# Changes of State, Changes in Weight?

# The Investigation:

# What's needed:

Two small paper cups A small plastic bag A balance scale Water Measuring cup Marker pen



#### What to do:

Paper towels

- 1. Label the first paper cup "Before" and the second paper cup "After."
- 2. Fill the "Before" cup with exactly 100 mL of water using the measuring cup.
- 3. Place the "Before" cup on one side of the balance scale and adjust the balance until it is level.
- 4. Record the weight of the cup and water on a piece of paper.
- 5. Pour the water from the "Before" cup into the plastic bag.
- 6. Close the bag tightly and label it "After."
- 7. Dry the "Before" cup and place it on one side of the balance scale again.
- 8. Adjust the balance until it is level.
- 9. Record the weight of the empty "Before" cup on a piece of paper.
- 10. Place the "After" bag on the other side of the balance scale.
- 11. Adjust the balance until it is level.
- 12. Record the weight of the "After" bag on a piece of paper.
- 13. Calculate the weight of the water by subtracting the weight of the empty "Before" cup from the weight of the "Before" cup and water.
- 14. Compare the weight of the water to the weight of the "After" bag.

# Record, report and explain your findings:

## **Conclusion:**

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#### **Teacher Notes:**

#### **Observations:**

The weight of the "Before" cup and water should be the same as the combined weight of the empty "Before" cup and the "After" bag. This demonstrates that matter (the water) does not change weight when it changes from a liquid to a solid state (in this case, from water to water vapor in the plastic bag).

## **Explanation:**

When water changes from a liquid to a solid state, it undergoes a physical change, which means that its chemical composition remains the same. As a result, the total mass of the water before and after the change remains constant. This is due to the Law of Conservation of Mass, which states that the mass of a closed system (like our experiment) will remain constant over time, even if the state of the matter changes.