will complete a task involving pieces of chocolate. Answer the questions before you begin.

1. What state of matter are chocolate pieces in? How do you know?
2. Your task is to change the chocolate pieces to liquid. According to the passage, what must you do in order for this to happen?

CHOCOLATE STATES OF MATTER

Name: _____ **Date:** _____

Objective: Change the chocolate from a solid to a liquid.

Materials Needed:

- Chocolate pieces (any type of meltable chocolate candy will work: baker's candy melts, Hershey Kisses, chocolate chips, etc)
- Zipper sandwich bags
- A refrigerator
- Printable

Teacher Directions:

1. Pass out the printable, a zipper sandwich bag, and several pieces of chocolate to each student.
2. Have the students place their chocolates into their bags and seal the bags tightly.
3. Record the observations of what state the chocolate is in now and what it looks like.
4. Explain to the students that they will be transforming the solid to a liquid by applying energy (in the form of heat or pressure) as they read in the passage. You may or may not want to brainstorm ways to do this before the students begin.
5. The students will work in pairs or groups to apply energy (heat) to their chocolate in order to change it from a solid to a liquid.
5. Have the students record the observations of what the chocolate looks like after a few minutes of applying heat and when the chocolate is finally in liquid form.
6. After the chocolate is melted, place the baggies into the refrigerator (or even outside if the weather is cold). Ask the students what will happen to the chocolate in the refrigerator (it will return to a solid form) and why (heat is being removed) Have the students record observations after the chocolate returns to a solid state.

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1. Your task is to transform the chocolate from a solid to a liquid using only your hands and desk. Create a brief plan for doing this. In your plan, include what you will try, what you think will work the best, and how long you think it will take.



2. Use the observation sheet to sketch what the chocolate looks like, and record the state of matter before, during, and after the activity.

3. Were you able to successfully transform the chocolate from a solid to a liquid? How do you know?

4. What did you try that was the most successful and why? What was the least successful and why?

5. What steps would you need to take to transform the chocolate back into a solid form?

Chocolate

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