



## Curriculum Overview: Combined Science Year group 11

### What your child will learn each half term

This overview shows the key topics, skills, and knowledge your child will be learning in Science in Y11. It helps families understand what's being taught, how it builds on previous learning, and how you can support your child at home.

#### • **How science works skills**

- Use and rearrange equations confidently in Chemistry and Physics topics.
- Link graphs and data to scientific models, drawing conclusions from evidence.
- Develop skills in planning, carrying out, and analysing required practicals.
- Apply practical skills: selecting equipment, measuring accurately, and identifying variables to control in an investigation.
- Communicate scientific ideas clearly in extended written answers, using correct terminology.

- **What we are learning:** The topic or focus for the half term.
- **Key knowledge & skills:** What students should understand and be able to do.
- **How we assess learning:** knowledge checks, practical tasks, written responses and formal assessments.
- **Key words to know:** Vocabulary students will learn and use.

Half term	What we are learning	Key knowledge and skills	How we will assess learning in this unit	Homework	Key vocabulary for this unit
HT 1 and 2	B5b Hormonal coordination  B6a Reproduction  B6b Variation and evolution  C6 Rate and extent of Chemical Change  P5a Forces in balance  P5b Motion graphs	Hormonal coordination (B5b): role of hormones in the body, blood glucose control, menstrual cycle, contraception.  Reproduction (B6a): sexual vs. asexual reproduction, meiosis, DNA and inheritance.  Variation & evolution (B6b): causes of variation, natural selection, extinction, selective breeding and genetic engineering.  Rates of reaction (C6): factors affecting rate (concentration, temperature, surface area, catalysts), reversible reactions, equilibrium.  Forces in balance (P5a): resultant forces, moments, levers and gears.  Motion graphs (P5b): interpreting distance–time and velocity–time graphs, calculating speed, acceleration, and stopping distances.	Continuous formative assessment in lessons.  End of topic tests.  Question level analysis and feedback.  Required practical assessment booklets.	Homework is set on a Monday and is due the following Monday. Homework will be set online using a website 'Educake' which pupils will receive their login details for.	<b>Biology: hormone, insulin, ovulation, meiosis, fertilisation, variation, mutation, natural selection, evolution, extinction.</b> <b>Chemistry: rate, collision theory, catalyst, activation energy, reversible reaction, equilibrium.</b> <b>Physics: force, resultant force, moment, centre of mass, velocity, acceleration, distance–time graph, velocity–time graph, stopping distance.</b>

HT 3 and 4	<p>B6c Genetics and evolution B7a Adaptations, interdependence and competition B7b Organising an ecosystem B7c Biodiversity and ecosystems</p> <p>C7a Crude oil and fuels C8 Chemical analysis C9 Our Atmosphere C10a The Earth's resources</p> <p>P5c Force and motion P6a Wave properties P7 Electromagnetism B7c Biodiversity and ecosystems</p>	<p>B6c Genetics and Evolution: DNA, genes, chromosomes, inheritance, dominant/recessive alleles, mutations, natural selection, evolution. Predict inheritance patterns, interpret Punnett squares, analyse evidence for evolution.</p> <p>B7a Adaptations, Interdependence and Competition: Adaptations of organisms, predator-prey relationships, competition for resources, food chains/webs. Explain adaptations, analyse interactions, interpret ecological data.</p> <p>B7b Organising an Ecosystem: Feeding relationships, trophic levels, biomass, energy transfer. Construct food chains/webs, calculate energy efficiency, interpret ecosystem diagrams.</p> <p>B7c Biodiversity and Ecosystems: Importance of biodiversity, human impacts, conservation, deforestation, pollution. Evaluate conservation methods, interpret environmental data, explain human impact.</p> <p>C7a Crude Oil and Fuels: Composition of hydrocarbons, fractional distillation, cracking, combustion, environmental impact. Predict products, explain fuel properties, interpret energy content.</p> <p>C8 Chemical Analysis: Purity, separation techniques (filtration, chromatography, distillation), identification of ions and gases. Perform simple tests, interpret chromatograms, identify substances.</p> <p>C9 Our Atmosphere: Composition of the atmosphere, greenhouse gases, climate change, carbon cycle. Explain processes, analyse data, evaluate environmental impacts.</p> <p>C10a The Earth's Resources: Renewable vs non-renewable, water treatment, life-cycle assessment, sustainable use. Evaluate resource management, interpret data, explain sustainability.</p>	<p>Continuous formative assessment in lessons.</p> <p>End of topic tests.</p> <p>Question level analysis and feedback.</p> <p>Required practical assessment booklets.</p>	<p>Homework is set on a Monday and is due the following Monday. Homework will be set online using a website 'Educake' which pupils will receive their login details for.</p>	<p>Biology Keywords</p> <p>DNA, Gene, Chromosome, Allele, Dominant, Recessive, Mutation, Inheritance, Evolution, Natural selection, Adaptation, Competition, Predator, Prey, Food chain, Food web, Trophic level, Biomass, Ecosystem, Biodiversity, Conservation, Deforestation, Pollution.</p> <p>Chemistry Keywords</p> <p>Hydrocarbon, Crude oil, Fractional distillation, Cracking, Combustion, Fuel, Energy content, Purity, Filtration, Chromatography, Distillation, Ion test, Identification, Atmosphere, Greenhouse gas, Carbon cycle, Climate change, Renewable, Non-renewable, Life-cycle assessment, Sustainability.</p> <p>Physics Keywords</p>
------------	---	---	---	--	--

		<p>P5c Force and Motion: Speed, velocity, acceleration, Newton's laws, resultant forces, momentum. Calculate speed/acceleration, draw force diagrams, apply equations to motion problems.</p> <p>P6a Wave Properties: Types of waves, wavelength, frequency, amplitude, reflection, refraction, sound, light. Measure wave properties, interpret wave diagrams, compare wave types.</p> <p>P7 Electromagnetism: Magnetic fields, electromagnets, motors, induced voltage, generators. Draw fields, explain operation of devices, calculate induced voltage.</p>			<p>Speed, Velocity, Acceleration, Force, Resultant, Momentum, Newton, Wave, Wavelength, Frequency, Amplitude, Reflection, Refraction, Sound, Light, Magnet, Magnetic field, Electromagnet, Motor, Generator, Induced voltage.</p>
--	--	---	--	--	---