

## 5th Grade: Matter Matters

**Course description:** As various natural processes occur, the matter that makes up our environment undergoes both physical and chemical changes. Students will begin to build a framework for describing and categorizing these changes by observing several representative examples of each type.

**Day 1:** All matter around us is built from discrete and fundamental units called atoms, which are then arranged and bonded in various ways in molecules. Students will be introduced to these concepts as a foundation before describing the properties of a given material. Students will observe various physical properties of matter (e.g., color, size, weight, shape, etc.) and classify objects accordingly. Students will then learn the three primary states of matter (solid, liquid, and gas) and will make a diagram to display the actions of atoms in various states of matter.

**Demonstration:** Students will be presented with examples of objects with different physical properties that they will need to sort into three groups depending on the state of matter. Students will create diagrams using M&Ms to display the action of atoms in the various states of matter. Students will snack on the “atoms” when they are done.

**Day 2:** Students will observe models to demonstrate the physical change as water goes from liquid to ice and from liquid to vapor. Students will then identify the physical properties of the individual ingredients of recipes and conduct experiments as they observe and explain the physical changes that occur during heating and cooling.

**Demonstration:** Students will create different types of slime to observe what happens when we combine different materials to alter states of matter. Students will discuss what physical changes occur through this chemical reaction and whether any phase changes were observed.



**Day 3:** Chemical reactions can happen at different rates as a result of various environmental conditions and the availability of the reactants. Students will make observations about how a reaction changes when different amounts of the reactants are used in Elephant Toothpaste demonstrations.

**Demonstration:** Students will help conduct several trials of Elephant Toothpaste demonstrations with varying quantities of the reactants and report on how the reaction changes as a result. They will also explore several insects that utilize specific chemicals for defense such as the vinegaroon.

**Day 4:** Test time! Students must combine the concepts they learned about changes of matter to identify a cabaret of mystery demonstrations. Each demonstration will be listed and described according to its physical and chemical changes and then students will need to match each observed experiment to its description on the list.



*Demonstration:* Students will observe, ask questions, and attempt to identify a series of demonstrations. A full list of demonstrations and descriptions will be shared with the students at the beginning of class which can then be referenced for each experiment throughout the class.