Science

Year 7

What are the aims and intentions of this curriculum?

The aim of our Key Stage 3 Curriculum is to provide the foundations for understanding the material world. Scientific understanding is changing our lives and is vital to the world's future prosperity, and all students should be taught essential aspects of the knowledge, methods, processes and uses of science. They should be helped to appreciate how the complex and diverse phenomena of the natural world can be described in terms of a small number of key ideas relating to the sciences which are both inter-linked, and are of universal application.

Term	Topics	Knowledge and key terms	Skills developed	Assessment
Autumn 1	**Biology** • Health and Safety in Lab • Cells • Movement	Students will learn about: • The different types of **health and safety measures** we need to adhere to before an investigation. • Using a Bunsen burner, graph skills, variables. • Levels of organization, the skeletal system, different types of joints, Functions of the muscles, identifying the different types of unicellular organisms, movement of substances in and out of cells as well as observing different cell structures under a microscope.	Students are able to: • Developing the skill how to work safely in a science laboratory. • Explain how to use a microscope to observe a cell. • Make an onion slide. • Compare the similarities and differences between plant cell and animal cell • Explain some specialized animal and plant cells. • Describe and explain tissues, organs, organ system and organism. • Describe and explain the main parts in the skeleton. • Describe the structure and function of joints. Possible careers are: Radiologist, Physiotherapist, Nurse, Laboratory assistant, Gym trainer, Molecular scientist.	• Formative assessment: Quizzes, class discussions, projects. • Summative assessment: End of topic test. Practical test.
Autumn 2	**Chemistry** • Particle model • Separating mixtures	Students will learn about: • Melting, boiling and freezing point, more changes in state, diffusion, gas pressure, inside particles.	Students are able to: • Describe the properties of solids, liquids and gases using the particle model. • Explain the physical changes like melting, boiling, evaporation and condensation.	• Formative assessment: Quizzes, class discussions, projects.

		• Pure substances and mixtures, solutions, solubility, filtration, evaporation, distillation and chromatography.	• Explain diffusion using particle model. • Use diagrams to represent atoms and molecules of elements and compounds. • Identify pure substances and mixtures using the melting point. • Explain how substances dissolve using particle model. • Explain how to separate mixtures using various separating techniques like filtration, distillation, evaporation and chromatography. Possible careers are: Engineering, Chemical industry, Theatre and stage props master, Car mechanic, Mechanical engineer, Water treatment worker, Analytical scientists, Farming and agriculture.	• Summative assessment: End of topic test. Practical test.
Spring 1	**Physics and Biology** • Speed • Gravity • Potential difference and resistance • Current	Students will learn about: • Fundamentals of forces, speed, distance time graphs, • Gravity, balance and unbalanced forces • Series and parallel circuits, Current, Charging up, Potential difference, Resistance	Students are able to: • Describe balance and unbalanced forces. • Describe and calculate speed. • Describe and explain distance-time graph. • Explain the difference between mass and weight and calculate gravity. • Describe and calculate potential difference and resistance. • Make series and parallel circuits from circuit diagrams. • Describe current and what happens to current in a series and parallel circuit. • Describe how charged objects interact. Possible careers are: Astrophysicist, Car mechanic, Mechanical engineer, Police, Traffic signalers, Electrical engineers, Electrician .	• Formative assessment: Quizzes, class discussions, projects. • Summative assessment: End of topic test. Practical test.

Spring 2	**Biology:** • Interdependence • Plant reproduction	Students will learn about: • Food chains, food webs, disruption to food chains and webs, ecosystem and competition • Flowers and pollination, fertilization and germination, seed dispersal.	Students are able to: • Describe and explain food chains and webs. • Explain how toxic materials can accumulate in a food web and the effect on different populations. • Describe ecosystem, habitat, community and interdependence. • Describe and explain flowers and pollination, fertilization, germination and seed dispersal in plants. Possible careers are: Nutritionist, Dietician, Farming and agriculture, Ecologist, Environmental field technician, Wildlife specialist, Sustainability consultant, Wildlife biologist, Environmental planner.	• Formative assessment: Quizzes, class discussions, projects. • Summative assessment: End of topic test. Practical test.
Summer 1	**Chemistry** • Acids and alkalis • Metals and non-metals	Students will learn about: • Chemical reactions of acids and alkalis, indicators and pH, acid strength, neutralization, making salts, more about elements. • Chemical reactions of metals and non-metals, metals and acids, metals and oxygen, metals and water and metal displacement reaction.	Students are able to: • Describe the characteristics of a chemical reaction. • Describe an acid and an alkali and how to identify them using pH scale and litmus paper. • Explain the uses of neutralization reactions. • Make copper sulphate crystals in a science laboratory. • Describe and explain chemical reactions of metals and non-metals.	• Formative assessment: Quizzes, class discussions, projects. • Summative assessment: End of topic test. Practical test.

			• Describe the chemical reactions of metals with oxygen, water and acids. • Describe and explain displacement reactions. Possible careers are: Pharmaceutical industry, Laboratory technician, Chemical industry, Plumbing, Engineering.	
Summer 2	**Biology** • Human reproduction **Physics** • Energy (costs and transfer) **Chemistry** • Earth structure and universe (Summer project-homework)	Students will learn about: • How hormones and the menstrual cycle works • The artificial control of fertility • Intimate and sexual relationships, including sexual health. • Changing adolescent body. • Food and fuels, energy resources, energy, power, energy dissipation • The structure of the Earth, sedimentary Rocks, igneous and metamorphic rocks, the rock cycle, ceramics, the night sky, the Solar System, the Earth, the Moon and changing ideas.	Students are able to: • Recall some of the facts about reproductive health, including fertility, and the potential impact of lifestyle on fertility for men and women and menopause. • State the facts about some of the contraceptive choices, efficacy and options available. • Recall the facts around pregnancy. • Recall how the use of alcohol and drugs can lead to risky sexual behaviour. • Know the key facts about puberty, the changing adolescent body and menstrual wellbeing. • Recall the main changes which take place in males and females, and the implications for emotional and physical health. • Compare the energy values of foods and fuels.	• Formative assessment: Quizzes, class discussions, projects. • Summative assessment: End of topic test. Practical test.

			• Explain the advantages and disadvantages of different types of energy resources to generate electricity. • Calculate power and electric and gas bills. • Calculate the efficiency of an appliance. • Describe The structure of the Earth. • Explain how sedimentary rocks, igneous and metamorphic rocks are formed and explain the rock cycle. • Describe the solar system. Possible careers are: Geneticist, Data scientist, Counsellor, Medical careers, Midwife, Obstetrician, Pediatric doctor, Wind turbine technician, Environmental scientist, Sustainability engineer, Solar engineer, Environmental consultant, Air quality engineer,Sound engineer.	