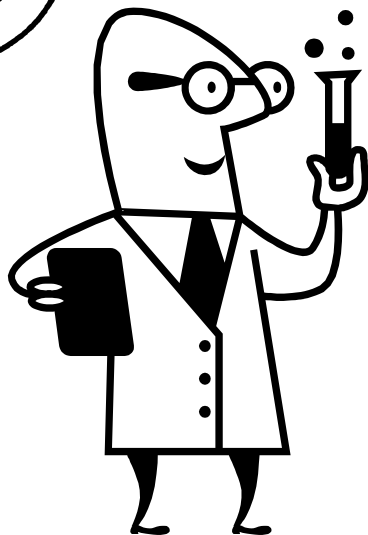
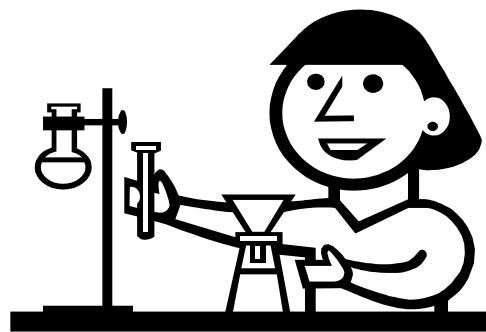


CHANGING AND SEPARATING MATERIALS



NAME:

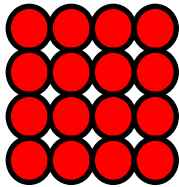
CONDENSATION AND EVAPORATION

* Write in the correct labels:

SOLID

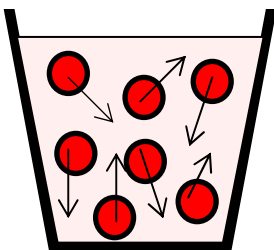
LIQUID

GAS

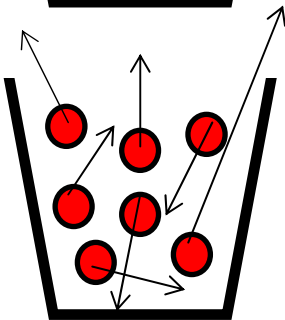


* Join up the correct labels to the diagrams

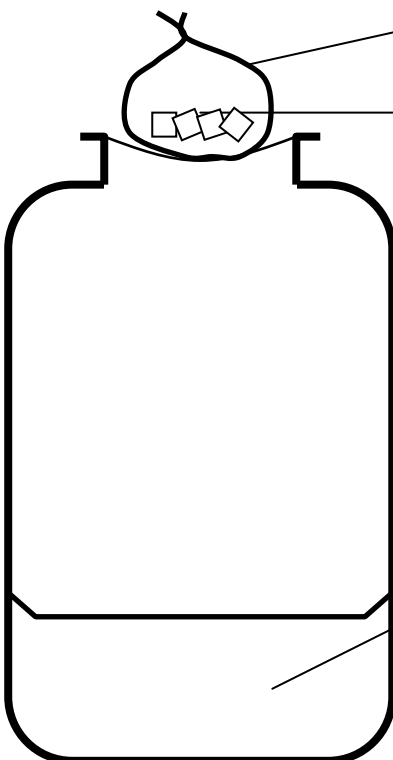
The molecules are free to move around. They can spread around an open space quickly and freely. They can't keep their shape unless they are kept in a *sealed* container.



The molecules have weaker bonds. They can move around slightly so they can flow. They can't keep their shape unless they're in a container.



The molecules are held together with strong bonds. They don't move very easily so they can keep their own shape and size



We set up a jam jar of hot water with a cling film cover and a bag of ice

* Label the diagram

* Draw on arrows to show the **water vapour** rising from the hot water

* Draw droplets of **water** forming on the cold underside of the cling film.

* Put the labels **evaporation** and **condensation** onto the diagram in the places where they are happening.

* This jam jar is like a mini version of the _____

CONDENSATION AND EVAPORATION

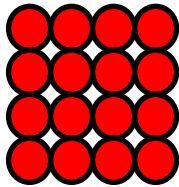
* Write in the correct labels:

SOLID

LIQUID

GAS

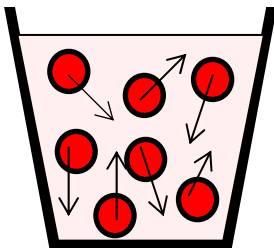
S
O
L
I
D



* Join up the correct labels to the diagrams

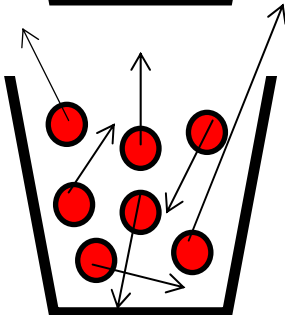
The molecules are free to move around. They can spread around an open space quickly and freely. They can't keep their shape unless they are kept in a *sealed* container.

L
I
Q
U
I
D

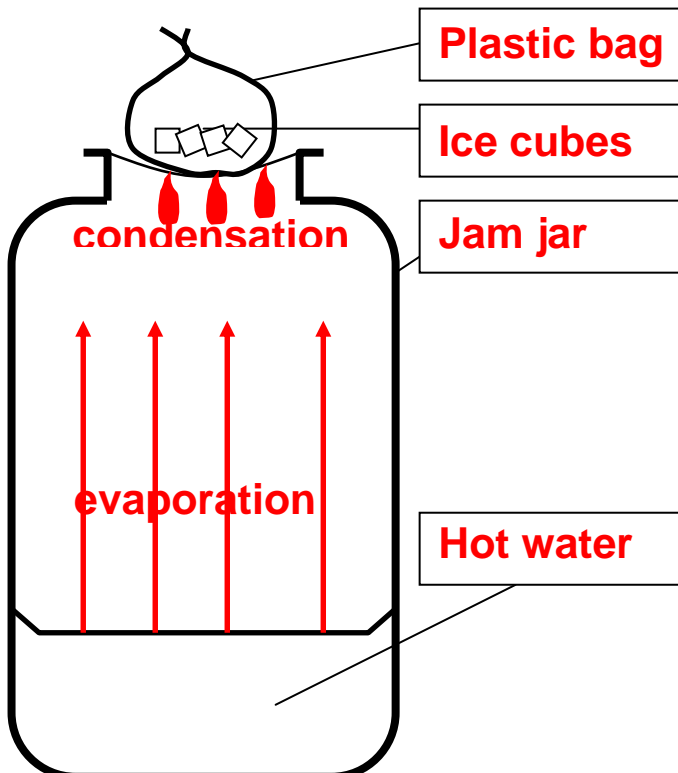


The molecules have weaker bonds. They can move around slightly so they can flow. They can't keep their shape unless they're in a container.

G
A
S



The molecules are held together with strong bonds. They don't move very easily so they can keep their own shape and size



We set up a jam jar of hot water with a cling film cover and a bag of ice

* Label the diagram

* Draw on arrows to show the **water vapour** rising from the hot water

* Draw droplets of **water** forming on the cold underside of the cling film.

* Put the labels **evaporation** and **condensation** onto the diagram in the places where they are happening.

* This jam jar is like a mini version of the Water Cycle

DOES IT DISSOLVE?

Test the following materials to see if they dissolve in water and then complete the table below.

MATERIAL	DOES IT DISSOLVE?
sand	
sugar	
chalk	
flour	
rice	
gravy granules	
coffee granules	



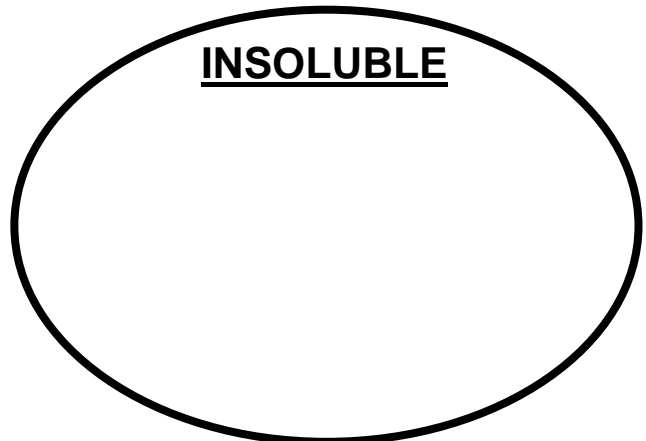
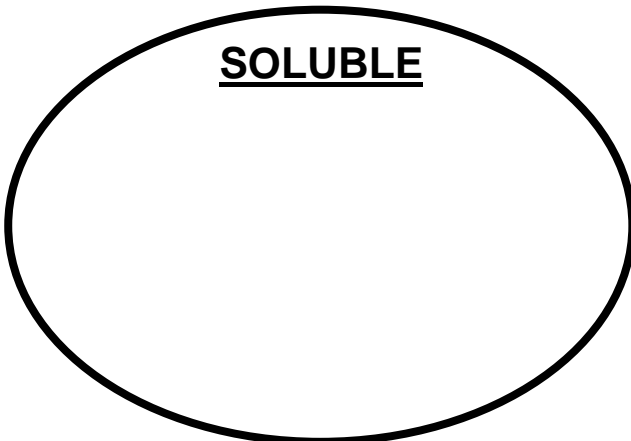
SOLUBLE means

INSOLUBLE means

Classify the materials you tested into the correct category:

SOLUBLE

INSOLUBLE



DOES IT DISSOLVE?

Test the following materials to see if they dissolve in water and then complete the table below.

MATERIAL	DOES IT DISSOLVE?
sand	N
sugar	Y
chalk	N
flour	N
rice	N
gravy granules	Y
coffee granules	Y



SOLUBLE means

it will dissolve

INSOLUBLE means

it will not dissolve

Classify the materials you tested into the correct category:

SOLUBLE

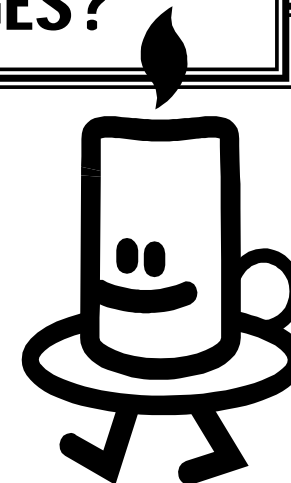
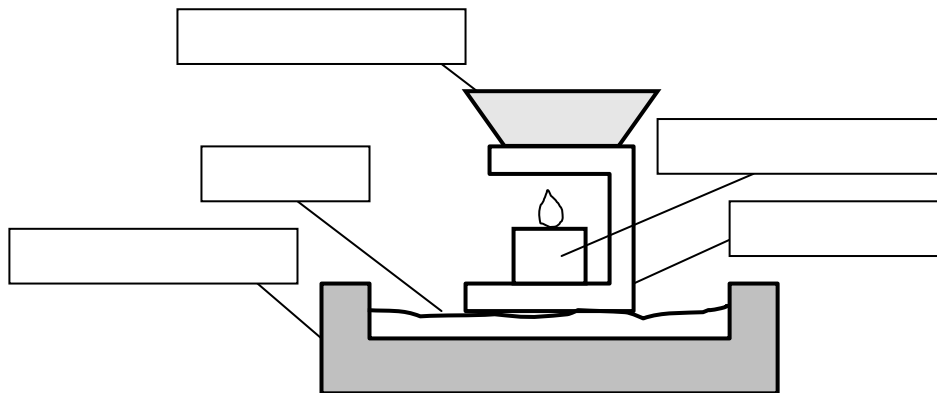
sugar
gravy granules
coffee granules

INSOLUBLE

sand
chalk
flour
rice

HEATING: REVERSIBLE OR NON-REVERSIBLE CHANGES?

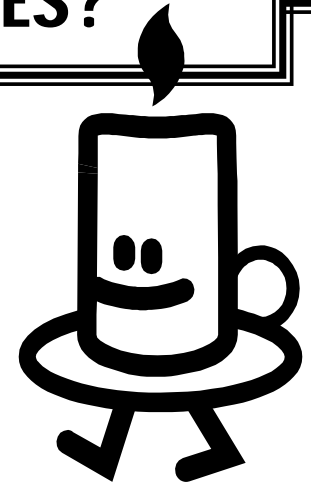
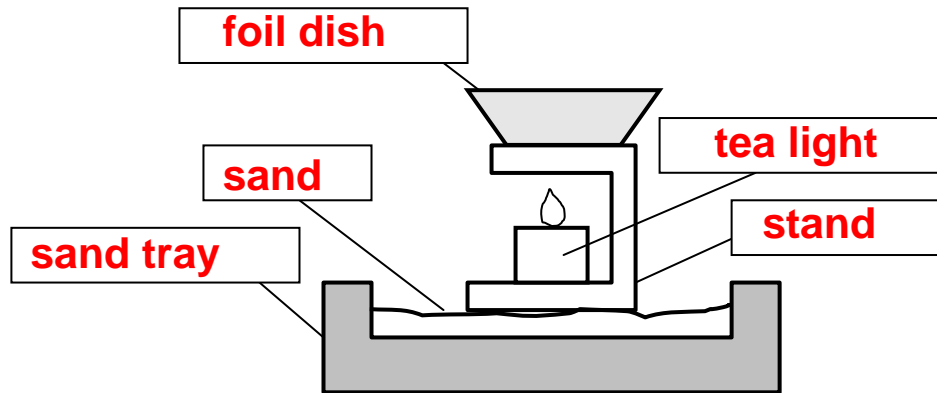
Heat the following materials over a tea light.



<u>MATERIAL</u>	<u>PREDICTION</u> Will the change be REVERSIBLE?	<u>DESCRIPTION BEFORE HEATING</u>	<u>DESCRIPTION AFTER HEATING</u>	<u>Allow it to cool.</u> Was the change REVERSIBLE?
<i>butter</i>				
<i>chocolate</i>				
<i>wax</i>				
<i>cheese</i>				
<i>egg</i>				
<i>plasticine</i>				

HEATING: REVERSIBLE OR NON-REVERSIBLE CHANGES?

Heat the following materials over a tea light.

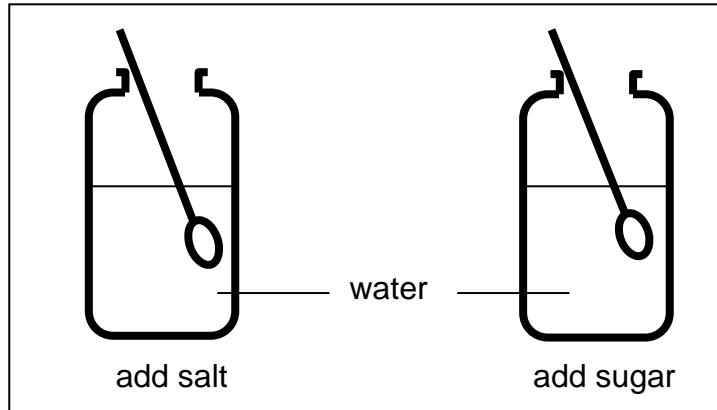


<u>MATERIAL</u>	<u>PREDICTION</u> Will the change be REVERSIBLE?	<u>DESCRIPTION</u> BEFORE HEATING	<u>DESCRIPTION</u> AFTER HEATING	<u>Allow it to cool.</u> Was the change REVERSIBLE?
<i>butter</i>				
<i>chocolate</i>				
<i>wax</i>				
<i>cheese</i>				
<i>egg</i>				
<i>plasticine</i>				

SATURATION

Add 1 spoonful of salt to some water and stir

Add 1 spoonful of sugar to some water and stir



Keep adding more spoonfuls until no more will dissolve.

The water dissolved spoonfuls of salt.

The water dissolved spoonfuls of sugar.

When the water dissolved the salt
it made _____.

When the water dissolved the sugar
it made _____.

When the water can not dissolve any more salt or
sugar we say that it is _____.

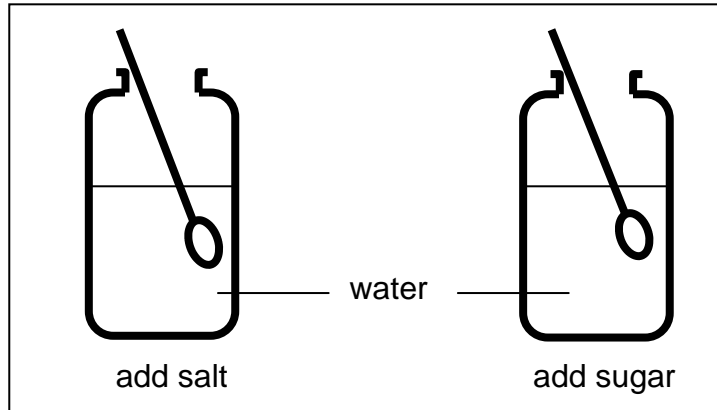
The water dissolved more _____ than _____,
before it became saturated.



SATURATION

Add 1 spoonful of salt to some water and stir

Add 1 spoonful of sugar to some water and stir



Keep adding more spoonfuls until no more will dissolve.

The water dissolved spoonfuls of salt.

The water dissolved spoonfuls of sugar.

When the water dissolved the salt
it made salt solution

When the water dissolved the sugar
it made sugar solution

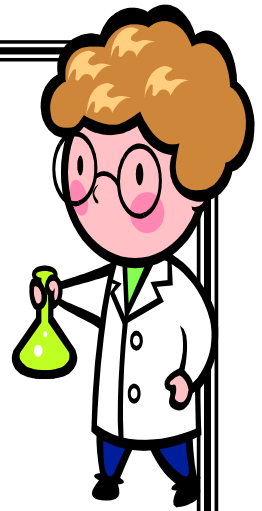
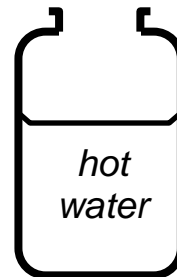
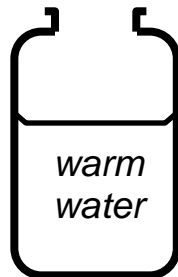
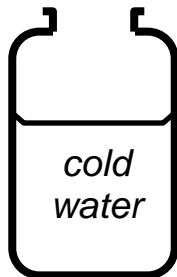
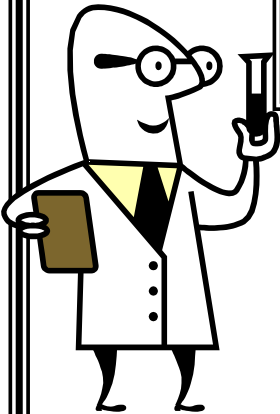
When the water can not dissolve any more salt or
sugar we say that it is saturated

The water dissolved more sugar than salt,
before it became saturated.



INVESTIGATION:

How does the temperature of water affect the speed of dissolving?



PREDICTION:

Which water do you think will dissolve the sugar fastest?

- 1) Put 3 spoonfuls of sugar into each jar and start your stopwatch.
- 2) Stir gently and stop the watch as soon as the sugar has dissolved.
- 3) Record how long it takes the sugar to dissolve in each jar below.
- 4) Repeat the test for each jar of water to check your results.

	Cold <input type="text"/> °C	Warm <input type="text"/> °C	Hot <input type="text"/> °C
Test 1			
Test 2			

- 5) Find the average time for each temperature

	Cold <input type="text"/> °C	Warm <input type="text"/> °C	Hot <input type="text"/> °C
Average Time			

CONCLUSION:

How does the temperature of the water affect the time it takes the sugar to dissolve?

Why did you repeat the test for each temperature of water?

NOW CAN YOU DRAW A LINE GRAPH OF YOUR RESULTS?

SEPARATING MIXTURES

Decanting

Evaporating
and Condensing

Magnetism

Filtering

Sieving

Write the correct process next to its definition:

Separates different sized solids
(sand + gravel)

Separates insoluble solids from liquids
(sawdust + water)

Separates two liquids which have different 'weights'
(oil + water)

Separates iron and steel from non-magnetic materials
(paperclips + sand)

Separates soluble solids and liquids
(salt + water)

MIXTURE	PROCESS TO SEPARATE IT
rice + pasta shapes	
paperclips + sawdust	
salt + water	
flour + rice	
sugar + water	
sand + water	

Challenger

Write down the process on the arrows which change each material to the next. Is the process **reversible** 😊 or **non-reversible** ☹️

salt $\xrightleftharpoons[\textit{evaporating}]{\textit{dissolving}}$ salt solution

sand + gravel $\xrightleftharpoons[\textit{mixing}]{}$ sand

sand + water $\xrightleftharpoons[\textit{mixing}]{}$ sand

sugar solution $\xrightleftharpoons[\textit{mixing}]{}$ sugar

paper \longrightarrow ash

SEPARATING MIXTURES

Decanting

Evaporating
and Condensing

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Write the correct process next to its definition:

Sieving

Filtering

Decanting

Magnetism

**Evaporating
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Separates soluble solids and liquids
(salt + water)

MIXTURE	PROCESS TO SEPARATE IT
rice + pasta shapes	Sieving
paperclips + sawdust	Magnetism
salt + water	Evaporating and Condensing
flour + rice	Sieving
sugar + water	Evaporating and Condensing
sand + water	Filtering

Challenger

Write down the process on the arrows which change each material to the next. Is the process **reversible** 😊 or **non-reversible** ☹️

salt $\xrightleftharpoons[\text{evaporating}]{\text{dissolving}}$ salt solution **reversible**

sand + gravel $\xrightleftharpoons[\text{mixing}]{\text{sieving}}$ sand **reversible**

sand + water $\xrightleftharpoons[\text{mixing}]{\text{filter}}$ sand **reversible**

sugar solution $\xrightleftharpoons[\text{dissolve}]{\text{evaporate}}$ sugar **reversible**

paper $\xrightarrow{\text{burn}}$ ash **non-reversible**

FINAL INVESTIGATION: WHAT A MESS!

Mr OoopsiDaisy was unloading some deliveries at his shop when he tripped and fell. Unfortunately he dropped some of the deliveries on the floor and they got mixed up. He swept up what he could and put it in a bucket. Can you help him separate the different materials again?



The mixture contains:
salt
sawdust
paperclips
gravel

Our Plan:

We will:

1

We will:

2

We will:

3

We will:

4

to separate the ...

to separate the ...

to separate the ...

to separate the ...

What I Know About Changing And Separating Materials

