

Year 9 Science Curriculum

Key:

HSW – How Science Works (investigation Skills)

A – Some classes may do this lesson if time. These lessons won't be examined in year 7.

	Subject	Topics
Half Term 1 (Autumn Term)	Chemistry-Fundamentals	1. Elements, mixtures and compounds
		2. Naming compounds
		3. Balancing Equations
		4. Gas tests HSW (A)
	Chemistry – Energy In Reactions	1. Energy in chemical reactions HSW
		2. Energy change theory
		3. Energy change practice
		4. Energy change calculations (A)
		5. Calorimetry
		6. Calorimetry HSW
	Biology-Genetics and Variation	1. DNA
		2. Continuous and Discontinuous Variation
		3. Inherited and Environmental Variation
		4. Genetic cross diagram
		5. Discovery of DNA (A)
		6. Charles Darwin and Natural Selection
		7. Selective Breeding
		8. Genetic Engineering (A)
		9. Cloning (A)
Half Term 2 (Autumn Term)	Biology-Enzymes	1. Enzyme structure and action
		2. Digestive Enzymes
		3. Highly processed food and diet (A)
		4. Amylase and Starch –pH and denaturation
		5. Milk and Trypsin –temperature and denaturation
		6. Denaturation summary
		7. Enzymes in industry (A)

	Physics-Newton's Laws	1. Free body diagrams/Balanced and unbalanced
		2. Newton's 1 st law
		3. Terminal Velocity (A)
		4. Newton's 2 nd law (theory)
		5. Newton's 2 nd law (practice)
		6. Acceleration investigation (A)
		7. Newton's 3 rd law
	Physics-Generating Electricity	1. Power stations
		2. The national grid
		3. Electricity in the home
		4. Electrical fault finding and safety.
		5. Practical – Finding resistance of components
		6. Electric Bills and energy efficiency.
		7. Electrical power (A)
Half Term 3 (Spring Term)		1. Discovery and development of the atom
		2. Rutherford Exp
		3. Structure of the atom (P, N, E)
		4. Structure of the atom (Electron configuration)
		5. Ions and Ionic Formulae
		6. Development of the periodic table
		7. The Modern periodic table
		8. Relative atomic and formula mass
		9. Alkali Metals
		10. Alkali Metals Reactivity
		11. Halogens (A)
		12. Halogen Displacement HSW (A)
		13. Transition Metals (A)
		14. Group 2 and stability of metal carbonates
	Biology-Exchange In Organisms	1. Diffusion
		2. Osmosis
		3. Osmosis (solutes) (A)

		4. Active transport
	Physics-Electromagnetic Waves	1. Properties of waves
		2. Visible spectrum and IR discovery
		3. The electromagnetic spectrum
		4. X-rays and Gamma rays (A)
Half Term 4 (Spring Term)	Physics-Simple Machines	1. Density
		2. Forces on an inclined plane
		3. Pressure
		4. Hydraulics
		5. Moments
		6. Moments HSW
		7. Hooke's law theory
		8. Hooke's law HSW
		9. Paper aeroplane project (HSW)
	Biology-Ecology	1. Keywords and quadrats for estimating populations
		2. Abiotic factors and communities (belt transects)
		3. Biotic factors and communities
		4. Parasitism
		5. Mutualism
		6. Biodiversity and Humans
		7. Preserving biodiversity
		8. Water Cycle
		9. Carbon Cycle
		10. Nitrogen Cycle (A)
Half Term 5 (Summer Term)	Biology-Ecology	11. Energy transfer (A)
		12. Assessing Pollution (A)
		13. Food Security (A)
		14. Rates of decomposition (A)
	Physics-Nuclear Physics	1. Nuclear structure and radioactivity (structure of atom + isotopes)

		2. Penetrating power of α , β , γ
		3. Uses of α , β , γ
		4. Half-life theory
		5. Half-life practice (graph skills)
		6. Decay equations (A)
	Chemistry-Separating Techniques	1. The particle model
		2. Changes of state
		3. Mixtures: Pure vs Impure
		4. Solubility: key terms
		5. Filtration and Crystallisation – Method writing
		6. Filtration and Crystallisation HSW
		7. Chromatography HSW
		8. Chromatography – Rf Values
		9. Simple Distillation HSW
		10. Potable Water (A)
		11. Fractional Distillation (A)
Half Term 6 (Summer Term)	Biology-Photosynthesis	1. Photosynthesis
		2. Adaptations of the Leaf
		3. Testing a Leaf for Starch
		4. Adaptations of the Root
		5. Adaptations of the Stem – Xylem and Phloem
		6. Limiting Factors (A)
	Biology-Respiration	1. Aerobic Respiration
		2. Role of the respiratory, digestion and circulatory system in delivering reactants including heart and breathing rate with exercise (A)
		3. Anaerobic respiration
		4. Respiration in plants
	Physics-Cosmology	1. Earth's Days, Earth's Seasons and The Solar System recap
		2. Scales in the universe and unit conversions
		3. Life cycle of the sun
		4. Telescopes
		5. Modelling the Big Bang
		6. Evidence for the Big Bang

	Subject	Topics
Half Term 1 (Autumn Term)	Intro to Science	Behaviour and Lab Safety
		Lab equipment
		Fire safety and Bunsen burners
		Accurate measurements
		HSW
		Behaviour and Lab Safety
	Biology - Cells	Life Processes
		Animal Cells
		Plant cells (Eukaryotic cells)
		Introduction to Microscopy
		Microscopy HSW
		Specialised Cells in animals
		Levels of organisation in animals
		Levels of organisation in plants
	Physics - Forces	Naming forces
		Force diagrams and balanced forces
		Resultant Forces
		Mass and Weight
Half Term 2 (Autumn Term)		Friction
		Friction HSW
		Speed
		Speed rearranging
		Distance-time graphs (A)
		Friction
	Physics - Energy	Energy stores
		Energy pathways
		Energy accounts/conservation
		Energy stores
	Chemistry – Particle Model	States of Matter HSW
		Particle Model
		Changing State
		4. Modelling the particle model
		5. Application of Particle Model
		Brownian Motion (A)
	Chemistry – Periodic Table	Atoms and Elements and symbols

		Element symbols and Chemical formulas
		Periodic table
		Atomic Structure
		Protons, Electrons and Neutrons
Half Term 3 (Spring Term)	Biology - Reproduction	Reproductive organs - female
		Reproductive organs - male
		Puberty
		The menstrual cycle
		Tampon investigation
		Fertilisation
		Pregnancy
		8. Impact of lifestyle on pregnancy (A)
	Chemistry – Compounds and mixtures	Chemical vs Physical Changes
		Compounds and Mixtures
		Making compounds HSW
		Naming Compounds
		Writing word equations
Half Term 4 (Spring Term)	Chemistry – Acids and Bases	Intro to Acids and Bases
		Use of indicators HSW
		Neutralisation
		Naming salts
		Neutralisation HSW
	Physics - Electricity	Conductors vs Insulators
		Electric circuits and components
		Current in series
		P.d. in series
		Current and p.d. HSW
	Physics - Magnetism	Magnets and magnetic materials
		Magnetic fields
		Electromagnets and their uses
		Electromagnets (A)
Half Term 5 (Summer Term)	Chemistry – Equations and Reactions	Word and symbol equations
		Balancing Equations theory
		Balancing Equations practice

		Acids and Metals
		Acid and Metals HSW
		Acids and metal carbonates (A)
		Displacement
		Oxidation HSW
		Precipitation and thermal decomposition (A)
	Biology - Environment	Habitats
		Adaptations
		Food Chains and Food Webs
		Pyramids
		Classification
	Biology – Food and Digestion	Food Groups
		Food Tests – Starch and Protein
		Food Tests – Fats and Sugars
		The Digestive Systems
		Digestive Enzymes (A)
		Non-Communicable Disease – Malnutrition, Starvation, Obesity
Half Term 6 (Summer Term)	Physics – Sound and Light	Wave introduction
		Wave properties
		Sound: pitch and volume
		How do we hear? (A)
		Speed of waves
	Physics - Space	Earth's Days
		Earth's Seasons
		The Solar System
		Changing ideas about the Solar System (A)