Name_____ Introduction to Matter
Date_____ Grade 6

Objectives:

Physical and Chemical Changes

- **Differentiate** between **physical changes** and **chemical changes**.
- **Identify** clues that a chemical change has occurred, such as a change in color, smell, or the formation of a gas.
- **Give** examples of common physical and chemical changes.

Mass, Volume, and Density

- **Define mass** and **volume**.
- **Explain** that **density** is the relationship between mass and volume.
- **Demonstrate** why some objects float and others sink based on their density.

Converting Measurements

- **Understand** the purpose of converting measurements.
- **Learn** how to convert between different units of measurement, such as grams to kilograms or liters to milliliters.
- **Solve** simple problems that require converting measurements.

Answer the questions and review the key concepts to help you prepare for the next topic.

1. Objects can be grouped by color. What are some other ways to group objects?

_____
_____
_____.

2. Name some ways to measure objects.

_____
_____
_____.

Matter: anything that has mass and takes up space is matter. Matter can be invisible like air, or visible like a tree. Matter is classified by its properties. Matter can be a solid, liquid, or gas.

3. Think about all the different types of matter you see every day. Complete the table to classify the matter listed below as a solid, liquid, or gas.

air • water • tree • plastic • oil • juice • oxygen • paper • house • rock

Solid	Liquid	Gas

Mixture: is made up of two or more substances that are together in the same place, but their atoms are not chemically bonded. A pure substance is a single kind of matter that always has a specific makeup. An example of a mixture is a bowl of different nuts or a bowl of ingredients to bake a cake.

4. Circle each example of a mixture.

salt **cookie** **coffee** **sea water** **baking soda**

Weight versus Mass

Weight is a measurement that depends on gravity, so it is not a reliable measure of matter in an object. For example, the moon has a weak gravitational pull, so objects will weigh less on the moon than on Earth. Even some places on Earth have slightly different gravitational pulls and weight can change because of it. Mass, on the other hand, is the amount of matter in an object, and it is not affected by gravity.

5. Circle the word that completes each sentence.

a. Peter's *(mass / weight)* changes as he travels from the equator to the North Pole.

b. The *(mass / weight)* of a piece of moon rock is the same on the moon and Earth.

Properties of Matter

A property describes something you can observe about matter, such as how it looks and behaves. Properties such as mass and volume can be used to measure matter. Mass is the amount of matter in an object, while volume is the amount of space that matter occupies. Matter exists as solids, liquids, or gasses. Each of these states have their own properties. Solids have a definite shape and volume. Liquids take the shape of their container, so they have a definite shape, but not a definite volume. A gas has no definite shape or volume.

6. Describe how the properties of water change as a solid, liquid, and gas.

_____
_____
_____.

Physical and Chemical Changes A **physical** change occurs when matter changes form or appearance, but does not turn into a new substance. A **chemical** change causes a single substance to change or break down into two or more different substances. Boiling water, breaking ice, and carving a wooden statue are examples of physical changes. Rusting metal is a chemical change, because the metal changes into rust.

7. Draw arrows from the types of change to the examples

Physical change	burned newspaper
	broken plate
	crumpled paper
Chemical change	chopped wood
	melting ice

Jenan is preparing to cook a family dinner, and she begins by gathering ingredients for the main course and dessert. She realizes that most ingredients go through both physical and chemical changes as they cook.

8. One of the ingredients for her main course undergoes physical changes. Which of the following is a physical change?

a. cooking eggs
b. grilling hamburger
c. baking bread
d. boiling water

9. For dessert, she prepares to bake a delicious apple pie. During one of the steps, she notices an example of a chemical change. Which one is it?

a. softening butter
b. folding a sheet of aluminum foil
c. heating sugar to make caramel
d. dicing an apple

10. As her family eats the delicious dinner, Jia remembers an important fact about the law of conservation of mass. What does she remember?

a. Matter always moves from hot to cold.
b. Matter is not created or destroyed in any change.
c. Matter can change physically or chemically.
d. Matter is the amount of mass in a given volume.

11. Amenah looks around the ice skating rink and notices many examples of the movement of thermal energy. For example, she sees her friend holding a cup of hot chocolate in the cold rink. Thermal energy flows from _____ matter to_____ matter.

Write the letter of the correct answer on the line at left.

12. Ghazal is training for a marathon and fueling her body with healthy food. What kind of energy changes the food into energy for her muscles? (1 point)

a. Thermal
b. Solar
c. Physical
d. chemical

13. Hamza is giving a presentation on thermal energy to his class. How can he use the terms endothermic and exothermic to explain the change in thermal energy from one substance to another? Give an example of each term.

_____
_____
_____
_____.

Physical property: a property that is observed with senses and is determined without destroying matter

Chemical property: a property that indicates how a substance reacts with something else, matter will be changed into a new substance after the reaction

Identify the following as a chemical (C) or physical property (P):

_____1. blue color

_____2. density

_____3. flammability (burns)

_____4. solubility (dissolves)

_____5. reacts with acid

_____6. supports combustion

_____7. sour taste

_____8. melting point

_____9. reacts with water

_____10. hardness

_____11. boiling point

_____12. shine

_____13. odor

_____14. reacts with air

Identify the following as chemical (C) or physical (P) changes.

_____1. NaCl (Table Salt) dissolves in water.

_____2. Ag (Silver) tarnishes.

_____3. An apple is cut.

_____4. Heat changes H2O to steam.

_____5. Baking soda reacts to vinegar.

_____6. Fe (Iron) rusts.

_____7. Alcohol evaporates.

_____8. Ice melts.

_____9. Milk sours.

_____10. Sugar dissolves in water.

_____11. Wood rots.

_____12. Pancakes cook.

_____13. Grass grows.

_____14. A tire is inflated.

_____15. Food is digested

When the worksheet is complete, please solve pages 34-35.