

Phases of Matter

YEAR FOUR

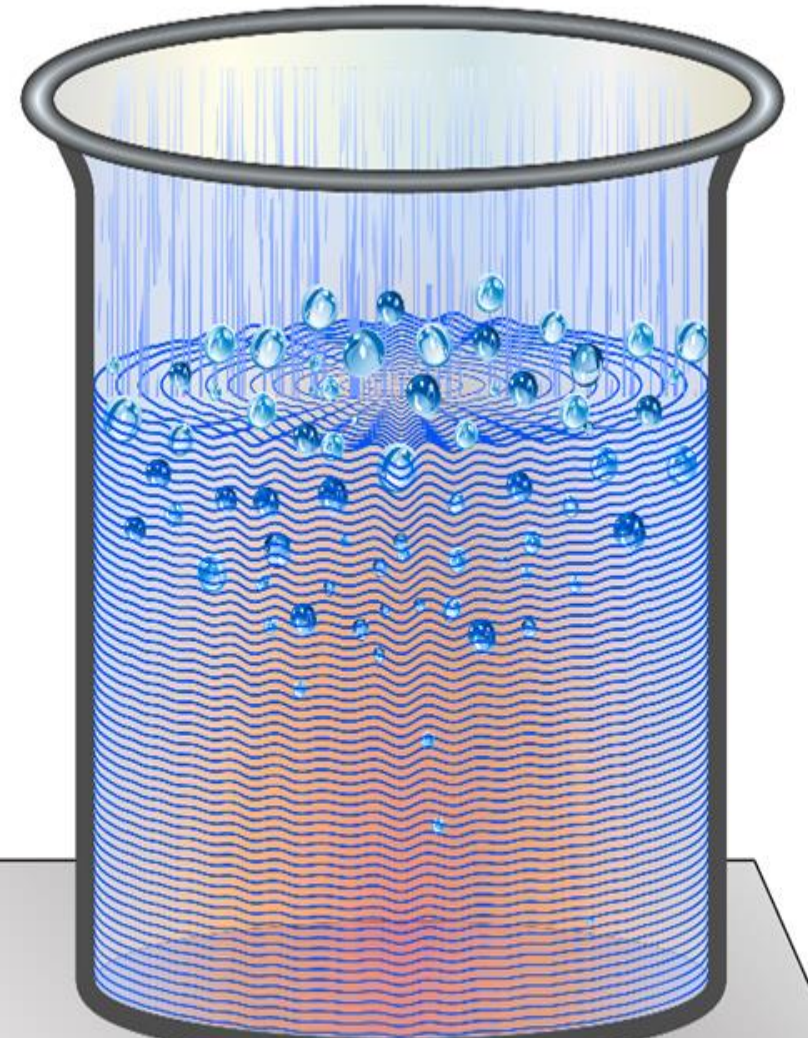
SPRING 1



Ice



Water



Water vapour

LESSON TWO

*How are particles arranged in solids,
liquids and gases?*

Do Now – Retrieval practice

a) Fill in the gaps below to complete the definitions of each property:

Compressibility – this property is whether a substance can be _____
into a smaller _____ or whether it has a _____ volume.

Ability to flow – can the substance _____ slide from one
_____ into another.

Fixed or changing shape – substances may have a fixed _____, may
_____ their shape to fit in the bottom of a _____ or always fill up
the _____ container.

b) Say whether each of the following are solid, liquid or gas?

a) I can be compressed and I fill whichever container I am in. What am I?

b) I am not compressible and I have a fixed shape. What am I?

c) I take the shape of the bottom of the container I am in. What am I?

From last year:

Match up the words below with the right definition:

Independent variable ...

...the thing you observe or
measure to see
how it is affected

Dependent variable ...

... the things you have to keep the
same to make sure it is a fair test

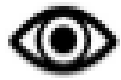
Control variables...

... the thing that you change

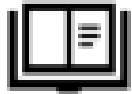


Watch the [video](#) and fill in the gaps below:

- Matter is anything that has w_____ and takes up s_____
- All matter is made out of very, very s_____ things called p_____
- Particles in a s_____ are packed so tightly that they don't move
- Particles in a l_____ have some s_____ between them
- There is a lot of s_____ between particles in a g_____



Watch the [video](#) and discuss with a partner what happened to the particles in solids, liquids and gases



Read the following passage about particles:

The discovery that all matter is made from particles first came from scientists observing sand. Sand is made from very small grains of solid and it appears to act as a liquid. Sand seems to be able to flow and takes up the shape of the bottom of any container it is in.

This helped scientists to understand that all liquids must be made of tiny parts called 'particles' which we think of as tiny balls. If liquids can become solid or gas then all matter must be made from particles.

To make the properties we observed in lesson 1, then particles must be arranged in the following ways in each state of matter:

Solid

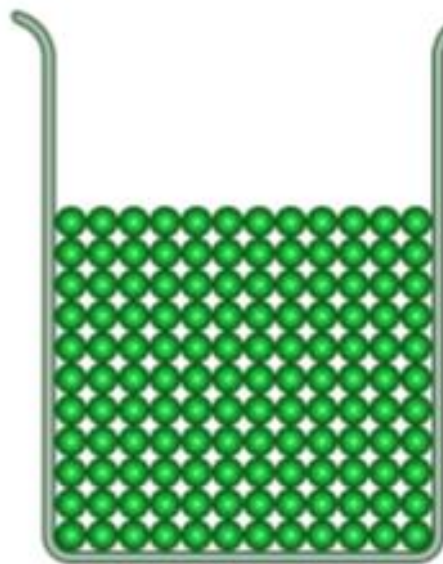
- Particles are very close together
- In a regular pattern
- Particles cannot move but can vibrate

Liquid

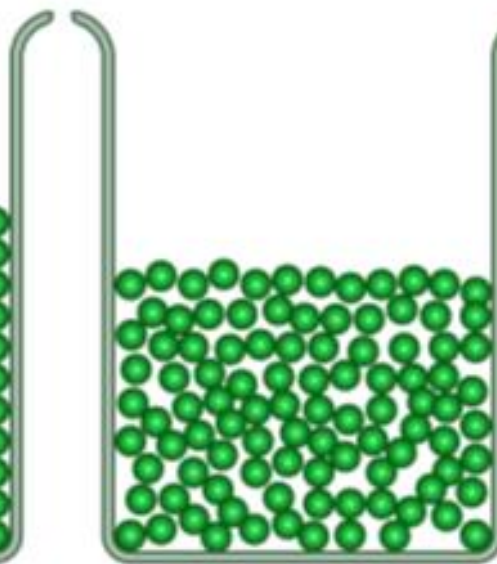
- Particles are close together
- In a random arrangement
- Particles can slide past each other

Gas

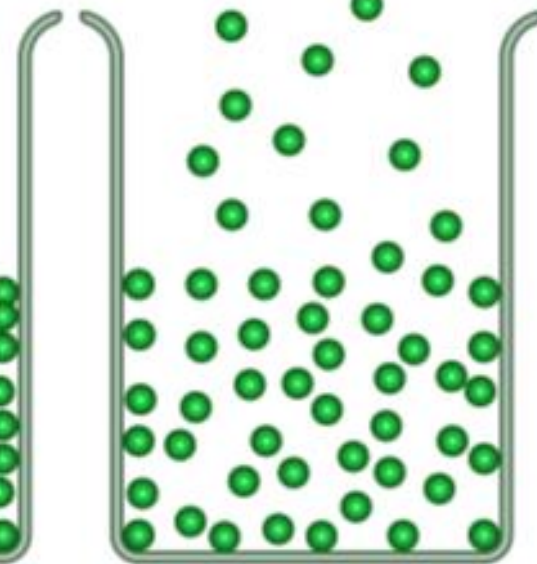
- Particles are far apart from each other
- In a random arrangement
- Moving constantly in all direction



Solid



Liquid



Gas



Find answers to the questions below in the passage above

1. Which substance helped scientists understand that all substances must be made from particles?

2. Draw lines to match the description to the correct state of matter.

Solid	- Particles are <u>very</u> close together
Liquid	- Particles are far apart from each other
Gas	- Particles are close together

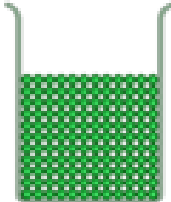
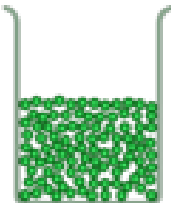
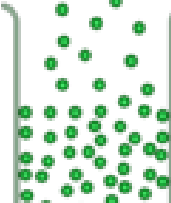
Solid	- Particles can slide past each other
Liquid	- Particles are moving constantly in all directions
Gas	- Particles cannot move but can vibrate



Watch the [video](#) and discuss with partner – how can tell that particles in gases and liquids are moving all the time?

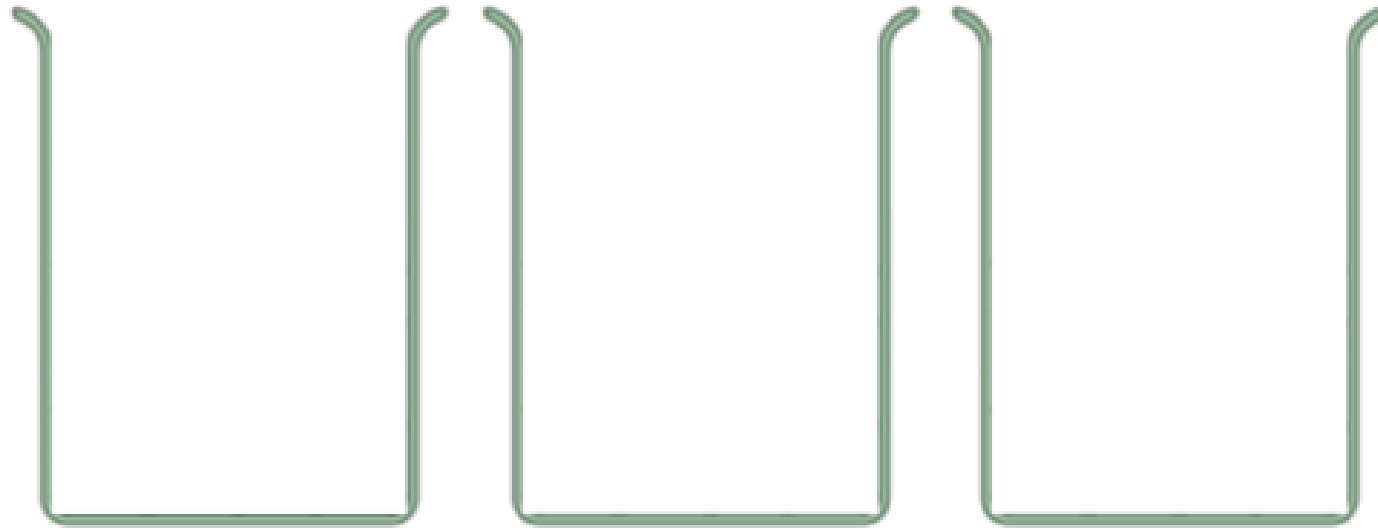


You are going to act out particles in a solid, liquid and a gas in groups. How could you show each of the following in a group of 4-5 students:

State of matter	How can you show how the particles behave?
<p data-bbox="456 391 550 429">Solid</p> 	<ul style="list-style-type: none">- _____- _____- _____
<p data-bbox="456 708 575 746">Liquid</p> 	<ul style="list-style-type: none">- _____- _____- _____
<p data-bbox="456 1025 542 1063">Gas</p> 	<ul style="list-style-type: none">- _____- _____- _____



The way that particles are arranged explains the properties of each state of matter. Draw the particles in each container to match their state:



Solid

Liquid

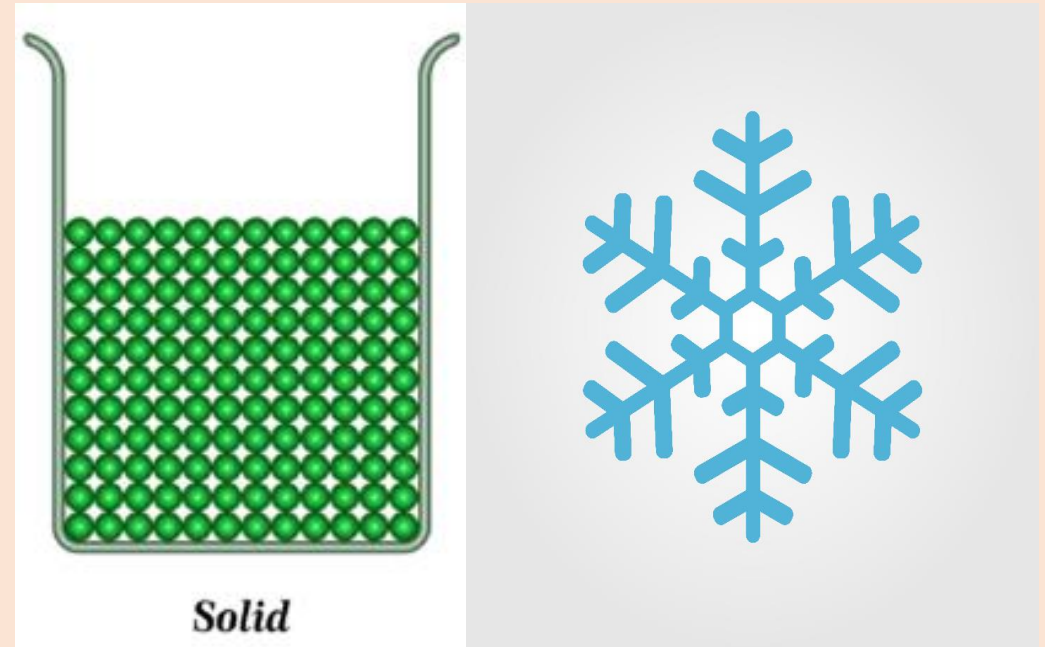
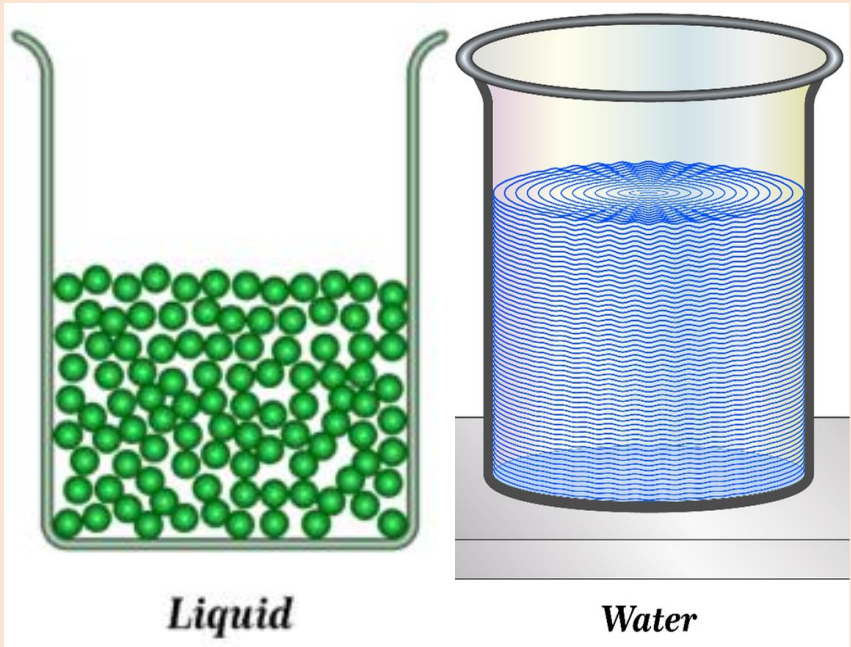
Gas



How are the particles arranged in a glass of water? How are they arranged in snow?



How are the particles arranged in a glass of water? How are they arranged in snow?



Phases of Matter

YEAR FOUR

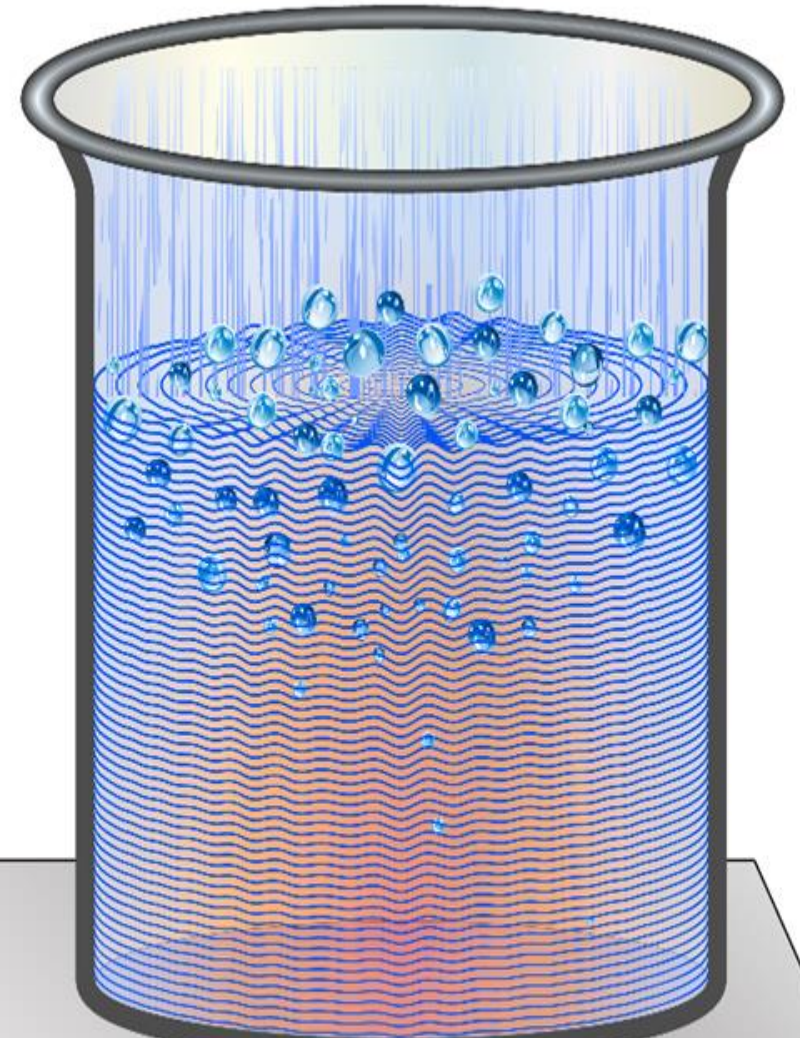
SPRING 1



Ice



Water



Water vapour