# STATES OF MATTER 7TH GRADE SCIENCE

## Lesson 4.1: Critical Reading

**Name_____ Class_____ Date_____**

***Read this passage from the text and answer the questions that follow.***

**Energy and States of Matter**

**Why do different states of matter have different properties? It's because of differences in energy at the level of atoms and molecules, the tiny particles that make up matter. Energy is the ability to cause changes in matter. Energy that causes matter to move is called kinetic energy. According to the kinetic theory of matter, the particles that make up matter have kinetic energy and are constantly moving.**

**So why don't all the particles move apart? Particles of matter of the same substance, such as the same element, are attracted to one another. This force of attraction tends to pull the particles closer together. The particles need a lot of kinetic energy to overcome the force of attraction and move apart. It's like a tug of war between opposing forces. The kinetic energy of individual particles is on one side, and the force of attraction between different particles is on the other side.**

- **In solids, particles don't have enough kinetic energy to overcome the force of attraction between them. The particles are packed closely together and cannot move around. All they can do is wiggle, or vibrate, in place. This**
- **explains why solids have a fixed volume and a fixed shape.**
- **In liquids, particles have enough kinetic energy to partly overcome the force of attraction between them. They can slide past one another but not**

pull apart. This explains why liquids can change shape but have a fixed volume.

- In gases, particles have a lot of kinetic energy. They can completely overcome the force of attraction between them and move apart. This explains why gases have neither a fixed volume nor a fixed shape.

**Questions**

1. Create a table comparing and contrasting solids, liquids, and gases.

2. Relate the kinetic theory of matter to states of matter.

# Lesson 4.1: Multiple Choice

## Name_____ Class_____ Date_____

*Circle the letter of the correct choice.*

1. What happens when matter changes state?
    a. Its chemical properties change.
    b. Its physical properties change.
    c. The energy of its particles remains the same.
    d. two of the above
2. The volume and shape of a solid could be changed by
    a. placing it in a container with a different shape.
    b. putting it in a container with a different volume.
    c. cutting or breaking it.
    d. all of the above
3. An example of an amorphous solid is
    a. candle wax.
    b. table salt.
    c. cellulose.
    d. none of the above
4. Surface tension is a force that affects
    a. gases.
    b. plasmas.
    c. solids.
    d. Liquids.
5. Which statement is true about plasma?
    a. It has a fixed volume.
    b. It has a fixed shape.
    c. It contains ions.
    d. It does not occur in nature.
6. Which state of matter has particles with the least energy?
    a. plasma
    b. gas
    c. liquid
    d. solid
7. The volume of a gas is
    a. fixed.
    b. viscous.
    c. the same as its container.
    d. equal to its mass

# Lesson 4.1: Matching

**Name_____ Class_____ Date_____**

***Match each definition with the correct term.***

**Definitions**

**_____ 1. state of matter that lacks a fixed volume and a fixed shape**

**_____ 2. state of matter with a fixed volume and a fixed shape**

**_____ 3. energy that moves matter**

**_____ 4. ability to cause changes in matter**

**_____ 5. state of matter with a fixed volume but not a fixed shape**

**_____ 6. state of matter that consists of ions**

**_____ 7. solid, liquid, gas, or plasma**

**Terms**

**a. solid**

**b. liquid**

**c. gas**

**d. plasma**

**e. kinetic energy**

**f. state of matter**

**g. energy**

## Lesson 4.1: Fill in the Blank

**Name_____ Class_____ Date_____**

***Fill in the blank with the appropriate term.***

1. **State of matter is a(n) _____ property of matter.**
2. **Water in the gaseous state is called _____.**
3. **Water in the solid state is called _____.**
4. **The force that pulls particles at the surface of a liquid toward other liquid particles is _____.**
5. **A liquid's resistance to flowing is known as _____.**
6. **The northern lights glow because of matter in the _____ state.**
7. **The particles of _____ solids are arranged in a regular repeating pattern.**

## Lesson 4.1: Critical Writing

**Name_____ Class_____ Date_____**

***Thoroughly answer the question below. Use appropriate academic vocabulary and clear and complete sentences.***

**Describe in detail the relationship between matter and energy.**

## Lesson 4.2: Critical Reading

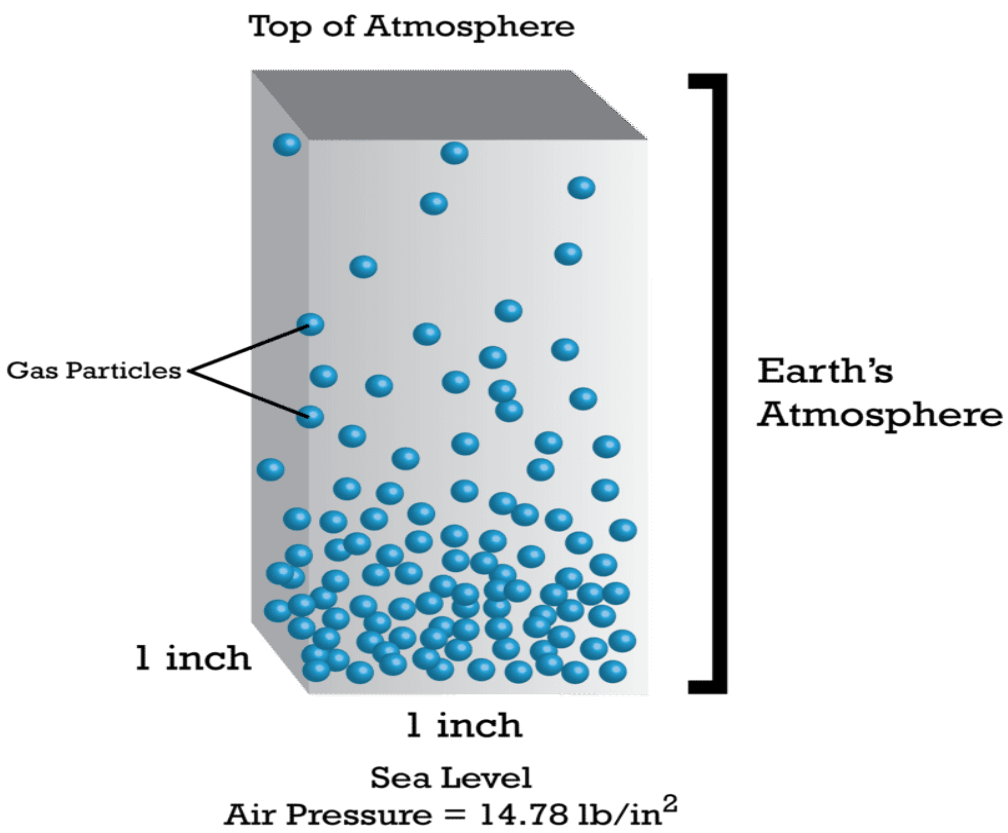
**Name_____ Class_____ Date_____**

***Read this passage from the text and answer the questions that follow.***

**What Is Pressure?**

**The molecules of a gas are constantly moving and bumping into things. The force of the particles against whatever they bump into creates pressure. Pressure is defined as the amount of force pushing against a given area. How much pressure a gas exerts depends on the amount of gas. The more gas particles there are, the greater the pressure.**

**You usually cannot feel it, but air has pressure. The gases in Earth's atmosphere exert pressure against everything they contact. The atmosphere rises high above Earth's surface and contains a huge number of individual gas particles (see diagram below). As a result, the pressure of the tower of air above a given spot on Earth's surface is substantial. If you were standing at sea level, the pressure would be 10.14 newtons per square centimeter (14.7 pounds per square inch).**




**Questions**

1. **Explain why gases exert pressure.**
2. **Describe how the pressure exerted by Earth's atmosphere changes with altitude. Explains why atmospheric pressure changes in this way.**

# Lesson 4.3: Multiple Choice

## Name_____ Class_____ Date_____

*Circle the letter of the correct choice.*

1. The process in which clouds form is
    a. sublimation.
    b. evaporation.
    c. condensation.
    d. none of the above
2. Which statement is true about changes of state?
    a. They involve energy.
    b. They cannot be undone.
    c. They involve chemical processes.
    d. They change the chemical makeup of matter..
3. Liquid water changes to ice when
    a. the water loses energy.
    b. the water gains energy.
    c. melting occurs.
    d. two of the above
4. Melting point is the temperature at which matter changes to a
    a. gas.
    b. liquid.
    c. solid.
    d. plasma.
5. The boiling point of water is
    a. 0 °C.
    b. 32 °F.
    c. 98 °F.
    d. 100 °C.
6. The bubbles in boiling water contain
    a. air.
    b. salt.
    c. liquid water.
    d. water vapor.
7. Which statement is true about evaporation?
    a. It occurs when a liquid boils.
    b. It occurs when a liquid reaches its boiling point.
    c. It happens more quickly at higher temperatures.
    d. all of the above

# Lesson 4.3: Matching

## Name_____ Class_____ Date_____

***Match each definition with the correct term.***

**Definitions**

**_____ 1. process in which a liquid changes to a gas without boiling**

**_____ 2. process in which a liquid changes to a solid**

**_____ 3. process in which a gas changes to a liquid**

**_____ 4. process in which a solid changes to a liquid**

**_____ 5. process in which a liquid boils and changes to a gas**

**_____ 6. process in which a gas changes directly to a solid**

**_____ 7. process in which a solid changes directly to a gas**

**Terms**

**a. condensation**

**b. deposition**

**c. evaporation**

**d. freezing**

**e. melting**

**f. sublimation**

**g. Vaporization**

## Lesson 4.3: Fill in the Blank

**Name_____ Class_____ Date_____**

***Fill in the blank with the appropriate term.***

1. **During a change of state _____ is either lost or gained.**
2. **_____ is the average kinetic energy of particles of matter.**
3. **The temperature at which a liquid changes to a solid is its _____.**
4. **The melting point of ice is _____ °C.**
5. **A gas condenses when it is cooled below its _____.**
6. **Changes of state are _____ changes in matter.**
7. **The process in which frost forms on a window is _____.**

## Lesson 4.3: Critical Writing

**Name_____ Class_____ Date_____**

***Thoroughly answer the question below. Use appropriate academic vocabulary and clear and complete sentences.***

**Explain how temperature of matter is related to changes of state.**