

Curriculum Map – Science

Year 8

Term	AUTUMN 1	AUTUMN 2		
Unit Title	Movement, Cells, Human Reproduction (Biology)	Particle model, Separating Mixtures (Chemistry)		
Length	6 weeks, 3 lessons	6 weeks, 3 lessons		
Outcomes	<p>Skills</p> <p>Correctly follows instructions to carry out experimental techniques or procedures.</p> <p>Identifies hazards and assesses risks associated with these hazards, making safety adjustments as necessary, when carrying out experimental techniques</p> <p>Uses appropriate safety equipment and approaches to minimise risks Use a microscope safely and effectively</p> <p>Produce accurate scientific drawings</p> <p>Accurately plot a graph on an appropriate scale. Work out an unknown value by rearranging an equation Calculate a mean from a set of data collected.</p> <p>Write extended answers for questions using the command words compare and describe.</p> <p>Retrieval of Year 7 content.</p>	<p>Knowledge</p> <p>Give the definition of a cell Describe how to use a microscope to observe very small objects Describe the function of each part of a cell Describe the functions of specialised cells Describe the adaptations of specialised animal cells Describe the adaptations of specialised plant cells Name some substances that move into cells and out of cells Describe the process of diffusion Describe examples of diffusion Give the definition of a unicellular organism Describe the features of an amoeba Describe the features of a euglena Give the definitions of tissue, organ, and organ system Describe the hierarchy of organisation in a multicellular organism Recall the main bones in the human skeleton Describe the structure of a bone Describe the functions of the skeletal system Describe the role of joints in movement Describe the structure of a joint Describe how to measure the force exerted by different muscles Describe the function of the major muscle groups Describe how muscles cause movement in the body Describe how antagonistic muscles control movement at a joint Describe the difference between adolescence and puberty Compare the physical changes in males and females during puberty Describe the role of sex hormones during puberty Describe the biological function of the female and male reproductive systems Label the main structures in the female and male reproductive systems Describe the biological function of the main structures in the female and male reproductive systems. Describe the process of fertilisation Describe what happens during sexual intercourse Describe the main steps which must take place for implantation to occur Give the definition of gestation Describe the function of the placenta, umbilical cord, and fluid sac Describe the main stages in the process of birth Describe what happens during a period Describe the main stages in the menstrual cycle Describe some different methods of contraception</p>	<p>Skills</p> <p>Correctly follows instructions to carry out experimental techniques or procedures. Identifies hazards and assesses risks associated with these hazards, making safety adjustments as necessary, when carrying out experimental techniques Uses appropriate safety equipment and approaches to minimise risks</p> <p>Accurately plot a graph on an appropriate scale.</p> <p>Use a temperature-time graph to describe the properties of a substance.</p> <p>Calculate a mean from a set of data collected. Calculate the Rf value from a chromatogram.</p> <p>Write extended answers for questions using the command words compare and describe. Retrieval of Year 7 content.</p>	<p>Knowledge</p> <p>Use the particle model to explain why different substances have different properties.</p> <p>State the factors in the particle model that determine the properties of a substance. Compare the properties of a substance in its three states.</p> <p>Describe the arrangement, separation, and movement of particles in the three states of matter.</p> <p>Use the particle model to explain the properties of a substance in its three states.</p> <p>Give the definitions of mass, volume, and density.</p> <p>Use the particle model to explain why the same substance has different densities in each of its three states.</p> <p>Use the particle model to explain why, in the solid state, different substances have different densities.</p> <p>Describe how the arrangement, separation, and movement of the particles change when a substance melts or freezes.</p> <p>Give the factor in the particle model that explains why different substances have different melting points.</p> <p>Estimate the melting point of a substance from its temperature-time graph. Describe how the arrangement, separation, and movement of the particles change when a substance boils.</p> <p>Predict the state of a substance at a given temperature from its melting and boiling points, where both are above 0 °C.</p> <p>Estimate the boiling point of a substance from its temperature-time graph. Compare evaporating, condensing, and subliming in terms of their before and after states.</p> <p>Describe how the arrangement, separation, and movement of the particles change when a substance evaporates, condenses, and sublimes.</p> <p>Compare the changes in the arrangement, separation, and movement of the particles in evaporation and boiling. Describe how (if at all) the separation and speed of movement of the particles change when a substance diffuses.</p> <p>Use the particle model to explain how temperature, particle size, and state affect how quickly diffusion happens.</p> <p>Use the particle model to explain the observations in an experiment that demonstrates diffusion. Give the definition of pure in science</p> <p>Use a temperature-time graph for a melting substance to determine whether it is pure Give the definition of a mixture</p> <p>Compare mixtures and compounds Give the definitions of solution, solute, solvent, and dissolve <i>mixing into a solvent.</i></p> <p>Use the particle model to explain dissolving</p> <p>Predict the mass of a solution made from given masses of solute and solvent Give the definition of solubility</p> <p>Plot a solubility-temperature graph from data in a table Describe how solubility changes with temperature for a named</p>
Activities and Assessment	<p>Key Activities (including project work, community visits): Observing prepared cells using a microscope Compare how the temperature affects the rate of diffusion Chicken Wing Dissection Trip to the Science Museum Smart Activate 1 Biology (1.1-1.5, 2.1, 2.4-2.6, 3.1-3.5)</p> <p>Key Vocab: Organism, Cell, Microscope, Observation, specialised cell, adaptations, diffusion, concentration, unicellular organism, multicellular organism, bone, skeleton, muscle, ligament, tendon, antagonistic, adolescence, puberty, ovaries, testes, hormones, gamete, fertilisation, embryo, implantation, gestation, placenta, foetus, mensrual cycle, contraception</p>	<p>Key Activities (including project work, community visits): Melting ice cubes Collapsing can Making rock salt crystals Distillation Chromatography</p> <p>Smart Activate 1 Chemistry (1.1-1.7,)Smart Activate 2 Chemistry (2.1-2.7)</p> <p>Key Vocab: Material, particle, mixture, substance, property, solid, liquid, gas, states of matter, mass, volume, density, melting, freezing, reversible, conserved, boiling, evaporating, condensing, sublimation, concentration, diffusion, pure, impure, solution, solute, solvent, dissolve, saturated, soluble, insoluble, filtration, filtrate, residue, distillation, chromatography, chromatogram</p>		
<p>Assessment (including hot and cold task) End of unit assessments taken from Smart Activate (Kerboodle) Practical skills assessments Seneca Learning Assessments Kerboodle Assessments (Smart Activate) Century Tech</p>				

Curriculum Map – Science

Year 8

Term	Spring 1	Spring 2
Unit Title	Forces, Sound (Physics)	Light, Space (Physics)
Length	6 weeks, 3 lessons	6 weeks, 3 lessons
Outcomes	<p>Skills</p> <p>MATHS SKILLS: How to multiply numbers (calculating distances or times using echoes)</p> <p>MATHS SKILLS: Substituting values into an equation to calculate weight when mass is known</p> <p>MATHS SKILLS: Changing the subject of an equation</p> <p>WORKING SCIENTIFICALLY: Make repeat measurements</p> <p>WORKING SCIENTIFICALLY: plot simple graphs</p> <p>WORKING SCIENTIFICALLY: Using newton meters, reading scales and identifying zero error</p> <p>LITERACY SKILLS: Writing extended pieces in a logical order (explaining how sound is detected by ears)</p>	<p>Knowledge</p> <p>Describe how light is emitted, travels, and is detected, or absorbed</p> <p>Describe what happens when light interacts with matter</p> <p>Describe how the speed of light is used to define distance</p> <p>Describe what happens when light is reflected</p> <p>Use the law of reflection to explain how images are formed in a plane mirror</p> <p>Describe the difference between specular reflection and diffuse scattering</p> <p>Describe what happens when light is refracted</p> <p>Explain what happens when light is refracted</p> <p>Describe how a convex lens affects light</p> <p>Describe how the eye works</p> <p>Compare a simple camera with the eye</p> <p>Describe and explain what happens when light passes through a prism</p> <p>Describe how primary colours add to make secondary colours</p> <p>Explain the effect of filters and coloured materials on light</p> <p>Describe the objects that you can see in the night sky with the naked eye and with a telescope</p> <p>Describe the structure of the Universe</p> <p>Compare the planets of the Solar System</p> <p>Describe how the solar system was formed</p> <p>Explain the apparent motion of the Sun and other objects in the sky</p> <p>Describe and explain seasonal changes in the UK</p>
Activities and Assessment	<p>Key Activities (including project work, community visits):</p> <p>Crash- testing an egg workshop at the Royal Institution</p> <p>Stretching Spring practical and graph drawing linked to it</p> <p>Using $w=mg$ equation</p> <p>Key Vocabulary</p> <p>air resistance; Balanced; Compress; contact force; Deform; Drag; driving force; elastic limit; electrostatic force; Equilibrium; Extension; Force; Friction; gravitational field strength; Gravity; Hooke's Law; interaction pair; kilogram (kg); linear (graphs); Lubrication; magnetic force; Mass; newton (N); newtonmeter; non-contact force; Normal; Reaction; Resistive force; Streamlined; Stretch; Tension; Unbalanced; water resistance; weight</p> <p>Assessment (including hot and cold task)</p> <p>End of unit assessments taken from Smart Activate (Kerboodle)</p> <p>Practical skills assessments</p> <p>Seneca Learning Assessments</p> <p>Kerboodle Assessments</p> <p>Century Tech</p>	<p>Skills</p> <p>WORKING SCIENTIFICALLY: identify variables</p> <p>MATHS SKILLS: Using a protractor to measure angles in a ray diagram</p> <p>WORKING SCIENTIFICALLY: Drawing ray diagrams</p> <p>Key Vocab to learn:</p> <p>Source, emit, reflect, absorb, ray, eye, luminous, non-luminous, transmit, transparent, translucent, opaque, light-time, image, virtual, plane, normal, incident ray, reflected ray, angle of incidence, angle of reflection, law of reflection, specular reflection, diffuse reflection, refraction, medium, lens, convex, concave, converging, focal length, focus, focal point, optic nerve, cornea, pupil, retina, iris, inverted, photoreceptor, camera, aperture, real, pixel, prism, spectrum, dispersion, primary colour, secondary colour, filter, satellite, Solar System, comet, meteor, star, galaxy, Universe, Milky Way, asteroid, ellipse, dwarf planet, terrestrial, gas giant, moon, astronomer, axis, year, season, hemisphere, constellation, Moon phase, umbra, total solar eclipse, partial solar eclipse, penumbra, lunar eclipse</p> <p>Key Activities (including project work, community visits):</p> <p>Key Activities (including project work, community visits):</p> <p>IMAX Movie 'A beautiful planet' at Science Museum</p> <p>Ray diagrams for reflection and refraction and measuring angles</p>

Curriculum Map – Science

Year 8

Term	Summer 1	Summer 2		
Unit Title	Acids and Alkalis, Metals and Non-metals (Chemistry)	Plant reproduction, Interdependence, Photosynthesis (Biology)		
Length	6 weeks, 3 lessons	6 weeks, 3 lessons		
Outcomes	<p>Skills Correctly follows instructions to carry out experimental techniques or procedures.</p> <p>Identifies hazards and assesses risks associated with these hazards, making safety adjustments as necessary, when carrying out experimental techniques</p> <p>Calculate the change in mass.</p> <p>Uses appropriate safety equipment and approaches to minimise risks.</p> <p>Know when a reaction has taken by observing colour change or change in mass.</p> <p>Write a word equation for reaction.</p> <p>Write a symbol equation for a reaction.</p> <p>Write a general equation for a reaction.</p> <p>Accurately plot a graph on an appropriate scale.</p> <p>Calculate a mean from a set of data collected.</p> <p>Write extended answers for questions using the command words compare and describe.</p> <p>Retrieval of year 7 content.</p>	<p>Knowledge Use the particle model to describe differences between concentrated and dilute solutions.</p> <p>Describe the hazards linked to using laboratory acids and alkalis and how to control the risks from hazards..</p> <p>Given the colour change on adding indicator, determine whether a solution is acidic or alkaline.</p> <p>Identify acids, alkalis, and neutral solutions on the pH scale</p> <p>Use universal indicator to measure the pH of a solution.</p> <p>Give the definitions of base and alkali.</p> <p>Describe how pH changes in neutralisation reactions.</p> <p>Give examples of useful neutralisation reactions.</p> <p>Give the definition of a salt.</p> <p>Predict the salts that form when acids react with metals or bases.</p> <p>Describe how to make a salt from an acid and a metal or insoluble base.</p> <p>Use a pattern to predict the products of the reaction of a metal with an acid</p> <p>Write a word equation for the reaction of a metal with an acid, given the names of the reactants and products</p> <p>Use a pattern to predict the products of the reaction of a metal with oxygen</p> <p>Write a word equation for the reaction of a metal with oxygen, given the names of the reactants and products</p> <p>Compare the patterns in the reactivity of metals with acids and with oxygen</p> <p>Use a pattern to predict the products of the reaction of a metal with water</p> <p>Write a word equation for the reaction of a metal with water, given the names of the reactants and products</p> <p>Use the reactivity series to predict how vigorously metals react with acids, oxygen, and water</p> <p>Write the meaning of displacement reaction</p>	<p>Skills Correctly follows instructions to carry out experimental techniques or procedures.</p> <p>Identifies hazards and assesses risks associated with these hazards, making safety adjustments as necessary, when carrying out experimental techniques</p> <p>Uses appropriate safety equipment and approaches to minimise risks</p> <p>Use a microscope safely and effectively</p> <p>Produce accurate scientific drawings</p> <p>Accurately plot a graph on an appropriate scale.</p> <p>Write a word equation for a process.</p> <p>Write a symbol equation for a process.</p> <p>Collect data by performing a survey.</p> <p>Calculate a mean from a set of data collected.</p>	<p>Knowledge Describe the function of the main structures in a flower</p> <p>Describe the process of pollination</p> <p>Compare the structure of wind-pollinated and insect-pollinated plants</p> <p>Describe the process of fertilisation in plants</p> <p>Describe how seeds and fruits are formed</p> <p>Describe the main steps in germination</p> <p>Describe the advantages of seed dispersal</p> <p>Explain how seeds are adapted for their method of dispersal</p> <p>Use relevant information to construct a food chain</p> <p>Describe the feeding relationships between organisms within a food chain</p> <p>Describe the feeding relationships between organisms within a food web</p> <p>Describe what is meant by the interdependence of organisms</p> <p>Suggest and justify how the change in population of one organism affects the population of another within a food web.</p> <p>Describe how toxic materials can accumulate in a food chain</p> <p>Define the terms habitat, community, and ecosystem.</p> <p>Describe how different organisms co-exist within an ecosystem</p> <p>Explain the resources that plants, and animals compete for.</p> <p>Describe the interaction between predator and prey populations</p> <p>Describe the process of photosynthesis</p> <p>Give the word equation for photosynthesis:</p> <p>Describe how to test a leaf for the presence of starch</p>
Activities and Assessment	<p>Key Activities (including project work, community visits): Making Red cabbage indicators Testing pH of everyday substances Neutralisation of indigestion tablet Making Salt crystals Metals and acids Metal displacement reactions Smart Activate Chemistry1 (4.1-4.4)Smart Activate 2 Chemistry (3.1-3.8)</p> <p>Key Vocab to learn: Acid, alkali, base, corrosive, concentrated, dilute, indicator, pH scale, neutralization, salt, metal, unreactive, reactivity series, displacement, ore,</p>	<p>Key Activities (including project work, community visits): Seed dispersal investigation Flower dissection Eye colour investigation Factors affecting photosynthesis Trip to Kew Gardens Smart Activate 1 (3.6-3.8) Smart Activate 2 (3.1-3.4 and 4.1-4.2)</p> <p>Key Vocab: Pollination, germination, seed dispersal, fruit, food chain, producer, prey, predator, food web, decomposer, competition, interdependence, ecosystem, community, habitat, environment, niche, adaptation, variation, species, inherited variation, environmental variation, discontinuous variation, continuous variation</p>	<p>Assessment (including hot and cold task) End of unit assessments taken from Smart Activate (Kerboodle) Practical skills assessments Seneca Learning Assessments Kerboodle Assessments (Smart Activate) Century Tech</p>	