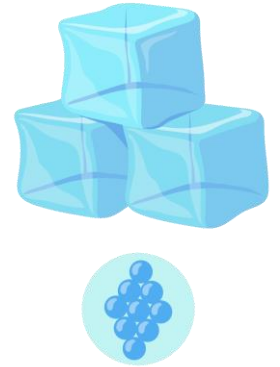


States of Matter

Matter is all around us - it's everything we can see and touch. Matter is an essential part of our physical world, and it can exist in three main states: solid, liquid, gas. There are a number of observable differences that allow us to tell the difference between these states.

Solids

Solid state of matter is a form of matter which has a fixed volume and shape. It is the most common state in which matter exists on the Earth. The particles that make up solid state matter are closely packed together, meaning they cannot move freely or easily like particles in other physical states. This causes a solid to hold its shape. One example of solid matter is an ice cube – it keeps its shape inside the freezer.



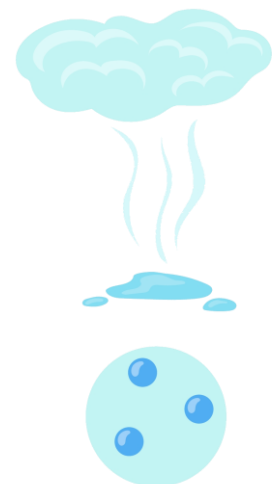
Liquids

The second state of matter is liquid. This state is characterized by its ability to take the shape of its container, unlike solids which keep their own shape. Liquids have no fixed shape. Liquids flow around the sides of the container and when you tilt it, the liquid moves with it. This is because they are made up of tiny particles that have enough energy to move around freely, but not enough energy to escape from each other's gravitational pull. While liquids don't have a set shape, they do have a definite volume. Two examples of liquids are water and honey.

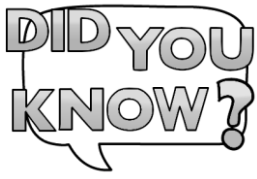


Gases

Gas is another of the fundamental states of matter. Gases differ from solids and liquids in that they have an indefinite shape and indefinite volume. Gases expand to fill the space available to them, making them extremely versatile. They are less dense than liquid or solid forms of matter. The gaseous state of matter is made up of atoms and molecules which move around freely at high speeds. This movement allows gases to mix easily with each other as well as other substances, creating a wide variety of mixtures and compounds. Steam is an example of a gas.



States of Matter



Plasma is a fourth state of matter. While plasma is not very common on Earth, it makes up 99% of all visible matter in the universe. Plasma is found in stars and other celestial bodies. Plasma consists of ions and free electrons that are suspended in an electromagnetic field; it is usually generated by heating neutral gas or by applying a high electric field. Plasma has some unique properties not seen in any other state of matter. For example, due to its ionic nature, plasma has the ability to conduct electricity easily, making it useful for many industrial applications such as welding and plasma cutting.

Changing State

Heat energy plays an important role in changing states of matter from solid to liquid to gas. When heat energy is added to matter, the particles inside the matter start to move faster and further apart.

When heat energy is applied to a solid, the particles inside it move around more quickly and the solid starts to melt into a liquid. When even more heat energy is added, the particles move even further away from each other until they become so far apart that they form gases like water vapor.

Take ice cubes as an example. If you were to put ice cubes in a pot on the kitchen bench, they will slowly melt as they absorb heat from their surroundings. If we add enough heat to the pot, the water will eventually boil. This means the particles become get so energetic that they escape off into the air and turn into steam. Steam is made up of tiny little drops of water that are floating around in the air, just like fog or clouds.



Cooling down materials works in reverse - as particles slow down again and come closer together, liquids turn back into solids and gases into liquids!

Conclusion

The three states of matter are all around us. They are essential to our everyday lives, from boiling water for coffee, to floating clouds in the sky. Each state has its own unique properties that make it special and allow it to interact with other objects in different ways.

States of Matter Questions

1. What causes a solid to have a fixed shape?

2. In which state of matter do the particles move at high speeds?

3. Which state of matter has a fixed volume but no fixed shape?

4. Which is the most common state of matter in the universe?

5. How do the images on Page 1 help the reader better understand the text?

6. What happens to the particles in matter when heat is added?

7. List some items in your fridge at home and write down the state of matter of each.

8. Give two of your own examples of when someone might change matter from one state to another.

a.

b.
