

Science KS3 Year 7-9 Curriculum Overview

Students follow the AQA KS3 Science Curriculum. Topics are taught on a Biology, Chemistry, Physics rotation. Each topic has two subtopics per year. Year 9 students have a two term preparation for GCSE topics before beginning GCSE science during term 3.

*Assessments are synoptic and will include knowledge and skills from previous units

Biology

Topic	Subtopic	Key Knowledge	Key Skills	Key Vocabulary	Common Misconceptions	Assessment*
Organisms	Yr7 Movement	Musculoskeletal system, types of joints and movement; structure of bones and muscles.	Label parts of the skeletal and muscular systems; explain movement mechanisms.	Ligament, tendon, joint, cartilage, muscle.	Muscles push to move bones; bones are not alive.	DC 1 assessment Formative in class questions
	Yr 7 Cells	Cell structure and function, specialised cells, basic cell biology.	Use microscopes; label cell diagrams; compare plant and animal cells.	Nucleus, cytoplasm, cell membrane, chloroplast, mitochondria.	Plant cells do not have a cell membrane; all cells are the same size.	DC 1 assessment Formative in class questions
	Yr 8 Breathing	Gas exchange in the lungs, breathing mechanics, effects of exercise on breathing.	Explain respiratory system function; measure lung capacity.	Alveoli, diaphragm, trachea, respiration, oxygen.	Breathing is the same as respiration; lungs store oxygen.	DC 1 assessment Formative in class questions
	Yr 8 Digestion	Digestive system structure, enzyme function, absorption of nutrients.	Describe digestion stages; explain enzyme action;	Enzyme, bile, stomach, small intestine, absorption.	Digestion only occurs in the stomach; all enzymes work the same way.	DC 1 assessment Formative in class questions

			label digestive organs.			
Ecosystems	Yr 7 Interdependence	Food chains and webs, predator-prey relationships, impact of human activities on ecosystems.	Construct food webs; explain energy flow in ecosystems.	Producer, consumer, decomposer, habitat, biodiversity.	Food webs have a set number of levels; only animals are part of food chains.	DC 2 assessment Formative in class questions
	Yr 7 Plant Reproduction	Flower structure, pollination, fertilisation, seed dispersal.	Label parts of a flower; describe pollination and fertilisation processes.	Pollination, stigma, stamen, ovary, seed dispersal.	Flowers only reproduce by seeds; all flowers are pollinated by bees.	DC 2 assessment Formative in class questions
	Yr 8 Respiration	Cellular respiration, aerobic vs. anaerobic processes, energy release from glucose.	Explain respiration equations; compare aerobic and anaerobic respiration.	Glucose, ATP, aerobic, anaerobic, mitochondria.	Respiration is only breathing; plants do not respire.	DC 2 assessment Formative in class questions
	Yr 8 Photosynthesis	Process of photosynthesis, factors affecting the rate, importance in ecosystems.	Write the photosynthesis equation; explain how light, carbon dioxide, and temperature affect the rate.	Chlorophyll, stomata, glucose, carbon dioxide, light intensity.	Plants get energy directly from the sun; photosynthesis only occurs with sunlight rather than any light source.	DC 2 assessment Formative in class questions
Genes	Yr 7 Variation	Variation is caused by genetic and environmental factors; continuous variation	Describe how variation occurs; analyse data to classify variation as	Variation, genetics, continuous, discontinuous, allele, trait.	Traits are only inherited from one parent; all variation is genetic.	DC 3 assessment Formative in class questions

		(e.g., height) vs. discontinuous variation (e.g., blood group).	continuous or discontinuous.			
	Yr 7 Human Reproduction	Structure and function of reproductive systems, fertilisation, stages of development from zygote to foetus, puberty changes.	Label diagrams of male and female reproductive systems; explain the process of fertilisation; describe changes during puberty.	Sperm, egg, fertilisation, zygote, embryo, foetus, puberty, ovary, testis.	Fertilisation occurs instantly after intercourse; puberty happens at the same age for everyone.	DC 3 assessment Formative in class questions
	Yr 8 Evolution	Evolution as a gradual change in species over time; natural selection and survival of the fittest; evidence for evolution, such as fossils.	Explain the process of natural selection; use evidence to support the theory of evolution.	Evolution, natural selection, adaptation, survival, fossil, species.	Individual organisms evolve during their lifetime; evolution is a choice or goal-directed process.	DC 3 assessment Formative in class questions
	Yr 8 Inheritance	Inheritance of traits from parents; dominant and recessive alleles; genetic diagrams like Punnett squares for predicting offspring traits.	Use Punnett squares to predict inheritance patterns; explain dominant and recessive inheritance.	Inheritance, allele, dominant, recessive, genotype, phenotype, chromosome.	Recessive traits are less common; one parent's traits are always	DC 3 assessment Formative in class questions
Preparing for GCSE	Yr 9 Preparing for GCSE	Photosynthesis, respiration, enzymes,	Describe trends in data - limiting	Photosynthesis, respiration, enzymes,	Plants do not respire, inherited traits are from one	DC 1 and 2 assessment

		pathogens, DNA and genetic testing	factors of photosynthesis. Temperature and pH on enzymes. Evaluating science ethics	limiting factors, pathogens, DNA, genotype, phenotype, genetic testing, ethics	parent, scientists can grow test tube babies.	Formative in class questions
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Chemistry

Topic	Subtopic	Key Knowledge	Key Skills	Key Vocabulary	Common Misconceptions	Assessment*
Matter	Yr 7 Particle Model	Properties of solids, liquids, gases; changes in state explained by particle movement.	Draw particle diagrams for different states; explain temperature and state changes.	Particle, diffusion, density, evaporation, sublimation.	Particles in solids are completely still; substances "disappear" when dissolved.	DC 1 assessment Formative in class questions
	Yr 7 Separating Mixtures	Techniques based on physical properties; examples include filtration, distillation, and chromatography.	Choose appropriate separation methods; explain solubility using curves.	Solvent, solute, solution, chromatography, distillation.	All substances dissolve in water; dissolved substances are "gone" from the mixture.	DC 1 assessment Formative in class questions
	Yr 8 Periodic Table	Patterns in element properties across groups and periods; chemical behaviour	Use data to identify trends; predict reactions of elements based on their group.	Group, period, alkali metals, halogens, noble gases.	The periodic table only shows metals; elements in the same group are identical.	DC 1 assessment Formative in class questions

		predictions based on position.				
	Yr 8 Elements	Properties of elements vs. compounds; atomic structure basics.	Classify substances using particle diagrams; name compounds based on their formulae.	Atom, molecule, compound, polymer, chemical formula.	Atoms are indivisible; molecules are always made of different elements.	DC 1 assessment Formative in class questions
Reactions	Yr 7 Metals and Non-Metals	Reactivity series, reactions with oxygen and acids, displacement reactions.	Describe reactions with word equations; represent reactions with particle diagrams.	Oxidation, displacement, reactivity, base, acid.	All metals react the same way; non-metals do not react.	DC 2 assessment Formative in class questions
	Yr 7 Acids and Alkalis	pH scale, neutralisation reactions, strength of acids and alkalis.	Choose indicators to identify pH; explain neutralisation applications.	pH, indicator, base, alkali, concentration.	Acids are always dangerous; alkalis are not dangerous; neutral solutions are always safe to touch.	DC 2 assessment Formative in class questions
	Yr 8 Chemical Energy	Exothermic and endothermic reactions; energy changes during chemical reactions.	Measure temperature changes; identify reactions based on energy profiles.	Exothermic, endothermic, activation energy, energy profile.	Chemical bonds release energy when formed; heat is always a reactant in reactions.	DC 2 assessment Formative in class questions
	Yr 8 Types of Reaction	Different types of chemical reactions, including combustion, oxidation, and neutralisation.	Identify reaction types from descriptions; balance chemical equations.	Combustion, oxidation, neutralisation, catalyst, precipitate.	Combustion is always with oxygen; all reactions are either exothermic or endothermic.	DC 2 assessment Formative in class questions

Earth	Yr 7 Earth Structure	Layers of the Earth, rock cycle, processes like erosion and sedimentation.	Label diagrams of the Earth's structure; explain rock formation processes.	Sedimentary, igneous, metamorphic, erosion, crust.	Rocks are not constantly changing; only volcanoes create rocks.	DC 3 assessment Formative in class questions
	Yr 7 Universe	Structure of the solar system, stars, and galaxies; concepts like light-years and gravity in space.	Explain planet orbits; use models to describe the solar system.	Solar system, galaxy, orbit, gravity, light-year.	Space has air; gravity does not exist outside of Earth's atmosphere.	DC 3 assessment Formative in class questions
	Yr 8 Climate	Factors affecting climate, evidence for climate change, human impact.	Analyse climate data; explain processes contributing to climate change.	Greenhouse gases, carbon footprint, global warming, climate.	Climate change is the same as weather change; only carbon dioxide affects climate.	DC 3 assessment Formative in class questions
	Yr 8 Earth Resources	Natural resource types, sustainable use, and environmental impact of resource extraction.	Compare renewable and non-renewable resources; suggest ways to reduce resource depletion.	Sustainability, conservation, natural resources, fossil fuels.	Renewable resources are infinite; fossil fuels are not harmful when burned.	DC 3 assessment Formative in class questions
Preparing for GCSE	Yr 9 Preparing for GCSE	Structure of the atom, trends in the periodic table, properties and structure of matter, energy changes and rate of reaction, neutralisation	Using data, word and symbol equations, forming conclusions from data.	Atom, element, proton, neutron, trend, endothermic, exothermic, rate, neutralisation.	Heat is also released during a reaction; atoms are solid and circular.	DC 1 and 2 assessment. Formative in class questions

Physics

Topic	Subtopic	Key Knowledge	Key Skills	Key Vocabulary	Common Misconceptions	Assessment*
Forces	Yr 7 Speed	Resultant force affects motion, speed calculation using distance/time, constant speed, acceleration.	Calculate speed; interpret distance-time graphs; describe changes in speed.	Speed, acceleration, distance-time graph, relative motion.	Speed and acceleration are the same; a stationary object has no forces acting on it.	DC 1 assessment Formative in class questions
	Yr 7 Gravity	Differences between mass and weight, gravitational forces, weight variation with gravitational field strength.	Use the formula $\text{weight} = \text{mass} \times \text{gravitational field strength}$; draw force diagrams.	Mass, weight, gravity, gravitational field strength.	Mass changes with gravity; weight is not a force.	DC 1 assessment Formative in class questions
	Yr 8 Contact Forces	Equilibrium, deformation, factors affecting friction and drag.	Sketch forces; explain factors affecting friction and drag; describe material behaviour under stress.	Friction, tension, compression, equilibrium, deformation.	Friction always opposes motion; friction is not needed for walking.	DC 1 assessment Formative in class questions
	Yr 8 Pressure	Pressure in fluids, effects of forces on surfaces, pressure calculation using force/area.	Use pressure formula; explain sinking, floating, and upthrust in terms of forces.	Pressure, fluid, upthrust, stress, atmospheric pressure.	Pressure is the same at all depths in a fluid; larger objects always sink.	DC 1 assessment Formative in class questions

Electromagnets	Yr 7 Voltage and Resistance	Voltage as energy transfer per unit charge, resistance reducing current flow.	Calculate resistance; draw circuit diagrams showing voltage measurements.	Voltage, resistance, ohm, electrical conductor, insulator.	Voltage gets "used up" in a circuit; thicker wires increase resistance.	DC 2 assessment Formative in class questions
	Yr 7 Current	Current in series and parallel circuits, effects of charged objects.	Describe current flow in different circuit types; build and interpret circuits.	Current, electron, series, parallel, electrostatic force.	Current is "used up" in components; current is the same in parallel circuits.	DC 2 assessment Formative in class questions
	Yr 8 Electromagnets	Magnetic field generation by electric current, factors affecting electromagnet strength.	Construct and modify electromagnets; explain their uses.	Electromagnet, solenoid, core, magnetic field.	Permanent magnets and electromagnets are the same; electric current is not needed for electromagnets.	DC 2 assessment Formative in class questions
	Yr 8 Magnetism	Magnetic field patterns, Earth's magnetism, magnetic force.	Use field lines to describe magnetic fields; explain navigation with magnetic fields.	Magnet, magnetic poles, permanent magnet, field lines.	Only metals attract magnets; all metals are magnetic.	DC 2 assessment Formative in class questions
Energy	Yr7 Energy Costs	Domestic energy costs, different energy resources, and their advantages/disadvantages.	Calculate energy usage costs; compare energy resource benefits.	Energy, power, renewable, non-renewable, fossil fuels.	Energy is "lost" or "destroyed" in a system; renewable energy is always free of environmental impact.	DC 3 assessment Formative in class questions
	Yr7 Energy Transfer	Conservation of energy, dissipation, different energy stores.	Describe energy transfers in real-life examples; calculate useful and dissipated energy.	Thermal energy, chemical energy, kinetic energy, dissipation.	Heat is a substance that flows; energy is only present in moving objects.	DC 3 assessment Formative in class questions

	Yr 8 Work	Relationship between force, distance, and work done; use of machines like levers and pulleys.	Use the formula work = force × distance; draw diagrams to illustrate work.	Work, lever, displacement, input force, output force.	Work is only done if an object moves; lifting an object slowly requires less work.	DC 3 assessment Formative in class questions
	Yr 8 Heating and Cooling	Thermal energy transfer by conduction, convection, and radiation; effect of mass and temperature.	Explain insulation methods; sketch diagrams of convection currents.	Conduction, convection, radiation, thermal conductor, insulator.	Cold travels; metal feels cold because it contains "coldness."	DC 3 assessment Formative in class questions
Waves	Yr 7 Sound	Sound as vibrations, properties of sound waves, factors affecting speed of sound.	Relate waveform shape to pitch and volume; describe wave behaviours like reflection and absorption.	Vibration, longitudinal wave, amplitude, frequency, pitch.	Sound travels through a vacuum; louder sounds travel faster.	DC 3 assessment Formative in class questions
	Yr 7 Light	Reflection, refraction, absorption of light; colour perception.	Construct ray diagrams; explain how lenses affect light.	Incident ray, refraction, absorption, transparent, opaque.	Light bends because it "slows down" suddenly; black objects reflect no light at all.	DC 3 assessment Formative in class questions
	Yr 8 Wave Effects	Energy transfer by waves, wave interactions with living cells, use of ultrasound and UV.	Describe effects of waves on cells; explain audio equipment functioning.	Ultrasound, ultraviolet, pressure wave, absorption, reflection.	All waves travel the same speed; higher frequency means more intensity.	DC 3 assessment Formative in class questions
	Yr 8 Wave Properties	Differences between transverse and longitudinal waves,	Use the wave model to explain reflection, absorption, and transmission.	Transverse wave, wavelength, speed, transmission, reflection.	Waves move matter from one place to another; transverse	DC 3 assessment Formative in class questions

		properties of waves such as speed and wavelength.			waves are the only wave type.	
Preparing for GCSE	Yr 9	Calculate resultant force, speed calculations, energy changes and efficiency, renewable and non renewable energy, potential difference, current and resistance in a circuit.	Using data, rearranging equations, using graphs, evaluating.	Inertia, scalar, vector, conservation of energy, efficiency, renewable and non renewable energy, potential difference, current, resistance.	There is no force acting on an object if it is stationary. Stationary objects have no energy. Current is 'used up' in a circuit.	DC 1 and 2 assessment. Formative in class questions.