

## MATTER AND ITS PROPERTIES

Everything around us is made out **matter**.

**Matter** is anything that takes up space and has mass.

All **matter** is made up of many different kinds of particles that are combined together in different ways.

### Lesson Checkpoint: What is matter?

An **atom** is the basic building block of matter that make up all objects. It is the tiniest particle of any element. An **element** is matter that is made up of one type of particle. Scientists have identified over 100 elements in nature, which are labeled on the Periodic Table of Elements. Some elements are copper, calcium, and uranium.

### States of Matter

There are three states of matter.

**Solid** matter has a definite shape and volume. A solid is like a rock. A solid is made up of particles that are packed closely together.

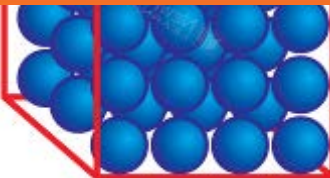
The shape of a solid is fixed. The volume of a solid is constant.



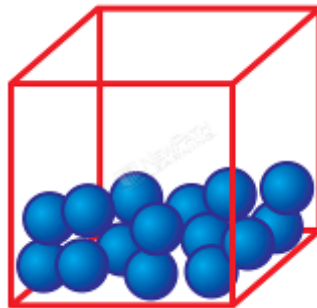
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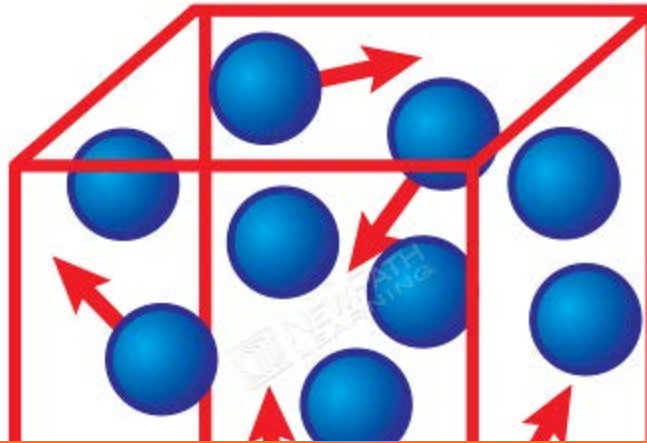


A second state of matter is **liquid**. A liquid is matter in which the particles are close together, but not as close as in a solid.



Liquids do NOT keep the same shape. Liquids take the shape of whatever container holds it. An example of a liquid is water.

A third state of matter is **gas**. A gas is matter in which its particles are very far apart.



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Gas, like the atmosphere, is all around us. There is a layer of gas that surrounds Earth, which is called the atmosphere. An example of a gas is oxygen, which we need to breathe in order to survive.

### ***Lesson Checkpoint: What are the three states of matter?***

#### **Properties of Matter**

A **property** of **matter** is a feature, trait, or characteristic. Matter can have many different properties. **Properties** are used to describe an object.

Some properties of matter can be measured using tools such as a balance to measure an object's **mass** and a graduated cylinder to measure the **volume** of liquids. Scientists most often use **metric** measurements when measuring matter.

**Density** is a property of **matter** that tells how much matter fits into a certain space. **Buoyancy** is also a property of matter. **Buoyancy** is whether an object sinks or floats in water.

A **property** of an item may also be its hardness, like a brick. Size is also a property of **matter**. The size of something has to do with how big, small, wide, or thin something is. The size of an object can be measured using the **metric units** millimeters (mm), centimeters (cm), and meters (m). For long distances the metric unit of kilometers (km) can be used.

### *Lesson Checkpoint: What is one property of matter?*

**Volume** is the amount of space **matter** takes up.

**Solids, liquids, and gases** all have volume.



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**Mass** is how much matter an object has. It is not to be confused with weight. **Mass** is the same no matter if it is on Earth or on the moon. An object's weight is different on the moon than it is on Earth because of gravity.

### *Lesson Checkpoint: What is mass?*