Science

Theme: Plant reproduction, energy and separating mixtures

Name: .....

Class: .....

Contents:

Introduction

This workbook is based on the following topics:
Plant reproduction
Energy
Separating mixtures
Particles
The tasks you will be completing consist of labelling a range of diagrams, reading and comprehension, sentence word fills, key words and definitions, check point tasks and end of topic test questions.
You will be expected to use your existing knowledge, the information in the booklet and the recommended websites to answer each question.

Useful websites:

'Bitesize KS3' Energy, separating mixtures and particles
https://www.bbc.co.uk/bitesize/subjects/zng4d2p
https://www.kerboodle.com/ - Here you will find a range of information to help you answer each topic.

Username and **password** = first initial followed by your surname (unless you have changed your password) e.g. jbloggs
Institution code = mnx1
Unable to log in?
Email me with your class and name at erobins@southchurchschool.com
Recommended booklets that can be purchased:
- Activate Intervention Workbook (Higher)

This can be purchased online:
https://global.oup.com/education/product/9780198423799?region=uk
- Collins KS3 Revision - KS3 Science All-in-One Revision and Practice

This can be purchased online:
https://collins.co.uk/products/9780007562831

Reproduction in plants

YOUR TASK : Read the paragraphs below ad use a RED pen to underline the important key words.

Plants use sexual reproduction too. This means they have male and female sex cells, each of which provides half of the genetic information for the offspring. Wind or insects (depending on the type of plant) help move the male sex cell (pollen) to different plants to allow cross pollination.

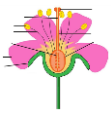
Pollination is the transfer of pollen from the male part of the plant to the female part of either the same plant or a different one. When the pollen gets to the female parts, a pollen tube grows so that fertilisation can take place.

YOUR TASK Use the labels on the diagram to explain how pollination and fertilisation happen in plants.

Key words: pollen, tube, nuclei, fertilisation, stigma, ovary

YOUR TASK: Label this diagram, giving definitions for each label.

1. Label this diagram, giving definitions for each label.



STUDY TIP:

Use the table below the plant reproduction questions.

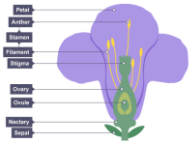
information in the to help you answer

The table describes the main parts of a flower and their functions:

Structure	Function
Sepals	Protect the unopened flower
Petals	May be brightly coloured to attract insects
Stamens	The male parts of the flower (each consists of an anther held up on a filament)
Anthers	Produce male sex cells (pollen grains)
Stigma	The top of the female part of the flower which collects pollen grains
Ovary	Produces the female sex cells (contained in the ovules)
Nectary	Produce a sugary solution called nectar, which attracts insects

Parts of a flower

The flower is the reproductive organ of many plants.



CHECKPOINT TASK:

1. What is the function of the flower in a plant?
2. What is the 'male' sex cell in a plant called?
3. What two ways is this gamete moved from one plant to another to allow pollination?
4. What name would we give to the 'embryo' that is formed in a plant after fertilisation?
5. Why do plants form fruits around their seeds?
6. How long is the gestation period in humans?
7. Briefly describe what happens in the three stages of labour.
8. How many chromosomes are in a human gamete?
9. Name three plant organs.

   Challenge Q: Order these from smallest to largest: Cell, Organ, Organ System, Organelle, Organism, Tissue

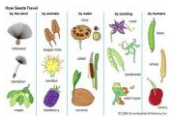
Feature	Insect-pollinated	Wind-pollinated
Petals	Large and brightly-coloured – to attract insects	Small, often dull green or brown – no need to attract insects
Scent and nectar	Usually scented and with nectar – to attract insects	No scent or nectar – no need to attract insects
Number of pollen grains	Moderate – insects transfer pollen grains efficiently	Large amounts – most pollen grains are transferred to another flower
Pollen grains	Sticky or spiky – sticks to insects well	Smooth and light – easily carried by the wind without clumping together
Anthers	Inside flower, stiff and firmly attached – to brush against insects	Outside flower, loose on long filaments – to release pollen grains easily
Stigma	Inside flower, sticky – pollen grains stick to it when an insect brushes past	Outside flower, feathery – form a network to catch drifting pollen grains

We depend upon pollination by insects (including the honey bee) for many of our crops. Without them the security of our food would be threatened.

<u>YOUR TASK</u>: Now use the information table above to compare insect and wind pollination. Aim to use as many key words as you can!

Seed dispersal

Seed dispersal is how a plant spreads its seeds. Different plants do this in different ways – by air, water or other organisms.



Dispersal

Plants compete with each other for factors such as:

- **light**
- **water**
- **space**
- **minerals in the soil**

Seeds must be dispersed or spread away from each other and from the parent plant. This is to reduce competition between the parent plant and the new plants, and between the new plants.

YOUR TASK: Use the information above to help you answer the progress check questions:

Q1) Explain what is meant by the term seed dispersal

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Q2) Explain why seeds must be dispersed far away from each other

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Q3) State some factors that plants compete for

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Energy:

Stores of energy

There are different forms of energy stores, including:

- kinetic energy
- internal energy
- elastic potential energy
- gravitational potential energy
- electrical energy
- magnetic energy

Energy stores

YOUR TASK: Read the paragraphs below ad use a RED pen to underline the important key words.

Ever since the universe was created the total amount of energy within it has stayed the same, this is because energy cannot be created or destroyed. We call this the law of conservation of energy. Not matter what we do we cannot make more energy or get rid of any energy. The only thing we can do is move energy around. It is this movement of energy that allows everything in our universe to happen, from a light bulb switch on to planets moving around the stars, all this is possible thanks to energy.

Energy is found in stores, there are several different ways energy can be stored. Here are some examples in the table below:

Store	Definition	Example
Chemical	energy stored in substance to be used later	Batteries, fossil fuels.
Thermal	energy stored by the movement of particles within a substance	
Elastic potential	energy stored ins stretched objects	
Electrostatic	Energy stored by electrically charged objects	
Nuclear	Energy stored in atoms	
Gravitational potential	Energy stored in objects suspended in gravitational fields	
Kinetic	Energy stored in moving objects	
Magnetic	Energy stored in magnetic fields.	

YOUR TASK:

1. Give an example where we might see each store of energy by filling in the last column of the above table.

2. **Produce a mnemonic to help remember the stores of energy. A mnemonic is a rhyme that you can use to help you remember facts.**

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YOUR TASK: Copy and complete the sentence below using key words.

Energy is the ability to do.....

Energy can be ..... by a number of ways, for example saving energy in the home and using renewable energy resources

Energy is measured in .....

One joule is a very small amount of energy so instead we often use k.....

How much energy in food?

Food labels tell you how much energy is in the store associated with food.

The amount of energy stored in different foods varies greatly.

Food	Energy (kJ) per 100 g
apple	200
banana	340
peas	250
chips	1000
cooked beef	1000
chocolate	1500

When you choose which foods to eat, you need to consider the nutritional value of the food as well as the energy that is in the store.

Energy in food Reading comprehension task:

Energy stored in food can be released by combustion (burning) or by respiration in our cells. The labels on packets of food show how much energy is available from the food.

A food label on a packet of naan bread. 215 calories is the same as 900 kJ.

The amount of energy available may be shown in a unit called the calorie, as in the photograph. However, the scientific unit for energy is the joule, which has the symbol J.

A lot of energy is available from most foods, so food labels usually show kJ (kilojoules) instead of J:

1 kJ = 1000 J

For example, 2000 J = 2000 ÷ 1000 = 2 kJ.

<u>YOUR TASK</u>:Draw a plate of food OR list foods that you consider to be part of a healthy balanced diet for a 15 year old.

Think carefully about energy values. Use the information table above to help you.

Draw your food plate in the space below.

YOUR TASK: Look at the two light bulb pictures below. Could you spot some differences between each. List as many differences as you can.

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Energy in the home test questions

1

What is another name for burning?

Combustion

Respiration

Thermal decomposition

2

What is the correct unit for energy?

Calorie

Joule

Gram

3

Which of these foods has the most energy per 100 grams?

Apple

Oxidation

Bread

4

Around how many kJ of energy does an adult need per day?

9000

4600

343

5

What is the term that means the rate at which energy is used?

Speed

Power

Joule

6

What are the units of power?

Newtons

Watts

Joules

7

How can energy be released from food?

Combustion and respiration

Combustion only

Responses only

8

How many watts are in a kilowatt?

10

100

1000

9

Which of these electric items uses the most power?

Clock

Drill

Oven

10

What units do electrical suppliers use for energy?

kWh

Millimi

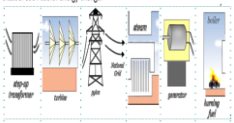
Joule

Challenge activity

1.Cut up the table and rearrange the pictures in the correct order to make a diagram of a power station.

2.Cut up the labels and match them to the correct part of the diagram.

3.Label each useful energy change.



The steam makes a turbine spin.	The fuel is burned. During the process heat is produced. The heat causes the water to boil.	The spinning turbine spins a generator which generates electricity.	The electricity is stored by the national grid until it is required.	The electricity goes to the transformers which transform electricity into the correct voltage.	As the temperature of the water increases it is turned into steam.

Put your rearranged pictures and explanations in the box below

CHECKPOINT TASK: Complete the sentences below using appropriate key words:

When a ……..is burned …… and ……energy are produced

…… is required in order to turn the turbine within a power station

Energy is stored within the …… …… Until it is required

Energy is measured in …… 1000 equal one …… ……

The job of the transformers within the power station is to:

YOUR TASK: Look at the pictures below and attempt to exaplain what you thik is happening. Use as may key words in your answer as you can.

Renewable and non-renewable energy resources:

<u>YOUR TASK</u>: Read the information below and underline the important key words.

Biofuel

Plant matter such as wood and vegetable oils can be used in the same way fossil fuels are to produce electricity, these don't release as much energy as fossil fuels but the carbon emissions have much less impact than those released from coal, oil and gas.

Solar

Solar power uses photovoltaic cells to harness energy from light and other waves given off by the sun, this energy is free but is not always readily available.

Wind

Wind power uses kinetic energy stored in the wind to spin a turbine and run a generator, this like solar power is free, but is not always viable, the wind turbines also pose a threat to bird life and some think they ruin the aesthetics of the landscape.

Commented [AR1]: wind turbine image

Wave

Wind across the oceans generate waves, the energy in these waves can be used to generate electricity, this again is free but not reliable. Like wind turbine wave power generators pose a threat to wildlife.

Tidal

The moons orbit around the planet causes tidal patterns in our oceans, the slow moving of water in and out from our shores. This movement can be used to generate electricity. Due to the predictability of the tides, this source is very reliable, but similarly to wave power does threaten wildlife.

Geothermal

The core of our planets releases a vast amount of thermal energy, we only need to dig down 10km to find temperature hot enough to

boil water, this steam can be used to generate electricity just like in a fossil fuel power station. This form of power is reliable but has big impact on the local environment as large bore holes need to be dug.

Hydroelectric

Commented [ARS]: Alt text

Moving water is a common source of power, in this case water trapped behind a dam can be released at any time to help produce electricity. The water can be pumped back up into a reservoir to be used again at any time. This method of generating electricity if hugely effective but like others does have a big impact on the local environment, in the worst cases valleys have had to be flooded in order to create reservoirs.

Apart from being renewable one the biggest advantages of these energy sources is that they don't produce any pollution.

CHALLENGE TASK: Complete the information table below:

Name of renewable energy source	Detail	Advantage	Disadvantage
Solar	*Collect energy being transferred by sunlight to produce electricity.*		
Wind		*Is free to run and is renewable.*	
Wave			*Is unreliable and can harm sea life*
Tidal	*Uses the movement of the ocean, caused by the moon, to generate electricity.*		
Biomass			*Does not produce a lot of electricity.*
Geothermal		*Is reliable and the energy is free, no fuel needed.*	
Hydroelectric	*Uses the movement of water due to gravity to*		

	generate electricity.		
Fossil Fuels **(Coal, Oil and Gas)**			*Causes lots of pollution, fuels are expensive.*

LET'S ASSESS OUR PROGRESS. CHECK POINT TASK

Finish the following sentences:

- **Some people think that a non-renewable energy source is one that will run out, they are wrong because**.....
  .....
- **Some people think that nuclear power is partly responsible for global warming they are wrong because**.....
  .....
  .....
- **Some people think that wave power is reliable they are wrong because**.....
  .....
  .....

As water flows from the top to the bottom lake it turns a turbine coupled to a generator that produces electricity.

What is the energy transformation that takes place as the water flows?

A **Electrical energy to kinetic energy.**

B **Gravitational potential energy to kinetic energy.**

C **Kinetic energy to gravitational potential energy.**

D Kinetic energy to heat energy.

Where does geothermal energy come from?

A Radioactive processes in nuclear power stations.
B Radioactive processes within the Earth.
C The decay of organic material.
D The movement of the tides.

Renewable energy sources can be used to generate electricity. However these sources are not always available.

Match words from the list with the numbers **1** to **4** in the table.

A hydroelectric scheme .....
B solar cells .....
C tidal barrage .....
D wind farm .....

Renewable energy source	Source is available to generate electricity ...
1	only during the daylight
2	only when the weather is suitable
3	only during certain periods of the day and night
4	usually whenever it is needed

Wind energy, waves, tides, falling water and solar energy can all be used as energy
sources to generate electricity.

(a) What do all these energy sources have in common?

A They are available at any time of the day or night.

B They are non-renewable energy sources.

C They do not affect wildlife.

D They do not cause any sort of pollution.

(b) Which of these energy sources is most appropriate to generate electricity to run a well in a remote African village?

A falling water

B solar energy

C tides

D waves

(c) Which of these energy sources is most likely to produce noise pollution when used to generate electricity?

A solar energy

B tides

C waves

D wind energy

(d) Which of these energy sources is **least** likely to be associated with damaging wildlife or the habitat of wildlife when used to generate electricity?

A falling water

B tides

C waves

D wind energy

CHALLENGE TASK: Use your knowledge to complete the table below:

Incorrect statement	Correct statement
Heat rises	
When solids are heated, the particles expand	
Black objects get hotter because they attract heat	
Two control variables when testing foods to see how much energy they release are: Amount of food Amount of water in test tube	
A fuel is something that produces energy when it burns	
When we heat a solid, the particles start to vibrate	
Insulators stop energy transfers	
Burning fossil fuels releases pollution	

YOUR TASK: Use the diagrams and information tables to explain some advantages (good points) and disadvantages (bad points) of using fossil fuels.

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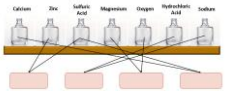
Separating mixtures:

YOUR TASK:

There are 4 substances below. Can you work out which chemicals were used to make them? Use the chemical shelf to help...



YOUR TASK: Use the information above to help you complete each chemical reaction:

a) nitrogen + oxygen →

b)hydrogen + chlorine →

c) nitrogen monoxide + oxygen →

d) methane + oxygen →

Atoms

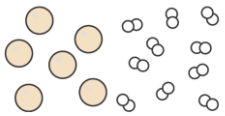
Everything is made from **atoms**, including you. Atoms are tiny particles that are far too small to see, even with a microscope. If people were the same size as atoms, the entire population of the world would fit into a box about a thousandth of a millimetre across.

We usually imagine atoms as being like tiny balls:

Elements

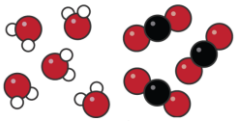
There are over a hundred different **elements**. The atoms in a particular element are the same as each other, and they are different from the atoms of all other elements. For example, lead and gold are elements. A piece of pure gold contains only gold atoms. A piece of pure lead contains only lead atoms.

The atoms of some elements do not join together, but instead they stay as separate atoms. Helium is like this. The atoms of other elements, such as hydrogen and oxygen, join together to make **molecules**.



Compounds

A **compound** is a substance that contains atoms of two or more different elements, and these atoms are chemically joined together. For example, water is a compound of hydrogen and oxygen. Each of its molecules contains two hydrogen atoms and one oxygen atom. There are very many different compounds.



<u>YOUR TASK</u>: **Use the above information and diagrams above to define the key words below.**

An atom is

_____.

An Element is

_____.

A compound (molecule) is

_____.

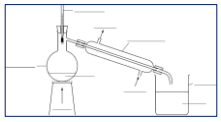
Now complete the following sentences by adding the correct key words

The smallest part of an element is called an _____. All the _____ in an element are the same. Atoms can't be broken down into _____ substances.

Atoms joined, or bonded, together chemically are called _____.

In a _____ change, new substances are formed. However, no new substances are made in a _____ change.

Distillation:



Label the pieces of equipement with the following keywords:

Heat	**Flask**	**Water in**	**Water out**
thermometer	**Beaker**	**Solution**	**Distillate**
Liebig condesner		**Beaker**	

Reading comprehension task: Read the iformation below and uderline the appropriate key words.

Seperating the solvent from a solution – simple distillation

Simple distillation is a method for separating the solvent from a solution. For example, water can be separated from salt solution by simple distillation. This method works because water has a much lower boiling point than salt. When the solution is heated,

the water evaporates. It is then cooled and condensed into a separate container. The salt does not evaporate and so it stays behind.

Every pure substance has its own particular melting point and boiling point. One way to check the purity of the separated liquid is to measure its boiling point. For example, pure water boils at 100°C. If it contains any dissolved solids, its boiling point will be higher than this.

Separating solids from liquids – filtration

If a substance does not dissolve in a solvent, we say that it is insoluble. For example, sand does not dissolve in water – it is insoluble.

Filtration is a method for separating an insoluble solid from a liquid. When a mixture of sand and water is filtered:

- the sand stays behind in the filter paper (it becomes the residue)
- the water passes through the filter paper (it becomes the filtrate)

Filtration equipment set up

<u>YOUR TASK:</u>

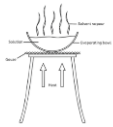
Use the key words to label your diagram:

Filter paper, funnel, collection flask, filtrate, residue.

<u>YOUR TASK:</u> use the information above to explain the process of filtration (how filtration is done)

Separating solids from liquids – evaporation

Evaporation is used to separate a soluble solid from a liquid. For example, copper sulfate is soluble in water – its crystals dissolve in water to form copper sulfate solution. During evaporation, the water evaporates away leaving solid copper sulfate crystals behind.

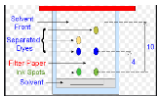


Evaporation equipment set up

YOUR TASK: Now explain how evaporation is carried out:

Chromatography: Reading comprehension task

Paper chromatography is a method for separating dissolved substances from one another. It is often used when the dissolved substances are coloured, such as inks, food colourings and plant dyes. It works because some of the coloured substances dissolve in the solvent used better than others, so they travel further up the paper.



<u>YOUR TASK:</u> Use the following sentences to help you describe how chromatography separates a mixture

A mixture is two or more substances jumbled up together.

Some substances are more soluble in water than others.

Coloured pens are made up of different dyes mixed together.

Substance that are more soluble in water move quickly up the paper and separate from the rest of the substances.

Now write an explanation to describe how chromatography is carried out.

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Checkpoint task:

Match the correct key word to the correct sentence.

Atom	Two or more substances which can be physically separated.
Element	The smallest particle used to make everything else.
Compound	Contains only one type of atom.
Mixture	Two or more atoms chemically joined together

Which is the best way to get salt from salty water?

Evaporation

Filtration

Distillation

2

Pure water can be separated from inky water by simple distillation because:

Water and ink have different boiling points

Water evaporates leaving the ink particles behind

Ink evaporates leaving the water behind

3

What is the correct order for obtaining salt from a mixture of sand and salt?

Dissolving in water - filtration - evaporation

Evaporation - filtration - dissolving in water

Filtration - dissolving in water - evaporation

4

Which method is usually used to separate coloured substances from each other?

Simple distillation

Evaporation

Chromatography

5

How could you separate iron filings from a mixture of iron and sulfur?

Using a magnet

By adding water and filtering

By distillation

6

In filtration, what name is used to describe the solid left in the filter paper?

Filtrate

Residue

Distillate

7

If you wanted to make pure drinking water from sea water, what process would you use?

Filtration

Distillation

Evaporation

8

Crude oil can be separated into several liquids that have different boiling points. What is the name of this process?

Simple distillation

Chromatography

Fractional distillation

9

In chromatography, where are the spots of coloured substances placed?

Randomly on the piece of paper

In a vertical line on the paper

On a horizontal line on the paper

10

What is the name of the piece of paper at the end of a chromatography experiment?

Chromatogram

Filtrate

Residue

Match the words to their definitions-

Mixture	*A solid that dissolves*
Solute	*Method used to separate a soluble solid from a liquid*
Solvent	*If a solute doesn't dissolve in a solvent then it is…*
Solution	*Two or more substances 'jumbled up' together*
Soluble	*When a liquid changes into a gas*
Insoluble	*A liquid that does the dissolving*
Distillation	*If a solute dissolves in a solvent then it is…*
Evaporation	*When a gas changes into a liquid*
Condensation	*Formed when a solute completely dissolves in a solvent*

Separation methods

Use the word bank in the box to fill in the gaps.

Distillation can be used to separate two or more liquids. The mixture is boiled and the gas with the lowest _____ _____ goes into the _____ first. It _____ into a liquid and is collected. The other liquid is left behind.

Filtration is used to separate a solid from a liquid using a filter. The solid cannot _____ in the liquid and it also cannot pass through the holes in the _____, but the liquid can.

Evaporation is used to separate a solid that is dissolved in a _____. As the liquid _____ into a gas, it leaves the solid behind, often as crystals.

Chromatography is used to separate more than one _____ which are soluble in one _____. A small amount of substances is spotted on some _____ and the solvent runs up this separating the mixture

evaporates	filter paper		dissolve	filter	
solvent	condenser	condenses	boiling point		liquid

Using the information above, explain whether you would use filtration, evaporation or distillation in each of these cases:

1. Greg lives by the sea and wants to make his own sea-salt for cooking. He gets it from seawater.
2. Eric has made some brandy at home. He wants it to be stronger by removing some of the water.
3. Boris accidentally drops 1kg of sugar in a bucket of hot water. It dissolves, but he wants to get the solid sugar back.

4. Lily is shipwrecked on an island. She needs clean water, but there isn't any – just a swamp with muddy water.
5. Angus has a bottle of alcohol mixed with water. He wants to remove the alcohol from the water to use as a fuel.

Reading and comprehension task:

In year 7 we learnt that particles are the building blocks of matter. We learnt that they can exist in 3 states solids, liquids and gases and that solids were denser than liquids which were denser than gases.

Which weighs more – a kilogram of feathers or a kilogram of iron? They weight the same!! Which would take up more space? Density is the amount of matter a substance has in relation to its volume. It is a sign of how closely packed the particles of a substance are.

But if we consider the picture to the right, we realise that this is not the whole truth. So, this topic extends on our understanding of how particles and forces interact.

YOUR TASK: Read the information below and underline the important key words.

How do solids, liquids and gases differ?
Everything is made up of tiny particles. The properties of a substance depend on what its particles are like, how they move, and how they are arranged.

Most substances can exist in three states: **solid, liquid and gas**. The particles of a substance are the same in each state, but their arrangement and movement change. This explains the different behaviour of a substance in its three states.

Solids
In the solid state the **vibrating** particles form a **regular pattern**. This explains the fixed shape of a solid and why it can't be compressed or poured.

Liquids
In a liquid the particles still touch their neighbours but they **move around, sliding over each other**. This is why you can pour, but not compress, a liquid.

Gases
In the gas state, **widely-spaced particles move around randomly**. This explains why you can compress gases and why they flow.

Models of atomic structure for solid, liquid and gas.

<u>YOUR TASK</u>: Now use the information above to fill in the information table below:

State	Solid	Liquid	Gas
Diagram			
Arrangement of particles		Closely packed Random	
Movement of particles	Particles are vibrating in place		
Forces of attraction between particles	Strong		
Density of substance			Very low

Solids, liquids and gases:

YOUR TASK: Now use the particle diagrams above to compare solids, liquids and gases.

YOUR TASK: How many key words can you find?

KEY WORDS TO FIND:

Flow, Force, Gas, Ice, Liquid, Particle, Solid, Steam, Vibrate, Water

CHALLENGE ACTIVITY: Now explain each of the above key words

Flow.....

Force.....

Gas.....

Ice.....

Liquid.....

Particle.....

Solid.....

Steam.....

Vibrate.....

Water.....

CHECK POINT TASK:

In which two states are the particles randomly arranged?

Liquid and solid

Liquid and gas

Gas and solid

2

In which state are the particles only able to vibrate in a fixed position?

Solid

Liquid

Gas

3

Which state can be compressed or squashed really?

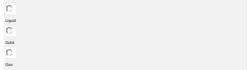
Solid

Liquid

Gas

4

Which state is shown in this diagram?



Liquid

Solid

Gas

5

Which state cannot flow from place to place?

Solid

Liquid

Gas

6

Particles, in which state have no bonds?

Liquid

Solid

Gas

7

Particles, in which state roll in a regular pattern and are held together tightly by bonds?

Solid

Liquid

Gas

8

At room temperature, what state is mercury in?

Solid

Liquid

Gas

9

What happens to the pressure of a gas when it is heated at constant volume?

Increases

No change

Decreases

10

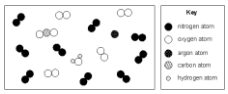
When 100 grams of water is boiled, what mass of steam is made? *

99 grams

100 grams

0 grams

Particle diagrams



Complete the following table. Use the diagram and key above to help you.

Name	symbol	chemical formula
Argon		Ar
Nitrogen		
Oxygen		O_2

Air is a gas at room temperature. What evidence in the

diagram above shows this?

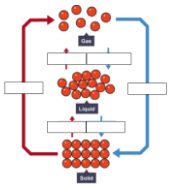
.....
.....
.....
.....
.....

A sample of air in a balloon is cooled.
Complete the sentences below using words from the box.
You may use each word more than once.

increases	decreases	stay the same

When the air is cooled, the volume of the air
..... **and the mass of the air**
..... **When the air is cooled, the**
density of the air .....

<u>YOUR TASK</u>: Use the above information to complete the flow chart below:



<u>YOUR TASK</u>: Summarise the changes of state using the information in the flow chart above