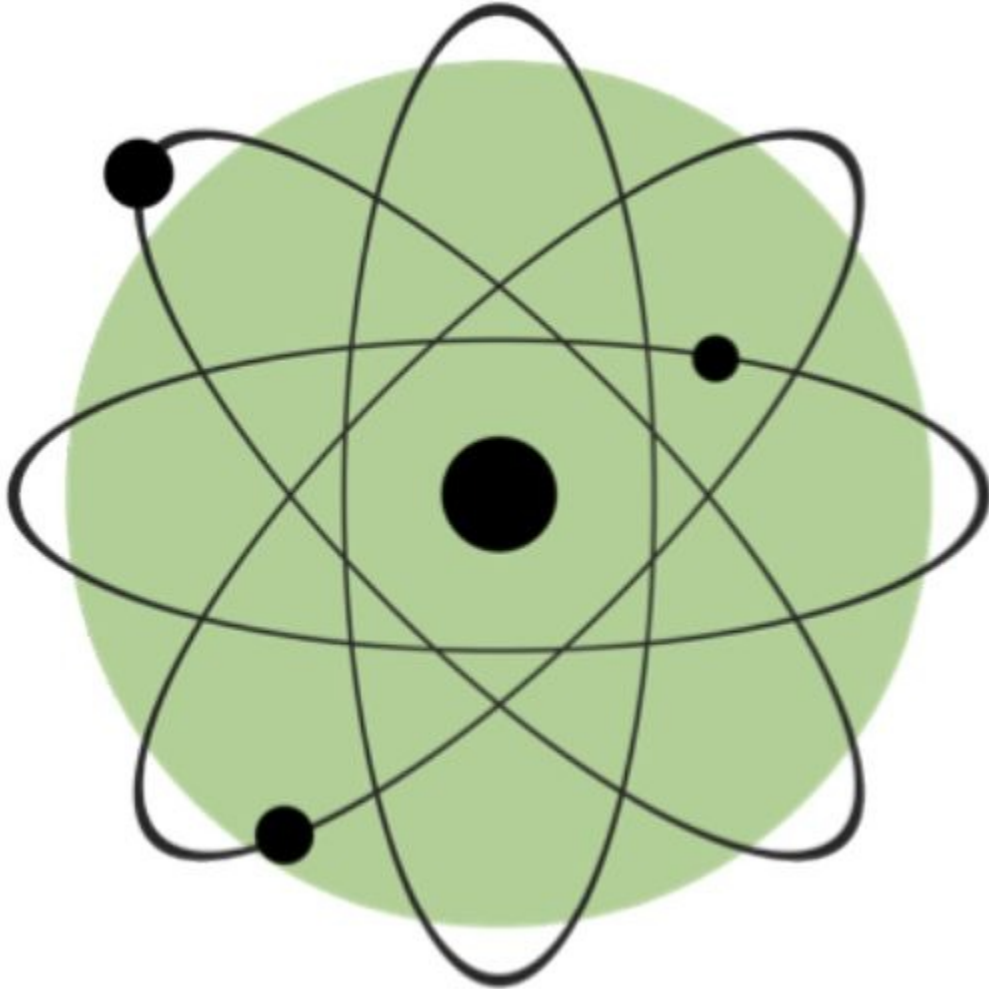


# Matter Is Everywhere!

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: \_\_\_\_\_

**Use the article "Matter Is Everywhere!" to answer questions 1 to 2.**

1. What can be identified according to a variety of properties?

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2. What are four examples of properties?

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**Use the article "Adventure on a Hot Air Balloon" to answer questions 3 to 4.**

3. The only thing Keith Rodriguez controls in his hot air balloon is altitude. How does he control the balloon's altitude?

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4. What property of propane does Rodriguez change using the burner? Support your answer with evidence from the text.

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**Use the articles "Adventure on a Hot Air Balloon" and "Matter Is Everywhere!" to answer questions 5 to 6.**

5. What is a property of matter that both texts address?

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6. Come up with a definition of "property" that works for both texts.

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