THE EARLS HIGH SCHOOL

EXCELLENCE | CARE | PARTNERSHIP

KS3 Curriculum overview: Science

Why doe we study Science at The Earls High School?
Science requires a student to develop and master many different skills: from the use of technical terminology to the application of mathematics in everyday life, from the methodical planning of investigative work to the confident analysis of experimental data. These skills are critical for young people looking to enter the workforce or further education. Science study prepares young people for the vast number of careers which require a firm grounding in Science. If you want to go on to train as a doctor, vet, physiotherapist chemist, beautician, architect, surveyor, engineer, farmer, sports trainer, a strong knowledge of at least one of the sciences will be required. But there are thousands of other careers for which it will be similarly essential. Science is a powerful force in modern society in technology, healthcare and protecting our environment. We believe all young people should know how to approach the big issues with a critical and balanced mindset: Should we allow children to be vaccinated? Is global warming caused by humans? Why does deforestation matter? Should we allow the genetic modifications of humans? How can we protect the finite resources of our planet?
What skills and knowledge do we anticipate students will have in this subject before they begin at The Earls High School?
We would expect students to have learned the following at KS2. - What is a plant and what different types are there? What do they need to grow? - What is an animal and what different types are there? How do they differ in the way they look, behave and feed? Where did fossils comes from and how do animals change over time? - What are the different systems that make up the human body? What is the basic function of the digestive system and reproductive system? - What different materials make up everyday objects? What are solids, liquids and gases? - What happens when things burn, dissolve or heat up? How can we measure these changes? - How can we separate things by sieving, filtration and evaporation? - What is our solar system like and how do the Earth, moon and planets move? - How does light travel and how can you make different sounds? - What are forces and how do they affect the way things move? Why do objects fall? Why do some materials stick to magnets? - Why is electricity so useful? Can you make a simple circuit that lights up or makes a sound. -

What skills and knowledge would we like students to have in this subject at the end of their time at The Earls High School?

In Biology, students will be able to:

* Describe the cells that make up all living things and the way substances move in and out of them *Explain the structure and adaptations of the major organs systems in plants and animals * Identify the way pathogens cause illness and the techniques doctors use to protect us *Explain the role of photosynthesis and respiration *Describe how the nervous system and hormone system monitor and control a variety of processes in the human body *Describe the process of reproduction, natural selection and evolution and they ways humans have manipulated these processes through selective breeding, cloning and genetic engineering. *Investigate and discuss the environmental impact of humans on the natural world

In Chemistry, students will be able to:

* Describe how our model of the atom has changed over time and use the current model to explain a variety of chemical processes such as combustion, acid reactions and electrolysis *Compare the bonding and structure of ionic, covalent and metallic substances *Carry out a variety of calculations to determine the outcome and yield of chemical reactions *Investigate the energy transfers that occur during chemical reactions *Describe the processing of crude oil and the chemistry of the organic molecules it produces *Investigate unknown chemicals using a variety of qualitative techniques such as chromatography, gas tests and ion tests *Discuss the environmental impact of humans on the atmosphere, land resources and water supply.

In Physics, students will be able to:

* Identify the different types of energy and describe the way energy is transferred *Describe different methods for generating electricity and discuss their advantages and disadvantages *Build and describe electrical circuits and measure a variety of electrical variables *Identify the uses and dangers of mains electricity and calculate the cost of running different household appliances *Describe radioactivity and how nuclear fission works, evaluating the risks each poses *Explain Newton's laws of motion and use them to explain the interaction and motion of objects *Investigate and describe the properties, behaviour and uses of waves.

*Describe the principles of magnetism and their uses in electromagnets, motors and generators *Describe models for the formation of the universe and the lifecycle of stars.

Year 7 Curriculum Map: Science

Autumn Term	Spring Term	Summer Term
Unit 1: Chemistry Basic Training To learn about: • Safety, risks and hazards • Separating mixtures • Using a thermometer • Identifying gases, metals and acids • Structure of the Periodic Table Unit 2: Paper Bridges To learn about: • Solids, liquids and gases • Changes of state • Weight and mass • Design, build and evaluate a paper bridge Unit 3: Animals and energy To learn about: • Respiration • Breathing and the lungs • Food and the digestive system • Blood and the circulatory system • Using a microscope • Animal cells Main home learning tasks: Science homework will usually be set once per week as an Educake quiz with a reminder on ClassCharts. Alternative homework may consist of revision tasks, online tasks, question sheets or extended projects. Key assessment: Twice a year students will complete a science key concepts assessment (60 marks, 10 per key concept). Students will be provided with knowledge organisers prior to the assessment to support revision. Assessment conditions: Exam conditions during a lesson	Unit 4: Combustion To learn about: • Fuels • Fire • Combustion as a chemical reaction • Pollutants and their effects Unit 5: Building a lighthouse To learn about: • Types of energy • Energy transfers • Electrical circuits • Design, build and evaluate a model lighthouse Unit 6: Plants and energy To learn about: • Leaves • Roots • Plant cells • Photosynthesis • Plants in an ecosystem Main home learning tasks: Science homework will usually be set once per week as an Educake quiz with a reminder on ClassCharts. Alternative homework may consist of revision tasks, online tasks, question sheets or extended projects. Key assessment: Twice a year students will complete a science key concepts assessment (60 marks, 10 per key concept). Students will be provided with knowledge organisers prior to the assessment to support revision. Assessment conditions: Exam conditions during a lesson	Unit 7: Keeping warm To learn about: • Conduction in solids • Convection in fluids • Thermal radiation • Uses of Insulation (e.g. home insulation) • Design, build and evaluate an insulated drinks flask Unit 8: Feeding relationships To learn about: • Collecting data on the distribution of organisms • Food chains • Predators and prey • Decomposition • Carbon Cycle • Impact of humans on other living things Main home learning tasks: Science homework will usually be set once per week as an Educake quiz with a reminder on ClassCharts. Alternative homework may consist of revision tasks, online tasks, question sheets or extended projects. Key assessment: Twice a year students will complete a science key concepts assessment (60 marks, 10 per key concept). Students will be provided with knowledge organisers prior to the assessment to support revision. Assessment conditions: Exam conditions during a lesson

Year 8 Curriculum Map: Science

Autumn Term	Spring Term	Summer Term
Unit 1: Health and lifestyle To learn about: • Nutrients • Digestive system • Drugs Unit 2: Periodic Table To learn about: • Metals and non-metals • Groups and Periods • Elements of Groups 1, 7 and 0 Unit 3: Electricity and magnetism To learn about: • Static electricity • Circuits • Magnets • Electromagnets Unit 4: Separation techniques To learn about: • Mixtures • Solutions • Filtration, evaporation, distillation & chromatography Main home learning tasks: Science homework will usually be set once per week as an Educake quiz with a reminder on ClassCharts. Alternative homework may consist of revision tasks, online tasks, question sheets or extended projects.	Unit 5: Ecosystem processes To learn about: • Photosynthesis • Leaves • Chemosynthesis • Respiration • Food chains and webs Unit 6: Metals To learn about: • Metals reacting with water, acids and oxygen • Displacement reactions • Extracting metals • Ceramics, polymers and composites Unit 7: Energy To learn about: • Food and fuels • Energy and temperature • Energy resources • Work, power and machines Main home learning tasks: Science homework will usually be set once per week as an Educake quiz with a reminder on ClassCharts. Alternative homework may consist of revision tasks, online tasks, question sheets or extended projects. Key assessment: Twice a year students will complete a science key concepts assessment (60 marks, 10 per key concept). Students will be provided with knowledge organisers prior to the assessment to support revision. Assessment conditions: Exam conditions during a lesson	Unit 8: Adaptation and inheritance To learn about: • Competition • Adaptation • Continuous and discontinuous variation • Inheritance • Natural selection and evolution Unit 9: Motion and pressure To learn about: • Speed • Pressure in gases, liquids and solids • Moments Unit 10: The Earth To learn about: • Sedimentary, igneous and metamorphic rocks • The rock cycle • The carbon cycle • Climate change • Recycling Main home learning tasks: Science homework will usually be set once per week as an Educake quiz with a reminder on ClassCharts. Alternative homework may consist of revision tasks, online tasks, question sheets or extended projects. Key assessment: Twice a year students will complete a science key concepts assessment (60 marks, 10 per key concept). Students will be provided with knowledge organisers prior to the assessment to support revision. Assessment conditions: Exam conditions during a lesson

Year 9 Curriculum Map: Science

Autumn Term	Spring Term	Summer Term
Unit B1: Cell structure and support To learn about: Microscopes, animal and plant cells, eukaryotic and prokaryotic cells, diffusion, osmosis, active transport, exchanging materials Unit B8: Photosynthesis. To learn about: The rate of and making the most of photosynthesis, how plants use glucose Unit B9: Respiration To learn about: Aerobic and anaerobic respiration, the response to exercise, metabolism and the liver Unit B5: Communicable diseases To learn about: Health and disease, pathogens, preventing infections, viral, bacterial and fungal diseases, diseases caused by protists, human defence responses Main home learning tasks: Science homework will usually be set once per week as an Educake quiz with a reminder on ClassCharts. Alternative homework may consist of revision tasks, online tasks, question sheets or extended projects. Key assessment: Twice a year students will complete a science assessment (60 marks) based on the GCSE content they have covered that term. Students will be provided with knowledge organisers prior to the assessment to support revision. Assessment conditions: Exam conditions during a lesson	Unit C1: Atoms, bonding and moles To learn about: Atoms, chemical equations, separating mixtures, fractional distillation, chromatography, history and structure of the atom, ions, isotopes, Electronic structures Unit C2: The periodic table To learn about: Development of the periodic table, electronic structure and the periodic table, group 1, group 7, explaining trends, the transition elements Unit C3: Structure and bonding To learn about: States of matter, ions, ionic bonding, giant ionic structures, covalent bonding, giant covalent structures, fullerenes, graphene, bonding in metals, nanoparticles Unit C5: Chemical changes To learn about: The reactivity series, displacement, extracting metals, salts from metals and insoluble bases, neutralisation and the pH scale, strong and weak acids Main home learning tasks: Science homework will usually be set once per week as an Educake quiz with a reminder on ClassCharts. Alternative homework may consist of revision tasks, online tasks, question sheets or extended projects. Key assessment: Twice a year students will complete a science assessment (60 marks) based on the GCSE content they have covered that term. Students will be provided with knowledge organisers prior to the assessment to support revision. Assessment conditions: Exam conditions during a lesson	Unit P2: Energy transfer by heating To learn about: Energy transfer by conduction, radiation, specific heat capacity, heating and insulating buildings Unit P3: Energy resources To learn about: Energy demands, energy from wind and water, power from the sun and the earth, energy and the environment, big energy issues Unit P6: Molecules and density To learn about: Density, states of matter, changes of state, internal energy, specific latent heat, gas pressure, temperature and volume Main home learning tasks: Science homework will usually be set once per week as an Educake quiz with a reminder on ClassCharts. Alternative homework may consist of revision tasks, online tasks, question sheets or extended projects. Key assessment: Twice a year students will complete a science assessment (60 marks) based on the GCSE content they have covered that term. Students will be provided with knowledge organisers prior to the assessment to support revision. Assessment conditions: Exam conditions during a lesson