

## Science Curriculum: Year 9

Science provides a key foundation for students to understand the world around us. Science effects our daily lives, stimulates curiosity and broadens student's horizons, both in the understanding of wider scientific issues and providing access to a range of job opportunities. The science curriculum provides students with the opportunity to develop a love and appreciation of science and realise their full potential through the breadth and depth of scientific knowledge and skills. Students are naturally curious, by stimulating this curiosity, through scientific ideas, practical investigation and the studying the wider implications of science, we can ensure they are motivated to reach their full potential.

All students complete the remaining Key Stage three units during the first 2 terms of the year before beginning the first GCSE units in the Summer term. All students study a unit of Biology, Chemistry and Physics each term as shown below.

	Autumn term	Spring	Summer
Biology	<b>Plants – Cells are alive and organisms are systems</b>  Students build on ideas of cells, organisation and reproduction by applying them to plants. They then study photosynthesis and link the structure of the leaf to how photosynthesis is carried out in the plant.	<b>Inheritance – characteristics are inherited and species show variation</b>  Students study variation that is both inherited and environmental and ideas of how features can be inherited. They examine how variations can develop and lead to a change in species over time.	<b>B2 Organisation – Bodies are systems</b>  Students will study the digestive system in detail, including the role of enzymes and Bile in digestion. Students move on to look at the circulatory system including the types of blood vessels and the constituents of the blood. Finally students build on work earlier in the year to study a range of plant organ systems.
	<b>Important vocabulary:</b> Distribution, estimate function, structure, diffusion, dispersal	<b>Important vocabulary</b> Variation, evolution, discontinuous, continuous, extinction	<b>Important vocabulary:</b> Digestion, optimum, denature, neutralize, emulsify, diffusion, pressure
Chemistry	<b>Separation science – structure determines properties</b>  Students investigate the factors that affect solubility and explain the idea of conservation of mass in solutions with reference to the particle model. Following this they study a range of ways to separate mixtures – building on ideas of physical and chemical changes	<b>Metals and their reactions – reactions rearrange matter</b>  Students study the reactions of metals, spotting patterns in reactions and representing these through the use of general equations.	<b>C1 Atomic structure and the periodic table – structure determines properties</b>  Students study the modern model of the atom including how ideas have changed over time including the experimental evidence that led to changing ideas. Students then move onto look at how and why elements are arranged as they are in the periodic table.
	<b>Important vocabulary:</b> Mixture, pure, dissolve, saturated, residue, filtrate, solvent, solute	<b>Important vocabulary:</b> Reactivity, reactant, product	<b>Important vocabulary:</b> Period, reactivity, trend, subatomic, relative, atomic
Physics	<b>Motion and pressure – forces predict motion and energy is conserved</b>  Students collect data, calculate speeds of objects and represent journeys on distance time graphs. They study pressure in solids, liquids and gases before investigating lever and calculating moments.	<b>Electricity and magnetism electricity transfers energy and field produce forces</b>  Students study electric current and potential difference in series and parallel circuits and investigate conductors and insulators. They finish the unit by investigating electromagnets	<b>P3 Particle model of matter – Energy is conserved</b>  Students review the particle model and how particle arrangement, movement and density is different in each state of matter. Students consider the energy needed to heat materials and change their state before using the particle model to explain the behavior of particles in a gas.

	<b>Important vocabulary:</b> Mechanism, moment, pressure, displacement, surface area	<b>Important vocabulary:</b> Charge, repel, potential difference, resistance, conductor, insulator	<b>Important vocabulary:</b> Density, specific, latent, capacity, internal,
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These topics will also help students to:

- make connections between these subject areas and become aware of some of the big ideas underpinning scientific knowledge and understanding.
- understand that science is about working objectively, modifying explanations to take account of new evidence and ideas and subjecting results to peer review
- apply knowledge and skills to solve scientific problems and answer scientific questions about the world around us.

## Key staff contacts:

Faculty Leader: Miss K Francis [k.francis@fi.coastandvale.academy](mailto:k.francis@fi.coastandvale.academy)

Head of Year 9: Mrs J Bestington [j.bestington@fi.coastandvale.academy](mailto:j.bestington@fi.coastandvale.academy)

## How parents can help:

- Review key vocabulary with your child to help them transfer it to their long-term memory.
- Ask students to explain what they have learnt that week, this also helps build long-term memory.
- Try watching science / nature programs together and talking about them to encourage them to investigate the world around them.
- Help them explore science YouTube channels (like Sci show or Minute Physics), to give them a broader knowledge of science in the real world.
- Research some simple experiments they can do at home.

## How your child will be assessed:

Assessment of learning takes many forms. Much of this will be informal assessment in lessons through verbal and written responses to questions. Students will have regular opportunity to assess their own progress through the regular quiz reviews.

In Science, we understand that to make progress students need to know and practice the next steps to improve their work. For this reason in each topic, staff assess an identified assessment task. Students will receive feedback that includes some improvement or next steps to complete. This may take a number of forms from short answer correction, answering additional, extension questions, or redrafting sections of longer written work either for correct scientific content or for improving the quality of written English.

To monitor the progress in students' knowledge and skills they will also sit a short assessment for each topic, with time to mark their work and correct mistakes. This provides an important opportunity for students to reflect on their learning and any additional steps to take.

Each term also includes 1 longer formal assessment that covers the previous 3 units, to give a clear assessment of learning over time. It is this assessment, along with the ongoing formative assessment that form the basis of the reports each term.

Developing an understanding of the scientific process is an intrinsic part of learning about science. In addition to carry out practical work in lessons where appropriate students understanding of this process will be assessed along with key knowledge in the topic assessment tasks, short unit assessments and the longer formal assessments in line with how these skills are assessed in standard national assessments.

Please feel free to contact us to discuss our assessment policy in depth.