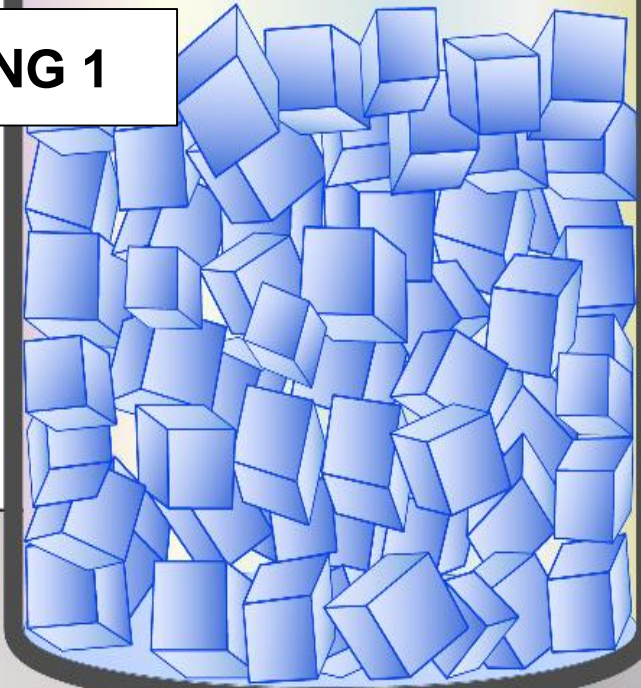


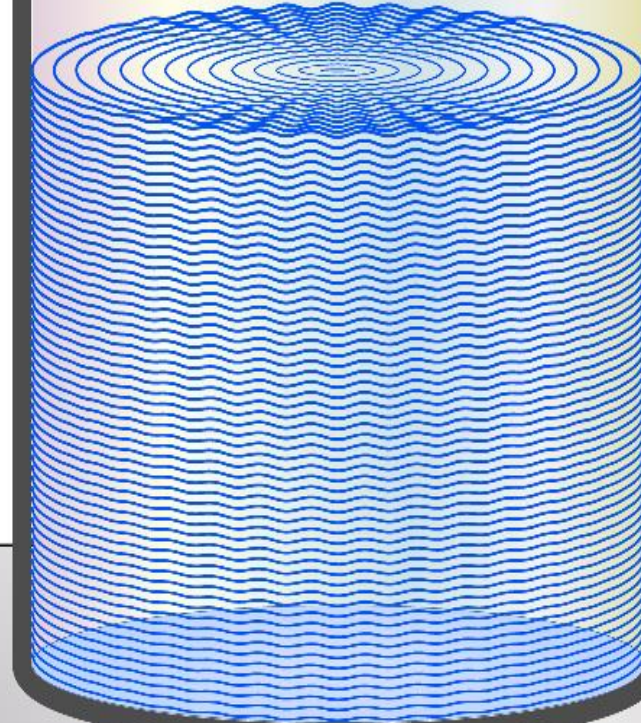
Phases of Matter

YEAR FOUR

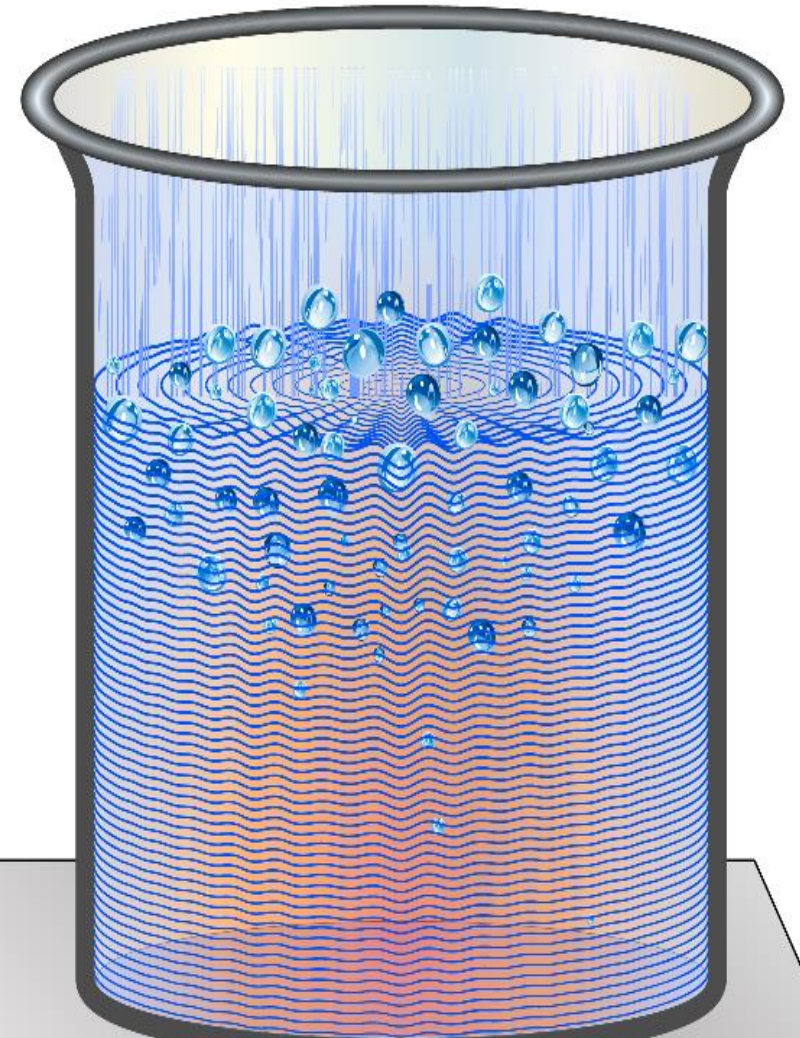
SPRING 1



Ice



Water



Water vapour

LESSON SIX

Which substances do not fit into one state of matter?



Do Now – Retrieval practice

1. What is temperature?

Temperature is a measure of _____.

2. What scale do we normally use to measure temperature?

We normally use a scale called _____ which is written as _____.

3. How did scientists decide what 0 and 100 should mean in this scale?

0°C is the temperature that _____

100°C is the temperature that _____

4. What do 'melting point' and 'boiling point' mean?

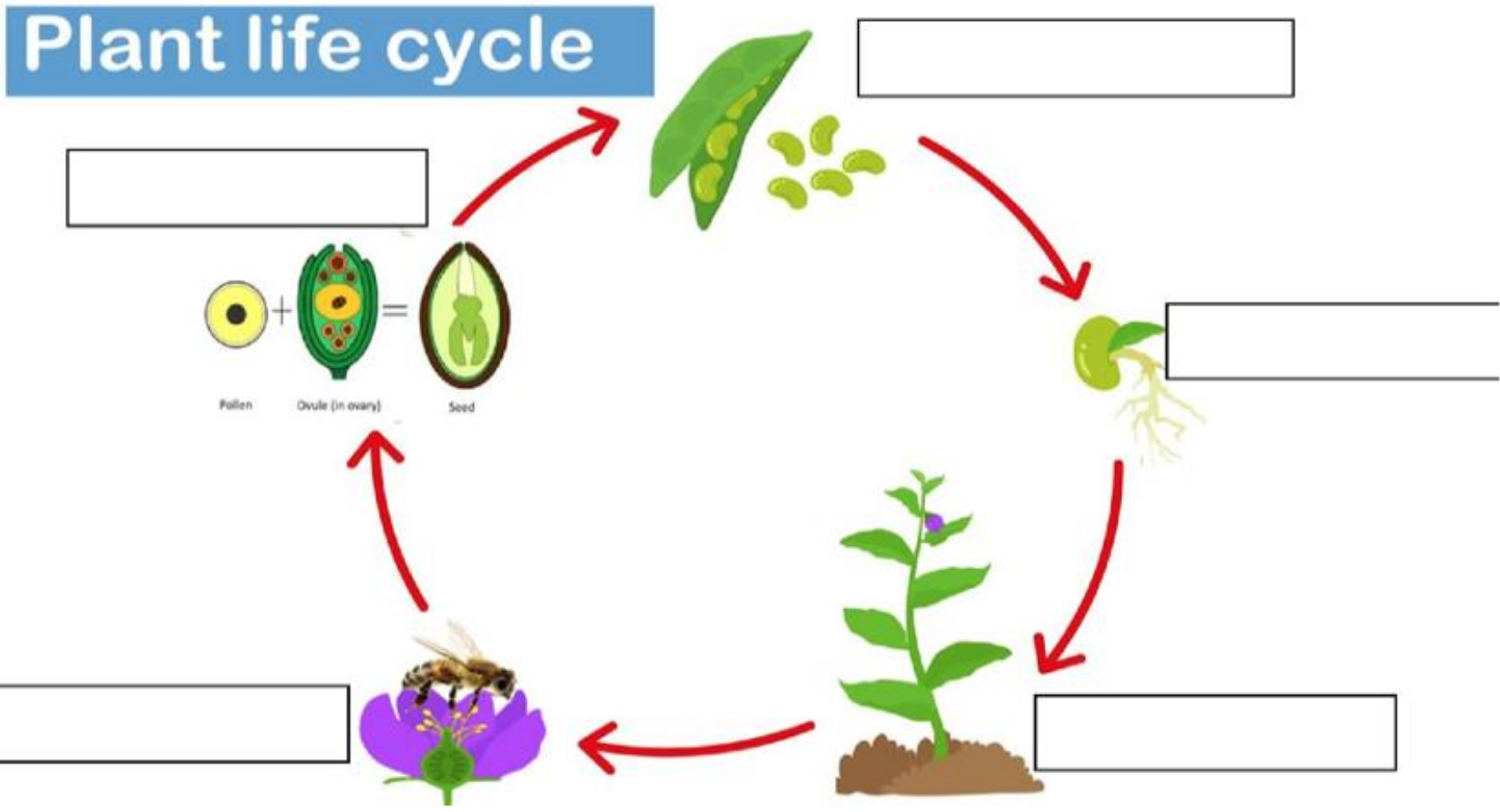
Melting point is the _____.

Boiling point is the _____.

From last cycle:

Label the life cycle of a plant:

Seed dispersal flowering fertilisation pollination germination





Fill in the gaps below – how much can you remember about solids, liquids and gases?

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.

Fill in the table below:

State of Matter	Is it compressible?	Can it flow?	What happens to its shape in a container?
Solid			
Liquid			
Gas			



Some substances show properties of more than one state of matter. How do each of the following things show properties of more than one state of matter?

Jelly

Jelly is like a solid because it is not c_____ and because it does not take the shape of the container.

However, jelly could be seen as a liquid as it does not keep a f_____ s_____ if you were to wobble the container it is in.

Foam balls

Foam balls are like solids because a single ball does not take the s_____ of the c_____ it is in and it moves but does not f_____ (it cannot be poured).

However, foam balls are like a gas because they can be c_____. This is partly because they are a mixture of s_____ and air bubbles which are an example of a g_____.

Sand

Sand is like a solid because it is not c_____ and each grain of sand keeps a fixed shape.

However, it acts like liquid because it takes the s_____ of the bottom of the c_____ that it is in. It also f_____ when you pour it.



Watch the [video](#) and observe how custard can act as a solid and a liquid depending on how it is treated.





Read the following passage about Non-Newtonian fluids

Some substances do show all the properties of a solid, liquid or gas but instead show a mixture of properties. One example of those are some liquids that are called 'Non-Newton fluids'. These are liquids that change their behaviour when a force is applied to them.

One example of this is 'Oobleck' which is a mixture of cornflour and water (which are both ingredients in

custard). When you squeeze it or try and pull something through it, it becomes more solid and will not allow its shape to be changed.

However, when it is not under pressure, it will flow and take the shape of the bottom of the container that is in – exactly as a liquid would do. In this way, Oobleck acts as both a solid and liquid depending on how it is treated.



Find answers to questions below in the passage above

1. What is a Non-Newtonian fluid?

A Non-Newtonian fluid is a liquid that changes its _____
when a _____ is applied to them.

2. What happens when you try and squeeze Oobleck?

When you try to squeeze it, it becomes more _____ and will not allow
its _____ .

3. How does Oobleck behave when it is not under pressure?

When not under pressure, it will _____ and take the shape of the
_____ that is in. Exactly as a _____ would do.



Follow the instructions below to first make and then investigate your own batch of Oobleck

Equipment:

- 1 cup of water
- 2 cups of cornflour
- (optional: food colouring)
- 1 bowl to mix ingredients in
- 1 spoon to mix and use to test the Oobleck

Method:

- 1) Place the cornflour in the bowl
- 2) Add the water (and food colouring if you are using some)
- 3) Stir the flour together very slowly
- 4) Your Oobleck should now be ready

Observations – do the following things and write down what you observe:

Test	What do you observe?
Try to quickly grab some oobleck in the bowl	When I tried to grab the oobleck quickly, I found that _____ _____ _____
Quick pick up some oobleck and hold your hand open over the bowl	When I released my hand, I found that _____ _____ _____
Drag your fingers through the oobleck quickly and then slowly	When I tried to move my fingers through quickly, I found that _____ _____ When I moved my hands through slowly, I found that _____ _____
Tip the bowl to the side quickly (not upside down)	If I tip the bowl quickly, I find that _____ _____

Observations – do the following things and write down what you observe:

Test	What do you observe?
Gently tip bowl to the side (don't let it spill!)	If I tip the bowl slowly, I find that _____ _____
Try picking up oobleck and squashing it into a ball then leave it in your hand	If I squash it into a ball, I find that _____ _____ If I leave it in my hand, I find that _____ _____

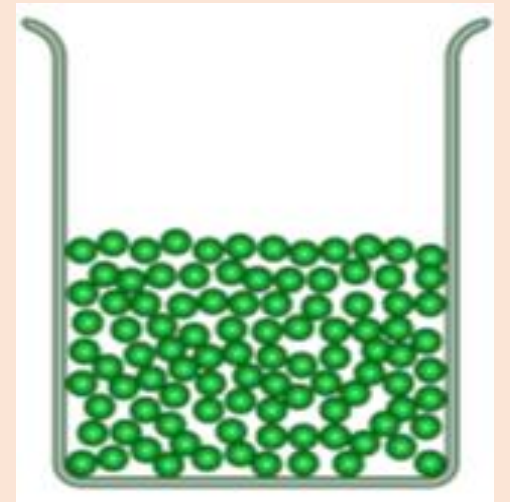


Is sand solid or liquid? How do you know?





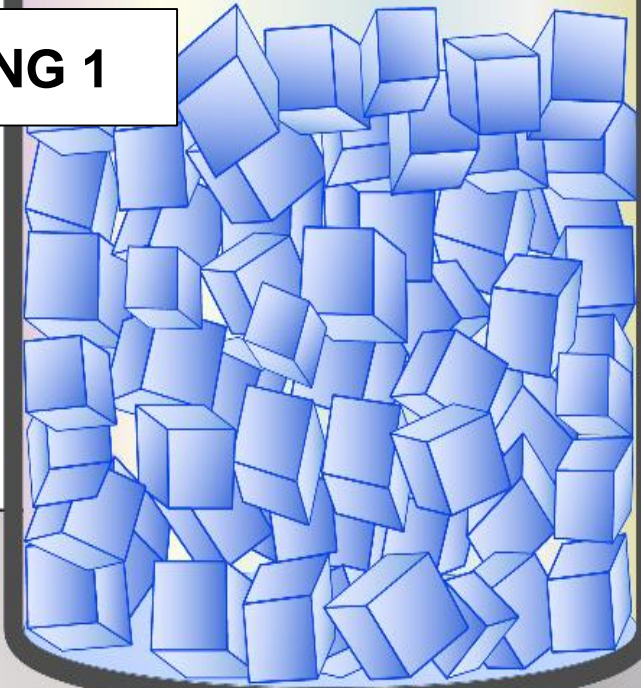
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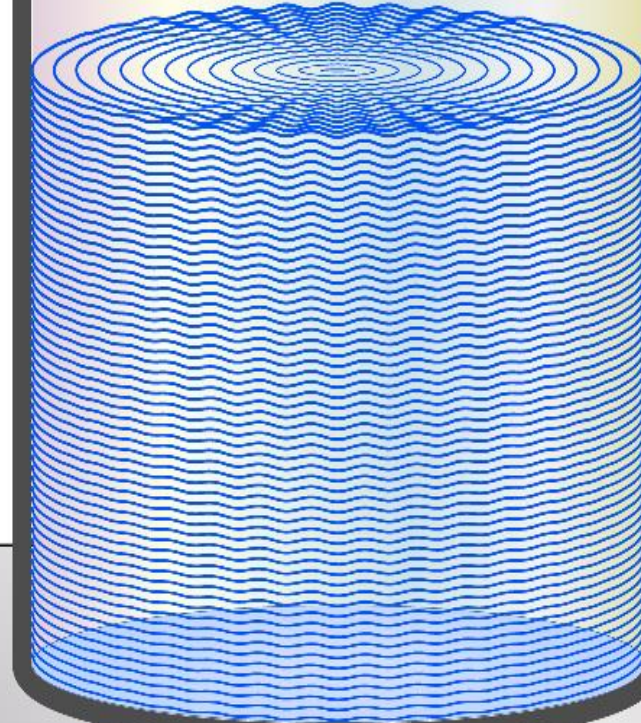
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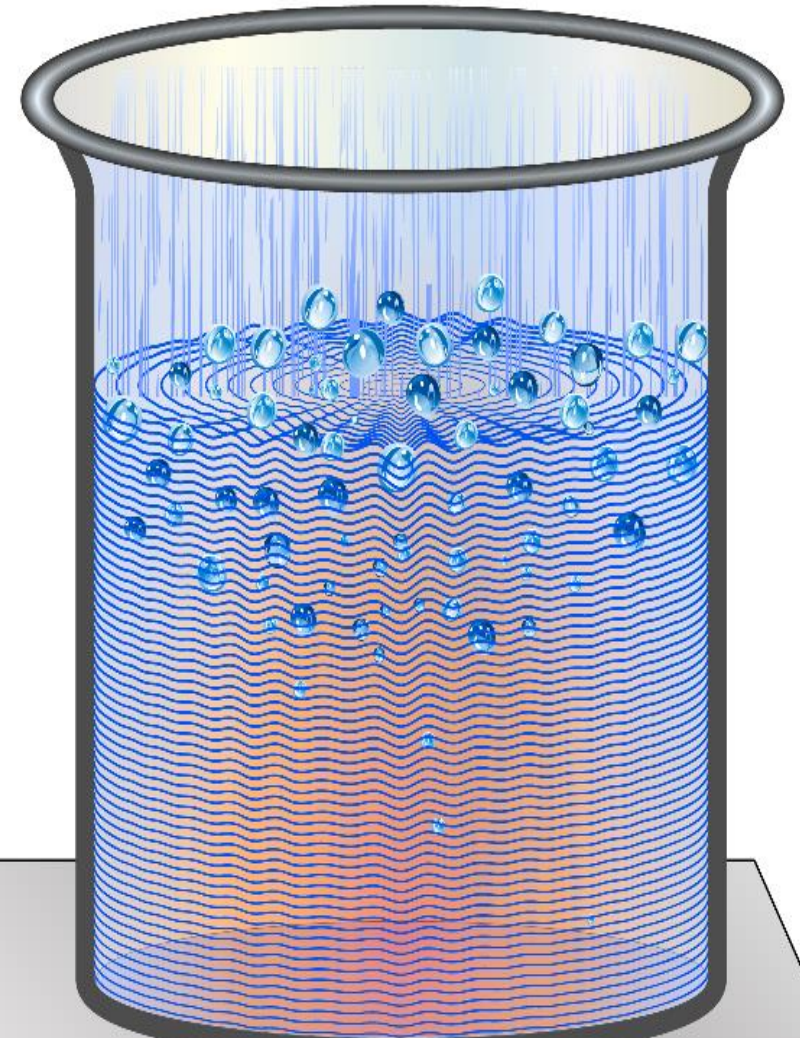
SPRING 1



Ice



Water



Water vapour