

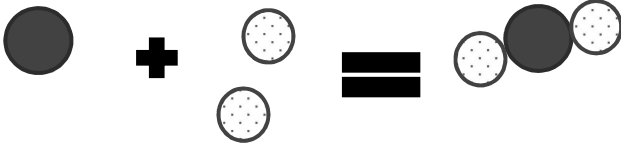
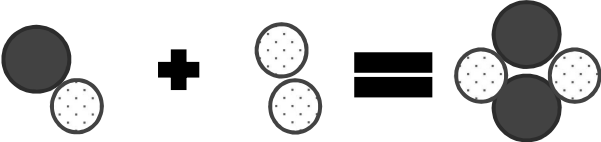


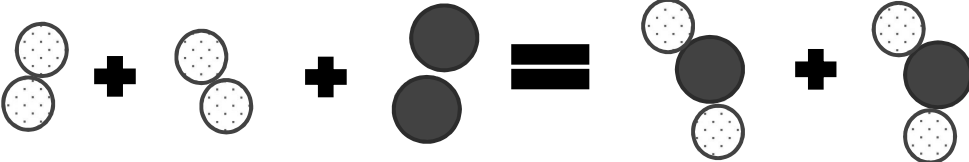
CW 2. Develop and use models to describe the atomic nature of matter; demonstrate how they provide a simple way to account for the conservation of mass, changes of state, physical change, chemical change, mixtures, and their separation

LAW OF CONSERVATION OF MASS:

In ordinary chemical or physical reactions, mass cannot be created or destroyed but can only be changed from one form to another.

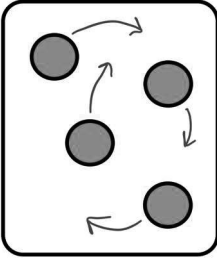
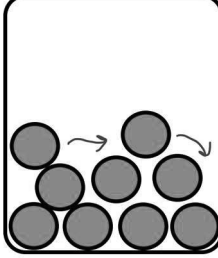
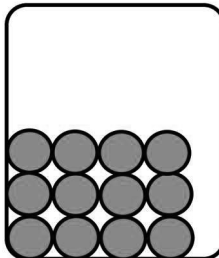
This means that the number of each type of atom **before** the reaction must equal the number of each type of atom **after** the reaction.

Look at the diagrams below. Which of the following models show the law of conservation of mass is being followed?

	YES OR NO?
<p>A:</p> 	
<p>B:</p> 	
<p>C:</p> 	
<p>D:</p> 	
<p>E:</p> 	

CHANGES OF STATE

The state which matter takes depends on the amount of energy it has. Typically, heat energy. Each state (solid, liquid, and gas) has its own unique set of physical properties.

GAS	LIQUID	SOLID
Gases do not have a fixed shape. Particles take the shape of their container. Particles are far apart, and move very freely.	Liquids do not have a fixed shape. Particles take the shape of their container. Particles are apart, and can move freely.	Solids have a definite size and shape. Particles are close together, and vibrate
 <p style="text-align: center;"><i>GAS</i></p>	 <p style="text-align: center;"><i>LIQUID</i></p>	 <p style="text-align: center;"><i>SOLID</i></p>

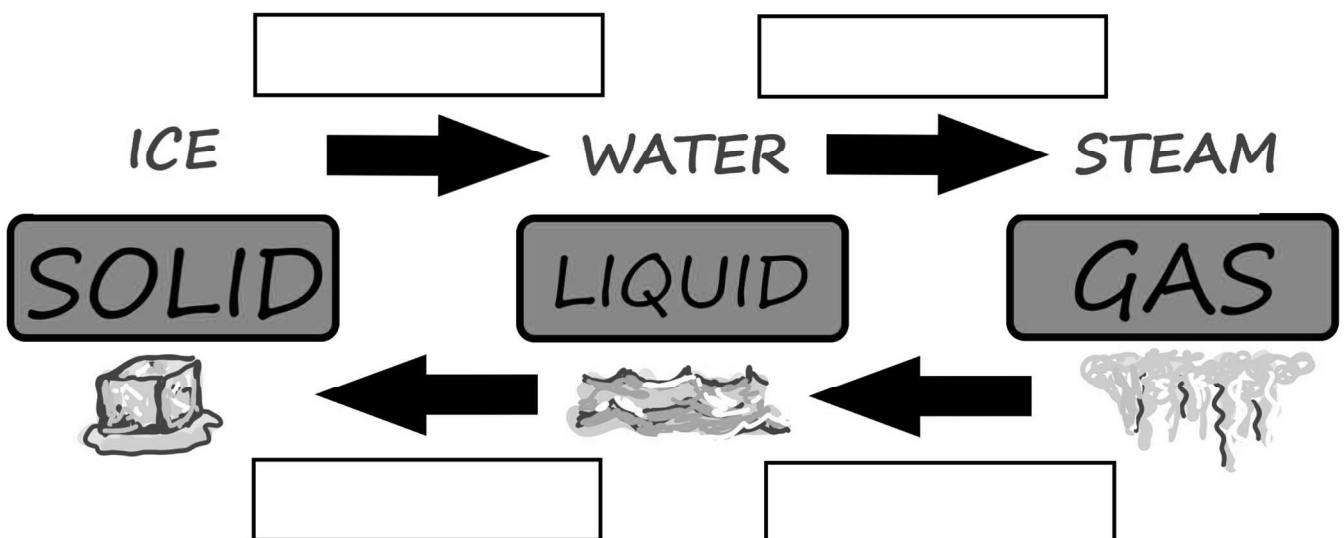
Melting - the change of state from solid to liquid

Freezing or Solidification - the change of state from liquid to solid

Boiling or Evaporation - the change of state from liquid to gas

Condensation - the change of state from gas to liquid

Q1: FILL IN THE BLANKS USING THE WORDS ABOVE:



Q2: Melting, boiling, freezing and condensing are the names of four changes of state. Draw lines to join each name to the correct change of state.

MELTING	GAS TO LIQUID
BOILING	LIQUID TO GAS
FREEZING	SOLID TO LIQUID
CONDENSING	LIQUID TO SOLID

Q3: For the following changes, state whether heat energy is applied or taken away:

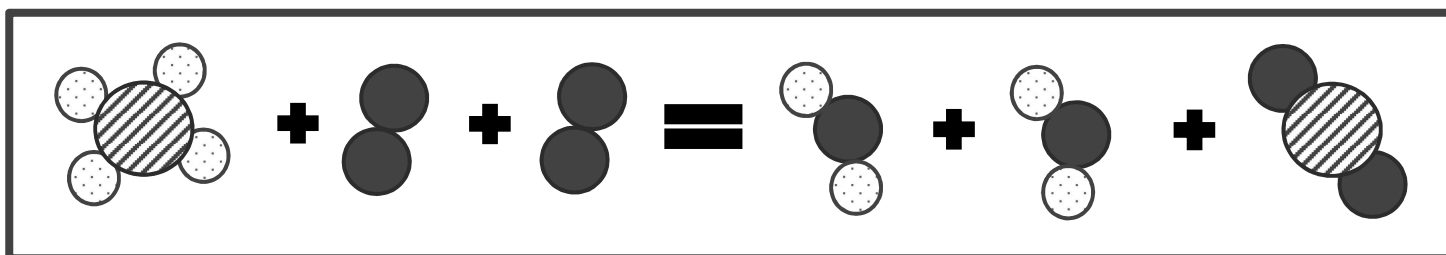
Change of state	ENERGY GIVEN or ENERGY TAKEN AWAY?
Solid to liquid	
Liquid to gas	
Solid to liquid	
Liquid to solid	

Q4: What piece of equipment in the lab can you use to add energy to water to make steam?

Q5: What piece of equipment in the lab can you use to remove energy from water to make ice?

CHEMICAL CHANGE VERUS PHYSICAL CHANGE

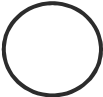
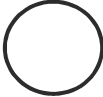
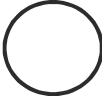
Q6: The following diagram shows a reaction where Methane is burned in Oxygen gas.



The model diagram shows the equation: **CH₄ + 2O₂ = CO₂ + 2H₂O**

Is this an example of a chemical or physical change? _____

In the diagram model, each type of circle represents a specific atom. Using the diagram and equation, colour the circle that represents the following:

Carbon  Hydrogen  Oxygen 

Count up the number of atoms on each side of the equation below and write this in to the table below.

CH₄ + 2O₂ = CO₂ + 2H₂O		
ATOM	REACTANTS	PRODUCTS
CARBON		
HYDROGEN		
OXYGEN		

Is the equation balanced? Yes or No: _____

The law of conservation of mass is followed here. What is the law of conservation of mass?

MIXTURES

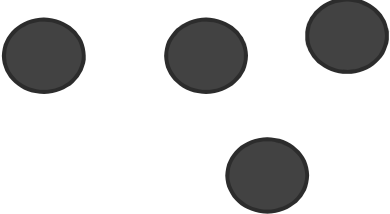
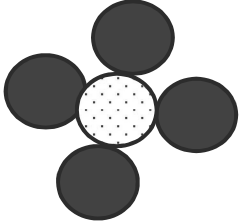
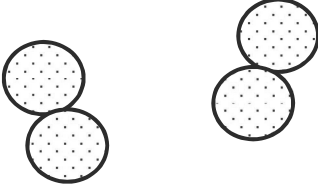
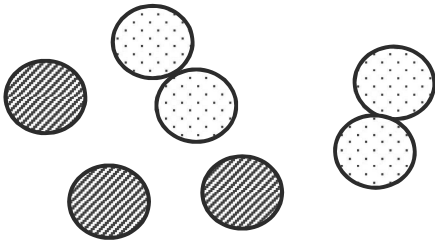
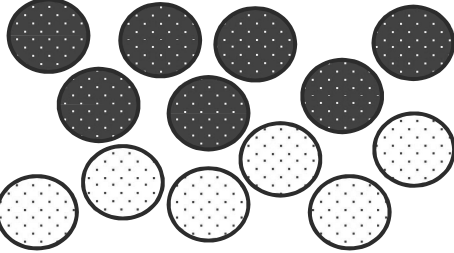
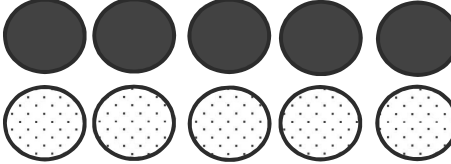
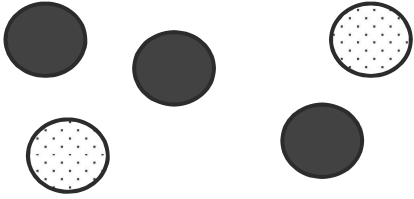
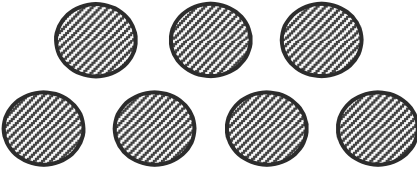
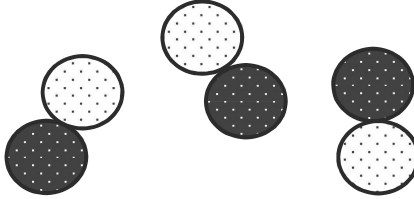
Mixtures: When different atoms or molecules are mingled together but NOT CHEMICALLY COMBINED

Molecules: describe two or more atoms CHEMICALLY COMBINED, there are two types of molecule:

Compounds: When two or more DIFFERENT atoms combine CHEMICALLY

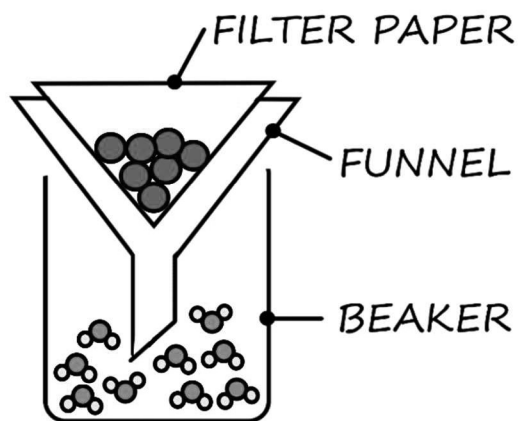
Element: When two or more of the SAME atoms combine CHEMICALLY

Q7: Study each of the following nine blocks below. For each block state whether it is a mixture, compound or element.

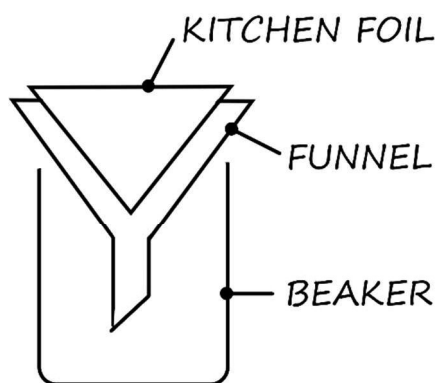
		
<p>A:</p>	<p>B:</p>	<p>C:</p>
		
<p>D:</p>	<p>E:</p>	<p>F:</p>
		
<p>G:</p>	<p>H:</p>	<p>I:</p>

Q8: Some mixtures can be separated with a filter. The table below shows some different mixtures. Complete the table to show if a filter can be used to separate each mixture. Write yes or no. One mixture has been done for you.

Mixture	Can be separated using Filtration? (Yes/No)
Sand and water	
Sand and sugar	
Soil and stones	
Salt and water	



John has a mixture of chalk powder, sugar and water. He tries to filter the mixture using kitchen foil.



The foil does not separate the mixture. Explain why the foil does not separate the mixture of chalk, sugar and water

John makes a new filter using a paper towel. The chalk stays on the paper towel but the water and sugar go into the beaker. Name a separation method he could use to separate the water and sugar:

Describe how John could use this method:
