

Curriculum Intent

Our aim for the science curriculum is to curate committed and passionate scientists whose level of scientific literacy and science capital enable them to fully engage with challenging scientific concepts. We aim to nurture resilient and able learners with strong characters, who are well equipped with scientific skills and knowledge and replete with science capital, so they are able to thrive in a modern scientific world. Over the five years students spend with us, they will make outstanding progress towards becoming well rounded scientists, equipped with an intimate knowledge of the big ideas in science, as well as an understanding of the scientific method and a strong well-rounded character. Knowledge has been sequenced based around big ideas in science. In biology, these are: ecosystems, cells, genetics, evolution and health. In Chemistry, these are: Earth chemistry, substances, particles and chemical reactions In Physics these are: Energy, electricity and magnetism, waves, matter, space, forces and motion. These big ideas represent the powerful knowledge of science- the game changing ideas that led to entire paradigm shifts in the way we view the universe. Within each big idea, the knowledge has been broken down further into relevant topics, and sequenced to allow progression. Lots of factors influenced our decision to sequence topics in the way they have been. For example, covering relevant prior learning, age-appropriateness and relevance. There is a focus on threshold concepts, allowing students to break through in the understanding to gain a deeper appreciate of science.

How is Science assessed at THA?

All assessments are made using material provided by external sources. We use steps to monitor students' progress. These ensures consistency and accuracy of assessment.

Cross Curricular Links

We have made multiple links with other subjects. There is significant overlap with maths, but almost all subjects in the school have overlap with science somewhere. These have been identified on the relevant schemes of learning.

How this prepares students for their next stage of education/employment

Our knowledge in science cycles through our 'Big ideas' in each scientific discipline. Throughout KS3 students grasp the foundations necessary to build on these concepts even further at KS4 level.

Our curriculum is ambitious for our students as it offers the breadth of knowledge from the National Curriculum but also goes beyond this in several areas of science that we teach.

Enrichment Opportunities

Resources/Materials to Support Learning



Throughout KS3 our students get the opportunity to work on four different projects. This develops their team work skills as these projects are completed as a group. They'll also develop their communication, researching and IT whilst putting together their scientific poster. Finally we put on four events throughout their time in KS3 where students present their work to friends and family after school at a science fair. This fair runs like a scientific conference to give students a taste of what studying science to a higher level is like.

We have knowledge organisers for each topic. All of our homework in science is set on a website called Educake. Alongside the quizzes that are set for each unit covered, there are also links to BBC bitesize pages so students are taken directly to the content where they can brush up on what we've been doing in class.

	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Year 7	Topic: <ul style="list-style-type: none"> • Organs, systems, organisation • Atoms, compounds and elements • Particles 	Topic: <ul style="list-style-type: none"> • Mixtures and separation • Earth & Seasons • Cells and tissues 	Topic: <ul style="list-style-type: none"> • Nutrition and food • Acids and alkalis 	Topic: <ul style="list-style-type: none"> • Ecology • Forces • The Rock Cycle 	Topic: <ul style="list-style-type: none"> • Introduction to waves • Reproduction 	Topic: <ul style="list-style-type: none"> • Introduction to circuits
	Key Knowledge: <p>In term 1, year 7 start their science journey with us by learning more about how their own bodies work. They learn about the circulatory, respiratory and digestive systems alongside also looking at bones and muscles.</p> <p>We then delve much smaller and find out what atoms, compounds and elements are. Students will also get their first taste of using word and symbol equations.</p> <p>Students will move onto looking at states of matter and will investigate the density of regular objects, irregular objects and liquids.</p>	Key Knowledge: <p>In term 2, we look at the human body – this time going even deeper into the world of cells and microscopes.</p> <p>We move onto looking at mixtures and how to separate one substance from another via different practical techniques.</p> <p>Next up we explore our own Solar system, seasons on the Earth and how our own weight would differ on another planet.</p>	Key Knowledge: <p>In term 3 year 7 will look at acids and nutrition and food. We learn about food and nutrition where we explore food groups, energy in food and health consequences arising from a poor diet.</p> <p>Students learn about the pH scale, what indicators are for and also have a go at using them. They'll also learn about neutralisation reactions and have a go at some equation practice.</p>	Key Knowledge: <p>Year 7 will look at ecology, forces and rocks this term. During their work on forces they'll investigate Hooke's law, contact and non-contact forces and pressure.</p> <p>In their ecology topic they will look at local ecosystems and they will also keep a weather diary to look at how the weather changes over the term and how the day length changes too. They'll also build on their existing understanding of food chains and webs where we'll focus on interdependence, food security and how humans harm ecosystems.</p> <p>Students will learn about the rock cycle and the three types of rock, whilst also gaining an appreciation for how our own coastline has been affected by erosion and weathering.</p>	Key Knowledge: <p>In term 5 students will look at types of waves, wave speed, frequency and they will also investigate what happens when waves collide.</p> <p>Students then move onto looking at the reproductive system of both plants and animals. This includes plant structure, seed dispersal and fruit, reproductive organs in humans, the menstrual cycle and pregnancy.</p>	Key Knowledge: <p>In term 6 year 7 look at circuit symbols, series and parallel circuits and static electricity.</p>

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<p>Key Skills: Each lesson has a specific working scientifically focus appropriate to the topic and lesson contents. Over the course of the KS3 curriculum all working scientifically skills listed in the national curriculum are covered thoroughly. In year 7, students will begin to explore experimental skills, analysis, measurement and scientific attitudes.</p>	<p>Key Skills:</p>	<p>Key Skills: This term students will do a group work project and will present this at a science fair to parents. Students will get to develop their communication, research and teamwork skills alongside learning how scientific conferences run.</p>	<p>Key Skills:</p>	<p>Key Skills:</p>	<p>Key Skills: Year 7 complete their second project of the year but this time they conduct their own experiment where they investigate a scientific question. They then record their results on a scientific poster, research their topic further and finally present their findings to parents at a science fair.</p>
<p>Assessment: Students will complete an end of topic test.</p>	<p>Assessment: Students will complete an end of topic test.</p>	<p>Assessment: Students will complete an end of topic test. Students will complete an assessed practical on antacids.</p>	<p>Assessment: Students will complete an end of topic test.</p>	<p>Assessment: Students will complete an end of topic test.</p>	<p>Assessment: Students will complete an end of topic test.</p>

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Year 8	Topic: <ul style="list-style-type: none"> • Specialised cells • Periodic table • Energy 	Topic: <ul style="list-style-type: none"> • Genetics • Reactions 1 • Sound and light 	Topic: <ul style="list-style-type: none"> • Bioenergetics 	Topic: <ul style="list-style-type: none"> • Reactions 2 • Astronomy 	Topic: <ul style="list-style-type: none"> • Disease • Earth's resources 	Topic: <ul style="list-style-type: none"> • Current and magnetism
	Key Knowledge: <p>Term 1 begins with looking at how cells have special features to do particular jobs. Students also get to use microscopes to investigate cells.</p> <p>Next up is an introduction to the periodic table, key features of some of the groups and comparisons between metals and non-metals.</p> <p>Students will then look at energy stores and ways that energy can be transferred in closed systems.</p>	Key Knowledge: <p>In term 2, students find out more about DNA including the discovery of its structure and how to extract it.</p> <p>Our first reactions topic looks at endo and exothermic reactions, combustion and fire safety.</p> <p>In their physics topic for this term students get to find out how our eyes and ears allow us to detect light and sound. We also look at Ultrasound, reflection and refraction.</p>	Key Knowledge: <p>In term 3 students learn about the reactions that take place both in animals and plants which are vital for life.</p>	Key Knowledge: <p>This term students get to look at reactions of various substances with acids. They also get to explore metal extraction, reactivity and catalysts.</p> <p>Whilst studying astronomy students learn about telescopes, galaxies, eclipses and lastly take a look at life cycles of stars.</p>	Key Knowledge: <p>During term 5, our students learn about our own health and how our lifestyle can affect it. They also learn about the two categories that diseases are grouped into.</p> <p>In the latter part of the term we look at how the Earth has a limited supply of resources, the benefits of recycling and the composition of our atmosphere and how we are affecting it.</p>	Key Knowledge: <p>In this term students learn about current in different circuits alongside also learning about resistance and insulators vs conductors.</p> <p>They'll also look at magnetic fields, electromagnets and motors.</p>
	Key Skills: <p>Each lesson has a specific working scientifically focus appropriate to the topic and lesson contents. Over the course of the KS3 curriculum all working scientifically skills listed in the national curriculum are covered thoroughly.</p> <p>In year 8, students will build on their year 7 working</p>	Key Skills:	Key Skills: <p>Students spend the remainder of the term conducting their third project. This is a research based topic where students get to choose whether they want to research 'survival of the fittest', 'what killed the dinosaurs' or 'a snapshot of our solar system'. They'll then get to further develop their presenting skills at a science fair where they</p>	Key Skills:	Key Skills:	Key Skills: <p>This term ends with students doing their final project where they get to explore a STEM career of their choosing. This is aimed at students finding out more about a chosen career path – salary, entry requirements, progression opportunities and perks of the jobs – and sharing this with their peers. They then will complete their final science fair where</p>

	<p>scientifically skills to conduct more advanced practical work, analysis and evaluation as well as continuing to develop their understanding of scientific attitudes and measurements.</p>		<p>show off their findings – scientific conference style – to friends and family.</p>			<p>they present their findings to friends and family.</p>
	<p>Assessment: Students will complete an end of topic test.</p>	<p>Assessment: Students will complete an end of topic test.</p>	<p>Assessment: Students will complete an end of topic test.</p>	<p>Assessment: Students will complete an end of topic test.</p>	<p>Assessment: Students will complete an end of topic test.</p>	<p>Assessment: Students will complete an end of topic test.</p>

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	Topic: <ul style="list-style-type: none"> • Evolution and selective breeding • Metals, reactivity and recycling 	Topic: <ul style="list-style-type: none"> • Energy resources • Brownian motion, diffusion 	Topic: <ul style="list-style-type: none"> • Forces and motion • Particle model 	Topic: <ul style="list-style-type: none"> • Chemical analysis • Cells 	Topic: <ul style="list-style-type: none"> • Atomic structure and the periodic table 	Topic: <ul style="list-style-type: none"> • Energy • Animal organisation and bioenergetics
	Key Knowledge: Term 1 starts with looking at variation and then moving on to survival of the fittest, extinction, selective breeding and biodiversity. We'll then move onto a recap of reactions where we'll look at displacement, oxidation and the reactivity series.	Key Knowledge: In term 2 students will find out about power stations, renewable and non-renewable resources and calculate fuel bills similar to what would be found in their own homes. They will then look at the discovery of Brownian motion and explore diffusion in the lungs and cells.	Key Knowledge: During term 3, students will look at forces and how they affect an objects motion and direction. They'll also look at distance time graphs and be introduced to relative motion. During the particle model topic students look at states, state changes, density, pressure and energy transfers.	Key Knowledge: In term 4, students will look at formulations, pure substances and chromatography. They'll also look at practical methods for identifying common gases. Students will then move onto looking at cells where they'll cover cell structure, specialisation, division and processes for transporting substances in cells.	Key Knowledge: Term 5 focuses on the atom where we look at the structure of the atom and the development of the model which we currently use. We also cover the difference between atoms, elements and compounds. We end with focusing on the development of the modern periodic table and focus on groups 1,7 and 0.	Key Knowledge: In term 6 we will look at energy stores and changes, whilst also looking at how energy is both conserved and can be dissipated. Students also gain an understanding of efficiency and energy resources. We finish the year by looking at how animals are organised into cells, tissues, organs and then organ systems. We also focus on non-communicable diseases which affect the body and can be contributed to by lifestyle choices. Finally we look at metabolism and respiration to finish off the year.
	Key Skills: Each lesson has a specific working scientifically focus appropriate to the topic and lesson contents. Over the course of the KS3 curriculum all working scientifically skills listed in the national	Key Skills:	Key Skills:	Key Skills:	Key Skills:	Key Skills:

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	Students will complete an end of topic test.	Students will complete an end of topic test. Students will do a mock assessment this term.	Students will complete an end of topic test.	Students will complete an end of topic test. Students will do a mock assessment this term.	Students will complete an end of topic test.	Students will complete an end of topic test. Students will do a mock assessment this term.

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Year 11	Topic: <ul style="list-style-type: none"> • Particle model • Atomic structure and the periodic table • Plant organisation and bioenergetics 	Topic: <ul style="list-style-type: none"> • Quantitative chemistry 	Topic: <ul style="list-style-type: none"> • Energy changes • Homeostasis • Magnetism and electromagnetism 	Topic: <ul style="list-style-type: none"> • Chemical changes • Rate and extent of chemical change 	Topic:	Topic:
	Key Knowledge: During the particle model topic students look at states, state changes, density, pressure and energy transfers. We also focus on the atom where we look at the structure of the atom and the development of the model which we currently use. We also cover the difference between atoms, elements and compounds. We end with focusing on the development of the modern periodic table and focus on groups 1,7 and 0. Students then look at plant tissues and organ systems. They then move onto looking at photosynthesis and the factors which affect the rate of photosynthesis.	Key Knowledge: In quantitative chemistry students learn about balancing chemical equations and conservation of mass. They also learn about concentration and the use of moles.	Key Knowledge: In term 3, we will cover the difference between exothermic and endothermic reactions and look at reaction profiles. Whilst looking at homeostasis students study the nervous system and endocrine system. They also discuss the menstrual cycle, contraception and fertility treatments. This term students will also study magnets, magnetic fields, motors and electromagnets.	Key Knowledge: In their chemical changes topic students study the reactivity series, the reactions of acids with various substances and electrolysis. In the second topic of the term students learn about rates of reaction, how to calculate rates, factors affecting them and catalysts.	Key Knowledge:	Key Knowledge:

Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
<p>Key Skills: Over the course of students GCSEs they will encounter a range of working scientifically skills. These will be present in each lesson but particularly during core practical work.</p>	<p>Key Skills:</p>	<p>Key Skills:</p>	<p>Key Skills:</p>	<p>Key Skills:</p>	<p>Key Skills:</p>
<p>Assessment: Students will complete an end of topic test.</p>	<p>Assessment: Students will complete an end of topic test. Students will do a mock assessment this term.</p>	<p>Assessment: Students will complete an end of topic test.</p>	<p>Assessment: Students will complete an end of topic test. Students will do a mock assessment this term.</p>	<p>Assessment:</p>	<p>Assessment:</p>