

Key Stage 3

The knowledge faculty consists of mathematics, science, science, technology, engineering and mathematics (STEM) and humanities (history and geography) departments. Each department has a specialist lead teacher, who oversees the teaching, learning and assessment within each subject. The subject specialists are supported by a key stage 2 link teacher who is responsible for the implementation of the subjects in their phase.

All departments within the faculty offer students the opportunity to achieve a range of qualifications:

Mathematics	Science	STEM	Humanities
Entry Level 1-3	ASDAN science (informal)	BCS Robotics Level 1	ASDAN geography (informal)
Functional Skills Level 1 and 2	Entry Level Certificate in science (level 1-3)		BTEC level 1 Introduction to travel and tourism
Edexcel GCSE	GCSE Combined science (Double award)		

When achieving these qualifications, students are encouraged to develop skills in reasoning, problem solving, analysing, social, literacy, numeracy and ICT. These skills will equip students with the ability to succeed across all subjects and within the world around them.

The faculty offers opportunities to students to participate in major national projects, such as the First Tech Robotics Challenge. This is delivered through lunchtime and after-school STEM clubs.

Due to the wide range of needs across the school, classroom learning is also supplemented by consideration of Individual Education Plans (IEPs), Educational Health Care Plans (EHCPs) and multi-agency reports. We encourage a love of learning through extracurricular activities. These include field trips, field work and practical learning opportunities. During these experiences, students apply the skills they have learned in the classroom within a practical setting, this enables the students to make links with different subjects and encourages independence.

The knowledge faculty work closely with the other faculties, ensuring we make best use of all available assessment data. Reading assessment data will inform teaching to ensure the curriculum is accessible to all learners.

The faculty strives to ensure that the learning is relevant to the students and to the world around them. This is achieved through planning current affairs, new discoveries, practical applications and localised studies into the lessons.

Key Stage 3 Maths and Numeracy Curriculum Map

Class	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
<p style="text-align: center;">Key Stage 3</p> <p style="text-align: center;">Pupils should be taught to:</p> <p>In order to teach and support every pupil at The Observatory School, we aim to personalise their learning as much as possible. Throughout the Maths Curriculum, the policy is to set pupils based on their ability, enabling the learning to be more appropriately structured and to meet the needs of every pupil.</p> <p>We pride ourselves in offering a rich, balanced and progressive curriculum. We actively promote our pupils to develop their reasoning, problem solving and numerical fluency. The Mathematics department uses STEAM links and projects to promote industry and cross curricular links.</p>						
Newton Year 7 Social Parks Year 7 Sensor	Baseline assessment Number and Place Value- Count to 1000 and backwards Explore number values.	Addition & Subtraction- dependent on pupils' ability Statistics	Multiplication tables (1-12) Long Multiplication and Division. Problem Solving- dependent on pupils' ability. Some pupils may focus on their	Fractions- Equivalent Fractions, Comparing fractions with the same/ a different denominator Adding and Subtracting Fractions	Geometry- Properties of 2D and 3D shapes. Lines of Symmetry Angles Position and direction	Measurement- length/height weight/capacity Telling the time Understanding money Perimeter and Area

	Multiplication tables (in particular 2, 5 and 10)		multiplication table			
Parks Year 8 Sensory Newton Year 8 Social	Baseline Assessment Number calculations - written methods for all 4 operations Problem solving using the 4 operations Estimating (inverse operations)	Prime numbers, factors, multiples, squared numbers and square roots BIDMAS Problem solving Estimating (rounding)	Ratio, proportion and rates of change Ratio notation Changing between units of time, length, area, volume, capacity and mass	Fractions, decimals and percentages Comparing, calculating and ordering fractions, decimals and percentages	Geometry Properties of 2D and 3D shapes Parallel and perpendicular lines, right angles Translations/rotations /reflections	Statistics (Mean, mode and median) Algebra Use of algebra notation Simplifying algebraic notations
Curie Year 9 Sensory Castner Year 9 Social	Straight line graphs Probability Testing conjectures	Three dimensional shapes Constructions & congruency Forming & solving equations	Numbers Using percentages Maths & money	Deduction Rotation & translation Pythagoras' theorem	Enlargement & similarity Solving ratio & proportion problems Rates	Probability Algebraic Representation Revision and end of year tests

Key Stage 3 Science Curriculum Map

The national curriculum for science aims to ensure that all pupils:

- develop scientific knowledge and conceptual understanding through the specific
- disciplines of biology, chemistry and physics
- develop understanding of the nature, processes and methods of science through
- different types of science enquiries that help them to answer scientific questions about
- the world around them
- are equipped with the scientific knowledge required to understand the uses and
- implications of science, today and for the future

<p style="text-align: center;">7</p> <p>Watson</p> <p>Adams</p> <p>Banksy</p>	<p style="text-align: center;">Introduction to Secondary Science</p> <p>7F Acids and Alkalis</p> <p>7A Cells, tissues, organs and systems</p>	<p>7I Energy</p> <p>7B Sexual reproduction in animals</p>	<p>7J Current electric ity</p> <p>7E Mixture s and separat ion</p>	<p>7G The particle model</p> <p>7C Muscles and bones</p>	<p>7K Forces</p> <p>7D Ecosystems</p>	<p>7H Atoms, elements and compounds</p> <p>7L Sound</p>
<p style="text-align: center;">8</p> <p>Newton</p> <p>Parks</p>	<p>8A Food and nutrition</p> <p>8E Combustion</p>	<p>8I Fluids</p> <p>8B Plants and reproduction</p>	<p>8F The periodic table</p> <p>8J Light</p>	<p>8C Breathing and respiration</p> <p>8G Metals and their use</p>	<p>8K Energy transfers</p> <p>8D Unicellular organisms</p>	<p>8H Rocks</p> <p>8L Earth and space</p>

the past have been constructed

<p>Newton Year 7 Social</p> <p>Parks Year 7 Sensor</p>	<p>Anglo-Saxon and Norman England –</p> <p>Anglo-Saxon society - Edward's 'promise' - Norman invasion - Battle of Hastings</p>	<p>Religious challenges to the monarch 1100-1199</p> <ul style="list-style-type: none"> Medieval Church and Norman reforms The Anarchy Murder of Thomas Becket The growth of Islam The Crusades 	<p>The Crusades</p> <ul style="list-style-type: none"> The key features of Islam The Byzantine Empire Events and consequences of The Crusade The Muslim Conquest of Jerusalem 	<p>The problems of Medieval Monarchs</p> <ul style="list-style-type: none"> England's medieval monarchs Claims of Matilda and Stephen Story of Eleanor of Aquitaine 	<p>The problems of Medieval Monarchs</p> <ul style="list-style-type: none"> England's medieval monarchs Claims of Matilda and Stephen Story of Eleanor of Aquitaine 	<p>The Black Death</p> <ul style="list-style-type: none"> Origins and the spread of the Black Death The impact on towns and villages <p>Key events and impact of the Peasants Revolt</p>
<p>Newton 8 Parks 8</p>	<p>Challenges to the Catholic Church</p> <ul style="list-style-type: none"> Catholicism Timeline from the Peasants Revolt Elizabethan reign The Gunpowder Plot 	<p>The English Civil War</p> <ul style="list-style-type: none"> Timeline of events The Civil War Religious unrest The New Model Army 	<p>Changing ideas: 1660 to 1789</p> <ul style="list-style-type: none"> Key features of the Commonwealth Death of Cromwell The Great Plague and reactions to it 	<p>The Slave Trade</p> <ul style="list-style-type: none"> Look at the Slave Trade in Liverpool African Kingdoms How and what happened to slaves Abolitionist demands Misconceptions 	<p>The British Empire</p> <ul style="list-style-type: none"> The Norman Conquest Conquests in the Caribbean and America Loss of the 13 colonies Decline of Mughal Empire Benefits to Britain 	<p>The Industrial Revolution</p> <ul style="list-style-type: none"> Agricultural Revolution Industrial Revolution Children's living and working conditions Common diseases What was there to see at The Great Exhibition
<p>Castner (9) Curie (9)</p>	<p>Getting the vote</p> <ul style="list-style-type: none"> Elections in c1800 	<p>The First World War</p>	<p>Conflict in the 20th Century</p>	<p>The Holocaust</p> <ul style="list-style-type: none"> What happened 	<p>The Middle East</p> <ul style="list-style-type: none"> How did the Middle East 	<p>What's the best way to bring about change?</p>

Geographical Information Systems (GIS)

- communicate geographical information in a variety of ways, including through maps, numerical and quantitative skills and writing at length.

Newton Year 7 Social Parks Year 7 Sensor	Local Area	China	Eco-Systems	Food	India	Rivers and Water (Visit to the River Mersey)
	<p>This topic aims to make students' first experience of timetabled geography fun, relevant and meaningful to them. It also has a fieldwork element which will involve group work and help the students to get to know one another. Students are encouraged to decide data collection methods, look at methods of data presentation, make suggestions and present their findings. The first two lessons are aimed at skills development</p>	<p>China is playing an increasingly large part in the world's future. Students, especially if they do not study geography at GCSE, need to have an insight into this significant country. We suggest studying this topic early in the year as it builds on a project approach that is followed in many primary schools. The topic not only builds an understanding of China but also introduces key skills and ideas, such as migration,</p>	<p>This topic introduces the concept of ecosystems. It also considers the use of an ecosystem, introducing the vocabulary of social, economic and environmental consequences, conservation and management. There was an opportunity for fieldwork in the school grounds or further afield. Students also</p>	<p>Where does our food come from? Students look at food supply and farming in the UK, see how it has changed, look at world farming types and also think about the future. There is an opportunity for fieldwork in the form of a farm visit. There is lots of support material online for this topic and it has useful links with science, citizenship and food technology. Some of the topics, such</p>	<p>Like China, India is important to the world's future. It has a large population and a developing economy. This scheme of work aims to give a flavour of the physical and human geography of India but also introduces students to other key geographical concepts such as birth rate and death rate, life expectancy, population distribution and migration.</p>	<p>A good grounding in the basic concepts and vocabulary of rivers and water systems is key for KS3 and beyond. This topic includes fieldwork which gives opportunities for hypothesis testing, data collection, mathematical manipulation of data, data presentation and evaluation. The topic finishes with flooding and flood management</p>

	<p>especially photograph skills. The unit aims to look at the local area, past, present and future. The content for present and future could be spread out over as many lessons as required to incorporate fieldwork. There is plenty of potential for booster and challenge activities in the way fieldwork collection, representation and analysis are carried out. The scheme develops skills that will be relevant for the rest of KS3 and KS4: map skills, photo skills, enquiry, data collection, data presentation, data analysis and decision making.</p>	<p>population growth, data analysis and interdependence, that will complement other units of study. These concepts lay a foundation for students' future success at higher study.</p>	<p>encounter other geographical skills and concepts such as climate graphs, their construction and how to read them. The aim of the topic is to engage students through the spectacular world of tropical plants and animals, making it as visual as possible. There is lots of potential for high-quality display work.</p>	<p>as fair trade and food aid, are able to promote discussion work and students should get used to expressing and justifying their opinions. They should also be able to articulate the views of other stakeholders.</p>		<p>where a local case will be studied.</p> <p>A trip to the River Mersey New Brighton to investigate.</p>
<p>Parks 8 Newton 8</p>	<p>Coasts (Visit to a local beach)</p> <p>Coasts form a key part of most GCSE and A Level courses, so it is important that students have a good grounding in</p>	<p>Tourism</p> <p>Everyone is a tourist. Most students will have gone on a day trip, if not an extended break. What about virtual tourism? This unit looks at how tourism</p>	<p>Weather and Climate</p> <p>All students have a direct experience of weather and its impact upon their lives. The unit also includes extreme</p>	<p>Japan</p> <p>Japan is a good example of a developed country - one that has developed really quickly based on its</p>	<p>Development</p> <p>This unit introduces students to important ideas about developing, emerging and developed countries and their</p>	<p>Economic Activities</p> <p>Having studied Food in Year 7, students will have covered agriculture as a primary activity. This unit looks at mining and fishing as other</p>

	<p>the topic. With global warming, increased storm activity and sea level rise, coastal management is also an important issue for the UK. The topic includes an opportunity to look at a case study, derived either directly from fieldwork at a local coastal area or from other resources. If the coast is accessible, then fieldwork time could be spent looking at and sketching landforms, assessing management techniques and conducting questionnaires about the use of the coast.</p> <p>A trip to New Brighton Beach will occur, where students will explore the coast.</p>	<p>has changed and the advantages and disadvantages in developing, emerging and developed countries. In week 1 there is an opportunity for data collection, presentation and analysis, using data generated by the students. A homework project across the unit gives students an opportunity to plan a holiday; the activity could be as sophisticated or as straightforward as desired, depending on the attainment of the students. Tourism is also a key employer and careers links can be made.</p>	<p>weather, which has great visual potential, showing geography to be an exciting subject. There is an opportunity for fieldwork in the school grounds. The length of the investigation – one lesson, a week or a month – will vary from school to school, but all students have the opportunity to work with data, producing graphs with multiple data, oktas charts and calculation of averages. A basic understanding of the UK climate pattern will help with later study of population distribution and there are principles that can be applied to more advanced</p>	<p>secondary manufacturing industry. This module aims to give students a flavour of Japan: it is a major player in world trade, its culture is found on British high streets and it will host the 2020 Olympics. It has a rich traditional culture, but it is also a forward-looking, modern country with a thriving robotics industry. This module looks at various aspects of the Japanese lifestyle, issues relating to an ageing population and living in a hazardous area, and finally, it makes links between the UK and Japan.</p>	<p>definitions. It looks at how development is measured and varies between countries; teachers can begin to explain why there is a development gap. Students are encouraged to think about appropriate solutions for problems. The unit concludes by looking at poverty within the UK.</p>	<p>examples from the primary sector. It looks at how both industries have changed. Students then look at the changing location of secondary industries as many companies move to developing countries – there are many decision-making exercises that could be carried out here. Students go on to consider the wide variety of tertiary jobs and why the number employed in this sector varies between developing, emerging and developed countries. Finally, students look at science parks and the quaternary sector. Links to the Development unit and previous country studies can help to reinforce knowledge and concepts.</p>
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Curie (9) Vocational/Base	Population Population growth is an important factor in the world's future success. This unit looks at why some areas are more densely populated than others and which areas of the world are growing rapidly. It touches upon high birth rates and ageing populations as causes of growth and looks at solutions to these issues. It also addresses migration. Students will be provided with an	Globalisation and Sustainability The first three weeks focus on globalisation: students as global citizens, transnational corporations (TNCs) and the advantages and disadvantages of globalisation. The unit then shifts focus to sustainability, bridged by recapping global food production and sustainable farming as studied in Year 7. The work on sustainability then focuses closer to home, looking at	Urban Areas Although this unit is about urbanisation, looking at rapidly urbanising areas and the consequences, it is possible to include much local geography, too. For example, there is an opportunity to include some higher-level fieldwork skills, such as environmental surveys and land-use mapping, and introduce techniques to show this data. There is the	Natural Hazards Natural hazards are exciting to study – they are dramatic and there are lots of visuals that can be used in lessons. This scheme looks at earthquakes, volcanoes and tropical storms, their causes and impacts. There is the opportunity for role play in this unit. It can be a really memorable topic, encouraging students to study geography for GCSE. The impacts of	Extreme Environments (Visit to Chester Zoo) This unit looks at three types of extreme environment: hot deserts, polar deserts and mountain environments. It examines their characteristics, how they are used by people, and the challenges faced by people who call these areas home. There is scope to include other activities in these areas, e.g. skiing, as teachers see appropriate. The unit also looks at the consequences of the use of these fragile	Brazil This topic gives students an insight into an emerging country. It looks at the physical and human characteristics, and the differences between regions. Coffee farming, a primary industry, is introduced in week 3, with manufacturing addressed in week 5. In week 4, students look at life in a favela and how that can be improved. Finally, students look at the legacy of the Rio Olympic Games and the impact they have had on the people of Brazil. This topic ties
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	<p>opportunity for fieldwork in the local area, finding out where people were born and when and why they moved to the area.</p>	<p>the resource use of individuals and the school, and how they could be reduced. Both concepts allow for data collection, presentation and analysis; the techniques of data presentation and analyses should be more sophisticated at this stage.</p>	<p>opportunity to revisit OS skills in week 2 when looking at urban models: for example, looking at road patterns and green spaces in an urban area, identifying the CBD using map symbols and working out distances from the CBD. Weeks 3 and 4 could take longer than two weeks to complete or, if a field visit is possible, those weeks could be used to collect data/information. The final week gives students the opportunity to use their imagination to plan the cities of the future.</p>	<p>hazards are studied and students can begin to analyse these under social, economic, environmental and short- and long-term impacts. Students are also encouraged to consider what can be done to mitigate the effects of hazards and consider if the UK is hazardous. Weeks 1 and 6 could be shortened so that there is more time to look in depth at the various hazards in weeks 2–4.</p>	<p>areas. There will be the opportunity to look at plants and animals that exist only in extreme environments and how they are specifically adapted. The final week asks students to act as advisers to an expedition to one of these extreme environments.</p> <p>A trip to Chester Zoo to explore the type of climates different animals need to survive.</p>	<p>together many elements from across the three years, consolidating their learning and preparing them for further study.</p>
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