Matter and Energy: What is matter?

By Encyclopaedia Britannica, adapted by Newsela staff on 03.30.17
Word Count **486**
Level **550L**

This photo of John Muir Glacier in Alaska shows two of the three main states of matter: solid (the ice and rock) and liquid (the water). Photo from: Wikimedia Commons.

A grain of sand and an elephant both have one thing in common: They are made of matter. Anything that takes up space is called matter. This includes air, water, rocks and even people.

Different types of matter can be described by their mass. The mass of an object is the amount of material inside it. For example, a bowling bowl and a beach ball can be the same size. But the bowling bowl has more mass. That is why it is so much heavier.

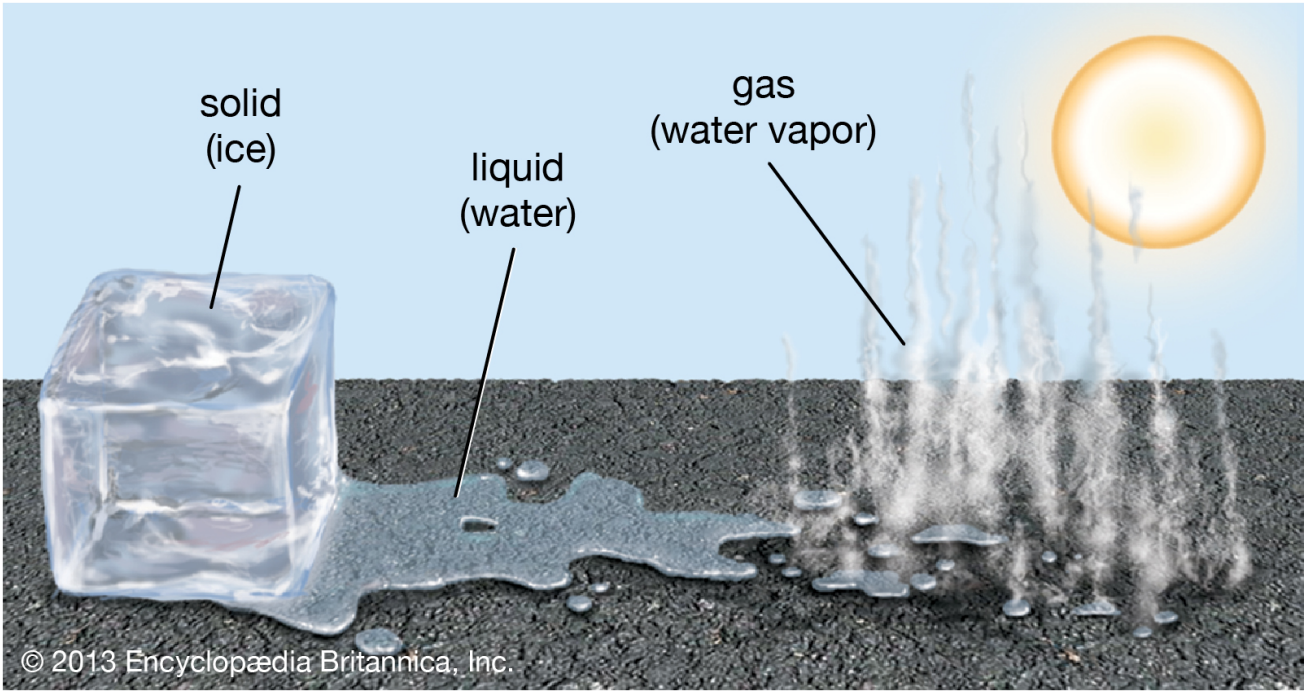
Different Forms Of Matter

Matter exists in several different forms. These different forms are called states. The three most familiar states are solid, liquid and gas.

Rocks, books and balls are examples of solids. Matter that is solid has a set size and shape. These do not change easily. For example, someone can move a book from one place to another. But this does not change the size or shape of the book.

Milk, orange juice and water are examples of liquids. Matter that is liquid has a set size. But its shape depends on its container. For example, milk has one shape inside a bottle. It has a different shape inside a glass.

The air inside a balloon is an example of a gas. Matter that is gas does not have a set size. It does not have a set shape either. Gas can spread out to fill a large container. It can also squeeze inside a small container.



Matter can change from one state to another. This happens when it is cooled or heated to a certain temperature.

Heat causes liquid water to evaporate. This turns the liquid water into water vapor. Water vapor is a gas. For water to evaporate, it has to reach a certain temperature. This is called its boiling point.

When water vapor cools, it turns back into a liquid. If it gets cold enough, liquid water will freeze. Then it becomes solid ice. To become ice, water has to reach a certain temperature. This is called its freezing point.

How Can Matter Change?

All matter has physical properties. These are things like color, amount and temperature. They can be measured without changing the matter.

All matter also has chemical properties. They tell how matter can change. For example, wood burns to ashes when it touches fire. Burning is called a chemical reaction. Chemical reactions change matter into new types of matter.