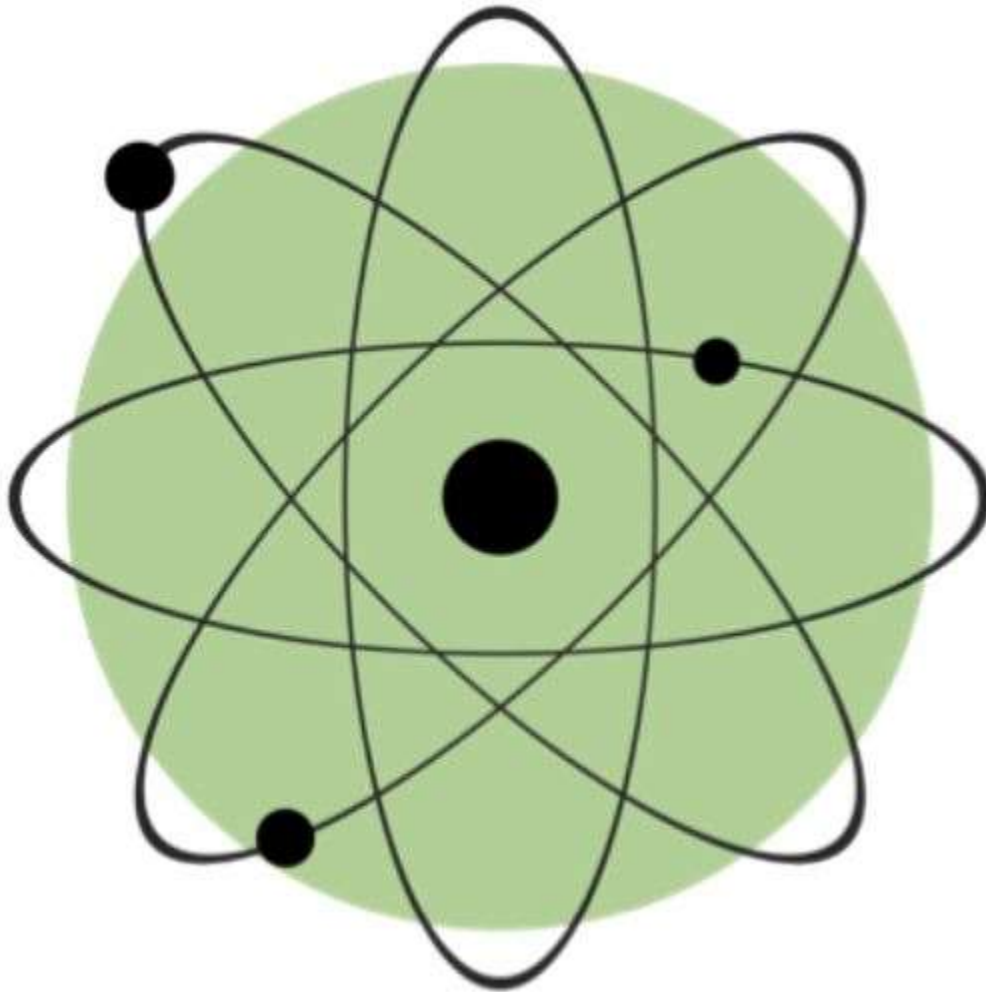


# Matter Is Everywhere!

by ReadWorks



Everything around us is made of matter-your clothes, the trees, even the water you drink! We divide matter into four major categories, which are called the four states of matter: liquid, gaseous, solid, and plasma. However, we will focus on the first three. Whatever the state of matter may be, all matter is made of tiny particles called atoms. These particles are too tiny to see with the naked eye; they're even too small to see with a regular microscope. If you line up a million atoms next to each other, they will be as thick as a single piece of human hair. So, we can only look at atoms through very powerful tools, one of them being the "scanning tunneling" microscope.

## How Do We Know?

We can easily see liquids and solids around us, but most gases aren't visible. We can't see the air around us, but it is still made of atoms that constantly move around freely in space. How can we tell?

Take a balloon, for example. When we pump air into a balloon, it visibly inflates. That means that gaseous matter is filling the balloon and taking up space. The more air we blow into the balloon, the bigger it gets. Therefore, we can observe the way gas moves around space. In the same way, inflatable pool toys also fill with air so that they can float on water. When we fill the plastic shells with air, the toys take shape. Since air is lighter than water, the pool toys can rest on the water without sinking. And then we can enjoy a sunny day while floating in a pool!

## Moving Atoms

Atoms are constantly moving. However, atoms move at different speeds within different states of matter. We have been able to determine that atoms move slower in solids than they do in liquids. That's because atoms in solids are tightly packed, and there is less space to move around freely. The atoms in gas move the fastest. Since the atoms move more freely in liquids and gases, they can undergo a process called diffusion. (Solids can diffuse as well, although it's a much longer process.) Diffusion is the movement of particles from a higher concentration to a lower concentration. That's why, when you spray perfume in a corner of a room, you will eventually smell it on the other side of the room. The atoms from the perfume diffuse through the air. Because of this diffusion, the perfume scent is spread.

## Identification

We can identify materials according to a variety of properties. Scientists have determined several different measurements to help label materials. Some examples are temperature, hardness, color and length. Usually, these are used to measure solids, like rocks and minerals. However, temperature can be used to measure liquids as well. When geologists study rocks, they often use the Mohs scale of mineral hardness. This scale allows us to characterize the scratch resistance of various minerals. A diamond is described as hard because it is extremely difficult to scratch. Scientists can measure hardness with the Mohs scale and compare minerals to other minerals.

Scientists always use various methods to group materials together-that way, it's easier to study and compare them. That's another reason why we differentiate between liquids, gases, solids and plasmas!

Name: \_\_\_\_\_ Date: \_\_\_\_\_

1. Everything around us is made of

- A. liquids
- B. matter
- C. plasma
- D. gas

2. Why does the author describe the balloon and inflatable pool toys filling up with air?

- A. in order to explain that it is impossible to observe the way gas moves around space
- B. in order to explain that air is not made of atoms that take up space
- C. in order to explain that air is made of atoms that take up space even though air is invisible
- D. in order to prove that these are fun objects to inflate

3. Atoms move slower in solids than they do in liquids. Which evidence from the passage best supports this statement?

- A. Solids, liquids, and gases can all undergo the process of diffusion.
- B. Diffusion is the movement of particles from a higher concentration to a lower concentration.
- C. The atoms in gas move the fastest.
- D. Atoms in solids are more tightly packed than atoms in liquids, so there is less space to move around freely in solids.

4. Based on the passage, the corner where a perfume is initially sprayed has

- A. has no concentration of perfume particles
- B. has the same concentration of perfume particles as the rest of the room
- C. a lower concentration of perfume particles than the other corners of the room
- D. a higher concentration of perfume particles than the other corners of the room

5. What is this passage mainly about?

- A. matter and the properties it has in certain states
- B. the process of diffusion
- C. the different measurement scientists use to label materials
- D. the inflation of balloons and pool toys

6. Read the following sentences from the passage: "Whatever the state of matter may be, all matter is made of tiny particles called atoms. These particles are too tiny to see with the naked eye; they're even too small to see with a regular microscope. If you line up a million atoms next to each other, they will be as thick as **a single piece of human hair**."

The author uses the example of "**a single piece of human hair**" to illustrate

- A. how atoms can be seen with a regular microscope
- B. how tiny atoms actually are
- C. how hairy atoms actually are
- D. how much they look like hair

7. Choose the answer that best completes the sentence below.

Scientists group materials together \_\_\_\_\_ it is easier to compare and study them that way.

- A. however
- B. but
- C. although
- D. because

**8.** Explain why atoms move at different speeds depending on whether they are in liquids or solids.

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**9.** What is diffusion?

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**10.** Explain whether smoke filling up a room is diffusion or not.

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- C. plasma
- D. gas

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A. however

B. but

C. although

**D. because**

8. Explain why atoms move at different speeds depending on whether they are in liquids or solids.

Students should indicate that the speed of the atoms is determined by the amount of space they have to move in. Atoms move slower in solids than they do in liquids. That's because atoms in solids are tightly packed and there is less space to move around freely.

9. What is diffusion?

Diffusion is the movement of particles from a higher concentration to a lower concentration.

10. Explain whether smoke filling up a room is diffusion or not.

Students should argue that smoke filling up a room is diffusion because the smoke particles are moving from an area of high concentration (the area where the smoke is coming from) to low concentration (the areas of the room the smoke is moving towards).

Name: \_\_\_\_\_ Date: \_\_\_\_\_

1. What is a meaning of the word **matter**?

- A. a piece of furniture
- B. substance, material
- C. a part of a meal

2. What is another meaning of the word **matter**?

- A. a father or mother
- B. a factory
- C. the essence

**Please use each answer choice only once. Choose the one word that best completes the sentence.**

3. The lion learned that it does not \_\_\_\_\_ how big or small your friends are.

- A. materialistic
- B. mattered
- C. material
- D. matters
- E. materials
- F. matter

4. The \_\_\_\_\_ that cover the Earth are called earth \_\_\_\_\_.

- A. materialistic
- B. mattered
- C. material
- D. matters
- E. materials
- F. matter



5. Metal is a great \_\_\_\_\_ for making pans.

- A. materialistic
- B. mattered
- C. material
- D. matters
- E. materials
- F. matter

6. For as everyone knows, in \_\_\_\_\_ that count, money always comes first.

- A. materialistic
- B. mattered
- C. material
- D. matters
- E. materials
- F. matter

7. What \_\_\_\_\_ was that they reached her.

- A. materialistic
- B. mattered
- C. material
- D. matters
- E. materials
- F. matter

8. When she begins to select male companions in her teenage years, she may show a distinct aversion to anyone who appears highly committed to \_\_\_\_\_ goals.

- A. materialistic
- B. mattered
- C. material
- D. matters
- E. materials
- F. matter

9. Please write your own sentence using the word **matter**.

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10. What would you like to remember about the meaning of the word **matter** so that you can use it when you write or speak?

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Name: \_\_\_\_\_ Date: \_\_\_\_\_

1. What is a meaning of the word **state**?

- A. a division of the United States
- B. the circumstances of a certain time
- C. a warning to others

2. What is another meaning of the word **state**?

- A. a nation
- B. a warning to others
- C. parts forming a whole

**Please use each answer choice only once. Choose the one word that best completes the sentence.**

3. Your state is only one of 50 \_\_\_\_\_ in our country.

- A. statements
- B. states
- C. interstate
- D. stated
- E. statement
- F. stating
- G. state

4. Many flags are symbols for a country or \_\_\_\_\_.

- A. statements
- B. states
- C. interstate
- D. stated
- E. statement
- F. stating
- G. state

5. Plus, hats can make a fashion \_\_\_\_\_.

- A. statements
- B. states
- C. interstate
- D. stated
- E. statement
- F. stating
- G. state

6. However, each of these \_\_\_\_\_ is false.

- A. statements
- B. states
- C. interstate
- D. stated
- E. statement
- F. stating
- G. state

7. The main idea is not \_\_\_\_\_.

- A. statements
- B. states
- C. interstate
- D. stated
- E. statement
- F. stating
- G. state

8. Most of the cars are on the \_\_\_\_\_ now.

- A. statements
- B. states
- C. interstate
- D. stated
- E. statement
- F. stating
- G. state

9. If you say that paper burns, you are \_\_\_\_\_ a fact.

- A. statements
- B. states
- C. interstate
- D. stated
- E. statement
- F. stating
- G. state

10. Please write your own sentence using the word **state**.

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11. What would you like to remember about the meaning of the word **state** so that you can use it when you write or speak?

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Name: \_\_\_\_\_ Date: \_\_\_\_\_

1. What is a meaning of the word **identify**?

- A. to associate oneself with some group
- B. make a logical or causal connection
- C. go to see a place, as for entertainment

2. What is another meaning of the word **identify**?

- A. to know as someone or something earlier seen
- B. give the name or identifying characteristics of
- C. to incline or bend from a vertical position

**Please use each answer choice only once. Choose the one word that best completes the sentence.**

3. That can help scientists \_\_\_\_\_ the mixture, or figure out what it is.

- A. identified
- B. identifies
- C. identify
- D. identification
- E. identifying
- F. identity

4. Once an organism has been \_\_\_\_\_ as an animal, it can be further classified into phylum, class order, family genus and species.

- A. identified
- B. identifies
- C. identify
- D. identification
- E. identifying
- F. identity

5. To get photo \_\_\_\_\_ may be hard to do for old or poor people.

- A. identified
- B. identifies
- C. identify
- D. identification
- E. identifying
- F. identity

6. The salmon was a very important food source for the Chinook, and it plays a large role in the Chinook sense of \_\_\_\_\_.

- A. identified
- B. identifies
- C. identify
- D. identification
- E. identifying
- F. identity

7. With each question you asked, you moved closer to \_\_\_\_\_ the animal.

- A. identified
- B. identifies
- C. identify
- D. identification
- E. identifying
- F. identity

8. It is a noun or pronoun that explains or \_\_\_\_\_ the subject of the sentence.

- A. identified
- B. identifies
- C. identify
- D. identification
- E. identifying
- F. identity



9. Please write your own sentence using the word **identify**.

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10. What would you like to remember about the meaning of the word **identify** so that you can use it when you write or speak?

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