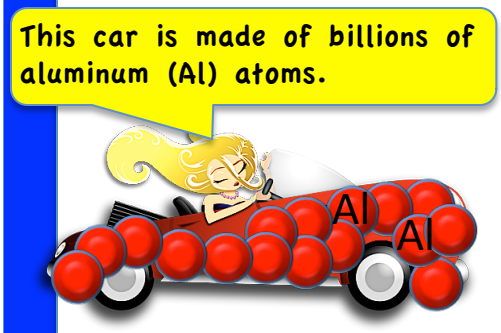
L1: What are Substances made from?

Have you ever wondered what your surroundings are made from? This girl for example is cruising down the Pacific Coast Highway, with her convertible top down listening to some phat beats. Unaware that between her and the road are a bunch of atoms, which are protecting her and making her ride enjoyable.

What are atoms?

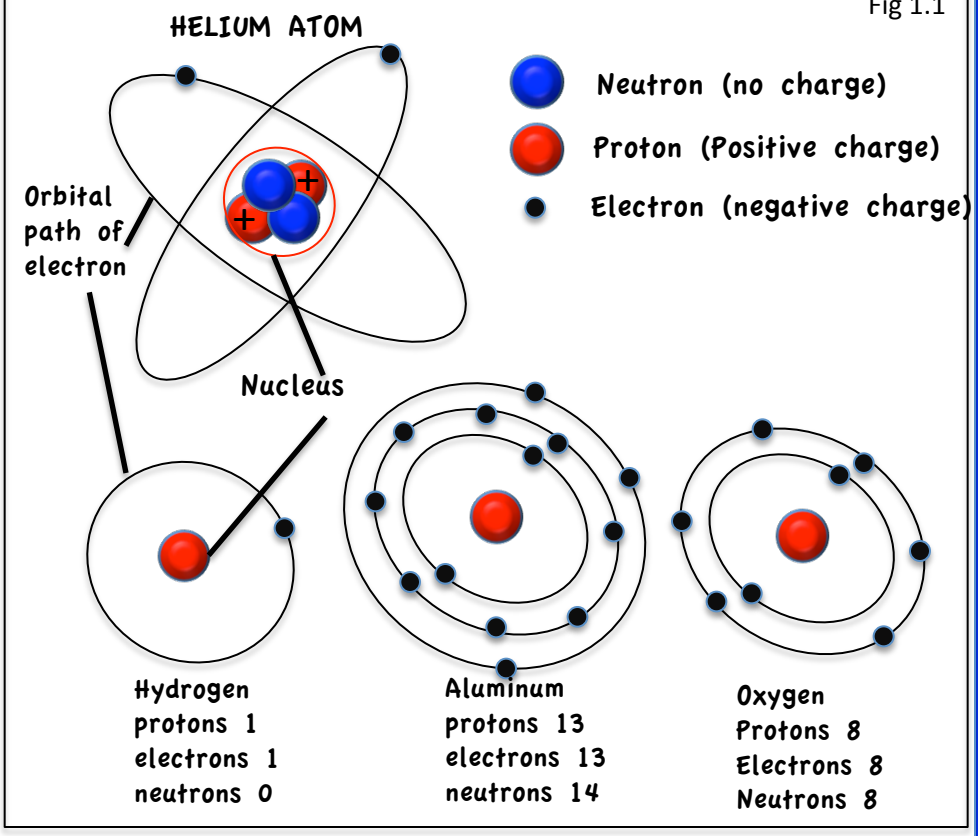
Atoms are all around us. Every substance that you can see and feel, is made of atoms. Depending on the substance; the atoms contained in them and their arrangement might be different. The basic atom consists of protons, neutrons and electrons. The center of the atom is called the nucleus and it is here where the protons and neutrons reside. **Protons** have a positive charge, and **neutrons** have no charge. Together they amount for the vast majority of a substances' mass. The nucleus is surrounded by tiny **electrons**, which have relatively very little mass, and are negatively charged. These electrons circle the neutron along orbital paths, the electrons are constantly moving.

Fig 1.1, below shows the atoms for the elements Helium, Hydrogen, Aluminum and oxygen. Helium is a gas, you can sometimes find it in balloons and it is the gas that makes them float. The reason for this is because the mass of the helium atoms are less than that of air. Helium's atom contains 2 protons, 2 neutrons and 2 electrons. **Note that each element has a different number of protons. They also have equal numbers of protons and electrons.**



As you can see every substance is made of different types of atoms. Hydrogen for example has atoms that contain just one electron and proton. Aluminum however, the metal found in the sports car above, has 13 electrons, 13 protons and 14 neutrons. Chemical substances can be identified by the number of protons that they have. This is called its **atomic number or proton number.**

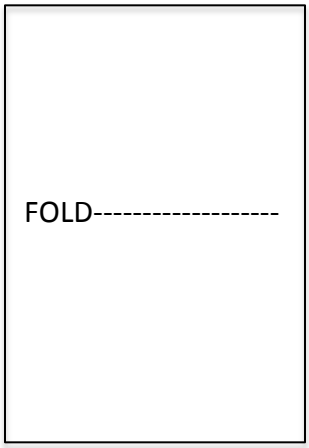
Fig 1.1

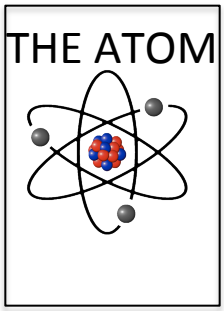


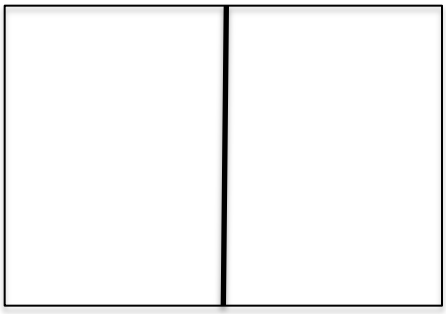
When 2 or more atoms are joined chemically they form a **molecule**. Water for example is made from 2 hydrogen atoms and 1 oxygen atom. It has the formula H_2O. Some molecules can contain thousands of atoms. The more atoms that there are in a molecule, the larger it is.

L1: What are Substances made from? ACTIVITY

1. Produce a booklet about the atom. Explain what it is, what it is made from, add as many labels as you can. Include examples of different atoms.







2. Find the answer to the following questions and then include these key facts in your booklet.

a) What 3 things are found in the atom?_____, _____, _____

b) Which part of the atom has the least amount of mass?_____

c) What particles are found in the nucleus of the atom?_____

d) Which particles in the atoms are positively charged?_____

e) Which particles have no charge? _____

f) Which particles of the atom have a negative charge?_____

g) If an atom has 20 protons, how many electrons will it have?_____

h) What is the atomic number?_____

i) What is a molecule?_____

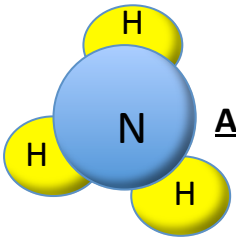
EXTRA: Further reading and research:

Use your Ipad/computer to research and explain how scientists know that protons and neutrons are found in the nucleus of the atom.

L1.1 EXPLORING THE ATOMS OF DIFFERENT SUBSTANCES

Atoms are the building blocks of life. Everything around us is made of atoms. If something contains one type of atom, it is called an **element**. Some of these atoms form **compounds** which are a combination of 2 or more chemically joined elements, and some form **molecules**, which are structures that contain 2 or more atoms.

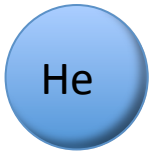
AMMONIA: is a gas that occurs naturally in the atmosphere, it can also be used as a cleaning agent when it is added to water. It is a compound that is composed of one nitrogen atom and 3 hydrogen atoms.



AMMONIA

Elements present _____ number of atoms_____

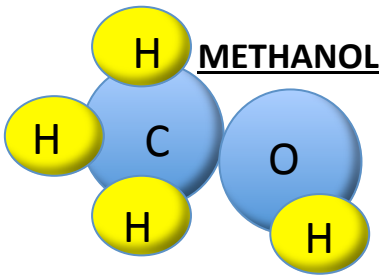
HELIUM: this is a gas, it is used to inflate party balloons as it is lighter than air, making the balloon float. It is made up of helium atoms.



HELIUM

Elements present_____ Number of atoms_____

METHANOL: is a chemical substance with the chemical formula CH_3OH. It is a compound as it contains 3 different elements; 1 carbon atom, 4 hydrogen atoms and 1 oxygen atom. Methanol is used in cars as an antifreeze, it can also be used as a fuel, to power monster trucks and speedway motorcycles.



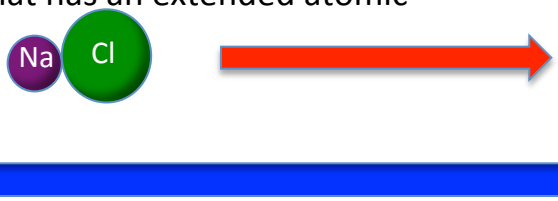
METHANOL

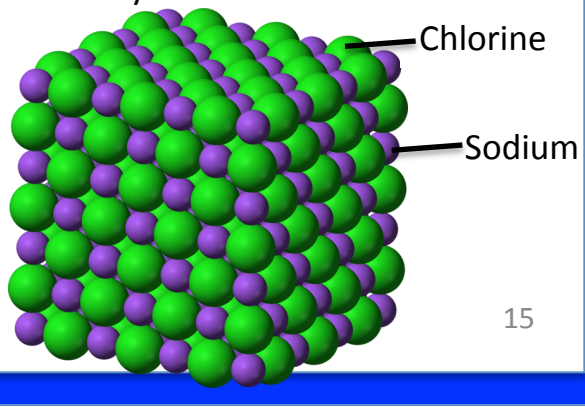
GLUCOSE: this is a type of sugar that is found in energy drinks, such as Gatorade. It is also found in many types of food and provides us with energy. Its chemical formula is $C_6H_{12}O_6$. It is a compound because it contains one or more chemically bonded elements, which include carbon, oxygen and hydrogen.

How many atoms are there in glucose? _____ What are their names?_____

SODIUM CHLORIDE: is a chemical substance that is made from sodium and chlorine. Its common name is salt. The same salt that can be used to season your food.

Each molecule of the compound sodium chloride, contains one sodium atom and one chlorine atom. These structures can be repeated to form a large solid molecule, that has an extended atomic structure.





L1.1 EXPLORING THE ATOMS OF DIFFERENT SUBSTANCES

ACTIVITY

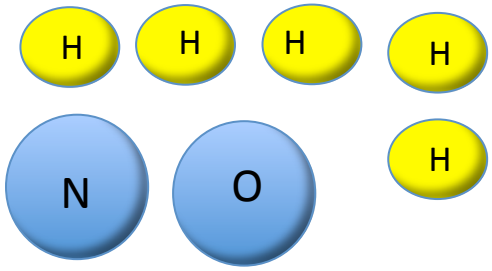
1. "Glass plus "is a cleaning product that can be used on windows. It contains water and ammonia. Ammonia has the chemical formula NH_3 and water has the chemical formula H_2O.

How many hydrogen atoms are in ammonia?_____

How many hydrogen atoms are in water?_____

Using the atoms that are available in the box below, draw the atomic structure of ammonia and water.

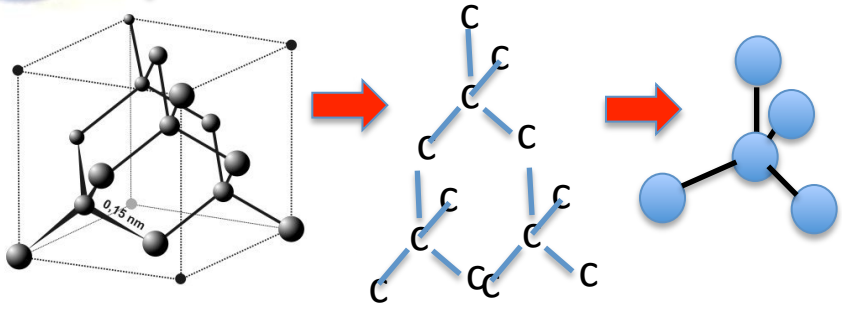
AVAILABLE ATOMS



AMMONIA

WATER

2. Diamonds are one of the rarest and most treasured crystals on the planet . Their atomic structure consist of Carbon atoms arranged in a crystal diamond lattice. Their arrangement makes diamonds one of the hardest structures on the planet. Their structure can be created using the model below:



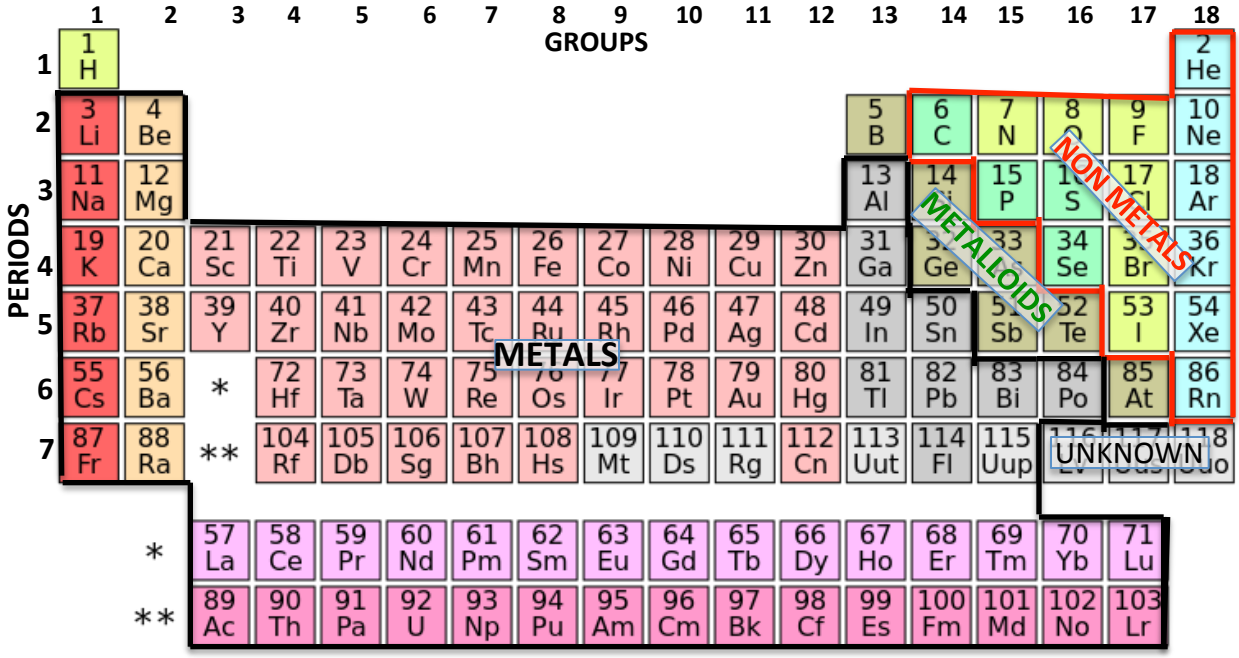
ACTIVITY: Using toothpicks and marshmallows, or simply using a piece of paper and a pen, see if you can create a diamond lattice. See how big you can make it.

L2: Elements and their properties

Gold is a precious metal, it is often used to make jewelry and if you want to bling out your outfit, it is a must have accessory. MC Penguin never leaves the house without it.

Gold is a metal and it consist of only gold atoms. Each gold atom has 79 protons, 79 electrons and 118 neutrons. Gold is an element which can be found in the Periodic Table, it has the chemical symbol Au.

The periodic table currently contains 118 elements. Each element is defined by the number of protons that are found within its atom (**proton number**). An element is defined as a substance that contains just one type of atom.



Each element in the Periodic Table is identified by its proton number and its chemical symbol. In most cases the chemical symbol is the first letter of its name, however there are exceptions, for example Sodium has the chemical symbol Na, Gold is Au and Silver is Ag.

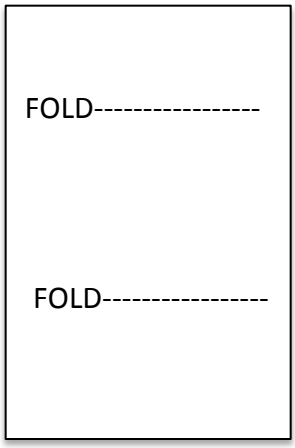
The periodic table is arranged by periods and groups. There are 7 period and 18 groups. They are then arranged by their chemical and physical properties. From left to right we have the metals, metalloids and non metals on the right.

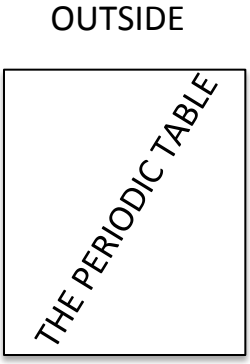
Each element has certain chemical and physical properties for example Gold's physical properties are that it is a yellowish colored metal, which is malleable and ductile, meaning that it can be shaped and stretched out like wire. Chemical properties of Gold include; it is relatively inert, meaning that it does not react with other elements. Sodium (Na) has similar physical properties to gold, in the sense that it is a malleable metal, however it is much softer and quite brittle; you can cut it with a knife. Sodium's chemical properties are very different to gold, as it very reactive, reacting violently with water.

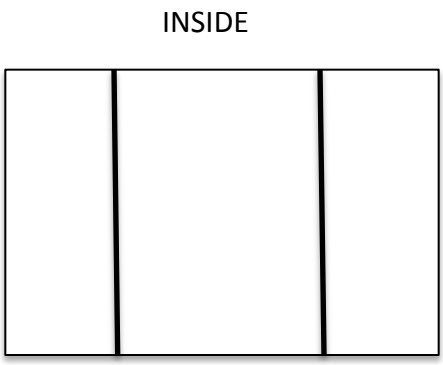
Many of the different physical and chemical properties of elements are due to their atom's structure and arrangement

L2: Elements and their properties ACTIVITY

1. Produce a foldable about the periodic table.







Include the following:

1. The Chemical symbol and full name of the first 20 elements
2. The number of electrons, protons and neutrons of the first 20 elements
3. Pick any two elements and describe their physical and chemical properties.

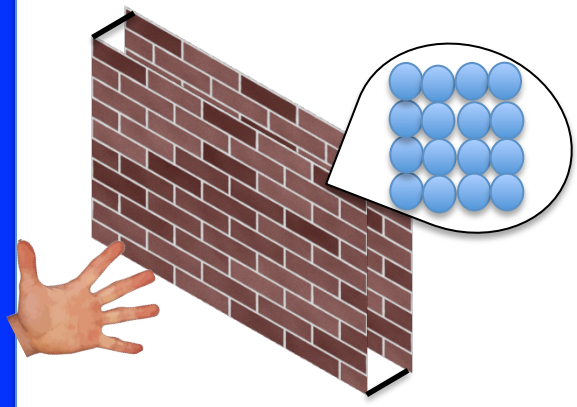
Example:

1. H = Hydrogen, protons =1, electrons=1, neutrons =0
2. He= Helium , Protons=2, electrons =2, neutrons =2

Yo! Remember that you can work out the number of neutrons by subtracting the proton number from the relative atomic mass of an element . I wrote it all down for you on the "Periodic Table" handout!. MC Penguin is out!

L3: States of matter

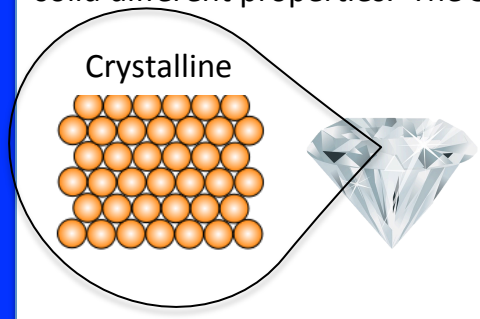
There are 3 main states of matter, Solid, Liquid and Gas. Each state behaves differently, giving it specific physical and chemical properties. Water for example is a liquid, it flows and takes the shape of its container. Have you ever wondered why you can swim in water but can't swim through the air? Or perhaps you wondered why you cant put your hand through a wall but can dip your hand into a pool of water. Atoms and molecules are present in air, water and a solid brick wall, but what is happening to these atoms in order for each substance to behave differently when we interact with it.



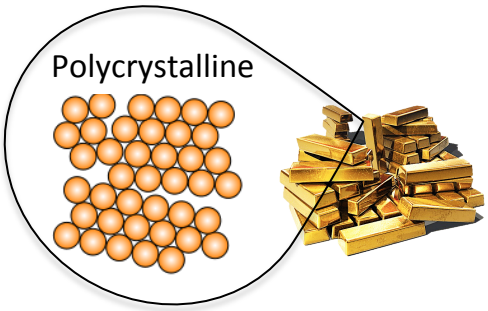
SOLIDS are formed from molecules and atoms that are in a fixed arrangement, the atoms are closely spaced and may vibrate in their fixed positions.

You know that something is a solid because it has a definite shape and volume. The wall for example has a definite rectangular shape and its volume stays the same. However hard you pressed against the wall, the atoms and molecules within the wall would not move from their fixed position, maintaining the walls shape and volume.

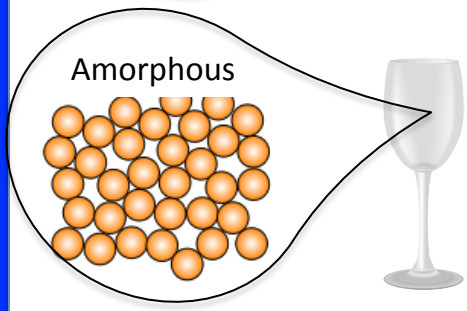
The atoms and molecules in a solid can be arranged in 3 patterns, these arrangements give the solid different properties. The 3 arrangements are crystalline, polycrystalline and amorphous.



Crystalline structures consist of highly ordered atoms and molecules, forming a crystal lattice that extends outwards in all directions. The arrangements of atoms are repeated throughout. These type of structures are found in diamonds and salt.

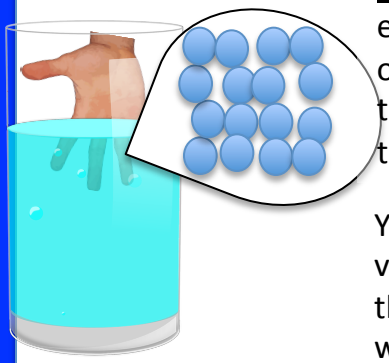


Polycrystalline structures consist of a large number of crystalline structures that are aligned in a variety of different directions. These structures are mainly found in most metals.

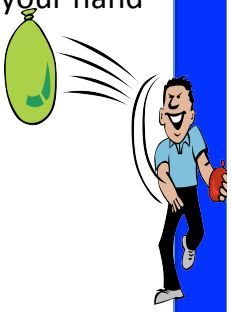


Amorphous structures consist of atoms and molecules that are arranged in no particular order. Examples of solids with amorphous structures include glass, wax and many plastics.

L3: States of matter



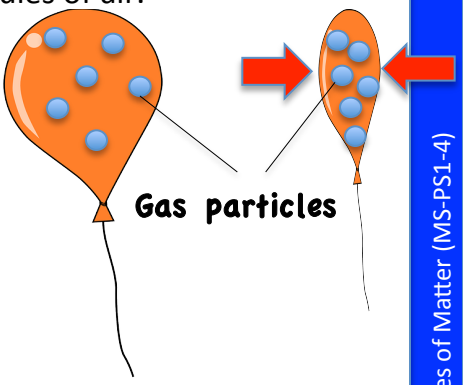
LIQUIDS consist of atoms and molecules that are in constant contact with each other, however unlike solids their atoms are able to move over each other. This is why it is possible to put your hand into a pool of water, as the water molecules move over each other and allow space for your hand to fit between the molecules.



You know something is a liquids because it has a definite volume, but its shape can change. Liquids take the shape of their container. For example if you were to fill a balloon with water the balloon would start to expand and the water would take the shape of the balloon. If the sides of the balloon are pressed the balloon will change shape but the volume stays the same.

GASES consist of molecules and atoms that are widely spaced apart. They are constantly flying around, and sometimes collide with each other. It is because of this arrangement that it is impossible to swim in air, your body simply falls through the spaces that exist between the molecules of air.

You know that something is a gas because the substance has no definite shape or volume. If you were to blow air into a balloon and tie a knot in the top of the balloon, you could change the volume of the balloon by squeezing on the sides of the balloon, which compresses the gas particles and reduces the volume of the gas, this also changes the shape of the balloon.



PLASMA

Fire has been around since the dawn of man. How do you think the atoms and molecules are arranged in fire? How would you classify its state of matter?

Fire, seems to move like a liquid, yet at the same time it looks like a gas. Fire is classified as PLASMA, which it the 4th state of matter.

Plasma is the most common form of matter that exists in our universe. It is found in the sun and other stars in the universe, it is also found in lightning and plasma televisions.

The particles in plasmas move independently like in a gas, but they break apart which allows them to conduct electricity.

L3: States of matter ACTIVITY

1. What are the 3 main states of matter? Draw a diagram for each one to show how the particles are arranged

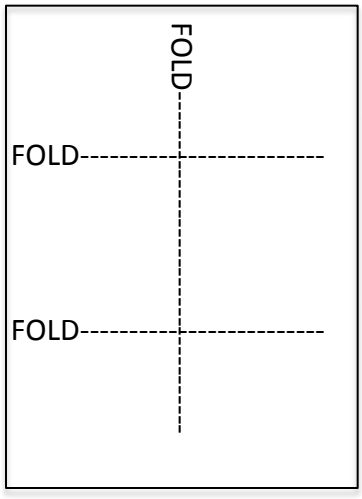
_____ _____ _____

2. Categorize the following substances into their appropriate state of matter, based on their physical properties.

Sugar, water, helium, oxygen, nitrogen, carbon dioxide, sand, gold, silver, wood, yogurt, cream, shaving foam, lighting, fire, glass, cola, orange juice, orange, salt.

SOLID	LIQUID	GAS	PLASMA

3. Produce a foldable to describe the states of matter. For each state of matter include examples.



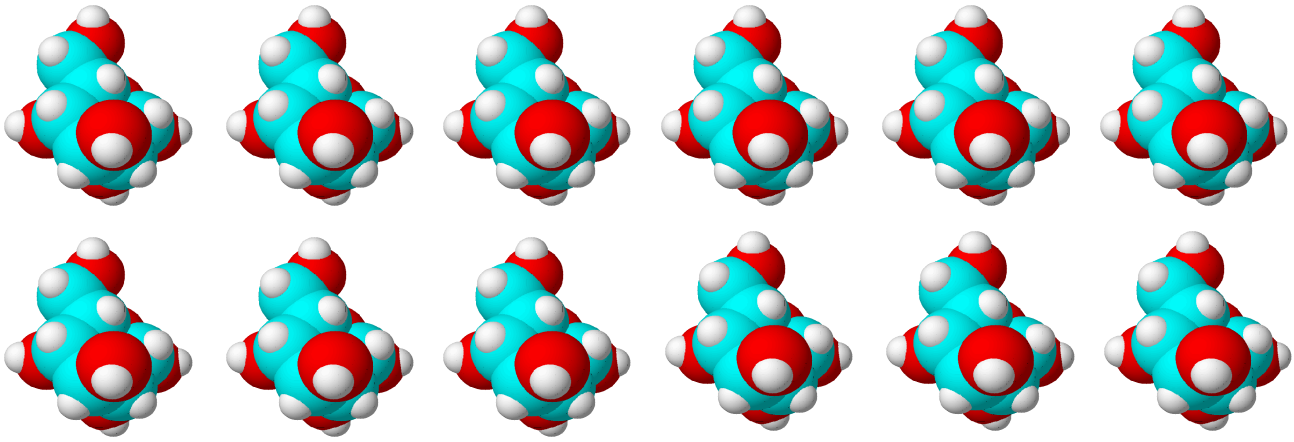
STATES OF MATTER

SOLID	LIQUID	GAS
DIAGRAMS		
Examples How are the particles arranged?		

PS1.A: Structure and Properties of Matter (MS-PS1-4)

L3: States of matter ACTIVITY II

1. Glucose is a sugar which has the chemical formula $C_6H_{12}O_{6..}$ This means that each particle of sugar has 6 carbon atoms, 12 hydrogen atoms and 6 oxygen atoms. Cut out the molecules of sugar, then arrange the particles on the spoon which is found on the next page. Your particles should be arranged as a solid.



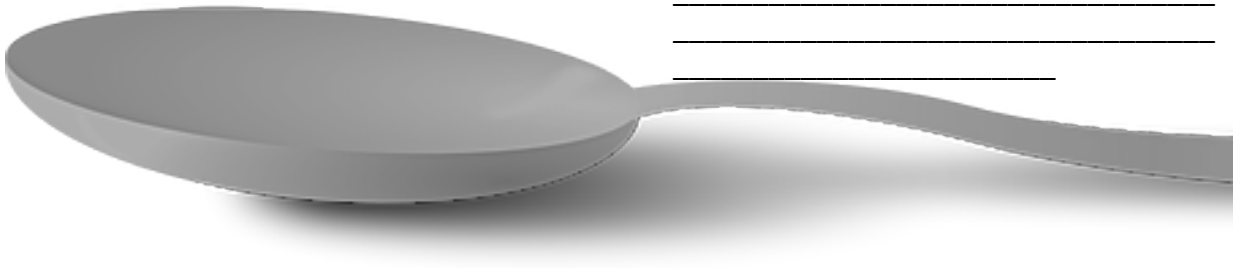
2. Helium is used to inflate party balloons. Helium is made of He atoms. Cut out the Helium atoms and then place them in the balloon on the next page. Your particles should be arranged as a gas

L3: States of matter ACTIVITY II

1. Place the molecules of sugar onto the spoon. Arrange the particles so that they resemble a solid.

a. How are the particles of sugar arranged on the spoon? How do they behave?

_____
_____
_____
_____
_____



2. Cut out the helium atoms and arrange them in the balloon to represent the particles in a gas

a. How are the particles of Helium arranged inside the balloon? How do they behave?

_____
_____
_____
_____
_____

3. Using the diagrams explain why you can change the shape and volume of a gas but not a solid_____
_____
_____

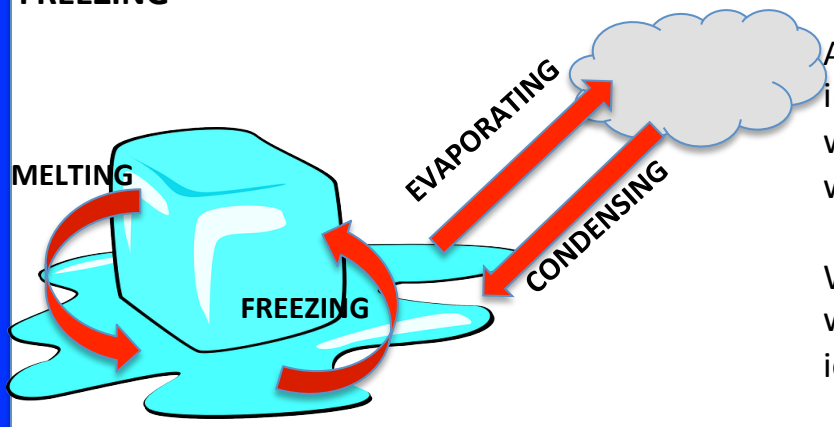
L4 What happens when substances change state?

Have you ever eaten a popsicle on a hot day, to find most of the ice turn to liquid and fall on the floor?

An iced popsicle, is a solid, it has a definite shape and volume. When the sun hits the popsicle it starts to melt and the shape of the popsicle starts to change it is now behaving like a liquid, it is changing state. If you were to leave the popsicle to melt into a liquid the volume of the liquid would equal the volume of the iced popsicle.

WHAT HAPPENS WHEN THINGS CHANGE STATE?

There are four main changes of state. **MELTING, EVAPORATING**, **CONDENSING** and **FREEZING**



An ice cube has a solid state, it will **melt** into water which is a liquid. The water will then **evaporate** into a water vapor which is a gas.

Water vapor can **condense** into water, which is a liquid. It can then **freeze** into ice which is a solid.

The four changes of state can be seen when you heat up an ice cube. As you heat the ice cube you are applying heat energy. This energy is transferred to the atoms and molecules in the ice. The heat energy causes the atoms in the ice to vibrate with more energy, this vibration causes the atoms to break the bonds of attraction that were holding it in the solid state. The point at which the solid ice changes to a liquid is known as the melting point.

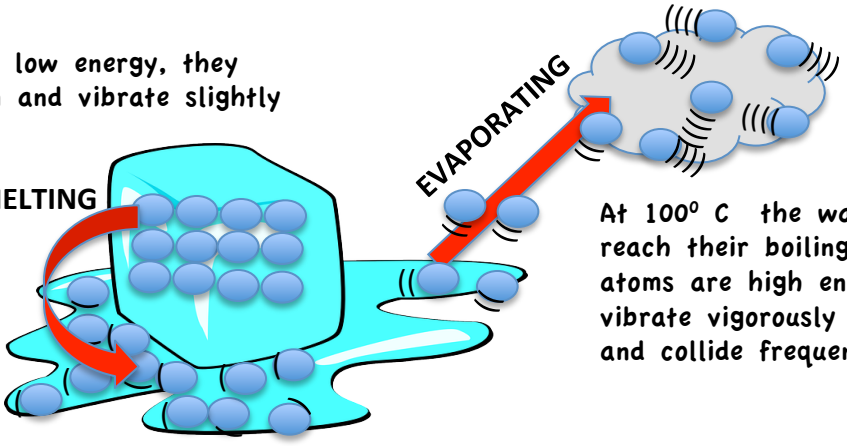
If you continue to heat the liquid to a temperature of 100^0C, the energy and movement within the particles will increase, to the point that they will overcome the bonds of attraction that were holding them in the liquid state. The water starts to boil, this is known as the boiling point, bubbles of water vapor escape from the water and evaporate to form a gas.

The temperature of a substance is therefore dependent on the movement (kinetic energy) of the atoms, that are within it. For example In ice the atoms are relatively still, with very little kinetic energy per atom. Resulting in a low temperature, Zero degrees Celsius. However in boiling water the relative kinetic energy of the atoms is high, as they move vigorously. This results in a higher temperature, 100 degree Celsius.

L4 What happens when substances change state? II

The atom in the ice have low energy, they remain in a fixed position and vibrate slightly

When heat is added to the ice the atoms have more energy and their vibration increases, the atoms move around



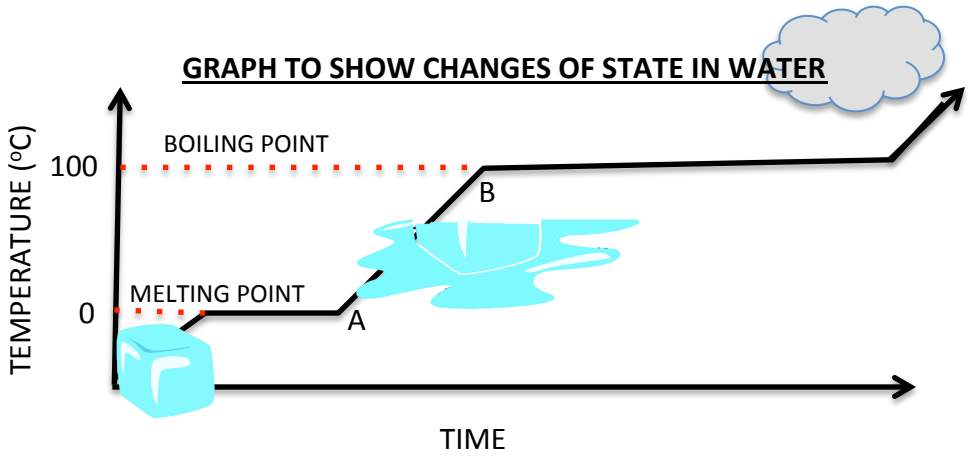
At 100° C the water molecules reach their boiling point, their atoms are high energy, they vibrate vigorously and move around and collide frequently.

The atoms in a gas move randomly and collide frequently, they are high energy, with lots of kinetic (movement) energy and vibrate vigorously. The atoms in a liquid move slightly and flow over each other, they are medium energy and vibrate at an intermediate level. The atoms in a solid are fixed, they vibrate slightly and are low energy.

The changes of states occur as a result of thermal energy that is transferred to the atoms. What do you think would happen if you removed the high energy levels that are seen in a gas? The answer is simple, the reverse would happen. The atoms would start to slow down, they would vibrate less, allowing the bonds of attraction to stabilize the atoms, the gas condenses and changes into a liquid. This is known as the condensation point.

If you continued to remove the energy from the atoms in the liquid they would continue to slow in their vibration, resulting in the bonds of attraction having greater effect, the atoms become more stable, the liquid freezes into a solid, this is known as the freezing point.

Not all substances go through the 4 changes of state, some substances such as dry ice, which is carbon dioxide in a solid state goes directly from a solid to a gas, this is known as **sublimation.**



Point A on the graph shows the melting point of water. The temperature remains at zero because the energy from the heat is used to break the bonds of attraction that exist between the atoms in the solid.

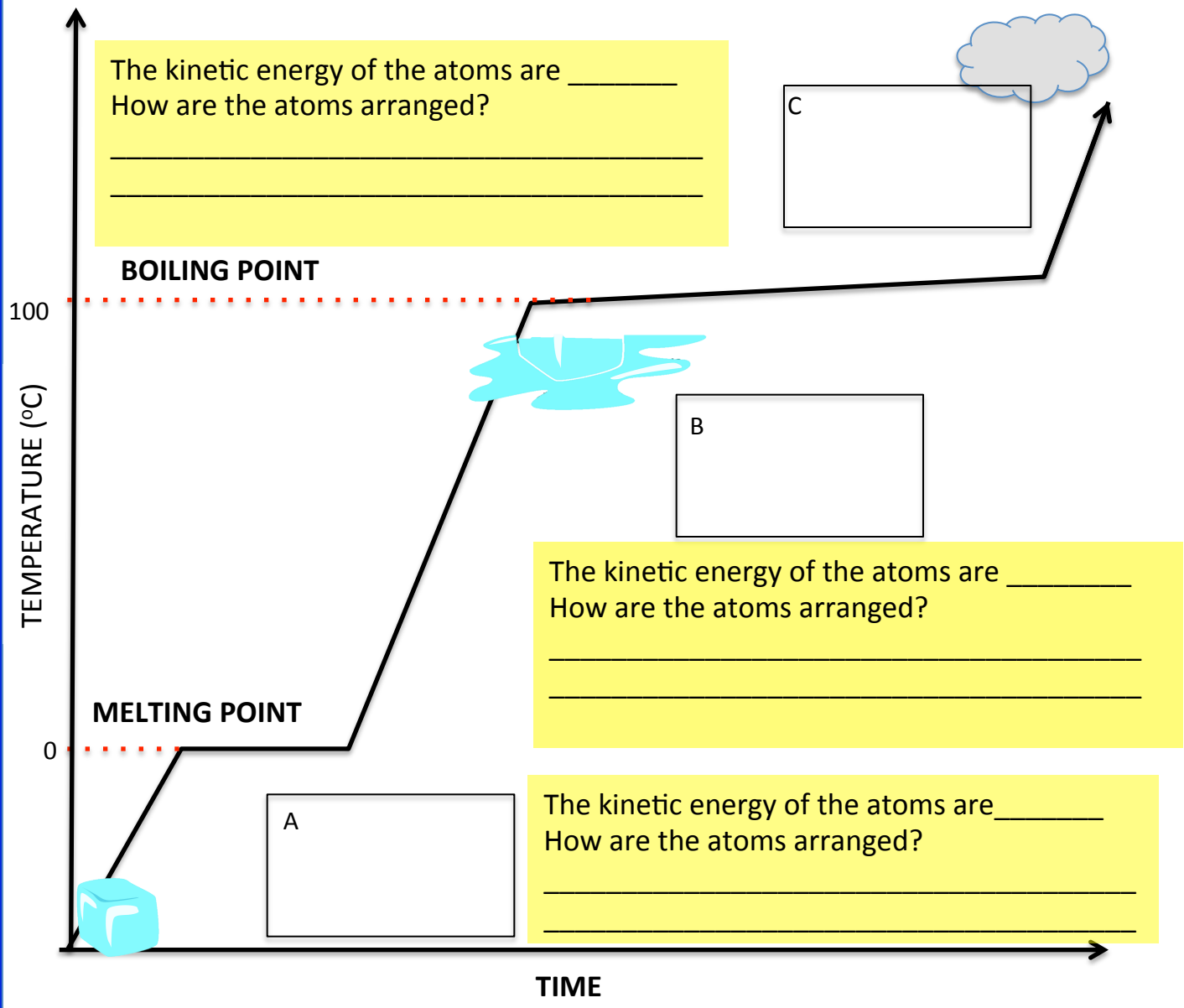
The same occurs at Point B, which is the boiling point of water

L4 What happens when substances change state?

ACTIVITY

1. The graph below is a model to show what happens when water is heated. At each stage draw a diagram to show the the movement of atoms and their energy levels.

GRAPH TO SHOW CHANGES OF STATE IN WATER



2. What is the melting point of ice? _____

3. What is the boiling point of water?_____

4. At which stage A, B or C do the atoms have the most kinetic energy?_____

5. Produce a poster to explain Why popsicles melt. Demonstrate knowledge of atoms and thermal energy.

INVESTIGATION: At What Temperature Does Water Boil?

Question: at what temperature does water boil and evaporate into a gas?

Prediction: _____

Materials: Water, beaker, thermometer, safety glasses, hot plate, Bunsen burner, heat proof mat, measuring cylinder

Diagram: Draw a scientific diagram of your setup.

Method:

1. Collect the apparatus and set up the experiment.
2. Measure 100ml of water into a beaker
3. Record the start temperature
4. Heat the water using the hot plate or Bunsen burner.
5. Record the temperature of the water every minute (60 seconds) until the water boils and steam is produced (evaporation).

Results:

TIME (minutes)	TEMPERATURE (degrees Celsius)

Investigating the changes of state in Water

What do your results show?

_____
_____
_____
_____

CONCLUSION: was your prediction right? What is the temperature at which water boils?

_____
_____
_____
_____
_____
_____
_____
_____

1. Using graph paper plot a graph to show how the the change in temperature over time.

2. What other questions could you investigate which relate to states of matter?

ASSIGNMENT #1 USING MODELS TO DESCRIBE THE ATOMIC STRUCTURE OF SIMPLE MOLECULES AND EXTENDED STRUCTURES

PERFORMANCE STANDARD:

MS-PS1-1. Develop models to describe the atomic composition of simple molecules and extended structures.

[Clarification Statement: Emphasis is on developing models of molecules that vary in complexity. Examples of simple molecules could include ammonia and methanol. Examples of extended structures could include sodium chloride or diamonds. Examples of molecular-level models could include drawings, 3D ball and stick structures, or computer representations showing different molecules with different types of atoms.]

1. Explain the difference between an element and a compound.

_____

_____

_____

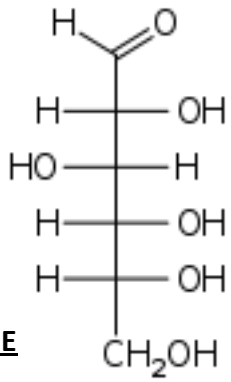
2. Explain the difference between a molecule and an atom.

_____

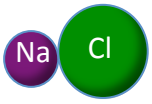
_____

_____

SCENARIO: you are working for kelloggs cereal. They received a complaint saying that their cereals were covered in a white substance that looked like salt. Create an build a model of glucose , and salt (sodium chloride). Explain the difference between the two structures, and the atoms that are used to form them.



GLUCOSE



Na—Cl

SALT

RUBRIC	**SCORE**
I have a model of glucose	**___/5**
I have a model of sodium chloride	**___/5**
I have a built an extended structure of salt, which includes more than 20 molecules	**___/5**
I have identified the atoms present in salt and sugar	**___/5**
I have explained the difference between glucose and salt.	**___/5**
I have presented my work on a poster.	**___/5**

ASSIGNMENT #2 USING MODELS TO PREDICTS AND DESCRIBES CHANGES IN PARTICLE MOTION, TEMPERATURE, AND STATE OF A PURE SUBSTANCE WHEN THERMAL ENERGY IS ADDED OR REMOVED.

PERFORMANCE STANDARD

MS-PS1-4. Develop a model that predicts and describes changes in particle motion, temperature, and state of a pure substance when thermal energy is added or removed.

[Clarification Statement: Emphasis is on qualitative molecular-level models of solids, liquids, and gases to show that adding or removing thermal energy increases or decreases kinetic energy of the particles until a change of state occurs. Examples of models could include drawings and diagrams. Examples of particles could include molecules or inert atoms. Examples of pure substances could include water, carbon dioxide, and helium.]

SCENARIO: Your teacher wants you to create a model for the class, that explains how temperature and particle motion relate to the physical state of water.

1. What are the 3 physical states of water?

_____, _____, _____

2. Produce a model to describe the changes that occur in particles when water changes state from a solid to a gas. Explain how the motion of particles relates to the state of water and its temperature. You should present your model using a poster board. You may also decide to create 3D models to represent the different states of matter. Use the rubric to help you create your model.

SCORE

RUBRIC

1. I have a model/poster which explains the 3 states of matter ___/5
2. I have drawings of the particle arrangements for a solid, liquid and gas ___/5
3. I have explained for each state of matter what would happen to the particles if thermal energy was added or removed. ___/5
4. I have produced a scale to show how the arrangement and motion of particles would change at 6 different temperatures, ranging from $0^{O}C$- $100^{O}C$. (you should pick 6 temperatures and draw diagrams that represent how the particles might behave at each temperature). ___/5
5. My work is well presented, easy to read and demonstrates time and effort. ___/5

STRUCTURE AND PROPERTIES OF MATTER VOCABULARY

MATTER: physical substances that occupies space and possess mass

SOLID: state of matter in which the substance has definite shape and volume, with fixed particles.

LIQUID: State of matter in which a substance has definite volume, liquids flow and take the shape of their container. They have particles which move over one another.

GAS: State of matter, in which a substance has no definite shape or volume, the shape and volume can be changed. The particles are arranged randomly and are spaced out. They collide frequently and have high kinetic energy.

PLASMA: the most common form of matter that exists in our universe. It is found in the sun and other stars in the universe, it is also found in fire and lightning.

PARTICLE: small unit of matter.

MOLECULE: a group of 2 or more atoms that are bonded together. For example a molecule of sugar.

ATOM: The basic unit of a chemical substance. For example an atom of helium.

MELTING POINT: the point at which something melts and changes from a solid to a liquid.

CONDENSING POINT: The point at which a gas changes into a liquid.

FREEZING POINT: The point at which something changes from a liquid to a solid.

BOILING POINT: The point at which something boils and changes from a liquid to gas.

KINETIC ENERGY: Type of energy which involves movement.

SUBLIMATION: change of state where something changes from a solid straight to a gas

PROTON: positively charged particle that is found in the nucleus of an atom

NEUTRON: particle found in the nucleus of an atom that has no charge.

ELECTRON: negatively charged particle, that is found in the empty space of an atom that surrounds the nucleus.

1. Create a personal dictionary to help you learn the key words. Include the word, definition, sentence and picture.

WORD	DEFINITION	SENTENCE	PICTURE

STRUCTURE AND PROPERTIES OF MATTER QUIZ 1

NAME_____ SCORE_____

1. What is the simplest most basic structure that can be found in a chemical substance?

A. ATOMS B. MOLECULE C. COMPOUND

2. What is the name given to a substances that contains just one type of atom?

A. COMPOUND B. MOLECULE C. ATOM D. ELEMENT

3. What is the name of the positively charged particles that are found inside the nucleus of an atom?

A. NEUTRONS B. PROTONS C. ELECTRONS D.QUARKS

4. What is the name of the negatively charged particles that are found around the outside of the atom?

A. NEUTRONS B. PROTONS C. ELECTRONS D.QUARKS

5. What is the name of the particles that are found in the nucleus that have no charge?

A. NEUTRONS B. PROTONS C. ELECTRONS D.QUARKS

6. What is the correct name that is given to a substance that contains 2 or more elements that are chemically bonded?

A. ELEMENT B. MOLECULE C. COMPOUND

7. What is the name given to something that has 2 or more atoms which are bonded together?

A. MOLECULE B. ATOMS C. COMPOUNDS

8. Which of the following substances can form an extended atomic structure?

A. AMMONIA B. METHANE C. WATER D. SODIUM CHLORIDE

9. How many periods are there in the periodic table?

A. 6 B. 7 C. 8 D. 9

10. What is the name of the chemical substance that has the chemical symbol Ag?

A. GOLD B. MERCURY C. SILVER D. CALCIUM

STRUCTURE AND PROPERTIES OF MATTER QUIZ 2

NAME_____ SCORE_____

1. What are the 4 states of matter?

_____, _____, _____, _____

2. You see that a substance has a definite shape and when you press down on it the volume remains the same. What is this substance?

A. SOLID B. LIQUID C. GAS D. FLUID E. HARD

3. You see a substance that has a definite volume but it changes shape taking the shape of its container. What is this substance?

A. SOLID B. LIQUID C. GAS D. FLUID E. HARD

4. There is an unknown substance in a plastic bag. The substance flows and takes the shape of the container, when you push on the sides of the bag the volume of the substance stays the same. What is this substance?

A. SOLID B. LIQUID C. GAS D. Helium E. HARD

5. A substance with an indefinite shape and volume is known as what?

A. SOLID B. LIQUID C. GAS D. FLUID E. HARD

6. What is the name of the point at which a gas changes into a liquid?

A. BOILING POINT B. FREEZING POINT C. MELTING POINT D. CONDENSING POINT

7. What is the name of the point at which a solid changes into a liquid.

BOILING POINT B. FREEZING POINT C. MELTING POINT D. CONDENSING POINT

8. Which state of matter contains particles which are high energy, resulting in frequent collisions between the particles?

A.SOLID B. LIQUID C. GAS

9. Which state of matter contains particles which are low energy, and are arranged in a fixed position?

A. SOLID B. LIQUID C. GAS

10. What is the CORRECT name given to a group of atoms that are bonded together?

A. PARTICLE B. ATOM C. MOELCULE D. COMPOUND