

What is an element?	A substance made up of only one type of atom.
What does an atomic number represent?	The number of protons in the nucleus or electrons in an atom.
What does the mass number represent?	The total number of protons and neutrons in the nucleus.
What is a mixture?	A substance made of more than one type of atom NOT chemically joined together.
What is a compound?	A substance that is made up of two or more atoms chemically joined together.
Name 4 features found in plants and animal cells	Nucleus, Cell membrane, cytoplasm, mitochondria
Name 3 features found in plant cells and not in animal cells	Chloroplasts large vacuole , cell wall
Why do muscle cells have a lot of mitochondria?	To respire and make energy for muscle contraction
What is the function of a cell wall in plants?	Cell wall supports the cell
What is the function of a nucleus?	Contains DNA which controls the cell's activities
In a series circuit, what happens to current?	Current is the same throughout
In a series circuit, what happens to voltage?	Voltage splits across the components
How should a voltmeter be connected?	In parallel to the component.
How should an ammeter be connected?	In series with the components.
In a parallel circuit, what happens to voltage?	Voltage is the same across each branch

Name the four ways in which mixtures can be separated.	Filtration, evaporation, chromatography and distillation.
Why do atoms sometimes gain or lose electrons?	To get a full outer shell.
What is an ion?	A charged particle, formed when an atom either loses or gains electrons.
What is a reactant in a chemical reaction?	A substance used up in a chemical reaction.
What is a product?	A substance made in a chemical reaction
What is the function of the cell membrane	Controls what enters and leaves the cell.
What is the function of a vacuole?	Filled with solution of glucose, amino acids and salts.
What is a tissue?	A group of similar cells with a similar function
What is an organ?	A collection of 2 or more tissues that perform a function.
What is diffusion?	Passive movement of substances down a concentration gradient.
In a parallel circuit, what happens to current?	Current splits across the branches
How do you find the total current in a parallel circuit?	Add up the current from each branch
What happens to the resistance of a bulb as voltage increases?	It increases
Which component only allows current to flow in one direction?	Diode
What is the relationship between current and voltage for a resistor?	Directly proportional

Name the three ways in which you can tell a reaction has occurred.	Change in colour, change in temperature or fizzing
What is an isotope?	Form of an element with the same number of protons but different numbers of neutrons
Where would you find electrons in an atom?	Electron shells (orbits) around the nucleus.
Why do atoms never have an overall charge?	An atom has same number of protons electrons. Protons are positive, electrons negative so they cancel each other out.
What is relative atomic mass?	The mass of an 'average atom' of that element compared with the mass of an atom of carbon-12.
Why is a cell membrane a selectively permeable membrane?	It only allows some chemicals through it.e.g. oxygen and glucose
What is osmosis?	Diffusion of water through a selectively permeable membrane
What is active transport?	The movement of substances against a concentration gradient. It requires energy/ATP
Why is diffusion described as a passive process?	No energy involved.
What will happen to a red blood cell in pure water?	It will burst as water enters across the cell membrane and there is no cell wall to prevent it bursting
What happens to resistance when more resistors are added in series?	Increases
What happens to resistance when more resistors are added in parallel?	Decreases
What happens to the resistance of a thermistor when it gets hotter?	Decreases
What happens to the resistance of a LDR when the light is brighter?	Decreases
What is power?	The rate of energy transfer

What does the group number tell us about the elements in that group?	The number of electrons in the outer shell
What is filtration?	A method of separating an insoluble solid from a liquid
What is evaporation?	A method of separating a soluble solid from a liquid.
What is chromatography?	separates soluble substances such as dyes or inks
What is distillation?	Separates a mixture of liquids due to differences in boiling points.
What are enzymes made of?	Proteins
What do enzymes do?	They speed up chemical reactions
What is the active site?	It is the specific site that the substrate binds to.
What effect does temperature have on enzyme action?	Increases rate of enzyme activity up to an optimum level then enzyme begins to denature
What effect does pH have on enzyme activity.?	Enzyme activity varies with pH. Each enzyme has an optimum pH
What are the 4 non-renewable energy resources?	Coal, oil, natural gas (fossil fuels) and nuclear (uranium). i.e COGaN!!
What are the main features of a coal fired power station?	Furnace - Boiler - Steam - Turbines - Generator
How does a nuclear power station provide heat energy?	Uranium undergoes a nuclear fission releasing energy.
What is the main advantage of nuclear energy?	No CO ₂ is produced in its generation
What is the main disadvantage of nuclear energy?	Radioactive waste is produced

In chromatography, the most soluble substance travels the.....	Furthest
What do these state symbols, (s), (l), (g) and (aq) represent?	Solid, liquid, gas and aqueous (dissolved in water)
What do elements in the same period have in common?	They have the same number of occupied electron shells.
What are group 1 metals also known as?	Alkali metals
Why does the reactivity of group 1 elements increase down the group.	outer electron is further away from the nucleus, is more shielded and easier to lose.
Define catalyst	It is a chemical which speeds up a reaction between 2 other chemicals without being used up itself.
Explain the lock and key model.	The substrate fits into the enzyme like a key fits into a lock. The substrate then is released by the enzyme as 2 or more products
What is the word equation for aerobic respiration?	Glucose + Oxygen → Carbon dioxide + water.+ energy.
What processes require energy from respiration?	Movement, digestion, growth and cell division.
What is respiration without oxygen called?	Anaerobic respiration.
Why are coal-fired power stations causes of global warming?	They increase levels of CO ₂ in atmosphere causing global warming.
Why do coal-fired power stations cause acid rain?	They increase levels of sulphur dioxide in atmosphere causing acid rain.
What are the disadvantages of wind turbines?	Unsightly. Noisy. Not always windy.
What are the disadvantages of tidal barrages?	Affect river estuaries, destroying animal habitats.
What are the disadvantages of hydroelectric schemes?	Need large reservoirs of water which can destroy animal habitats.

Which group has elements which are unreactive?	Group 0
Alkali metals react with oxygen to form what?	Oxides
Alkali metals react with water to form what?	Hydroxides and hydrogen gas
Alkali metals react with chlorine to form what?	Chlorides
Why are most of the alkali metals stored in oil?	They are very reactive and react with oxygen in the air.
What is the name of the chemical which stores the energy released from respiration?	ATP
What is the word equation for anaerobic respiration?	Glucose >> Lactic acid
Why does anaerobic respiration produce less energy than aerobic?	Not all the glucose is broken down so less ATP is made.
What chemical is lactic acid broken down into?	Carbon dioxide and water.
What is oxygen debt?	Oxygen which has to be paid back to break down lactic acid and release it's energy
What are disadvantages of solar cells?	Need large areas to generate large amounts of power.
What is the role of the National Grid?	To transfer electricity from power stations to the home/factories etc.
What does a step up transformer do?	Increase the voltage (and decrease the current)
Why is the voltage 'stepped up'?	To reduce energy loss due to resistance heating
What is the role of a step down transformer?	To decrease the voltage so it is safe to be transmitted to the home.

Why do group 7 elements get less reactive as you go down the group?	more difficult to gain an electron as there are more shells and more shielding from the nucleus.
What colour are sodium ions in a flame test?	Orange - yellow flame
What colour are lithium ions in a flame test?	Crimson-red flame
What colour are potassium ions in a flame test?	Lilac flame
What colour is bromine at room temperature?	Reddish-brown liquid
Name the 3 types of tube in the respiratory system	Trachea; bronchus; bronchioles.
What is mucus?	A sticky substance that traps dust and microbes from the air as it passes through the trachea and bronchi.
What are cilia?	Small hairs on cells lining the breathing tubes.
What is the sequence of events which causes Inhalation?	Diaphragm contracts down
Inhaled and exhaled air contains most of which gas and why?	Nitrogen because the body does not absorb it.
What causes heat to be transferred?	Temperature differences
What is conduction?	Transfer of heat by vibration of particles through solids.
What materials are the best conductors and why?	Metals, they have free electrons
What is convection?	Transfer of heat by hot, less dense gases or liquids rising
What is radiation?	Transfer of heat by infra red waves from hot regions to cold.

What happens to lithium, sodium and potassium in air / oxygen?	Tarnishing of freshly cut surface.
What test is used to identify hydrogen gas?	Squeaky pop is observed with a lit split.
What will you observe when potassium reacts with water?	floats, fizzes, moves on the surface and catches fire with a lilac flame
What will you observe when sodium reacts with water?	floats, fizzes, moves on the surface and melts into a sphere
What are group 7 elements also known as?	Halogens
What is the sticky substance that clogs up the small air passages?	Tar
Which chemical in cigarettes is very addictive?	Nicotine.
Which chemical is a poisonous gas and makes it more difficult for red blood cells to carry oxygen?	Carbon Monoxide
Name 2 diseases which can be caused by smoking.	Lung cancer, Emphysema,
What structures are paralysed by cigarette smoke?	The cilia. This means harmful stuff like tar, dust and microbes can enter the smaller bronchioles and alveoli.
What surfaces are good absorbers and emitters of infra red radiation?	Dark, matt surfaces
What surfaces are poor absorbers and emitters of infra red radiation?	Light, shiny surfaces
How is a radiator designed so that it loses heat easily?	Large surface area.
How can energy loss through walls be reduced?	Cavity wall insulation
How can energy loss through ceilings be reduced?	Loft insulation

What colour is iodine at room temperature?	grey/black solid
What colour is chlorine at room temperature?	Greenish-yellow gas
What is the reaction called when a more reactive halogen displaces a less reactive halogen?	Displacement reaction
What would you see if you added silver nitrate to chloride ions?	White precipitate
What would you see if you added silver nitrate to bromide ions?	cream precipitate
What is the percentage of oxygen in inhaled and exhaled air?	inhaled 21% exhaled 16%
What is the percentage of carbon dioxide in inhaled and exhaled air?	inhaled 0.04% exhaled 4%
What is the percentage of Nitrogen in inhaled and exhaled air?	inhaled 78% exhaled 78%
What chemical can be used to detect Carbon dioxide?	Limewater , it will turn milky in the presence of carbon dioxide.
What chemical absorbs carbon dioxide?	Sodium hydroxide.
Why are double glazed windows good?	They save a lot of energy on your bills.
Why might you not buy double glazing?	Long payback time
Why is it important to reduce energy loss in the home?	Reduces CO2 emissions (from generating electricity)
Which is the most dense state of matter?	Solid
Why are gases the least dense state of matter?	Particles are spread far apart.

What would you see if you added silver nitrate to iodide ions?	Yellow precipitate
Give uses for chlorine	Kills bacteria; used in treatment of water supplies, treatment of swimming pool water, making household cleaners.
Give uses for iodine	Kills bacteria; used as antiseptic following hospital procedures
What flame colour would you expect for barium ions?	Apple green
What flame colour would you expect for calcium ions?	Brick red
Name the enzyme that breaks down carbohydrates and the products formed	Carbohydrase, it breaks down starch into glucose
Name the enzyme that breaks down proteins and the products formed	Protease, it breaks down proteins into amino acids
Name the enzyme that breaks down fats(lipids) and the products formed	Lipase, it breaks fats into fatty acids and glycerol
Where is protein digested?	Stomach and small intestine
Where are carbohydrates digested?	Mouth and small intestine
What is the SI unit of power?	Watt
What does kWh stand for?	KiloWatt Hour
What is a kWh a measure of?	(Electrical) energy used.
What is direct current?	Current that flows in one direction around a circuit
What is the mains voltage in the UK?	230V

Why are noble gases very unreactive?	They have a full outer shell.
What is the test for carbon dioxide?	Lime water turns milky
What gases are dissolved in rainwater?	Carbon dioxide and oxygen
What ions does groundwater contain?	Mg ²⁺ , Ca ²⁺ , Na ⁺ and K ⁺
How do ions get into the groundwater?	From minerals dissolved as it travels through rocks.
Where are lipids digested?	Small intestine.
Where is water reabsorbed in the gut?	Large intestine.
How do villi help absorption?	They greatly increase the surface area over which molecules can be absorbed.
How is food moved through the gut?	Waves of muscle contraction called peristalsis.
What does bile do, where is it made and stored	It helps the lipase enzyme by emulsifying the fats i.e. splitting them into small droplets.
Name the three wires in a plug	Live, neutral and earth
What happens when a fuse blows?	It melts
What makes a fuse melt?	When current is too high
How does a miniature circuit breaker (mcb) work?	An electromagnet opens a switch if the current goes above a certain value.
Why is a mcb better than a fuse?	It can be reset

What is the definition of a solute?	Chemical which dissolves in a solvent to form a solution.
Name 4 man-made pollutants that pollute natural water?	Pesticides, fertilisers, household waste and industrial waste.
What is desalination?	Removing salt from sea water to convert it into water fit for drinking.
Name 3 sources of drinking water	rivers, lakes, reservoirs
State the three ways water is purified.	Sedimentation, filtration and chlorination.
What is a balanced diet?	A diet which contains carbohydrates, proteins and fats; minerals, vitamins, fibre and water in appropriate amounts.
What diseases can be brought about by being overweight?	Heart disease, stroke, cancer, type 2 diabetes
What problems does a high salt diet cause?	High blood pressure, heart disease and stroke.
What is the test for glucose?	Benedict's solution blue to orange red precipitate.
What is the test for protein?	Biuret test. Blue to purple.
How does a residual current circuit breaker (rccb) work?	Detect a difference between the current in the live and neutral wires.
Why is a rccb better than a mcb?	More sensitive
Which appliances need to be earthed?	Ones with a metal frame
What does the live wire do?	Carries current to the house at high voltage
What does the neutral wire do?	Completes the circuit

What happens in the filtration stage of treating water?	Through layers of sand and gravel, smaller insoluble particles are removed.
What happens in the sedimentation stage of treating water?	Larger solid particles settle under gravity.
What happens in the chlorination stage of treating water?	Kills bacteria, prevents disease/makes it safe to drink.
Why is fluoride added to the water?	Prevent tooth decay.
State 3 reasons not to add fluorine to water.	fluorosis, bone cancer, mass medication
What is the test for starch?	Iodine brown to blue/black
What is digestion?	The breaking down of large insoluble molecules into small soluble molecules that can enter
Name the 4 parts of the blood.	Plasma, red blood cells, white blood cells and platelets
What is the function of platelets?	Cell fragments which help the blood to clot.
State two ways red blood cells are adapted to their function.	They have no nucleus and are shaped like a biconcave disc to increase surface area.
What causes a transverse wave?	Vibrations perpendicular to the direction of travel
What causes longitudinal waves?	Vibrations parallel to the direction of travel
How do we measure the amplitude of a wave?	The distance from the middle to the top of a transverse wave
What does frequency mean?	The amount of waves travelling per second
How is wavelength measured?	The distance between two similar points on a wave

What are the two ways of removing water from sea water?	Distillation and reverse osmosis
How does distillation separate water and ethanol?	ethanol has a lower boiling point so will evaporate first
What is the boiling point of water?	100°C
What is a fractionating column used for?	Separating several different liquids
What two processes are involved in distillation?	Boiling and condensing
Starting from the vena cava, describe the flow of blood to the lungs and back to the heart.	Vena cava, right atrium, right ventricle, pulmonary artery, lungs, pulmonary vein, left atrium, left ventricle, aorta.
What is a double circulation?	The pulmonary circulation around the lungs and the systemic circulation around the body.
What is the function of the semi lunar valves in the heart?	To stop backward flow of blood from arteries to ventricles.
Why does blood pressure get much higher in the left ventricle than the right.?	LV walls are thicker with more muscle so create higher pressure to push blood out of aorta and around the body.
Why do arteries have a much thicker wall than veins?	To withstand the higher blood pressure they must carry.
How do the angles of incidence and reflection compare to each other?	The are the same
What does a more dense substance do to the waves in refraction?	Slows the waves down
How are ultraviolet, x rays and gamma rays different from radio waves?	Shorter wavelength, higher frequency and energy
How are ultraviolet, x rays and gamma rays damaging?	They can ionise cells.
What do all Electromagnetic waves have in common?	They all travel at the same speed / transfer energy / transverse waves

What does saturated mean?	When no more solute can dissolve
What ions do hard water contain?	Calcium (Ca ²⁺) and magnesium (Mg ²⁺)
What does temporary hard water contain?	Calcium hydrogencarbonate and / or magnesium hydrogencarbonate
What happens when temporary hard water is boiled?	Hardness removed and scale (solid calcium carbonate) is formed.
What is the problem with limescale?	reduces efficiency of heating elements, can clog up pipes.
Which blood vessels supply the heart?	The coronary arterie and veins.
Where would you find oxygenated blood?	Arteries except the pulmonary artery.
Where would you find deoxygenated blood?	Veins except the pulmonary vein.
Why does blood in the capillaries travel very slowly	So that materials can be exchanged with the cells they surround.
How does venous blood go in the right direction?	Valves are needed to stop backward flow.
What is the order of the EM Spectrum from low to high frequency?	Radio, Micro, Infra Red, Visible, Ultra Violet, X Rays, Gamma Rays
What is the order of the EM Spectrum from low to high wavelength?	Gamma Rays; X Rays; Ultra Violet; Visible; Infra Red; Micro; Radio
Which regions of the EM spectrum transfer energy?	All of them!
Which regions of the EM spectrum transmit information?	Visible; Infra Red; Micro; Radio
What is a geosynchronous orbit?	When a satellite returns to the same point at the same time each day.

What does permanent hard water contain?	Chlorides and / or sulfates of calcium and magnesium
How does adding sodium carbonate soften hard water?	Prevents calcium and magnesium ions bonding to the washing detergent meaning less detergent has to be used.
What is the inner core of the earth made from?	Mostly iron with some nickel.
What is the outer core made of?	Liquid layer made of iron and nickel
What is the crust made up of?	Thin layer of solid rock.
The mantle is the thickest layer of the earth, what does it consist of?	Semi molten rock.
What is the lithosphere?	The crust and the upper rigid part of the mantle.
What is the function of red blood cells?	To carry oxygen by combining it with haemoglobin
What is the function of a white blood cell?	Immunity
Name the 4 factors needed for photosynthesis.	Light, CO ₂ , water and chlorophyll.
How do you test for starch in a leaf?	Iodine goes blue/black.
How do you remove chlorophyll from a leaf?	Boil in alcohol.
How do you de starch a plant?	Place in the dark for 24hours.
How are minerals taken into a root?	By active transport.
How is glucose used after it has been made by photosynthesis?	It is converted to starch for storage or used to make cellulose, proteins and oils.

What is Pangaea?	Where land mass on Earth was grouped together in one supercontinent.
What is the continental drift?	Where plates move a few centimetres per year.
What three observations prove continental drift?	Jigsaw edges of continents fit together, similar rocks of same age and similar plant and animal fossils found on different continents.
What are convergent boundaries?	Edges of the plates 'crumples' forming mountain ranges. Magma can be released if one plate slides under the other.
What are divergent boundaries?	Plates move apart and molten rock (magma) is released as in a volcano.
What are conservative boundaries?	Plates slide passed one another, neither moving towards nor away from each other.
Which three gases made up the very early atmosphere?	Carbon dioxide, water vapour and ammonia.
Why is it useful for a plant to have air spaces in the spongy mesophyll layer of the leaf?	To allow CO ₂ to reach the palisade cells.
What is a limiting factor	Something which is limiting the rate of photosynthesis at a given time.
What are the limiting factors of photosynthesis?	Temperature; levels of CO ₂ ; light intensity
Give the equation for photosynthesis	Carbon dioxide + water > Glucose + oxygen
What cell organelle is required for photosynthesis?	a chloroplast
What is the source of energy in a food chain?	The sun
What is another name for the first stage consumer?	Primary consumer
What is biomass?	The total weight of organisms in a given area .

How were the oceans formed?	The surface of the Earth cooled over time, the water vapour present in the early atmosphere condensed forming oceans and ice from comets.
What has caused the percentage of carbon dioxide in the atmosphere to decrease?	Photosynthesis in plants locked in limestone and chalk formed from marine animal's shells and locked in fossil fuels.
How is nitrogen formed in the atmosphere?	Ammonia from volcanoes decomposed on reaction with oxygen.
What does acid rain cause?	Lowers the pH of lakes and soil, damages buildings made of limestone and increases the rate of corrosion of metal structures such as bridges and statues.
What is carbon capture?	Removes CO ₂ produced by the burning of fossils fuels before they enter the atmosphere.
What does rate measure?	A change in concentration over a given time.
What is the activation energy?	The minimum amount of energy needed to start a reaction.
Why is a pyramid of biomass more accurate than a pyramid of numbers?	Because producers can be small in number but large in mass so using numbers only will distort a pyramid
What processes releases carbon into the atmosphere?	Respiration and combustion
What process takes Carbon dioxide out of the air?	Photosynthesis.
What process transfers carbon from plants to animals?	Eating
What process unbalances the C cycle?	Combustion
Name 5 types of pollutant	Chemical, sewage, noise, heat , rubbish
What is bioaccumulation?	Toxins building up in an organism, usually one at the top of a food chain.
What is an indicator species?	It is a species whose presence or absence is a sign of pollution.

What factors affect the rate of reaction?	Temperature, concentration and surface area.
What does a catalyst do?	Speeds up a reaction without being used in the reaction by lowering the activation energy.
What test is used to identify oxygen gas?	Glowing splint re-lights when placed into a jar containing oxygen gas.
What test is used to identify carbon dioxide gas?	Limewater turns milky
Which organisms are indicators of air pollution?	Lichens
Which organisms are indicators of water pollution?	aquatic invertebrates.
Which organisms are responsible for the lowered level of dissolved oxygen seen in eutrophication?	Bacteria.
What is intensive farming?	An agricultural system that aims to produce maximum yield from the land