

 **Lesson Plan: Introduction to Matter****Grade Level:** 6**Subject:** Physical Science**Duration:** 45–60**NGSS MS-PS1-1:** Develop models to describe the atomic composition of simple molecules and extended structures. **Learning Objectives**

By the end of this lesson, students will be able to:

- **Define** matter as anything that has mass and takes up space.
- **Identify** the three primary states of matter (solid, liquid, gas) and describe their properties.
- **Explain** the difference between atoms, elements, and molecules.



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particles that make up the matter.

- **Chemical change:** A change in the actual chemical makeup of a substance, where one kind of substance is changed into a different kind of substance.
- **Density:** A property of matter that tells how much matter fits into a certain space. Density is the amount of mass per unit volume.

 **Materials Needed:** (all links are included in this PDF)



- Printed copies of the Study Guide (<https://newpathworksheets.com/api/guide/study-guide-science-grade-6-introduction-to-matter-1.pdf>)
- Vocabulary matching worksheet (<https://newpathworksheets.com/api/vocabulary/vocabulary-science-grade-6-introduction-to-matter-1-1.pdf>)
- Practice Worksheet 0 (<https://newpathworksheets.com/api/worksheet/worksheet-science-grade-6-introduction-to-matter-1-0.pdf>)
- Ice cubes in a sealed plastic bag
- Water in a clear container
- Small everyday objects (salt, sugar, aluminum foil, a penny)

Lesson Procedure

Step 1: Introduction (5 minutes)



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- Demonstrate the three states of matter using the ice cube in the sealed bag. Place the bag on a desk and observe the ice (solid), then hold it in your hands to show it melting into water (liquid), and explain that if heated further, water would evaporate into water vapor (gas).
- Discuss physical and chemical properties of matter, emphasizing that physical changes do not alter the substance while chemical changes create new substances. (<https://newpathworksheets.com/api/guide/study-guide-science-grade-6-introduction-to-matter-1.pdf>)

Step 3: Guided Practice (15 minutes)



- Distribute the vocabulary matching worksheet and work through the first two terms as a class to model the process. (<https://newpathworksheets.com/api/vocabulary/vocabulary-science-grade-6-introduction-to-matter-1-1.pdf>)
- Have students complete the remaining vocabulary terms in pairs, then review answers together. (<https://newpathworksheets.com/api/vocabulary/vocabulary-science-grade-6-introduction-to-matter-1-1.pdf>)
- Display small everyday objects (salt, sugar, water, aluminum foil, a penny) and guide students to classify each as an element, molecule, or mixture based on the Study Guide definitions.

Step 4: Independent Practice (15 minutes)

- Distribute Practice Worksheet 0 and have students complete it individually, applying their knowledge of matter, energy, and measurement. (<https://newpathworksheets.com/api/worksheet/worksheet-science-grade-6-introduction-to-matter-1-0.pdf>)

Encourage students to refer to the Study Guide and vocabulary sheet as needed.



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For advanced learners:

- Challenge students to research and present on a fourth state of matter (plasma) and where it occurs in nature or technology.
- Have advanced learners create a concept map connecting atoms, elements, molecules, and the three states of matter with real-world examples.

For learners needing support:

- Provide a pre-labeled diagram of the three states of matter with particle arrangements for visual reference.



- Offer sentence frames for vocabulary definitions, such as 'Matter is _____ that has _____ and takes up _____.'
-

Extension Activities

- Have students design and conduct a simple experiment at home to observe a physical change (such as freezing water or dissolving sugar) and document their observations with photos or drawings.
 - Create a matter scavenger hunt where students find and photograph examples of solids, liquids, and gases in their school or home environment.
 - Research and write a short report on how the particle model of matter explains everyday phenomena like evaporation, condensation, or dissolving.
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NEW PATH LEARNING

INTRODUCTION TO MATTER

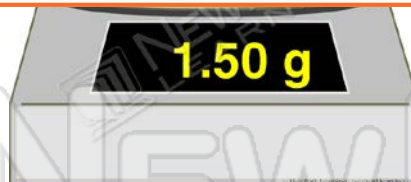
What Is Matter?

Matter is anything that takes up space and has mass. Some of its properties are **physical** and would include such things as color, volume and weight. Other properties are **chemical** and deal with how matter chemically reacts with other materials. An example would be what would happen to an acid if it reacted with a base.



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Lesson Checkpoint:
What system of measurement is used to measure matter?

Changes in Matter

Matter can undergo both **physical** and **chemical** changes.

A **physical change** would include a change in color or a change in state. The different states of matter are solid, liquid and gas. When a physical change occurs, the substance does not change. For example, when you fry an egg, you change its physical state but it is still an egg in substance.

Chemical changes are those that change the actual chemical makeup of the substance. When these occur, materials lose their identity. For example, when you make a cake, you mix an egg with the other ingredients, which together become cake batter. The egg is now transformed and is part of something else—the batter.



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Energy can also take various forms. These include the energy of moving parts which is called **mechanical energy**. Other forms of energy include **electromagnetic energy** such as light, the **chemical energy** of a battery or the **nuclear energy** released from radioactive elements. Other forms are **electrical** and **thermal** or heat energy.

Lesson Checkpoint:
Name one type and one form of energy and give an example of each.

Changes in Energy Form

Energy can be changed from one form to another. This is referred to as an **energy transformation**. We rely on these transformations for many important things. For example, the chemical energy of food in our body gets changed to heat us. Gasoline is burned to move a car, electricity is used to heat a toaster, and generators are turned to produce electricity.



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Name _____ Class _____ Date _____

1

A **nuclear reactor** changes nuclear energy into _____.

- A chemical energy
- B heat energy
- C mechanical energy
- D sound energy



2

When a student **turns on** a flashlight, which of the choices below is correct?

- A Nuclear energy is changed into mechanical energy.
- B Mechanical energy is changed into potential energy.
- C Chemical energy is changed into electrical energy, then light energy.
- D Light energy is changed into kinetic energy, then mechanical energy.

3

The color of an object is a **physical property**.
True or false?

- A true
- B false



4

In the diagram below, which statement is true about the rock **sitting** at the top of the **cliff**?

- A it has more potential energy than kinetic energy
- B it has more kinetic energy than potential energy



5



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9

Which of the statements below is **scientifically** correct?

- A Energy is needed to do work.
- B Energy cannot be converted from one form to another.
- C Potential energy is energy in motion.
- D Kinetic energy is energy at rest.

10

What is the length of the line drawn above the **centimeter** ruler shown below?



- A 45 centimeters
- B 45 millimeters
- C 4.5 millimeters
- D 450 centimeters



Name _____ Class _____ Date _____

1 A **nuclear reactor** changes nuclear energy into _____.

- A chemical energy
- B heat energy
- C mechanical energy
- D sound energy



(B)

2 When a student **turns on** a flashlight, which of the choices below is correct?

- A Nuclear energy is changed into mechanical energy.
- B Mechanical energy is changed into potential energy.
- C Chemical energy is changed into electrical energy, then light energy.
- D Light energy is changed into kinetic energy, then mechanical energy.

(C)

3 The color of an object is a **physical property**.
True or false?

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(A)

4 In the diagram below, which statement is true about the rock **sitting** at the top of the **cliff**?

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(A)

5



(A)

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(B)

9 Which of the statements below is **scientifically** correct?

- A Energy is needed to do work.
- B Energy cannot be converted from one form to another.
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- D Kinetic energy is energy at rest.

(A)

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(B)

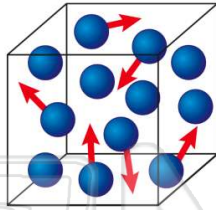


Name _____ Class _____ Date _____

1

Matter is anything that **has mass** and _____.

- A gives off heat
- B occupies space
- C freezes easily
- D gives off light



2

When a **lightbulb** is turned on, what **energy change** occurs?

- A Light energy is changed into electrical energy.
- B Electrical energy is changed into chemical energy.
- C Electrical energy is changed into light energy.
- D Chemical energy is changed into electrical energy.



3

What is the **volume** in **cubic inches** of the cube shown below?

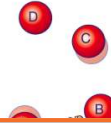
- A 25 in³
- B 15 in³
- C 50 in³
- D 125 in³



4

Which of the balls in the diagram below has the **greatest** amount of **potential energy**?

- A A
- B B
- C C



5



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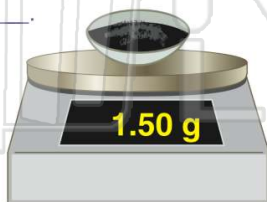
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9

To convert **grams** to **milligrams** a student would **multiply** the number of grams by _____.

- A 1
- B 5
- C 10
- D 1,000



10

What is the weight in **kilograms** of a football player that weighs **220 pounds**?

- A 220 kg
- B 22 kg
- C 100 kg
- D 110 kg

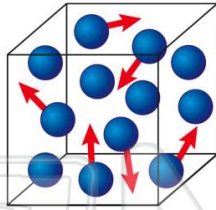




Name _____ Class _____ Date _____

1 **Matter** is anything that **has mass** and _____.

- A gives off heat
- B occupies space
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(B)

2 When a **lightbulb** is turned on, what **energy change** occurs?

- A Light energy is changed into electrical energy.
- B Electrical energy is changed into chemical energy.
- C Electrical energy is changed into light energy.
- D Chemical energy is changed into electrical energy.



(C)

3 What is the **volume** in **cubic inches** of the cube shown below?

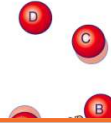
- A 25 in³
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(D)

4 Which of the balls in the diagram below has the **greatest** amount of **potential energy**?

- A A
- B B
- C C



(D)

5



(D)

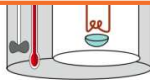
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(A)

D mechanical

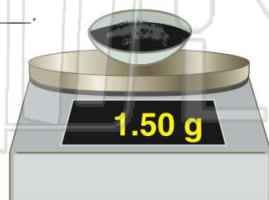


- Chemical energy.
- D Chemical energy is changed to kinetic energy.

9

To convert **grams** to **milligrams** a student would **multiply** the number of grams by _____.

- A 1
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- C 10
- D 1,000



(D)

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What is the weight in **kilograms** of a football player that weighs **220 pounds**?

- A 220 kg
- B 22 kg
- C 100 kg
- D 110 kg



(C)



Name _____ Class _____ Date _____

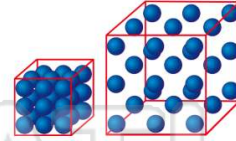
1 The making of **acid rain** from a combination of car exhaust gases and water vapor is a _____ change.

- A chemical
- B physical
- C potential
- D kinetic



2 If a student increases the **volume** of an object without changing the **mass**, the **density** of the object _____.

- A increases
- B decreases
- C stays the same
- D increases then decreases



3 A base can combine with an acid to make salt and water. This is a **chemical property**. True or false?

- A true
- B false



4 When a car burns gas, what is the **energy transformation** that makes the car move?

- A electrical to chemical
- B chemical to light



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9 Light energy is changed to **thermal energy** when _____.

- A car windows are kept closed on a sunny day
- B a flashlight is turned off
- C a refrigerator is turned on
- D a battery is used



10 Which of the following describes a **phase change** of matter?

- A a house is painted
- B an ice cube melts
- C a fan makes the air move
- D a tree is cut down





Name _____ Class _____ Date _____

1 The making of **acid rain** from a combination of car exhaust gases and water vapor is a _____ change.

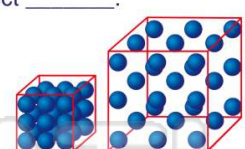
A chemical
B physical
C potential
D kinetic



(A)

2 If a student increases the **volume** of an object without changing the **mass**, the **density** of the object _____.

A increases
B decreases
C stays the same
D increases then decreases



(B)

3 A base can combine with an acid to make salt and water. This is a **chemical property**. True or false?


A true
B false



(A)

4 When a car burns gas, what is the **energy transformation** that makes the car move?

A electrical to chemical
B chemical to light



(D)

5



(C)


7

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(D)

9 Light energy is changed to **thermal energy** when _____.


A car windows are kept closed on a sunny day
B a flashlight is turned off
C a refrigerator is turned on
D a battery is used



(A)

10 Which of the following describes a **phase change** of matter?

A a house is painted
B an ice cube melts
C a fan makes the air move
D a tree is cut down



(B)



Name _____ Class _____ Date _____

Match each of the following terms to its definition:

Mass

Chemical change

Chemical property

Physical change

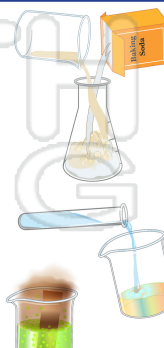
Nuclear reactor

Energy transformation

Density

Phase change

1. _____ - a change in the actual chemical makeup when one kind of substance is changed into a different kind of substance



2. _____ - a characteristic of a substance related to how it chemically reacts with other substances

3. matter



4. another

5. of matter

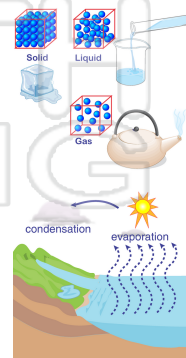
6. elements

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7. another

_____ - the conversion of one state of matter to



8. _____ - change of the size, shape or state in matter but does not change the particles that make up matter



Name _____ Class _____ Date _____

Match each of the following terms to its definition:

Mass

Chemical change

Chemical property

Physical change

Nuclear reactor

Energy transformation

Density

Phase change

1. chemical change - a change in the actual chemical makeup when one kind of substance is changed into a different kind of substance

2. chemical property - a characteristic of a substance related to how it chemically reacts with other substances

3. density - a certain

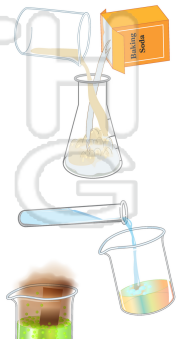
4. energy

5. mass - how much

6. nuclear - is produced

7. phase change - the conversion of one state of matter to another

8. physical change - change of the size, shape or state in matter but does not change the particles that make up matter



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