Science

Year 6

States of Matter

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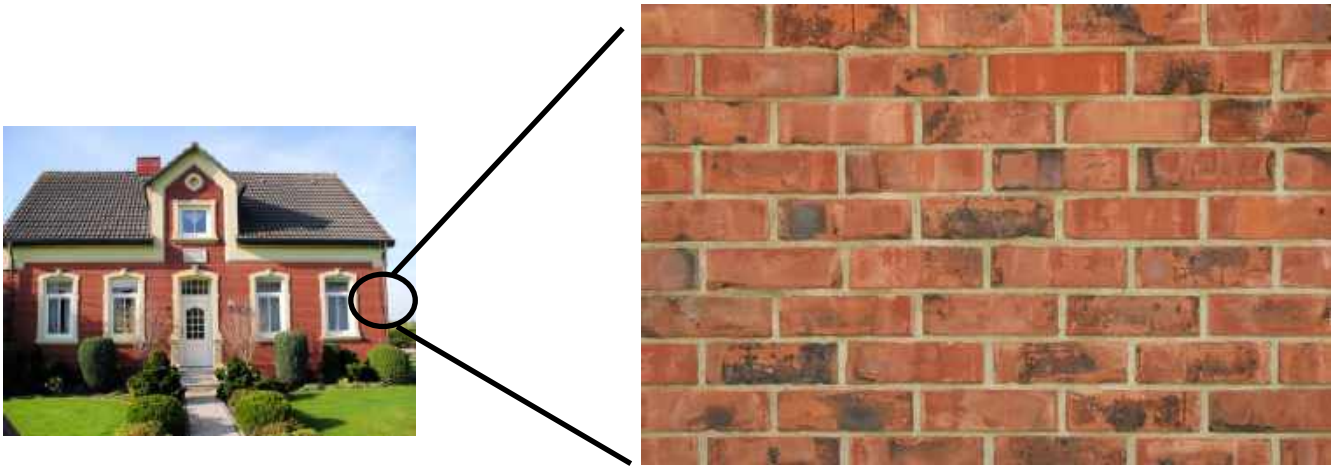
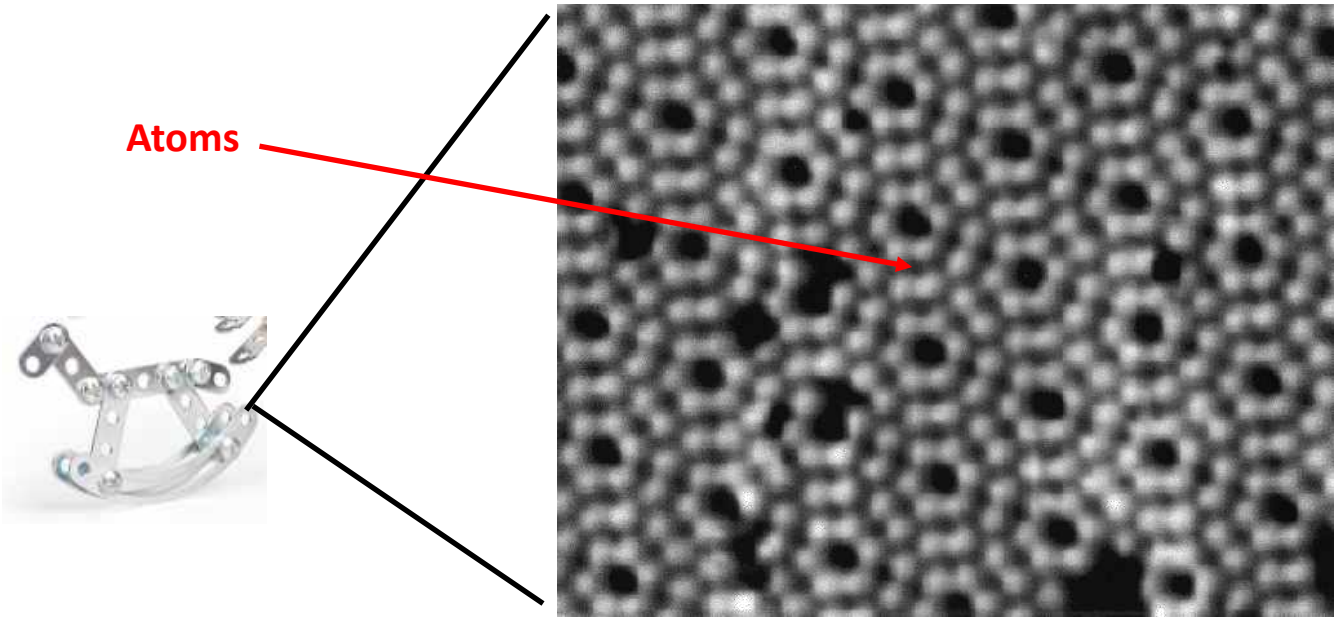
What is Matter: All things around us are made up from matter (The word Materials comes from the word Matter). Examples of matter are: rock, soil, metal, wood, water, oil, milk, ink, air, smoke, perfume and cooking gas.

Atoms: When we look at a house from a distance, we see it as a whole object. But if we look at it from a closer distance the house is made up from smaller single bricks.



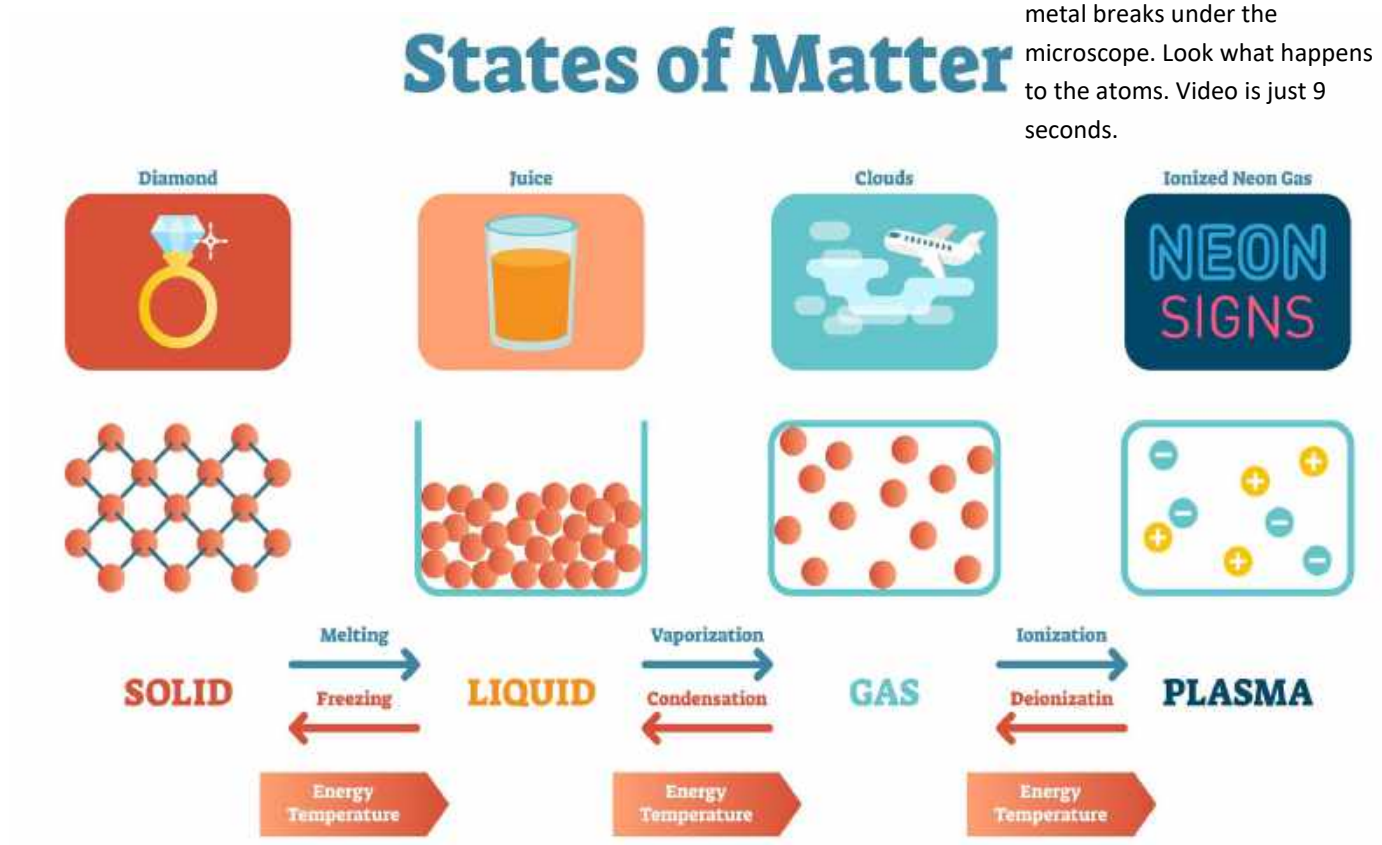
The same thing can be said for matter. If we look closely to matter, it is made up from small tiny particles called atoms. These particles are so small that to see a glimpse of them a special microscope is required. Atoms are the building blocks of matter.

Press red Icon to watch Video 1: This video give a general view for this topic.



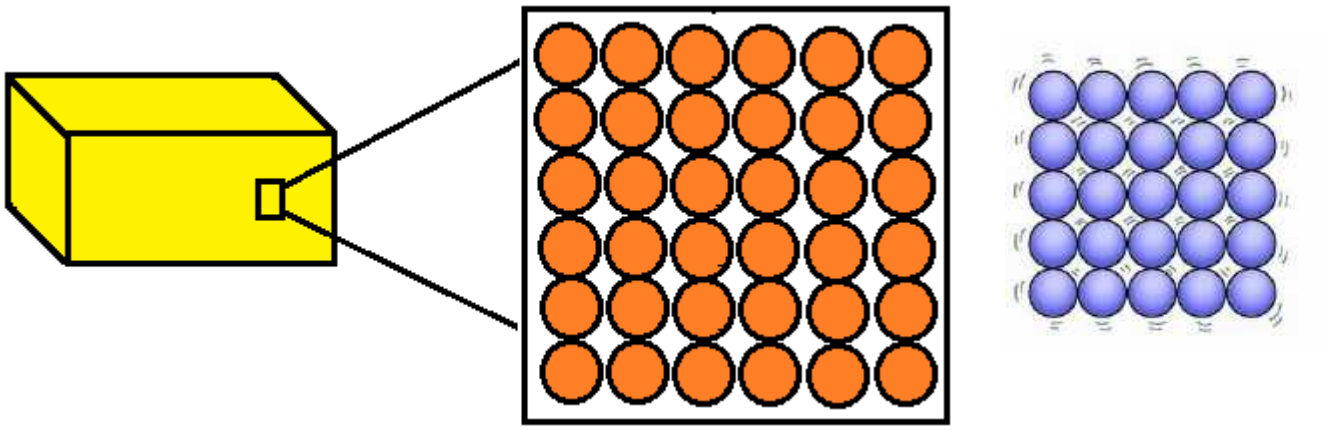
Atoms of a metal toy seen under a special microscope. These are very small, so small that in 1mm^2 we can fit 4,000,000,000,000 atoms!

Press blue Icon to watch Video 2: This video shows how a piece of metal breaks under the microscope. Look what happens to the atoms. Video is just 9 seconds.



There are four states of matter: Solid, liquid, gas and plasma. In the primary years we are going to cover the first three. You will learn about Plasma if you continue to study science at a higher level.

Solid State

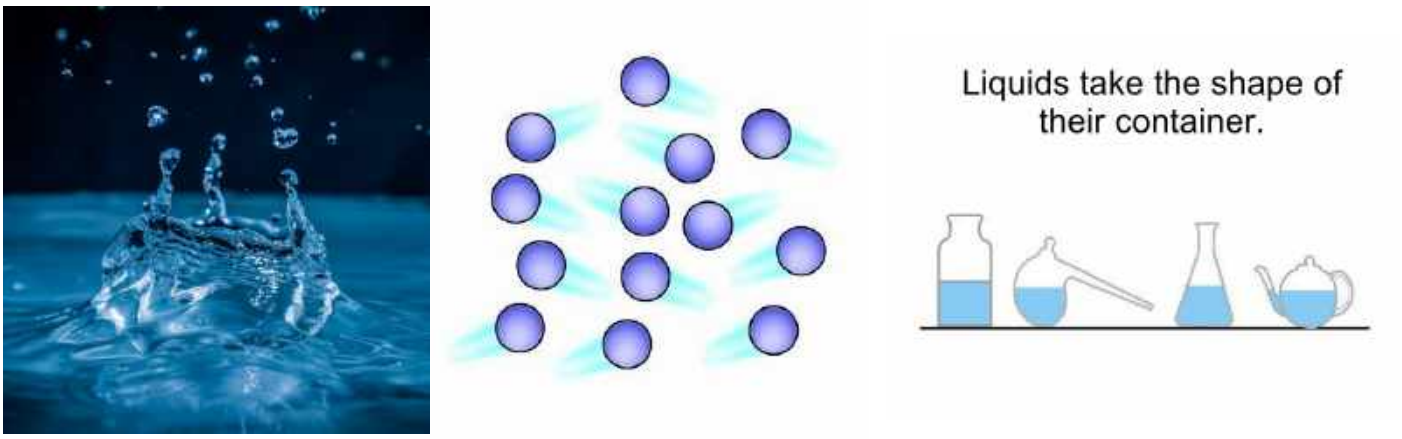


In a solid state the atoms (particles) are tightly packed together.

For this reason solid have a fixed shape.

Press green Icon to watch Video 3: This video further explains the concepts outlined here.

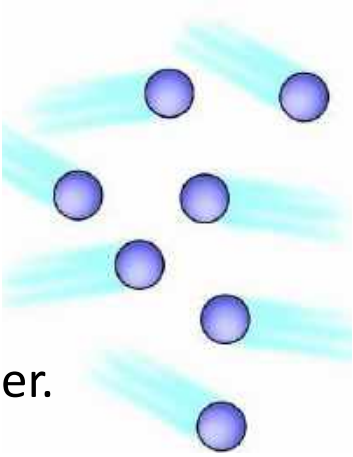
Liquid State



In a liquid state the atoms (particles) are less packed together.

For this reason liquids does not have fixed shape but can take the shape of the container. Liquids can flow and be poured.

Gas State



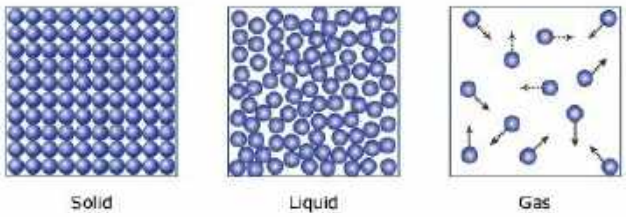
Particles (atoms) in gases are very spaced and they can move freely.

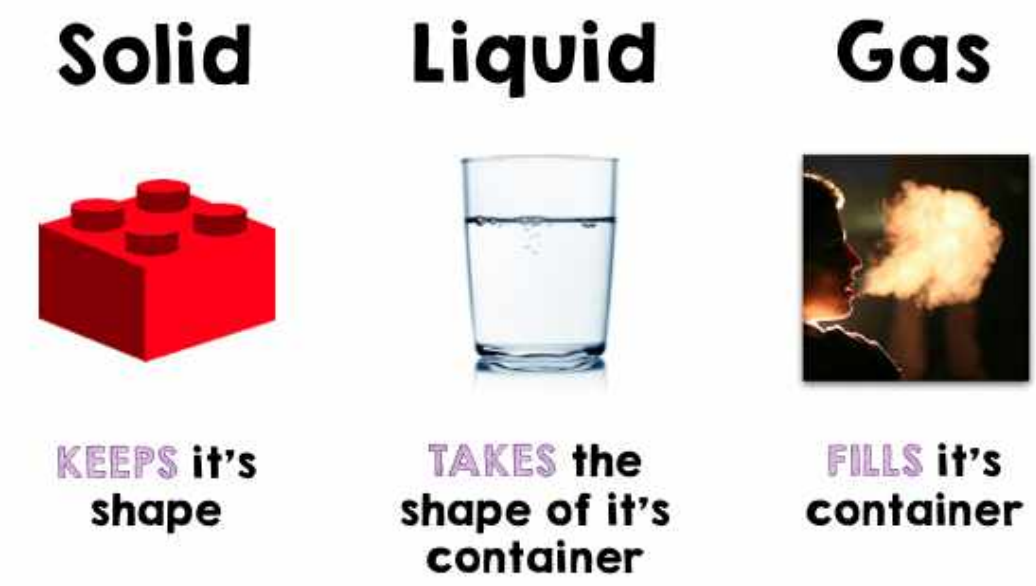
For this reason, gases fill in all the container.

Gases can diffuse (spread easily).

Gas spread and fill-in the container. In this case the container is planet Earth.

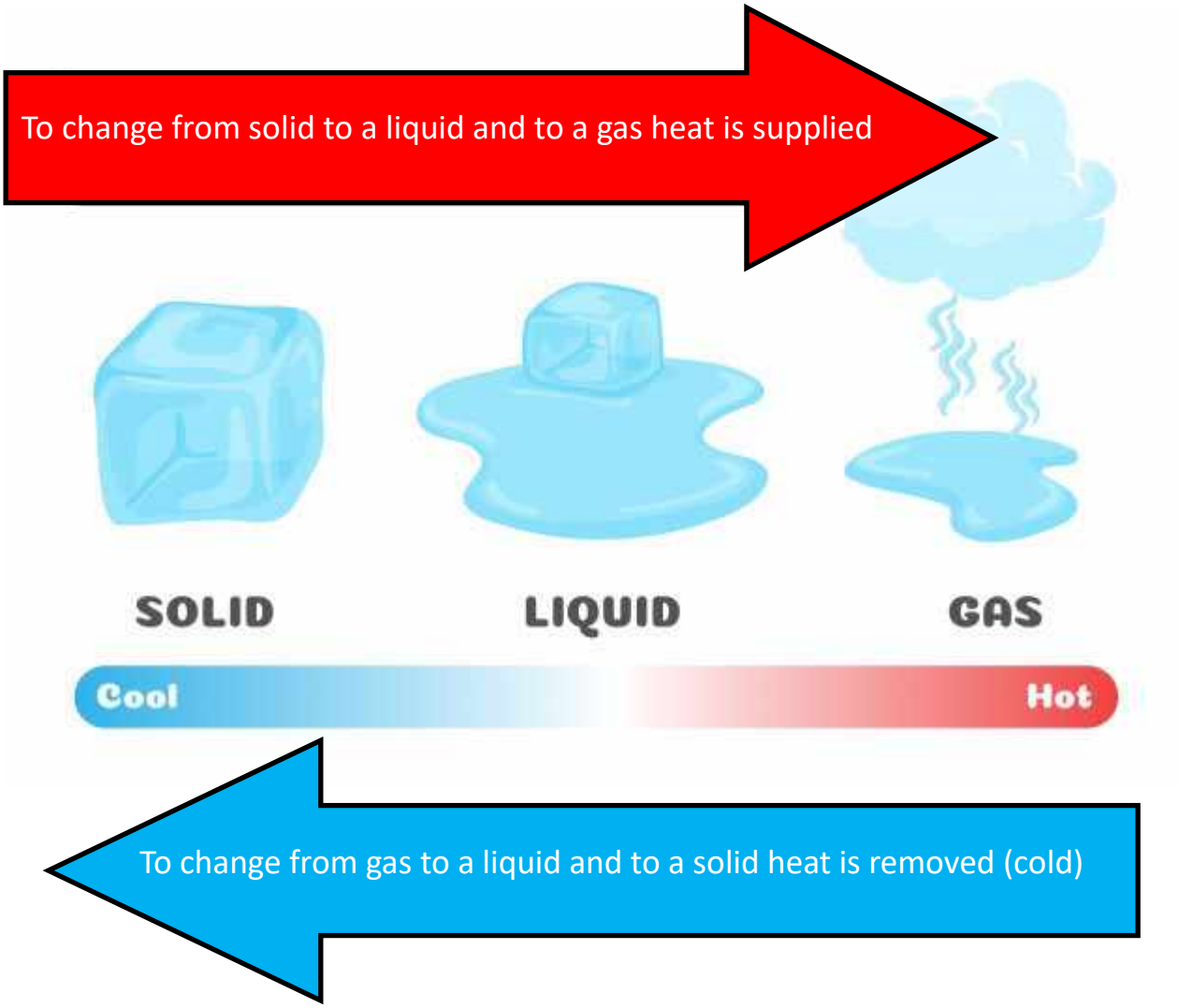
Press blue Icon watch Video 4: This video explains the properties of solid, liquid and gases.





Change of State

Matter can change its state. From solid it can be changed to a liquid and to a gas. For example ice (a solid) can change to water (liquid) and to steam (gas). Heat is needed to change from solid to a liquid and liquid to a gas. To change the other way around from gas to a liquid and to a solid heat must be removed (make it colder).

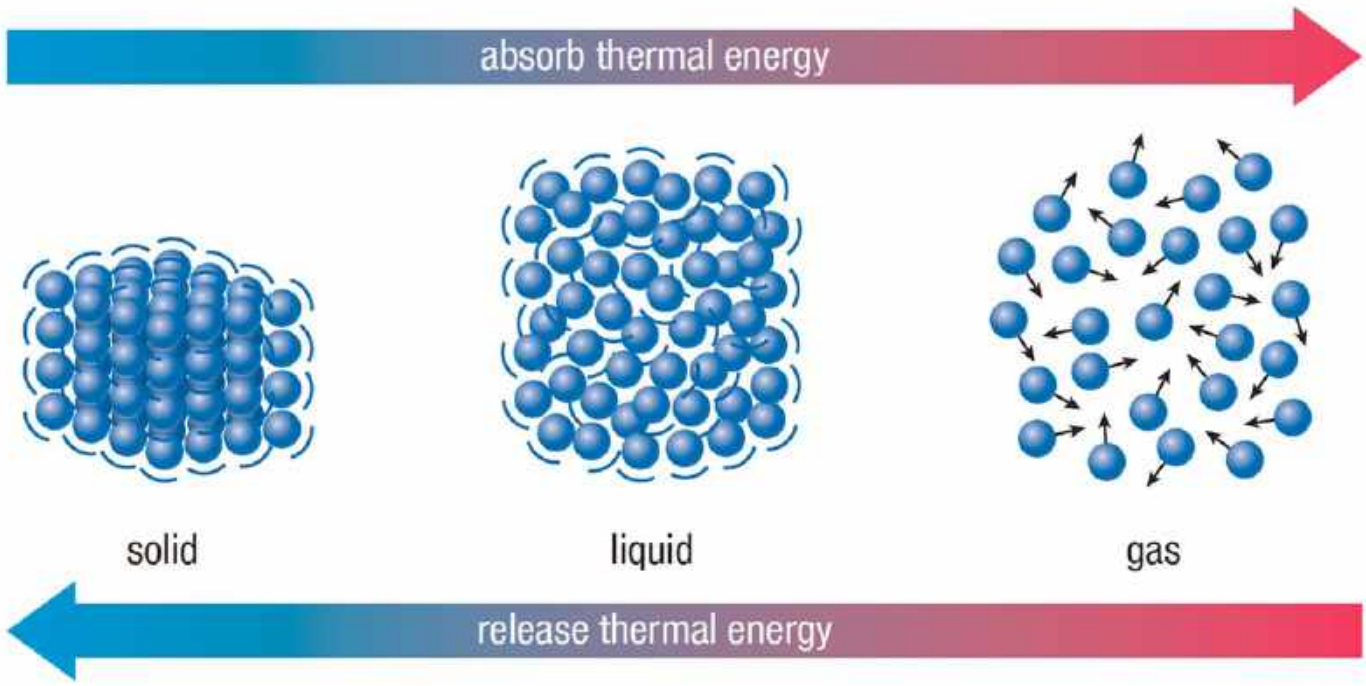


When heat is added

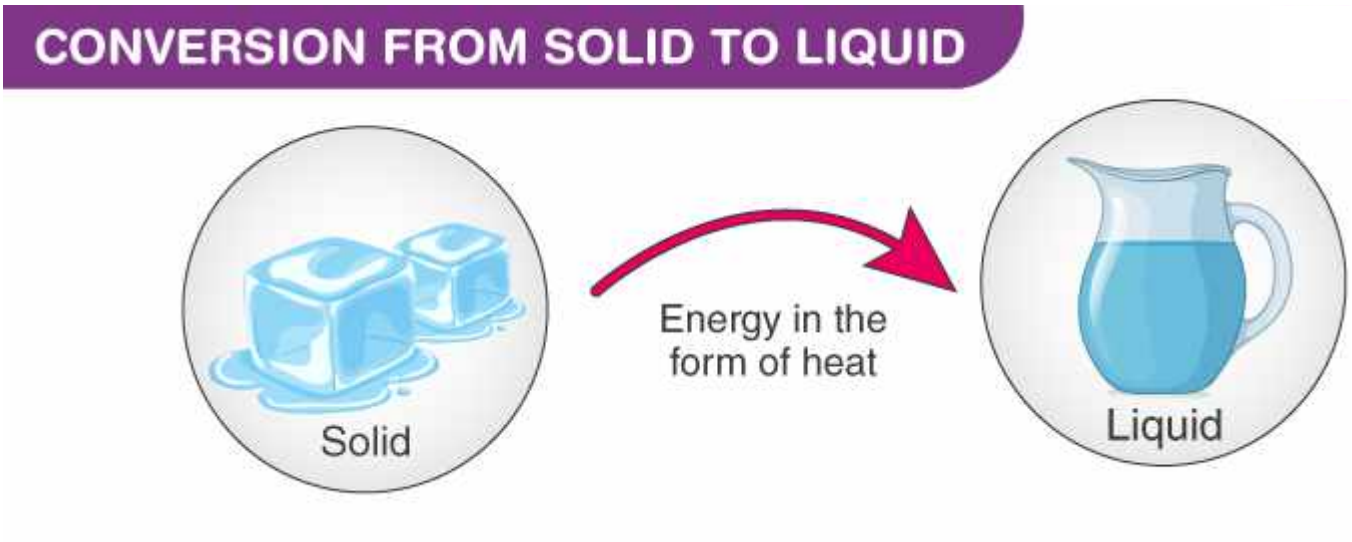
Solid —> Liquid —> Gas

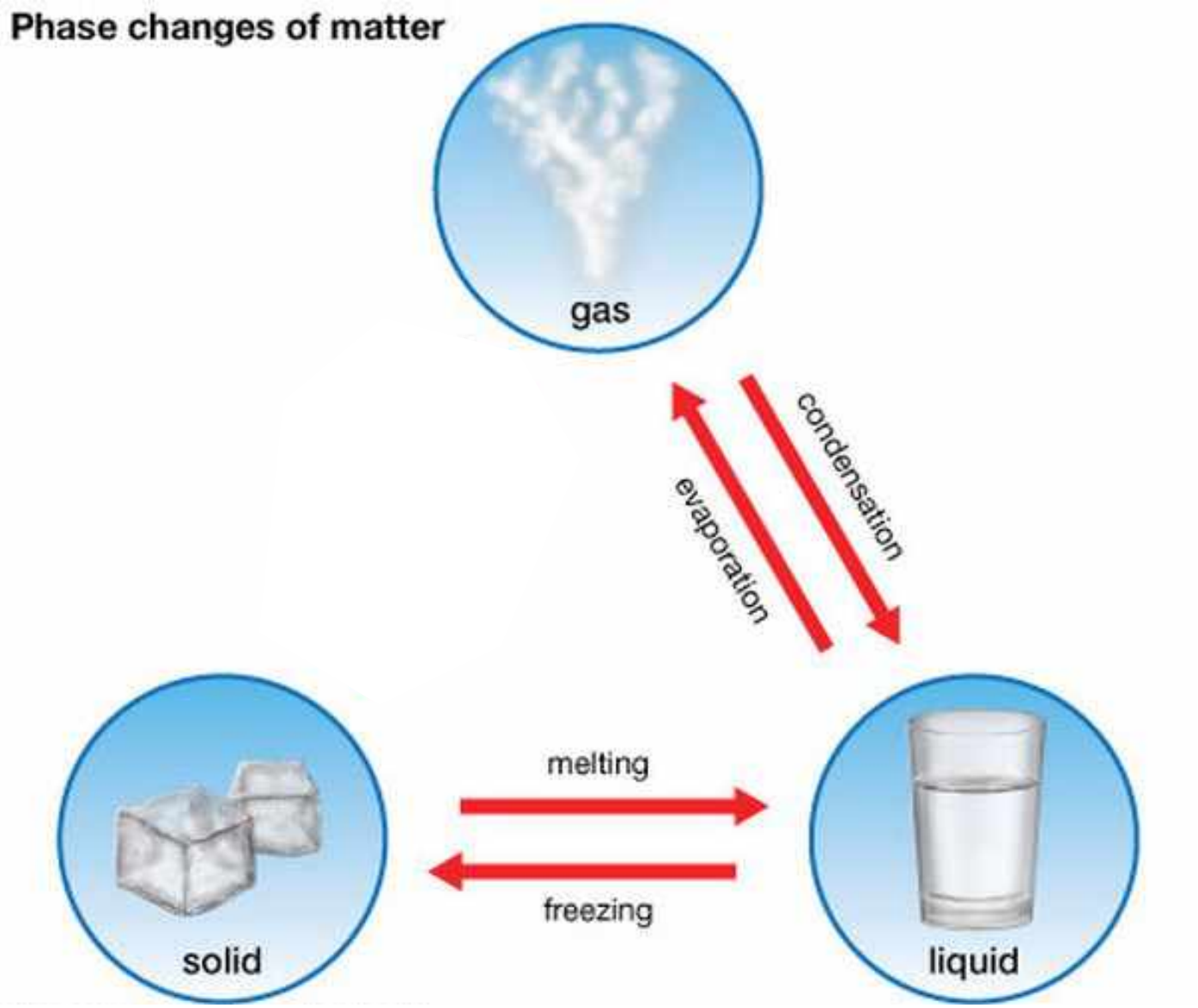
When heat is taken (get colder)

Solid <— Liquid <— Gas



Melting point is the temperature when a substance changes its state from a solid to liquid.





Changing from solid to liquid is called Melting.

Changing back from liquid to solid is called Freezing.

Changing from liquid to gas is called Evaporation.

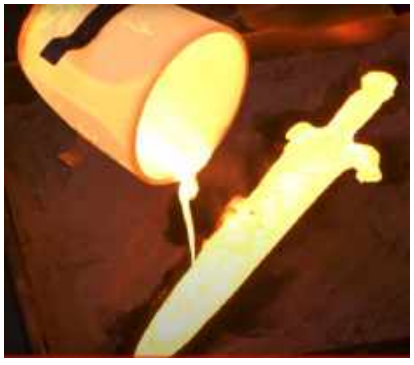
Changing back from gas to liquid is called Condensation.

Examples

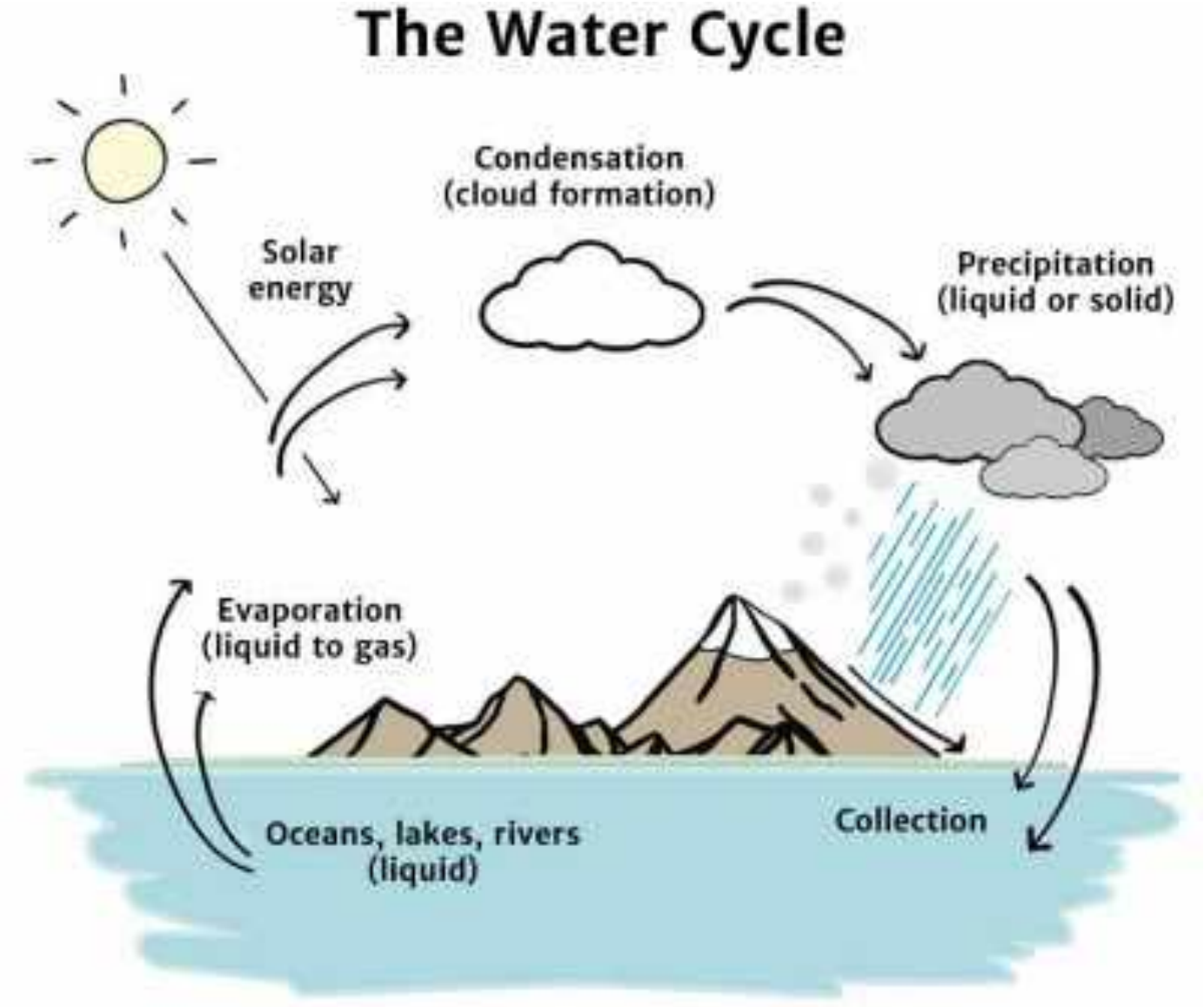
In volcanoes rock is heated and becomes liquid. It is called lava.

Water to steam

Metal can be melted into liquid by heat.



The metal is poured into a sword mold shape. Liquids take the shape of the container and when the metal cools it becomes solid again as a metal sword.



The water cycle is an example of changes in states of matter.

Experiment to try

Experiment to try

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Some experiments need help from adult supervision.