

Science Curriculum Intent

Science at Trinity Academy Leeds endeavours to endow students with powerful knowledge to understand the world around them and develop life long, inquisitive learners with a curiosity that drives them to **reach higher** and **see further**. We intend to develop Scientifically **literate students**, irrespective of their background, who are able to use their **scientific voice** to make informed decisions and engage in **discursive debate**. Our Science curriculum will ensure our **diverse community is** exposed to the exciting and broad careers on offer and feel **empowered and inspired** to pursue a STEM based route after TAL.

We aim to achieve this through an accessible but rigorous curriculum, using the national curriculum as its key framework. The Science Curriculum at Trinity Academy Leeds has been developed using research-based evidence of best practise and has the mastery of knowledge and recall at its core. A curriculum that explicitly teaches fundamental knowledge and skills required to understand the world around them with a focus on the impact of human activity, how to protect the world we live in and moral and ethical implications of potential technological advances. By cultivating a wide base of scientific understanding across a number of disciplines, this will allow learners to recall and understand the scientific principles that will open the doors in an increasingly technological age. The key skills students will develop are: analytical mathematics which will be explicitly taught in a Science context; critical thinking to interpret evidence and provide recommendations for improvement; and finally, communication skills which will allow students to be fluent in the language of Science.

Science Phase One Curriculum

Overview:

By the end of KS3 we would like students to have a broad and balanced knowledge of several key topics, that encourages students to explore and understand the world around them. The curriculum aims to encompass all of the national curriculum and follow a spiral structure, constantly building upon previous knowledge in order to reinforce understanding at a deeper level. We wish students to develop into confident, resilient and reflective learners who enjoy science and move on and up to be successful at GCSE. We ensure that we also prepare students in both practical and mathematical skills, in order for them to fully access the curriculum and explore investigations scientifically.

Content:

	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Year 7	<p>Biology - The differences between species, how cells build up to organisms and how to use a microscope</p> <p>Chemistry – How we experience different states of matter and how matter is composed of atoms, compounds and mixtures.</p> <p>Physics – How we experience forces, moments and how to measure them.</p>	<p>Biology – Our digestive system, the effects of a healthy diet, and how poor diet can impact health.</p> <p>Chemistry – Introduction to the periodic table of elements, and the chemical and physical properties of those elements.</p> <p>Physics – How we experience speed, motion and how to measure and record the speed of objects.</p>	<p>Biology – The role of diffusion in the body. gas exchange in the lungs and the effects of smoking and lung damage.</p> <p>Chemistry – An introduction to basic chemical reactions, including how we represent them and the different types.</p> <p>Physics – How we experience gravity. Measuring weight as a force, mass and the effect of mass on different planets.</p>	<p>Biology – The structure and function of the skeleton, including joints and looking at the heart.</p> <p>Chemistry – We discover what the Earth is made out of and we look at the rock cycle.</p> <p>Physics – In this topic we take a look at magnets and their effects. We also look into space and the structure of our solar system.</p>	<p>Biology – We look at flowers, plants and their importance to us.</p> <p>Chemistry – In this topic we look in depth at acids, alkali and neutralisation.</p> <p>Physics – We look at waves and their effects in mechanical situations, such as sound, water and other vibrations.</p>	<p>Biology – In this topic we look at reproduction, including the menstrual cycle, gestation and birth. We also compare plant and animal reproductive methods.</p> <p>Chemistry – We recap and build upon our work with the periodic table further investigating properties.</p> <p>Physics – We continue with the theme of waves and now compare them to electromagnetic waves.</p>
Year 8	<p>Biology – We learn about respiration, both anaerobic and aerobic, and the impact of exercise and smoking.</p> <p>Chemistry – Here we recap on chemical reactions, both endothermic and exothermic.</p> <p>Physics – In this topic we learn about fuels,</p>	<p>Biology – In this topic we look at the leaves and how they are adapted for photosynthesis.</p> <p>Chemistry – Here we look at elements compounds and mixtures in greater detail, as well as a variety of separation techniques.</p>	<p>Biology - The roles of polymers and monomers in the context of food, carbohydrates, proteins and fats.</p> <p>Chemistry – We look in depth at the composition of the atmosphere and the carbon cycle.</p>	<p>Biology – We look at food chains, webs and the interdependence of organisms.</p> <p>Chemistry – at this point we look at the reactivity series and the use of carbon to refine metals.</p> <p>Physics – In physics we look at series and</p>	<p>Biology – We look at the work of Watson, Crick and Franklin. DNA mutations, and the importance of gene banks. Chemistry –</p> <p>In this topic we discover the properties of gases and their application.</p>	<p>Biology – Finally we look at animal and bacterial cells and how they build to tissues and organs.</p> <p>Chemistry – In chemistry we recap and build on word equations, reactants and products.</p> <p>Physics – And finally in physics we look at interacting forces,</p>

	energy resources as well as looking at domestic fuel bills and costs.	Physics – We look at the particle model including its limitations, as well as chemical and physical changes.	Physics – In physics this term we look at the transfer of thermal energy as well as the different types of energy stores.	parallel circuits, and the relationship between current, voltage and resistance.	Physics – We look at the mechanics of the eye and the interactions of light, colour and reflection.	energy transfers and work done.
Year 9	<p>Biology – In this topic we learn about Evolution. Building on students' knowledge of DNA, we will explore how mutations lead to genetic variation within a species</p> <p>Chemistry – Here we recap on reactions between acids and alkalis. Students learn how the salt formed depends on the acid and alkali</p> <p>Physics – In this topic students will explore the behaviour of light when it encounters a range of different mediums with different properties.</p>	<p>Biology – Students will develop their understanding of body systems by examining the nervous system and how it response to stimulus.</p> <p>Chemistry – Students will bring all their knowledge on chemical reaction together and are introduced to balancing symbol equations.</p> <p>Physics – Electricity units will be revisited here. Students will construct series and parallel circuits, the advantages and disadvantages of each will be explored.</p>	<p>Chemistry – The history of the atomic model will be taught this term. Students will look at the current model we use to describe atoms and how new technology has developed our understanding. The understanding of subatomic particles will be developed and the significance of their properties determined.</p> <p>Physics – Using students understanding of the atomic model, this unit will explain electrostatic forces between positive and negative charges. The study of noncontact forces and Hooke's law provides students with opportunity to bring together numerous strands of working scientifically developed over the last three years including the identification of variables, risk</p>	<p>Biology – In the final biology unit of KS3 students will build on many important biological concepts from previous topics.</p> <p>Cells- Students will explore cells in more detail, identifying key differences between eukaryotic and prokaryotic cells. Students will also revisit microscopy to examine cells and subcellular structures along with calculating magnification.</p> <p>Life processes - these processes depend on biological molecules whose structure is related to their function. Students will revisit enzymes as proteins and create links to their importance in controlling many life processes such as respiration.</p> <p>Students will investigate photosynthesis in more detail, looking at how</p>	<p>Physics- In the final physics unit of KS3 students will build on many important physical concepts from previous topics.</p> <p>Density- Students will revisit density and how this can be calculated using measurement of regular and irregular solids as well as liquids. Density of different states of matter will be explored and students will evaluate the quality of the data obtained in relation to the method used. Students will have to draw together their Working Scientifically skills to ensure they select appropriate methods to determine the density of objects.</p> <p>States of matter- Students will then further explore the states of matter by quantifying the amount of energy required to change the state of a substance.</p> <p>Energy- They will also</p>	

			<p>assessment, data collection and critical analysis of results.</p>	<p>environmental factors affect the rate of this reaction in plants. Working Scientifically - Students will continue to develop these key skills by using microscopy to examine cells and sub-cellular structures. This will give students an opportunity to identify risks, select appropriate equipment, write methods and make observations.</p>	<p>draw together knowledge of the energy stored by different states to quantify the amount of energy required to change the temperature of a substance. Pressure- Gases and pressure, caused by the force exerted by particles, will be explored along with the consequences of changing gas volume or pressure.</p>
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