

# States that Matter

*Study the structure and properties of matter before and after they undergo a change. Students will be introduced to the concepts of heat and heat transfer.*

## **SUMMARY:**

Using water as an example, they will learn how, why, and in which progression matter usually transforms from one state to another. The class will learn and observe the basic properties of heat by play-acting the role of atoms, as well as observing the effects and behavior of warm air and water. The children will witness a tea bag rocket-launch and learn of a lesser known phenomenon called “sublimation,” whereby a solid turns directly into a gas without ever becoming a liquid. Then, they will see it in action with dry ice!

## **EDUCATIONAL VALUE:**

This workshop provides students with an opportunity to explore matter and transformations between solids and liquids. They will experiment to see that gases, liquids and solids are all made up of particles, but the behaviors of these particles differ in the three states. They will experiment with contained air and how it may change as heat is applied, but still takes up space and has mass. Hands-on activities encourage students to interact with the concepts presented.



## **TAKE-HOME MESSAGE:**

- 1 Matter can change from a solid to a liquid and a liquid to a solid by heating and cooling.
- 2 Air surrounds us, takes up space and has mass.
- 3 When heat is applied to an object the particles in that object begin to vibrate more rapid.



**TAKE-HOME PRODUCT:**  
Mad Science® Insta-Snow

## **North Carolina Essential Standards:**

Understand the structure and properties of matter before and after they undergo a change.

- 3.P.2.1 Recognize that air is a substance that surrounds us, takes up space and has mass.
- 3.P.2.2 Compare solids, liquids, and gases based on their basic properties.
- 3.P.2.3 Summarize changes that occur to the observable properties of materials when different degrees of heat are applied to them, such as melting ice or ice cream, boiling water or an egg, or freezing water.