Science Y8

Term	1		2		3		4		5		6	
Topic	**8E**	**8F**	**8A**	**8B**	**8I**	**8J**	**8G**	**8H**	**8C**	**8D**	**8K**	**8L**
Detail	Combustion and oxidation reactions, including those of hydrocarbons, metls and non metals.	This unit uses the context of firworks to develop an understanding of matter, atoms and chemical and physical change.	Looks at the main components in the human diet and why they are needed, The digestive system is also covered in some detail, and the idea of enzymes is introduced,	This unit covers reproduction in plants, both sexual and asexual, although the former is of chief importance.	This unit looks at changes of state, and then goes on to look at fluids and some of their effects, including pressure, floating and sinking, and drag.	This unit revises work from KS2 on light, which is then extended to consider how light travels and what happens when it meets an object. The unit is set in the context of stage, film and illusions.	This unit uses the context of metals used in building to review common physical properties of metals, and to introduce their main chemical properties.	This unit examines the different types of rock and the processes that bring about their formation, leading to the idea of a rock cycle that operates within a huge geological timescale.	Under the broad theme of water sports, this unit covers gas exchange in humans and other organisms, together with details of aerobic and anaerobic respiration in humans.	Under the broad theme of diseases, this unit takes a detailed look at what unicellular organisms are, the differences between different types, their problems and their uses.	This unit looks at energy transfers by heating in the context of homes.	This unit builds on work from KS2 on the Solar System and looks at the Earth, including the seasons and the Earth's magnetic field and gravity. It also looks at the Solar System and what is beyond the Solar System.
Mastered	Deecribe how rocket engines obtain enough oxygen in space to explode using oxidation agents. Model simple reactions using symbol equations. Justify methods of risk reduction.	Use information about reaction ratios to calculate atomic masses. Give a description of the valency of an element. Explain Mendeleev's periodic table.	Interpret results from food tests. Describe the roles of vitamins. Describe the causes and control of type 2 diabetes. Evaluate different models of basic enzyme action.	Use simple calculations (e.g. biodiversity index) to compare biodiversity. Evaluate the advantages ad disadvantages of seual and asexual. Evaluate different methods of pollination.	Use quantitative information on expansion aand contraception. Use the idea of latent heatwhen discussing changes of state.	Use ray diagrams to model and explain the effect of hole size on the image formed by a pinhole camera. Describe the effects of concave lenses on parallel beams of light.	Use valencies to deduce the formula of simple two-element compounds including transition metals. Model simple reactions using balanced symbol equations.	Compare the densities of igneous rocks. Describe features in limestone landscapes. Compare quantative data. Explain methods used to extract metals from their ores.	Evaluate the use of a word equation to model aerobic respiration. Explain how and why a concentration gradient is maintained for oxygen and carbon dioxide between the blood and lungs.	Explain the importance of surface area:volume ratio for organisms. Apply microbial growth rates to growth curves of other organisms. Describe how Gram staining works and use results to identify differences between bacteria.	Describe how the average kinetic energy of the particles in a gas relates to its Kelvin temperature. Explain the causes and effects of wind chill. Apply the idea of thermal mass to homes.	Use a model to explain why we have partial and total solar eclipses. Analyse the rotations and axes of other planets to predict annual changes. Use ideas about the Earth's magnetic field to explain variation, dip and deviation.
Secure	Explain the formation of the products when hydrocarbons burn. Explain the change in mass seen in reactions. Describe what is meant by exothermic changes.	Use the idea of Dalton's atomic model to describe a compound.compound. Describe how the periodic table is arranged. Compare particle sies to the sizes of common objects.	Describe tests for starch and fat. Explain the relationship between diet, exercise, age, gender and energy. Explain the links between specific forms of malnutrition. Describe ingestion.	Identify the genus and species names from a binomial name. Correctly use the terms species and hybrid. Explain the importance of seed dispersal.	Explain how density depends on mass and volume. Explain what happens to apartiles during changes in state. Explain ideas of density.	Use a ray diagram to explain how shadows are formed and to explain image formation in pinhole cameras. State the meaning of focal length, focus, and principal axis.	Model simple reactions of metals and non-metals using word equations. Identify the products and reactants using a symbol equation. Model simple reactions of metals and water using word equations.	Explain variation in crystal size. Compare fragment sizes that can be transported by wind, water and ice. Realte grain size and roundness to transport history. Evaluate environmental effects of quarrying.	Model aerobic respiration using a word equation. Explain how the lungs are adapted for efficient gas exchange. Describe the effects of nicotine, tar and carbon monoxide in tobacco smoke.	Use the key characteristics of microorganism cell structure to classify microorganisms. Describe what is happening in the different parts of a growth curve.	Use the particle model of matter to explain energy transfer by evaporation from a surface. Explain the process(es) in which energy is transferred by heating in a given situation.	Explain why the heliocentric model is our current model of the Solar System. Explain the effect of the tilt of the Earth's axis on the energy received from the Sun.
Developing	Identify the products and reactants using a word equation. Identify and explain the products formed by the oxidation of metals. Explain why different types of fire need to be put out in different ways.	Describe Dalton's ideas about atoms. Model c hemical reactions using word equations. Describe what elements in the same group of the periodic table share. Use data to identify trends.	Recall the names of nutrients in food. Interpret nutrition information labels. Explain how deficiency diseases are caused. Describe the role of enzymes as catalysts in digestion. Explin diffusion.	Explain how organisms are classified, using smaller and smaller groupings of shared characteristics. Describe the events for pollination.	State what is meant by density and recall its units. Describe physical weathering. Describe what factors affect upthrust. Describe the causes of air and water resistance.	State the meaning of transverse wave and recall that light waves are transverse waves. State the meaning of: refraction, angle of refraction, refracted ray, convex lens, converging lens.	Relate the uses of different elements to their chemical properties. Recall some reactions that happen slowly and some that happen quickly.	Describe the textures and properties of igneous rocks. Explain erosion and weathering. Describe a link between rock size and deposition. Describe how metals are extracted from their ores.	Explain how aerobic respiration can change the surroundings. Describe the functions of the organs in the human gaseous exchange system and what happens during gas exchange.	Explain why multicellular organisms need efficient transport systems. Explain how yeast can be used to make both alcoholic drinks and bread. Define feeding relationships in terms of energy flow.	Recall the effect of evaporation on the temperature of the remaining liquid and recall ways of reducing energy transfers by evaporation. Use the particle model of matter to explain energy transfers by conduction and convection.	Compare the geocentric and heliocentric models of the Solar System. Use a model to explain why the height of the Sun at noon and hours of daylight vary with latitude. Explain how a compass can be used together with maps for navigation.
Emerging	State the meaning of: fuel, combustion and hydrocarbon. State what happens to mass in a chemical reaction, Name the three sides of a firw triangle. Describe the reactions of non-metals with oxygen	Recall that different elements have different physical properties. Explain how chemical reactions are different to physical. State what happens at a material's melting and boiling point.	Correctly use the term: diet. Recall why we need food. Explain the benefits of a balanced diet. Identify the main parts of the digestive system. Recall where digested food rnters th blood.	Describe the key characteristics of the five kingdoms of organisms and use this to assign organisms to their kingdoms. Use the terms asexuals and sexual reproduction. Identify different structures within a seed.	Describe rhe three states of matter. Recall that ice is less dense than water. State what is meant by upthrust. Explain the effects of balanced forces in simple situations.	Recall that light travels in straight lines and can pass through empty space. Recall the primary colours for light. Recall the colours of the visible spectrum, in order.	Describe some common properties of metals and non-metals. Describe the corrosion of metals by reactions with oxygen. Describe the reactions of different metals with water.	Recall th Earth consists of a core, mantle and crust. Recall some examples of physical and chemicl changes. Recall the name of some sedimentary and igneous rocks. Recall that metals can be recycled.	Recall what happens in respiration (in terms of needing oxygen to release energy from food and producing carbon dioxide). Identify and recall the main organs in the human gaseous exchange system.	Recall the life processes (MRS GREN). Recall the five kingdoms of organisms. Recall that some foods, such as bread, beer and wine, are made using yeast. Recall the conditions under which bacteria grow quickly.	Recall some units for measuring temperature. Recall that energy will be transferred by heating between materials at different temperatures. Recall that energy can be transferred by heating in conduction, radiation and convection.	Describe how the Earth, Moon and planets move. Explain the changes in day length and height of the Sun in terms of the tilt of the Earth's axis. State what is meant by a magnetic field and recall the shape of the field of a bar magnet.
Keywords	Reactants, products, fossil fuels, hydrocarbons, metals, non- metals, metal oxides, exothermic, extinguisher, complete combustion, carbon monoxide, pollutants.	Atoms, element, compounds, physical changes, physical properties, symbols, chemical properties, hypothesis, prediction, scientific method, periodic table, alkali metals, halogens, noble gases, melting /boiling point.	Diet, proteins, carbohydrates, vitamins, minerals, fats, starch, sugars, kilojoules, fuel, respiration, malnutrition, kwashiorkor, scurvey, heart disease, obesity.	Sexual reproduction, hybrid, fertile, asexual repoduction, zygote, fertilised egg, gametes, pollination, self and cross pollination, pollen tube, egested, embryo, dominant, interdependance.	Melting, freezing, water vapour, condenses, anomalous, pressure, fluids, upthrust, weight, streamlined, balanced.	Transparent, transmitted, reflected, absorbed, translucent, pinhole camera, spectacular reflection, diffuse reflection, ray diagrams, interface, focal point, focal length, refraction, primary and secondary colours.	Halogens, catalysts, corrosion, rusting, formula, reactivity, reactivity series, repeatable, reproducible, efferescence, salt, malleable.	Earthquake, sinkholes, geologists, rocks, porous, permeable, cement, gravel, igneous rocks, metamorphic rocks, sedimentary rocks, physical, biological and chemical weathering, erosion.	Combustion, mucus, gas exchange, surface area, haemoglobin, heart disease, tissue fluid, blood, limewater, photosynthesis aerobic and anaerobic respiration.	Multicellular, unicellular, kingdoms, prokaryote, fungi, bacteria, virus, fermentation, flagella, enzymes, chromosomes, pyramid of number, producers.	Radiation, conduction and convection, absorbed, emit, medium, thermal conductors and insulators, solar panels, sankey diagrams, power, kilowatts, efficiency, payback time.	Elliptical, compass, seeking pole, attract, repel, magnetic field, gravitational field strength, weight, gravity, satellite, constellations, galaxy.
Resource Links	https://www.bbc.co.uk/education/guides/zqd2mp3/revision/1	https://www.bbc.co.uk/education/guides/zt2hpv4/revision	https://www.bbc.co.uk/education/guides/zyjx6sg/revision	https://www.bbc.co.uk/education/guides/zs7thyc/revision	https://www.bbc.co.uk/education/guides/zc9q7ty/revision	https://www.bbc.co.uk/education/guides/zq7thyc/revision	https://www.bbc.co.uk/education/guides/zqwmxnb/revision	https://www.bbc.co.uk/education/guides/zgb9kqt/revision	https://www.bbc.co.uk/education/guides/zq349j6/revision	https://www.bbc.co.uk/education/guides/z9hyvcw/revision	https://www.bbc.co.uk/education/guides/zyfgr82/revision	https://www.bbc.co.uk/education/guides/z8wx6sg/revision