SCIENCE



YEAR 9

| | Торіс | Knowledge & ui | nderstanding | Key Vocabulary |
|----------|--------|---|---|----------------------|
| | | Know that sexual reproduction requires two individuals to produce an organism | Know how to take a cutting from a plant to produce healthy clones. | Tier 2 Variable |
| | | of the same type. | Know how to label a diagram of a | Hypothesis |
| | | Know that asexual reproduction requires | flower correctly. | Product |
| | | one parent to produce a new organism. | Know how to dissect a flower and | Method |
| | | Know that asexual reproduction | present the reproductive organs. | Equipment |
| | | produces clones (genetically identical | Know how to dissect a seed and | Apparatus |
| | | copies), whereas sexual reproduction | label it correctly. | Pigment |
| | | results in genetic variation within a | Know how to effectively plan an | Surface area |
| _ | | population. | investigation so a variable can be | Broad |
| Autumn | | Know that the differences in the | tested in order to obtain valid | Flat |
| <u>t</u> | Plants | characteristics of plants produced by | results. | Obtain |
| Au | | sexual reproduction are examples of | Know how to structure a sentence | |
| | | inherited variation. | to form a prediction. | |
| | | Know that there are various methods of | | Tier 3 |
| | | asexual reproduction including potatoes | | Sexual reproduction |
| | | producing tubers, strawberries | prepare a slide to view stomata | Asexual reproduction |
| | | producing runners, various plants | from the underside of a leaf. | Fertilisation |
| | | produce spores e.g. ferns and mosses, | | Gamete |
| | | and onions producing bulbs. | | pollination |
| | | Know that plants can be artificially | | Pollen tube |
| | | created from cuttings taken from the | | Zygote |
| | | leaf or shoot of an existing plant. | | Embryo |



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|---|-----------------|
| Know that the scientific names for sex | Germination |
| cells is gametes | Photosynthesis |
| Know that when gametes' nuclei fuse | Diffusion |
| together by the process of fertilisation, a | Respiration |
| zygote (fertilized egg) is formed. | Chlorophyll |
| Know the structure of a flower including | Chloroplast |
| male (Carpel) and female (Stamen) | Cell Wall |
| reproductive organs and parts. | Cell Membrane |
| Know the male and female names for | Vacuole |
| gametes in both humans (sperm, egg) | Mitochondria |
| and plants (pollen grain, egg). | Ribosome |
| Know that pollination is the transfer of | Nucleus |
| pollen from an anther to a stigma. | Cytoplasm |
| Know that anthers are where pollen is | Stomata |
| produced, ovules are where egg cells are | Gas exchange |
| produced, stigma is where pollen grains | Epidermis |
| land during pollination, the ovary | Palisade |
| contains the ovule, the style holds up the | Xylem |
| stigma, the filament holds up the anther, | Cuticle |
| flowers attract insects for pollination, | Producer |
| and sepals protect unbudded flowers. | Consumer |
| Know that cross pollination is when | Decomposer |
| pollen from one plant is transferred to | Seeds |
| another plant's stigma, whereas self- | Rooting powder |
| pollination is when pollen is transferred | Cuttings |
| from a plants anther to its own stigma, | Variation |
| resulting in offspring that are not clones | |
| of the parent. | |
| Know the difference between wind | |
| (pollen is light) and insect (pollen is | |
| spikey, flower is colourful and scented) | |
| pollinated plants and their pollen. | |



| Know that a fertilised egg grows into a | |
|---|--|
| seed. | |
| Know that when zygotes are fertilised | |
| they use a process called mitosis (cell | |
| division) to form an embryo, which | |
| develops into small roots and shoots. | |
| Know that germination is when a seed | |
| starts to grow after being fertilised and | |
| that the ovary will develop into fruit | |
| around the seed. | |
| Know that the seed has a store of food | |
| to use during germination, a seed coat to | |
| protect the seed, tiny roots to absorb | |
| water, and tiny shoots to grow leaves. | |
| Know that seeds can be dispersed by | |
| animal fur, animal faeces, wind, and | |
| water. | |
| Know examples of seed adaptations to | |
| allow seed dispersal e.g. spike to stick to | |
| animal fur, light or specific shapes to | |
| allow floating in air, less dense than | |
| water so can float, fruits that animals will | |
| consume. | |
| Know the order of the scientific method | |
| – hypothesis, prediction, experiment, | |
| observation, results, conclusion, | |
| evaluation. | |
| Know the chemical reaction for | |
| photosynthesis and correctly identify | |
| reactants and products. | |
| Know that water for photosynthesis is | |
| obtained through the soil via the roots | |
| | |



| and carbon dioxide is obtained through the leaves via the stomata. Know that chloroplasts contain chlorophyl which absorbs sunlight for photosynthesis to take place. Know that glucose produced by photosynthesis can be stored as starch for later use by the plant. Know the functions of plant organelles: mbosome for protein synthesis, chloroplast to absorb light and carry out photosynthesis, cell membrane to allow substances to move in and out of the cell, cell wall to strengthen and support the cell, cytoplasm is where chemical reactions take place, vacuele contains cell sap and keeps the cell rigid, nucleus contains DNA. Know that plants are adapted to obtain light from the sun, water from the soil, and carbon dioxide from the ain. Know that plants are adapted to obtain light from the sun, water from the soil, and carbon dioxide from the soil. Know that plants are adapted to abtain light from the sun, water from the soil. Know that plants are adapted to abtain light from the sun, water from the soil. Know that plants are adapted to abtain light from the sun, water from the soil. Know that plants are adapted to abtain light from the sun, water from the soil. Know that plants are adapted to abtain light from the soil. Know that plants have root hair cells that increase surface area so that more up the plant from the roots to the leaves in one direction. Know that xylem allows water to move up the plant from the roots to the leaves in one direction. Know that soles have root hair cells that increase surface area so that more water can be absorbed from the soil. Know that xylem allows water to move up the plant from the roots to the leaves in one direction. Know that soles have soles have somal holes on their underside called stomata which allow oxgent to diffuse into the plant | | """ Right 5" |
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| Know that leaves have small holes on their underside called stomata which | up the plant from the roots to the leaves | |
| their underside called stomata which | in one direction. | |
| | Know that leaves have small holes on | |
| allow oxygen to diffuse into the plant | their underside called stomata which | |
| | allow oxygen to diffuse into the plant | |



| | | | 1 | |
|--|-------------|--|---|-----------------|
| | | and carbon dioxide to diffuse out | | |
| | | (gaseous exchange). | | |
| | | (Basesas exertange). | | |
| | | | | |
| | | | | |
| | | Know that speed can be calculated using the formula | Know how to perform a simple experiment to | Tier 2: |
| | | Know that speed can be calculated using the formula below: | Know how to perform a simple experiment to determine speed. | |
| | | | Know how to apply the formula speed = distance | Speed |
| | | speed = distance ÷ time | | Mass |
| | | Know that displacement is the distance in a straight line | | Weight |
| | | between an object and its starting point. | Know how to draw a distance-time graph | Gravity |
| | | Know that a distance- time graph can be used to analyse | | Density |
| | | the movement of an object. | Know how to interpret a distance-time graph to | Balanced |
| | | Know that the area under a speed-time graph can be | determine whether an object is stationary or | Unbalanced |
| | | used to calculate the distance travelled by an object. | traveling at a constant speed. | Volume |
| | | Know that relative motion is the motion of one object | Know how to calculate the speed of an object | Model |
| | | with respect to another. | from a distance-time graph. | Rotate |
| | | Know that gravity is a non-contact force acting at a | Know how to calculate the relative motion of | Clockwise |
| | | distance on Earth and in space. | objects moving towards and away from each | Anticlockwise |
| | | Know that unsupported objects fall towards the Earth | other. | |
| | | because of the force of gravity acting between the Earth | Know how to calculate weight using the formula | Tier 3: |
| | | and the falling object. | below; weight = mass x gravitational field strength | Anomaly |
| | | Know that every object with mass will exert a | Know how to describe ways in which drag forces | Exert |
| | More Forces | gravitational pull on other objects. | can be increased or decreased. | Relative motion |
| | | 5 | Know how to calculate moments and describe the | Displace |
| | | closer the object is to Earth, the more the force of | subsequent motion if the system is not in | Displacement |
| | | gravity will act upon it. | equilibrium. | Upthrust |
| | | Know that weight can be calculated using the formula | Know how to calculate the work done using the | Drag |
| | | below: | formula below: | Friction |
| | | weight = mass x gravitational field strength. | work done = force x distance | Streamlined |
| | | Know that gravitational field strength on Earth is | | Pressure |
| | | 10N/Kg and is different on other planets and stars. | | Fluids |
| | | Know that upthrust is an upward force exerted on an | | Inflate |
| | | object by a fluid. | | Depth |
| | | Know that objects less dense than water will float and | | Atmosphere |
| | | those that are denser will sink. | | Implode |
| | | Know that water resistance and water resistance are | | Turning force |
| | | types of drag. | | Moment |
| | | Know that streamlining a shape will reduce drag. | | Pivot |
| | | Know that as the speed of an object increases so does | | Fulcrum |
| | | the drag. | | Lever |
| | | Know that when forces on an object are balanced the | | Effort |
| | | speed will be unchanged. | | Load |
| | | Know that atmospheric pressure decreases with height | | Equilibrium |
| | | due to the weight of the air above decreasing. | | Conservation |
| | | Know that pressure in liquids increases with depth. | | Conscivation |
| | | | | • |



| | | | 5 |
|-----------|--|--|---------------------|
| | Know that pressure in fluids acts in all directions. | | Work |
| | Know that a moment is the turning effect of a force. | | Machine |
| | Know that moments are calculated by multiplying the | | |
| | force by the perpendicular distance. | | |
| | Know that this relationship can be represented by the | | |
| | formula below: | | |
| | Moment = force x perpendicular distance from pivot | | |
| | Know that if the clockwise moment is equal to the | | |
| | anticlockwise moment, then the system is in equilibrium | | |
| | Know that a lever can be used to multiply forces. | | |
| | Know that a simple machine, such a lever or pully, | | |
| | | | |
| | provides a greater force at the expense of smaller | | |
| | movement. | | |
| | Know that in a simple machine, the product of force x | | |
| | displacement remains unchanged. | | |
| | | | |
| | Know that an atom is the simplest particle that exists. | Know how to write the chemical symbols of | Tier 2 |
| | | | |
| | Know that an element is made up of the same type of | elements, with the first letter always being a | conservation |
| | atoms. | capital letter and the second letter as a lower-case | properties |
| | Know that molecules are two or more atoms chemically | | ratio |
| | bonded together. | Know how to write chemical formulae for simple | trends |
| | Know that a compound is two or more different types of | | extinguish |
| | atoms bonded together | Know how to balance symbol equations. | greenhouse |
| | Know that mixtures are made up out of different | Know how to identify trends in reactivity of alkali | reversible |
| | substances not chemically bonded to each other. | metals. | irreversible |
| | Know that John Dalton's atomic theory stated the | Know how to determine anomalies from data. | |
| | following: a) that all matter is made up of tiny particles, | Know how to calculate mean averages from data, | |
| | b) In chemical reactions atoms rearrange to make a new | removing anomalies from the calculation. | |
| Chemical | substance. | Know how to draw a line graph using mean | |
| | Know that Dalton's theory stated that atoms were tiny | averages calculated to draw a line of best fit. | Tier 3 |
| reactions | indestructible spheres with no empty space. | Know how to infer data from a line graph by | matter |
| | Know that the modern version of the atom contains | extrapolating data. | atoms |
| | protons and neutrons in the nucleus, with electrons | Know how to identify trends in data to draw | elements |
| | orbiting the nucleus on shells. | conclusions. | compounds |
| | Know that non-metal elements are found on the right- | Know how to evaluate data for reliability. | chemical formula |
| | hand side of the periodic table and metal elements are | , | physical properties |
| | found on the left. | | chemical properties |
| | Know that the rows in the periodic table are called | | reactants |
| | periods and the columns are called groups. | | products |
| | Know that physical changes are reversible, and no new | | combustion |
| | substances are formed. | | Oxidation |
| | Know that chemical changes are irreversible and new | | Reduction |
| | substances are formed. | | |
| | substances dre formeu. | | Activation energy |



| Know that alkali metals react with water, and the | Exothermic |
|--|----------------|
| reactivity of the alkali metals increase as you move | endothermic |
| down group 1. | pollutants |
| Know that metals can react with oxygen to form metal | global warming |
| oxides and that the appearance of metal oxides are | climate change |
| different to the appearance of the metal. | effervescence |
| Know that oxidation is a gain of oxygen and reduction is | reactive |
| the loss of oxygen. | |
| Know that combustion is a type of oxidation reaction as | |
| elements combine with oxygen | |
| Know that fuel, heat, and oxygen are needed for | |
| combustion to occur. | |
| Know that carbon dioxide and water are produced in | |
| complete combustion of fuel | |
| Know that carbon monoxide, carbon and water are | |
| produced by incomplete combustion of fuel | |
| Know that atoms are not created or destroyed in a | |
| chemical reaction so the mass of the products in a | |
| reaction remains the same as the mass of the reactants. | |
| Know that metals react with oxygen to form metal | |
| oxides | |
| Know that metals react with water to form metal | |
| hydroxides and hydrogen | |
| Know that exothermic reactions transfer thermal energy | |
| to the surroundings and endothermic reactions take in | |
| thermal energy from the surroundings. | |
| Know that every reaction requires bonds to be broken | |
| first before new bonds are formed. | |
| Know that energy must be taken in to break bonds | |
| which is an endothermic reaction. | |
| Know that energy is given out when bonds are formed | |
| which is an exothermic reaction. | |
| Know that combustion and other human activity such as | |
| farming of cattle leads to the production of greenhouses | |
| gases. | |
| Know that sulfur is an impurity found in fossil fuels, | |
| which combusts to form sulfur dioxide, which dissolves | |
| in water vapour to form acid rain. | |
| Know that acid rain causes limestone to weather, stops | |
| fish eggs from hatching and makes soil too acidic for | |
| some crops to grow. | |
| Know that greenhouse gases absorb thermal energy | |
| radiated from earth and re-radiates heat back into the | |
| atmosphere. | |
| | |



| | | | 9 |
|-----------------|---|--|----------------|
| | Know that conduction is the transfer of energy through a | Know how to compare the rates of conduction in | Tier 2: |
| | material by the movement of its particles | different conductors | Vacuum |
| | Know that metals are good conductors of thermal energy | Know how to use convection currents to ensure | Emit |
| | Know that non-metals are poor conductors of thermal | circulation of fresh air in a system | Absorbed |
| | energy | Know how to calculate thermal energy changes | Medium |
| | Know that insulators are poor conductors of thermal | using specific heat capacity | Appliance |
| | energy | Know how to explain energy transfers and | Rate |
| | Know that a vacuum is a space totally empty of matter | pathways in a variety of situations | Attract |
| | Know that stationary air is a good thermal insulator | Know how to use Sankey diagrams to show energy | Repel |
| | Know that convection is the transfer of thermal energy in | transfers and pathways | Resistance |
| | fluids due to density changes | Know how to calculate the efficiency of various | Tier 3: |
| | Know that more dense fluid will sink, and less dense fluid | energy transfers | Conduction |
| | will rise to the top | Know how to use meter readings to calculate how | Convection |
| | Know that radiation is the transfer of energy via wave or | much energy needs to be paid for | Density |
| | particle | Know how to graphically compare the resistance | Radiation |
| | Know that density is the amount of mass per unit volume | of two wires | Delta |
| | Know that infrared is the transfer of thermal energy via a | Know how to apply and carry out calculations | Dissipation |
| | radiation pathway | using Ohms law, V = I x R | Efficiency |
| | Know that infrared cameras can be used to produce | Know how to experimentally plot a magnetic field | Current |
| | maps of temperature. | | Attract |
| | Know that infrared is used in night vision equipment | | Repel |
| Electricity, | Know that black dull objects are good absorbers and | | Magnetic field |
| | emitters of infrared radiation. | | Induced magnet |
| magnetism and | Know that white or shiny objects are poor absorbers of | | - |
| energy transfer | infrared radiation | | |
| 07 | Know that the Greek letter delta is used to represent 'the | | |
| | change in' | | |
| | Know that energy can neither be created or destroyed, | | |
| | only transferred between stores via pathways | | |
| | Know that dissipated energy is energy that ends up in a | | |
| | non-useful store | | |
| | Know that the efficiency of an energy transfer is the ratio | | |
| | between the input energy and the usefully transferred | | |
| | useful energy | | |
| | Know that appliances with a lower efficiency rating will | | |
| | cost more to run | | |
| | Know that electricity meters measure energy transferred | | |
| | in kilowatt-hours | | |
| | Know that power can be calculated by power = | | |
| | energy/time | | |
| | Know that power is the rate of transfer of energy | | |
| | Know that everything is made of atoms | | |
| | Know that atoms are made of protons, neutrons and | | |
| | electrons | | |
| | Know that protons and neutrons are in the nucleus | | |
| | Know that electrons are in shells around the nucleus | | |
| | | | |



| | 5 mg |
|--|------|
| Know that the atom has no overall charge as it has equal | |
| number of positive and negative charges | |
| Know that a charged object has an electrostatic field | |
| around it | |
| Know that if a charged object is placed in an electrostatic | |
| field than it will experience a force acting upon it | |
| Know that friction between two insulating materials | |
| results in a transfer of electrons resulting in the two | |
| items having an equal and opposite charge | |
| Know that current is the rate of flow of charge | |
| Know that parallel circuits contain branches but series | |
| circuits do not | |
| Know that current is measured in series with a | |
| component by an ammeter | |
| Know that current splits and comes together at junctions | |
| in a parallel circuit. | |
| Know that current is constant in parallel circuits | |
| Know that potential difference is a measure of the | |
| energy transferred by the charge | |
| | |
| Know that potential difference is measured in parallel to | |
| a component using a voltmeter | |
| Know that potential difference is shared across | |
| components in a series circuit | |
| Know that potential difference is the same across all | |
| components in a parallel circuit | |
| Know that resistance in electrical conductors is due to | |
| collisions between the electrons and the ions in the | |
| lattice. | |
| Know that the resistance of an electrical conductor will | |
| be dependent upon the material it is made from and it's | |
| temperature | |
| Know that the resistance of a conductive wire also | |
| depends on its length and thickness | |
| Know that current flowing against an electrical resistance | |
| in an electrical appliance causes the device to heat up | |
| Know that materials that have very high resistances that | |
| stops current flowing are called insulators | |
| Know that we can calculate voltage using current and | |
| resistance | |
| Know that opposite poles on a magnet attract | |
| Know that like poles on a magnet repel | |
| Know that not all metals are magnetic | |
| Know that a magnetic field is an area around a magnet | |
| where magnetic materials experience a force | |
| Know that an induced magnet has become magnetised | |
| by being placed in a magnetic field | |



| | | | | ""anity High Sev" |
|--------|-----------------|---|--|--|
| | | Know that the magnetic field is strongest at the poles Know that the Earth's magnetic field comes from the spinning molten Iron core Know that the geographical north pole of the Earth is the magnetic south pole and vice versa Know that the north end of a compass points to the geographical north pole as it is attracted to the magnetic south pole of the Earth Know that a current flowing through a wire produces a magnetic field Know that the magnetic effect of a current flowing through a wire can be increased by arranging the wire into a coil around an iron core Know that a coil of wire with a current flowing through it is called a solenoid Know that an increase in the number of coils, or in the current flowing will increase the strength of a solenoid. | | |
| Spring | Metal reactions | Know that corrosion refers to reaction with oxygen that occurs on the surface of the metal Know that corrosion is an oxidation reaction. Know that oxidation is the gaining of oxygen. Know that rusting is the corrosion of iron and requires both water and oxygen to react with iron. Know that the reaction between iron, oxygen and water will form iron hydroxide as the product. Know that rusting can be prevented by covering the metal's surface with plastic, paint or oil. Know that some metals such as the alkali metals will react readily in water to produce a metal hydroxide and hydrogen gas | Know how to write a prediction based on scientific knowledge and understanding. Know how to place metals in order of reactivity by observing their reactions in water. Know how to write a word equation for the reaction of metals with water. Know how to write a balanced, symbol equation for the reaction of metals with water. Know how to name the salt produced from the reaction of metals with acid. Know how to write word and balanced, symbol equations for the reaction between metals and acids. Know how to predict the products in a displacement reaction by comparing the | Tier 2 evaluate effervescence displace extract ore malleable Tier 3 prediction salt compound oxidation reduction native state |



| | | 5 |
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| Know that when a gas is produced, effervescence is | reactivities of the two metals present in the | pure |
| observed. | reaction. | |
| Know that alkali metals produce metal hydroxides that | Know how to deduce which substance has been | |
| are alkali in solution. | oxidized or reduced in a displacement reaction. | |
| Know that some metals react with acids to produce a | | |
| salt and hydrogen gas. | | |
| Know that the salts produced are named depending on | | |
| the acid and metal that had reacted together. | | |
| Know that in a displacement reaction, the more reactive | | |
| metal takes the place of a less reactive metal from its | | |
| compound. | | |
| Know that a compound is two or more different types of | | |
| elements chemically bonded together. | | |
| Know that displacement reactions can be observed by a | | |
| colour change in a reaction and a formation of a solid | | |
| metal. | | |
| Know that an ore is a rock that contains a metal | | |
| compound. | | |
| Know that very unreactive metals such as gold are | | |
| found native. | | |
| Know that metals must be extracted from their ores by | | |
| either heating with carbon or by electrolysis. | | |
| Know that metals that are less reactive than carbon in | | |
| the reactivity series can be extracted from its compound | | |
| by both heating and carbon and electrolysis. | | |
| Know that heating with carbon is the preferred method | | |
| for extracting metals from its compound as it is cheaper. | | |
| Know that metals that are more reactive than carbon in | | |
| the reactivity series can only be extracted by | | |
| electrolysis. | | |
| Know that a pure substance only contains one type of | | |
| substance. | | |
| Know that alloys are a mixture of metals and has | | |
| desirable properties than those of pure metals. | | |
| Know that alloys have a range of melting points as it is a | | |
| mixture whereas pure metals have a sharp melting | | |
| point. | | |
| Know that alloys are less malleable than pure metals as | | |
| the different sized atoms disrupts the layers of atoms so | | |
| the layers of metal atoms cannot slide over each other | | |
| easily. | | |
| | | |
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| | I | | 5 the 1 th |
|-------------|---|--|-------------------|
| | To know what is meant by the term species. | Know how to read data and graphs to identify | Tier 2: |
| | To know and identify examples of inherited and | variation as continuous or discontinuous. | Controversial |
| | environmental variation. | Know how to create a model to represent | Explain |
| | To know the difference between continuous and | scientific ideas. | Describe |
| | discontinuous variation | Know how to plan a project so a final | Competition |
| | To know what gametes are. | presentation can be created successfully. | Diversity |
| | To know the process of fertilisation. | Know how to present information both verbally | Sugar |
| | To know what a normal distribution is and that | and visually to help others and yourself to better | Environmental |
| | continuous data usually gives a 'bell curve shape'. | understand a topic. | Continuous |
| | To know that genes are found in chromosomes and that | Know how to use key words to help structure a 6- | Discontinuous |
| | they are made from DNA | mark answer. | |
| | To know the role of chromosomes, genes and DNA in | Know how to use a model we have created to | Tier3: |
| | heredity. | better help understanding. | Evolution |
| | To know and be able to describe the structure of DNA. | | Natural selection |
| | To know the roles played by Watson, Crick, Franklin and | | Extinct |
| | Wilkins in the discovery of the structure of DNA. | | Biodiversity |
| Genes and | To know how individual parts of a model represent the | | Ecosystem |
| inheritance | different parts of a DNA molecule. | | |
| millentance | To know reasons why Rosalind Franklin's role in the | | Guanine |
| | discovery of DNA was misreported. | | Cytosine |
| | To know reasons for preventing species becoming | | Adenine |
| | extinct, thereby preserving biodiversity. | | Thymine |
| | To know ways in which biodiversity can be preserved, | | DNA |
| | including the use of gene banks, and evaluate their | | Base |
| | effectiveness. | | Double Helix |
| | To know and describe examples of a change to a species | | Chromosome |
| | that gave it a better chance of survival. | | Heredity |
| | To know how changes in an environment can lead to | | Gene |
| | changes in species or extinction through natural | | Phosphate |
| | selection. | | Species |
| | To know about variation and adaptations to explain | | |
| | Darwin's theory of evolution by natural selection. | | |
| | Darwin's theory of evolution by natural selection. | | |
| | | | |
| | Know that sexual reproduction requires two individuals | Know how to take a cutting from a plant to | Tier 2 |
| | to produce an organism of the same type. | produce healthy clones. | Variable |
| | Know that asexual reproduction requires one parent to | Know how to label a diagram of a flower | Hypothesis |
| | produce a new organism. | correctly. | Product |
| | Know that asexual reproduction produces clones | Know how to dissect a flower and present the | Method |
| Plants | (genetically identical copies), whereas sexual | reproductive organs. | Equipment |
| Pidrits | reproduction results in genetic variation within a | Know how to dissect a seed and label it correctly. | Apparatus |
| | | Know how to effectively plan an investigation so a | Pigment |
| | population | to encettery plan an intestigation so a | |
| | Know that the differences in the characteristics of | variable can be tested in order to obtain valid | Surface area |
| | | variable can be tested in order to obtain valid | 0 |
| | Know that the differences in the characteristics of | variable can be tested in order to obtain valid | Surface area |



| Know that there are various methods of asexual | Know how to test leaves for starch. | |
|--|--|----------------------|
| reproduction including potatoes producing tubers, | Know how to use a microscope and prepare a | |
| strawberries producing runners, various plants produce | | |
| spores e.g. ferns and mosses, and onions producing | | Tier 3 |
| bulbs. | | Sexual reproduction |
| Know that plants can be artificially created from | | Asexual reproduction |
| cuttings taken from the leaf or shoot of an existing | | Fertilisation |
| plant. | | Gamete |
| Know that the scientific names for sex cells is gametes | | pollination |
| Know that the scientific names for sex certs is gametes | | Pollen tube |
| process of fertilisation, a zygote (fertilized egg) is | | Zygote |
| formed. | | Embryo |
| Know the structure of a flower including male (Carpel) | | Germination |
| and female (Stamen) reproductive organs and parts. | | Photosynthesis |
| | | Diffusion |
| Know the male and female names for gametes in both | | Respiration |
| humans (sperm, egg) and plants (pollen grain, egg). | | Chlorophyll |
| Know that pollination is the transfer of pollen from an | | Chloroplast |
| anther to a stigma. | | Cell Wall |
| Know that anthers are where pollen is produced, ovules | | Cell Membrane |
| are where egg cells are produced, stigma is where pollen | | Vacuole |
| grains land during pollination, the ovary contains the | | Mitochondria |
| ovule, the style holds up the stigma, the filament holds | | Ribosome |
| up the anther, flowers attract insects for pollination, and | | Nucleus |
| sepals protect unbudded flowers. | | Cytoplasm |
| Know that cross pollination is when pollen from one | | Stomata |
| plant is transferred to another plant's stigma, whereas | | Gas exchange |
| self-pollination is when pollen is transferred from a | | Epidermis |
| plants anther to its own stigma, resulting in offspring | | Palisade |
| that are not clones of the parent. | | Xylem |
| Know the difference between wind (pollen is light) and | | Cuticle |
| insect (pollen is spikey, flower is colourful and scented) | | Producer |
| pollinated plants and their pollen. | | |
| Know that a fertilised egg grows into a seed. | | Consumer |
| Know that when zygotes are fertilised they use a | | Decomposer |
| process called mitosis (cell division) to form an embryo, | | Seeds |
| which develops into small roots and shoots. | | Rooting powder |
| Know that germination is when a seed starts to grow | | Cuttings |
| after being fertilised and that the ovary will develop into | | Variation |
| fruit around the seed. | | |
| Know that the seed has a store of food to use during | | |
| germination, a seed coat to protect the seed, tiny roots | | |
| to absorb water, and tiny shoots to grow leaves. | | |
| Know that seeds can be dispersed by animal fur, animal | | |
| faeces, wind, and water. | | |
| Know examples of seed adaptations to allow seed | | |
| dispersal e.g. spike to stick to animal fur, light or specific | | |



| Shapes to allow floating in air, less dense than waters or can float, fulls that animals will consume. Shapes to allow floating in air, less dense than waters or can float, fulls that animals will consume. Know the other of the scientific method - hypothosis, prediction, experiment, boerwator, resultation. Know that construct floating that and the plant. Know the the chemical research to photosynthesis is all correctly identify reactants and produced. Know that valier of photosynthesis of bottend. Know that valier of photosynthesis of bottend. Know that coll same show that the plant. Know that tolerophats contain chiorophy which abosts sulight no correct photosynthesis is child through the plant. Know that tolerophats contain chiorophy which abosts using that no correct photosynthesis child through the plant. Know that tolerophats contain cell sap and keeps to end out of the cell, cell wall to strengthen and out of the cell, cell wall to strengthen and out of the cell, cell wall to strengthen and out of the cell, cell wall to strengthen and support the cell, clopplasm is where chemical methods from the surver. Know that constance area so that more light is trapped. Know that topic heaves in one detection. Know that constane constance area so that more light is trapped. Know that constane constance. The 2: chemical speed can be calculated using the formula below: speed detection the serve in one detection. Know that constan which allow congen to diffuse into the below in one detection. Know how to perform a simple experiment to chemical speed can be scalulated using the formula below: speed detatone + | | | | | 5 |
|---|---|-------------|---|--|------------|
| Know the order of the scientific method - hypothesis, prediction, expedition, exped | | | - | | |
| prediction, experiment, observation, results, conclusion, evaluation. Rnow the chemical reaction for photosynthesis and products. Know that value for photosynthesis is obtained through the saws via the roots and carbon dioxide is obtained through the leaves via the stomata. Know that values for photosynthesis contain chiorophyl which aborts suffying for photosynthesis to take place. Know that chioroplastic contain chiorophyl which aborts suffying for photosynthesis to take place. Know that chioroplastic contain chiorophyl which aborts suffying for photosynthesis can be by the plant. Know that glucose produced by photosynthesis can be stored as stored astored stored by the stored as the stored as the | | | | | |
| evaluation. Know the chemical reaction for photosynthesis and correctly identify reactants and products. Know that water for photosynthesis is obtained through the leaves via the stomata. New that fulcosepast control dioxide is obtained through the leaves via the stomata. Know the fulcose produced by photosynthesis can be stored as starch for later use by the plant. Know that functions of plant organelles: ribosome for protein synthesis, cell companelts: ribosome for protein synthesis, cell companelts and deeps to move in and out of the cell, cell wall to strengthen and support the cell, cytoplasm is where chemical reractions take place, vacuale contains Cell span deeps the cell rigd, nucleo stortains DNA. Know that plant leaves are broad and flat to increase surface area so that more ight is trapped. Know that plant leaves are broad and flat to increase surface area so that more water can be absorbed from the soil. Know that system allows water to move up the plant from the roots to the leaves in one direction. Know that taxe shift allow oxygen to diffuse into the plant and carbon dioxide to diffuse out (gaseous exchange). Know that speed can be calculated using the formula below: Know how to perform a simple experiment to determine speed. The 72; | | | | | |
| Know the chemical reaction for photosynthesis and correctly identify reactants and products. Know that water for photosynthesis is obtained through the soil via the roots and carbon dioxide is obtained through the leave six the stomata. Know that vater for photosynthesis to state place. Know that places produced by photosynthesis can be assort for later use by the plant. Know that glucose produced by photosynthesis can be stored a starch for later use by the plant. Know the functions of plant organelise: ribosome for protein synthesis, cell membrane to allow substances to move in and out of the cell, cell wall to strengthen and support the cell, cytoplant is subscatcherial reactions take place, vacuole contains cell sap and keeps the cell rigd, nucleus contains DNA. Know that plants are adapted to obtain light form the sun, water from the soli, and crone dinkide from the air. Know that plants are adapted to obtain light form the sun, water from the soli, and crone of noise contains DNA. Know that plant leaves are toroad and flat to increase surface areas to that more glub is site or can be absorted from the soli. Know that roots have root hair cells that increase surface areas to that more water can be absorted from the soli. Know that leaves have small holes on their underside called stomata which allow oxigen to diffuse into the plant and carbon dixide to diffuse out (gaseous exchange). Know that speed can be calculated using the formula being experiment to the plant and carbon dixide to diffuse out (gaseous exchange). | | | prediction, experiment, observation, results, conclusion, | | |
| Know that values and across and carbon dioxide is obtained through the soli via the roots and carbon dioxide is obtained through the leaves via the stomata. Know that values for photosynthesis can be assored by a stare stare as the assored as stare the called stare as the assored as stare to obtain light from the sun, water from the soli, and carbon dioxide from the air. Know that plant leaves are broad and flat to increase as unface areas so that more water can be absorbed from the soli. Know that plant leaves are broad and flat to increase as unface areas so that more water can be absorbed from the soli. Know that plant leaves areas on that more water can be absorbed from the soli. Know that plant leaves area to as the owagen to diffuse in the plant from the roots to the leaves in one direction. Know that carbon dioxide to diffuse in the plant from the soli. Know that geed can be calculated using the formula exchangel. Know that speed can be calculated using the formula | | | evaluation. | | |
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| protein synthesis, chloroplast to absorb light and carry out photosynthesis, cell membrane to allow substances to move in and out of the cell, cell wall to strengthen and support the cell, cytoplasm is where chemical reactions take place, vacuole contains cell sap and keeps the cell rigid, nucleus contains DNA. Image: Contains cell sap and keeps the cell rigid, nucleus contains DNA. Know that plants are adapted to obtain light from the sun, water from the soil, and carbon dioxide from the air. Image: Contains cell sap and keeps the cell rigid, nucleus contains DNA. Know that plant leaves are broad and flat to increase surface area so that more light is trapped. Image: Contains cell sap and keeps the soil. Know that plant leaves are broad and flat to increase surface area so that more up the plant from the roots to the leaves in one direction. Image: Contains cell sap and keeps the soil. Know that yole diffuse out (gaseous exchange). Know how to perform a simple experiment to below: Tier 2: | | | Know the functions of plant organelles: ribosome for | | |
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| | 2 | More Forces | between an object and its starting point. | Know how to draw a distance-time graph | Gravity |
| Know that a distance- time graph can be used to analyse accurately. Density | 5 | | . | | , |
| the movement of an object. Know how to interpret a distance-time graph to Balanced | 2 | | the movement of an object. | Know how to interpret a distance-time graph to | |
| Know that the area under a speed-time graph can be determine whether an object is stationary or Unbalanced | • | | Know that the area under a speed-time graph can be | determine whether an object is stationary or | Unbalanced |
| used to calculate the distance travelled by an object. traveling at a constant speed. Volume | | | used to calculate the distance travelled by an object. | traveling at a constant speed. | Volume |



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| Know that relative motion is the motion of one object | Know how to calculate the speed of an object | Model |
| with respect to another. | from a distance-time graph. | Rotate |
| Know that gravity is a non-contact force acting at a | Know how to calculate the relative motion of | Clockwise |
| distance on Earth and in space. | objects moving towards and away from each | Anticlockwise |
| Know that unsupported objects fall towards the Earth | other. | |
| because of the force of gravity acting between the Earth | Know how to calculate weight using the formula | Tier 3: |
| and the falling object. | below; weight = mass x gravitational field strength | Anomaly |
| Know that every object with mass will exert a | Know how to describe ways in which drag forces | Exert |
| gravitational pull on other objects. | can be increased or decreased. | Relative motion |
| Know that the greater the mass of an object, and the | Know how to calculate moments and describe the | Displace |
| closer the object is to Earth, the more the force of | subsequent motion if the system is not in | Displacement |
| gravity will act upon it. | equilibrium. | Upthrust |
| Know that weight can be calculated using the formula | Know how to calculate the work done using the | Drag |
| below: | formula below: | Friction |
| weight = mass x gravitational field strength. | work done = force x distance | Streamlined |
| Know that gravitational field strength on Earth is | | Pressure |
| 10N/Kg and is different on other planets and stars. | | Fluids |
| Know that upthrust is an upward force exerted on an | | Inflate |
| object by a fluid. | | Depth |
| Know that objects less dense than water will float and | | Atmosphere |
| those that are denser will sink. | | Implode |
| Know that water resistance and water resistance are | | Turning force |
| types of drag. | | Moment |
| Know that streamlining a shape will reduce drag. | | Pivot |
| Know that as the speed of an object increases so does | | Fulcrum |
| the drag. | | Lever |
| Know that when forces on an object are balanced the | | Effort |
| speed will be unchanged. | | Load |
| Know that atmospheric pressure decreases with height | | Equilibrium |
| due to the weight of the air above decreasing. | | Conservation |
| Know that pressure in liquids increases with depth. | | Work |
| Know that pressure in fluids acts in all directions. | | Machine |
| Know that a moment is the turning effect of a force. | | |
| Know that moments are calculated by multiplying the | | |
| force by the perpendicular distance. | | |
| Know that this relationship can be represented by the | | |
| formula below: | | |
| Moment = force x perpendicular distance from pivot | | |
| Know that if the clockwise moment is equal to the | | |
| anticlockwise moment, then the system is in equilibrium | | |
| Know that a lever can be used to multiply forces. | | |
| Know that a simple machine, such a lever or pully, | | |
| provides a greater force at the expense of smaller | | |
| movement. | | |
| Know that in a simple machine, the product of force x | | |
| displacement remains unchanged. | | |



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| | | | T 0 |
| | Know that an atom is the simplest particle that exists. | Know how to write the chemical symbols of | Tier 2 |
| | Know that an element is made up of the same type of | elements, with the first letter always being a | conservation |
| | atoms. | capital letter and the second letter as a lower-case | properties |
| | Know that molecules are two or more atoms chemically | letter. | ratio |
| | bonded together. | Know how to write chemical formulae for simple | trends |
| | Know that a compound is two or more different types of | • | extinguish |
| | atoms bonded together | Know how to balance symbol equations. | greenhouse |
| | Know that mixtures are made up out of different | Know how to identify trends in reactivity of alkali | reversible |
| | substances not chemically bonded to each other. | metals. | irreversible |
| | Know that John Dalton's atomic theory stated the | Know how to determine anomalies from data. | |
| | following: a) that all matter is made up of tiny particles, | 5 | |
| | b) In chemical reactions atoms rearrange to make a new | - | |
| | substance. Know that Dalton's theory stated that atoms were tiny | Know how to draw a line graph using mean | T 0 |
| | , | averages calculated to draw a line of best fit. | Tier 3 |
| | indestructible spheres with no empty space. Know that the modern version of the atom contains | Know how to infer data from a line graph by | matter |
| | | extrapolating data. | atoms |
| | protons and neutrons in the nucleus, with electrons | Know how to identify trends in data to draw conclusions. | elements |
| | orbiting the nucleus on shells. | | compounds |
| Chemical | Know that non-metal elements are found on the right- hand side of the periodic table and metal elements are | Know how to evaluate data for reliability. | chemical formula |
| reactions | found on the left. | | physical properties |
| reactions | Know that the rows in the periodic table are called | | chemical properties |
| | periods and the columns are called groups. | | reactants |
| | Know that physical changes are reversible, and no new | | products |
| | substances are formed. | | combustion Oxidation |
| | Know that chemical changes are irreversible and new | | Reduction |
| | substances are formed. | | Activation energy |
| | Know that alkali metals react with water, and the | | Exothermic |
| | reactivity of the alkali metals increase as you move | | endothermic |
| | down group 1. | | pollutants |
| | Know that metals can react with oxygen to form metal | | global warming |
| | oxides and that the appearance of metal oxides are | | climate change |
| | different to the appearance of the metal. | | effervescence |
| | Know that oxidation is a gain of oxygen and reduction is | | reactive |
| | the loss of oxygen. | | reactive |
| | Know that combustion is a type of oxidation reaction as | | |
| | elements combine with oxygen | | |
| | Know that fuel, heat, and oxygen are needed for | | |
| | combustion to occur. | | |
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| | Know that carbon dioxide and water are produced in | | |
| | complete combustion of fuel | | |
| | Know that carbon monoxide, carbon and water are | | |
| | produced by incomplete combustion of fuel | | |
| | Know that atoms are not created or destroyed in a | | |
| | chemical reaction so the mass of the products in a | | |
| | reaction remains the same as the mass of the reactants. | | |
| | Know that metals react with oxygen to form metal | | |
| | oxides | | |
| | Know that metals react with water to form metal | | |
| | hydroxides and hydrogen | | |
| | Know that exothermic reactions transfer thermal energy | | |
| | to the surroundings and endothermic reactions take in | | |
| | thermal energy from the surroundings. | | |
| | Know that every reaction requires bonds to be broken | | |
| | first before new bonds are formed. | | |
| | Know that energy must be taken in to break bonds | | |
| | which is an endothermic reaction. | | |
| | Know that energy is given out when bonds are formed | | |
| | which is an exothermic reaction. | | |
| | Know that combustion and other human activity such as | | |
| | farming of cattle leads to the production of greenhouses | | |
| | gases. | | |
| | Know that sulfur is an impurity found in fossil fuels, | | |
| | which combusts to form sulfur dioxide, which dissolves | | |
| | in water vapour to form acid rain. | | |
| | Know that acid rain causes limestone to weather, stops | | |
| | fish eggs from hatching and makes soil too acidic for | | |
| | some crops to grow. | | |
| | Know that greenhouse gases absorb thermal energy | | |
| | radiated from earth and re-radiates heat back into the | | |
| | atmosphere. | | |
| | | | |
| | Know that conduction is the transfer of energy through a | Know how to compare the rates of conduction in | Tier 2: |
| | material by the movement of its particles | different conductors | Vacuum |
| | Know that metals are good conductors of thermal energy | Know how to use convection currents to ensure | Emit |
| | Know that non-metals are poor conductors of thermal | circulation of fresh air in a system | Absorbed |
| Electricity, | energy | Know how to calculate thermal energy changes | Medium |
| magnetism and | Know that insulators are poor conductors of thermal | using specific heat capacity | Appliance |
| | energy | Know how to explain energy transfers and | Rate |
| energy transfer | Know that a vacuum is a space totally empty of matter | pathways in a variety of situations | Attract |
| | Know that stationary air is a good thermal insulator | Know how to use Sankey diagrams to show energy | Repel |
| | Know that convection is the transfer of thermal energy in | transfers and pathways | Resistance |
| | fluids due to density changes | Know how to calculate the efficiency of various | Tier 3: |
| | | energy transfers | Conduction |



| Know that more dense fluid will sink, and less dense fluid | Know how to use meter readings to calculate how | Convection |
|--|--|------------------------------|
| will rise to the top | much energy needs to be paid for | Density |
| Know that radiation is the transfer of energy via wave or | | Radiation |
| particle | of two wires | Delta |
| Know that density is the amount of mass per unit volume | | Dissipation |
| Know that infrared is the transfer of thermal energy via a | | Efficiency |
| radiation pathway | Know how to experimentally plot a magnetic field | Current |
| Know that infrared cameras can be used to produce | new new to experimentally plot a magnetic field | Attract |
| maps of temperature. | | Repel |
| Know that infrared is used in night vision equipment | | Magnetic field |
| Know that black dull objects are good absorbers and | | Induced magnet |
| emitters of infrared radiation. | | induced ind ₀ net |
| Know that white or shiny objects are poor absorbers of | | |
| infrared radiation | | |
| Know that the Greek letter delta is used to represent 'the | | |
| change in' | | |
| Know that energy can neither be created or destroyed, | | |
| only transferred between stores via pathways | | |
| Know that dissipated energy is energy that ends up in a | | |
| non-useful store | | |
| Know that the efficiency of an energy transfer is the ratio | | |
| between the input energy and the usefully transferred | | |
| useful energy | | |
| Know that appliances with a lower efficiency rating will | | |
| cost more to run | | |
| Know that electricity meters measure energy transferred | | |
| in kilowatt-hours | | |
| Know that power can be calculated by power = | | |
| energy/time | | |
| Know that power is the rate of transfer of energy | | |
| Know that everything is made of atoms | | |
| Know that atoms are made of protons, neutrons and | | |
| electrons | | |
| Know that protons and neutrons are in the nucleus | | |
| Know that electrons are in shells around the nucleus | | |
| Know that the atom has no overall charge as it has equal | | |
| number of positive and negative charges | | |
| Know that a charged object has an electrostatic field | | |
| around it | | |
| Know that if a charged object is placed in an electrostatic | | |
| field than it will experience a force acting upon it | | |
| Know that friction between two insulating materials | | |
| results in a transfer of electrons resulting in the two | | |
| items having an equal and opposite charge | | |
| Know that current is the rate of flow of charge | | |



| Know that parallel circuits do not circuits do not component by an ammeter Know that current is measured in series with a component by an ammeter Know that current is constant in parallel circuits Know that current is constant in parallel circuits Know that current is constant in parallel circuits Know that contential difference is a measured in parallel to a component using a voltential difference is measured in parallel to a component using a voltenter Know that potential difference is shared across components in a parallel circuit Know that potential difference is the same across all components in a parallel circuit Know that potential difference is constant in parallel to a components in a parallel circuit Know that potential difference is the same across all components in a parallel circuit Know that potential difference is an maximum and it's thereparature Know that resistance of an electrical conductor will be dependent upon the material tis made from and it's thereparature Know that the resistance of a conductive wire also depends on its length and thickness Know that current flowing against an electrical resistance in an electrical appliance causes the device to heat up Now that materials that have very high resistances that stops current dowing are called insulators Know that interport and magnetic Mow that in ill meata are magnetic Know that in all meata are magnetic there magnetic field is an are agrouped know that an induced magnet has become magneteriged by being pleaded in a magnetic field | |
|--|--|
| Know that current is measured in series with a component by an amuse to getter at junctions in a parallel circuits in a parallel circuits. Know that current is constant in parallel circuits. Know that potential difference is a measure of the energy transferred by the charge. Know that potential difference is measured in parallel to a component using a voltmeter. Account to the potential difference is shared across. Components in a parallel circuit. Know that potential difference is the same across all components in a parallel circuit. Know that potential difference is the same across all components in a parallel circuit. Know that externel is electrical conductors id ue to collisions between the electrons and the ions in the lattice. Know that the resistance of an electrical conductor will be dependent upon the material it is made from and it's to temperature. Know that the resistance of a conductive wire also depends on its length and thickness. Know that current flowing against an electrical resistance for acrould resistance in an electrical resistance of a conductive wire also depends on all science causes the device to heat up. Know that materialis that have very high resistances that stops current flowing against an electrical resistance of in a electrical resistance of know that materialis that have very high resistances that stops current flowing against an electrical resistance of Know that materialis that have very high resistance the know that materialis are magnetic field is an area around a magnet type of the stop of the | |
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| by being placed in a magnetic field | |
| | |
| Know that the magnetic field is strongest at the poles | |
| Know that the Earth's magnetic field comes from the | |
| spinning molten Iron core | |
| Know that the geographical north pole of the Earth is the | |
| magnetic south pole and vice versa | |
| Know that the north end of a compass points to the | |
| geographical north pole as it is attracted to the magnetic | |
| south pole of the Earth | |
| Know that a current flowing through a wire produces a | |
| magnetic field | |



| | | | 5 mg |
|-----------------|--|--|------------------|
| | Know that the magnetic effect of a current flowing through a wire can be increased by arranging the wire into a coil around an iron core Know that a coil of wire with a current flowing through it is called a solenoid Know that an increase in the number of coils, or in the current flowing will increase the strength of a solenoid. | | |
| | Know that corrosion refers to reaction with oxygen that | Know how to write a prediction based on | Tier 2 |
| | occurs on the surface of the metal | scientific knowledge and understanding. | evaluate |
| | Know that corrosion is an oxidation reaction. | Know how to place metals in order of reactivity | effervescence |
| | Know that exidation is the gaining of oxygen. | by observing their reactions in water. | displace |
| | Know that rusting is the corrosion of iron and requires | Know how to write a word equation for the | extract |
| | both water and oxygen to react with iron. | reaction of metals with water. | ore |
| | | | malleable |
| | will form iron hydroxide as the product. | for the reaction of metals with water. | maneable |
| | Know that rusting can be prevented by covering the | Know how to name the salt produced from the | Ti o |
| | metal's surface with plastic, paint or oil. | reaction of metals with acid. | Tier 3 |
| | Know that reduction is the losing of oxygen. | Know how to write word and balanced, symbol | prediction |
| | Know that some metals such as the alkali metals will | equations for the reaction between metals and | salt compound |
| Metal reactions | react readily in water to produce a metal hydroxide and | acids. | oxidation |
| | hydrogen gas | Know how to predict the products in a | reduction |
| | Know that when a gas is produced, effervescence is | displacement reaction by comparing the | native state |
| | observed. | reactivities of the two metals present in the | pure |
| | Know that alkali metals produce metal hydroxides that | reaction. | |
| | are alkali in solution. | Know how to deduce which substance has been | |
| | Know that some metals react with acids to produce a | oxidized or reduced in a displacement reaction. | |
| | salt and hydrogen gas. | | |
| | Know that the salts produced are named depending on the acid and metal that had reacted together. | | |
| | Know that in a displacement reaction, the more reactive | | |
| | metal takes the place of a less reactive metal from its | | |
| | compound. | | |
| | | | |



| | wely High o |
|--|-------------|
| Know that a compound is two or more different types of | |
| elements chemically bonded together. | |
| Know that displacement reactions can be observed by a | |
| colour change in a reaction and a formation of a solid | |
| metal. | |
| Know that an ore is a rock that contains a metal | |
| compound. | |
| Know that very unreactive metals such as gold are | |
| found native. | |
| Know that metals must be extracted from their ores by | |
| either heating with carbon or by electrolysis. | |
| Know that metals that are less reactive than carbon in | |
| the reactivity series can be extracted from its compound | |
| by both heating and carbon and electrolysis. | |
| Know that heating with carbon is the preferred method | |
| for extracting metals from its compound as it is cheaper. | |
| Know that metals that are more reactive than carbon in | |
| the reactivity series can only be extracted by | |
| electrolysis. | |
| Know that a pure substance only contains one type of | |
| substance. | |
| Know that alloys are a mixture of metals and has | |
| desirable properties than those of pure metals. | |
| Know that alloys have a range of melting points as it is a | |
| mixture whereas pure metals have a sharp melting | |
| point. | |
| Know that alloys are less malleable than pure metals as | |
| the different sized atoms disrupts the layers of atoms so | |
| the layers of metal atoms cannot slide over each other | |
| easily. | |