Science Faculty

Key Stage 3 Science

Activate is our Key Stage 3 Science course which matches the 2014 National Curriculum. It is specifically designed to support every student on their journey through Key Stage 3 to Key Stage 4 success as it provides an ideal preparation for all GCSE routes, with comprehensive and flexible assessment and progression. The course has significant amounts high demand content which suits our learners due to the high prior attainment of students entering KS3. This allows us to stretch and challenge the most able students, accessing the mastery element of the program of study, supporting students to achieve the top grades. Developed within the Schemes of Learning are differentiated resources to help support and guide less able students with scaffolded activities to develop their skills and learning. We make use of course linked workbooks for support and differentiation where required in close liaison with the Enhanced Learning Faculty. The course sparks students' curiosity in science, whilst gradually building the maths, literacy and working scientifically skills vital for success in the new GCSEs. We have tailored the KS3 Activate course to provide accelerated progress for students and to implement key skills the students will build on throughout KS3 and KS4 years.

Science is an important core subject. We want students to understand how important scientists and engineers really are, as they literally shape the world around us. In Key Stage 3 we introduce the core concepts which will be built upon throughout the three Key Stages. Science is the curiosity and search for knowledge of how concepts work and why they work in this way, using observation and experimentation. Science works alongside many different subjects, such as English, Mathematics, Engineering and Technology to support the development and understanding of our world today. A high-quality education in Science allows pupils to develop their analytical skills and support them in linking their observations from practical activities to the concepts and fundamental laws that have been developed by great Scientists over the years. During their practical Science lessons pupils will develop skills in communication and working with others to test concepts for themselves, as well as developing Mathematical and ICT skills during the analysis of their results. In Science we offer a wide range of additional extracurricular activities provide students with opportunities further develop their interest in the key areas of the subject.

During Year 7 and 8 students will be taught 3 lessons of Science per week, and the content they will be taught has been separated into blocks. Each block contains at least one Biology module, at least one Chemistry module and at least one Physics modules. We also incorporate part of the Relationships and Sex Education within the curriculum where these link to the Science concepts being covered. Once pupils move into Year 9 they will undertake specifically developed lessons to support practical skills and investigative skills development as a transition from their KS3 to KS4 program of study. Practical elements will be used to develop and refine key practical skills further supporting the delivery of the required practical of GCSE Sciences. This programme of study also creates close links with Science and STEM careers, providing additional enrichment opportunities and links with industry. After this has taken place, pupils begin GCSE preparations, and this is to allow the full breadth and depth of the skills required for the KS4 course to be delivered and embedded.

The aim of the Key Stage 3 Activate course is:

- Impart a systematic body of scientific knowledge and facts, and an understanding of scientific concepts, principles, themes and patterns across Biology, Chemistry and Physics

- Further students' appreciation of the practical nature of science, developing experimental skills based on correct and safe laboratory techniques, developing analytical and evaluative skills to determine clear conclusions.
- Develop application skills to allow students to think outside the box with unfamiliar examples, applying their knowledge and understanding of key science processes.
- Develop an appreciation of the importance of accurate experimental work to scientific method and reporting, ensuring complicated methods are followed and measurements recorded to a high level of precision.
- Develop the application of science specific mathematics skills.
- Develop students' ability to form hypotheses and design experiments to test them, writing clear methods identifying specific apparatus and techniques required.
- Sustain and develop an enjoyment of, and interest in, the scientific world across Biology, Chemistry and Physics, identifying overlap between the subjects
- Foster an appreciation of the significance of science in wider personal, social, environmental, economic and technological contexts, with a consideration of ethical issues
- Develop future Scientists who will continue the study of Sciences onto A level and Higher Education

Key ideas on Biology:

- Pupils will discover what plants and animals are made of and the functions of different parts of the cell. They will look at tiny organisms that can only be viewed under a microscope and be taught how to correctly set up microscopes. They will also look at how cells can be specialised and why they are adapted for certain functions.
- Pupils will look at the different systems in the body and how these will work together for organisms to function. They will also be looking at how different organs are adapted to work correctly.
- Pupils will discover how new plants and animals are made through the process of reproduction. They will learn why all of the reproductive organs are important and how plants are successful in spreading their seeds.
- Pupils will discover the effects of a healthy and unhealthy lifestyle on their bodies. They will test certain foods for the presence of different nutrients, as well as looking at how these are broken down and absorbed into the body.
- Pupils will discover how life evolved on Earth by looking at organisms that did not need oxygen to survive. They will also look at how organisms are arranged in food chains and food webs and how energy is transferred through these.
- Pupils will discover how animals compete with each other to ensure they have enough resources to survive. They will also look at how animals have adapted to change to ensure the survival of their species, as well as how certain characteristic of species have died out due to natural selection.

Key ideas in Chemistry:

- Pupils will discover how particles are arranged in solids, liquids and gasses and how this arrangement causes the substances to have different properties. They will also look at how we can change between the three states of matter through heating or cooling the materials.
- Pupils will learn about the elements on the periodic table and how these make up everything on the Earth and beyond. They will also study how these can combine to make compounds and how this combination can affect the properties of the separate elements.

- Pupils will learn about some of the key chemical reactions that take place including combustion and decomposition. They will look at how hydrogen can be used as a fuel in cars in the future and how hand warmers and cold packs work.
- Pupils will learn about some household substances and how they can test if these are acids or alkalis. They will also discover how to neutralise substances such as bee and wasp stings to form neutral substances and eliminate the pain.
- Pupils will learn about how the periodic table is arranged to group elements together that react in a similar way. They will also look at three specific groups on the periodic table, group 1, 7 and 0, their properties and reactions.
- Pupils will learn about how different mixtures can be separated such as sand, salt and water on a desert island or the different liquids mixed in a bottle of cola. They will look at how forensics use chromatography when analysing pen inks left on notes at crime scenes.
- Pupils will learn about how metals can form many different products that are useful to us. They will look at metals reacting with acid, oxygen and water and determine some uses of different metals from the results of their practical investigations. They will also look at other materials and their uses, linking to the properties.
- Pupils will learn about how different rocks are formed on the Earth and how these rocks can be changed from one form into another. They will also look at how the levels of carbon dioxide is constantly changing in the atmosphere and how we can reduce climate change.

Key ideas in Physics:

- Pupils will learn about the forces acting on objects to keep them from falling through the floor or floating off into space. They will also look at how weight can differ on other planets and how balanced and unbalanced forces can affect our speed and direction.
- Pupils will discover how sound waves travel through different substances, as well as how different animals can hear different frequencies. They will also look at how the ear can be damaged through high amplitude sounds.
- Pupils will look at how light behaves when it meets mirrors, glass blocks and prisms. They will look at how the eye works and even create a simple camera using their knowledge of how we see objects.
- Pupils will look at the different objects we can observe in the night sky and the differences between a planet, a dwarf planet, comets and meteors. They will also discover facts about the different planets in our solar system and how they have different year lengths, as well as covering why we have different seasons throughout a year.
- Pupils will look at how series and parallel circuits differ and how these can affect the current and potential difference within the circuit. They will also discover how electromagnets work and what can make these stronger for use in a scrapyard.
- Pupils will look at how fuels and foods are a store of energy and how energy can be transferred through conduction, convection and radiation. They will also look at how insulating the house will save energy, therefore saving money on heating bills, as well as evaluating the uses of different energy sources such as solar and wind.
- Pupils will look at how speed can be calculated and shown on a distance time graph. They will also look at how marshmallows expand due to a drop in gas pressure and why dams are thicker at the bottom due to an increase in the pressure of water. They will also be able to explain what the centre of gravity is and how things balance.

Key ideas in RSE:

- Pupils will look at the facts about reproductive health, including fertility and the impacts of fertility problems. They will also discuss what the menopause is and how the menopause causes women to no longer be fertile.
- Pupils will look at a range of contraceptives, their advantages and disadvantages to allow them to make informed choices about this in the future. They will also look at how different STIs are transmitted, how risks can be reduced through certain types of contraception and the importance on testing for STIs early.
- Pupils will look at the facts about pregnancy including miscarriage, why this can occur and the effects this can have on a persons wellbeing.

Prior learning

Science is a core subject that students have studied at KS2, the aim of KS3 Science is to build on these foundations as part of our spiral curriculum, increasing the level of demand and challenge as students' cognitive ability develops to prepare pupils for GCSE. The rationale behind the teaching order is to ensure the building blocks are in place as we progress through the topics, allowing students to fully access each topic.

For Key Stage 3 Science we try to keep students with the same teacher, if possible, to give more consistency with the students with respect to contact time. During the year each teacher will be responsible for the delivery of all three Science Curriculum areas. Careful consideration has been given to the teaching order to ensure that a spiral curriculum is delivered and basic concepts are being taught first to then be built upon as the level of difficulty progresses.

Year 7 Delivery

Block	Topic	Term		Content
	Introduction to Science	Autumn	1	1.1 Hazards 1.2 Bunsen burners 1.3 Equipment 1.4 Thinking scientifically 1.5 Graphs 1.6 Evaluations Baseline assessment Builds on the ideas that use practical evidence to answer scientific questions pupils will have started to develop at KS2, developing into the specific equipment used in a Science laboratory and how we can effectively analyse our data collected
1	B1 Cells	Autumn	1/2	B1 1.1 Observing cells B1 1.2 Plant and animal cells B1 1.3 Specialised cells B1 1.4 Movement of substances B1 1.5 Unicellular organisms Builds on the ideas of classifying plants and animals pupils will have studied at KS2, developing into what living organisms are

				made from and how the parts of living cells all have different functions
1	C1 Particles	Autumn	1/2	C1 1.1 The particle model C1 1.2 States of matter C1 1.3 Melting and freezing C1 1.4 Boiling C1 1.5 More changes of state C1 1.6 Diffusion C1 1.7 Gas pressure Builds on the ideas of properties of materials and states of matter pupils will have studied at KS2, developing into what the particles look like in a solid, liquid and gas, and linking these arrangements to the properties they have.
1	P1 Forces	Autumn	1/2	P1 1.1 Introduction to forces P1 1.2 Squashing and stretching P1 1.3 Drag forces and friction P1 1.4 Forces at a distance P1 1.5 Balanced and unbalanced Builds on the ideas of forces and how things move pupils will have studied at KS2, developing into how we can make objects move faster, slower or at a constant speed by balancing forces, giving us the ability to be able to use parachutes unharmed.
2	B2 Body Systems	Autumn/Spring	2/1	B1 2.1 Levels of organisation B1 2.2 Gas exchange B1 2.3 Breathing B1 2.4 Skeleton B1 2.5 Movement: joints B1 2.6 Movement: muscles Builds on the ideas that everything living is made from cells, how some cells can specialise and why we need cells to specialise to create bones, muscles and specific organs with specific functions
2	C2 Atoms, Elements and Compounds	Autumn/Spring	2/1	C1 2.1 Elements C1 2.2 Atoms C1 2.3 Compounds C1 2.4 Chemical formulae Builds on the ideas of particles pupils will have previously studied in year 7, developing into how different substances have different properties due to the elements they are made

				from, and how the properties can change again when they bond.
2	P2 Sound	Autumn/Spring	2/1	P1 2.1 Waves P1 2.2 Sound and energy transfer P1 2.3 Loudness and pitch P1 2.4 Detecting sound P1 2.5 Echoes and ultrasound Builds on the ideas of how sounds are made pupils will have studied at KS2, developing into how we can use sound to measure distance, how we cannot hear all sound waves and the uses of ultrasound.
3	B3 Reproduction	Spring/Summer	2/1	B1 3.1 Adolescence B1 3.2 Reproductive systems B1 3.3 Fertilisation and implantation B1 3.4 Development of a foetus B1 3.5 The menstrual cycle B1 3.6 Flowers and pollination B1 3.7 Fertilisation and germination B1 3.8 Seed dispersal Builds on the ideas of reproduction pupils will have studied at KS2, as well as the specialised cells topic they have previously covered in year 7, developing into how a foetus develops over 40 weeks and how the menstrual cycle allows for reproduction to occur.
3	C3 Reactions	Spring/Summer	2/1	C1 3.1 Chemical reactions C1 3.2 Word equations C1 3.3 Burning fuels C1 3.4 Thermal decomposition C1 3.5 Conservation of mass C1 3.6 Exothermic and endothermic Builds on the ideas of particles and atoms pupils will have previously studied in year 7, developing into how different substances can be made through different reactions.
3	P3 Light	Spring/Summer	2/1	P1 3.1 Light P1 3.2 Reflection P1 3.3 Refraction P1 3.4 The eye and the camera P1 3.5 Colour Builds on the ideas of light and shadows pupils will have studied at KS2, developing into how different colours are created and how images are perceived by the brain from the eye.

4	C4 Acids and Alkalis	Summer	2	C1 4.1 Acids and alkalis C1 4.2 Indicators and pH C1 4.3 Neutralisation C1 4.4 Making salts Builds on the ideas of particles and reactions pupils will have previously studied in year 7, developing into how certain reactions can be useful and how household substances are able to have different uses due to their pH.
4	P4 Space	Summer	2	P1 4.1 The night sky P1 4.2 The Solar System P1 4.3 The Earth P1 4.4 The Moon Builds on the ideas of seasons and the Earth pupils will have studied at KS2 and bringing in information pupils have already studied about forces in year 7, then developing into why changes in seasons happen with reference to the axial tilt of the Earth.
	Practical Action Projects	Summer	2	Practical action supports communities in tackling their toughest challenges, helping to create a world that works better for everyone. Pupils will be designing some innovative products to solve some of the biggest problems within our world. Builds on the ideas that use practical evidence to answer scientific questions and how to analyse our data collected pupils will have continued to develop from KS2 throughout Year 7, developing into how these can be used in real life examples

Year 8 Delivery

Block	Topic	Term		Content
5	B5 Health and Lifestyle	Autumn	1/2	B2 1.1 Nutrients B2 1.2 Food tests B2 1.3 Unhealthy diet B2 1.4 Digestive system B2 1.5 Bacteria and enzymes in digestion B2 1.6 Drugs B2 1.7 Alcohol B2 1.8 Smoking Builds on the ideas of healthy diets and foods pupils will have studied in KS2,

				developing into how the body breaks down foods to allow us to get nutrients, as well as how certain substances negatively affect the body.
5	C5 The Periodic Table	Autumn	1/2	C2 1.1 Metals and non-metals C2 1.2 Groups and periods C2 1.3 The elements of Group 1 C2 1.4 The elements of Group 7 C2 1.5 The elements of Group 0 Builds on the ideas of atoms, elements and compounds topic pupils will have previously studied in year 7, developing into how a substances position on the periodic table links to its properties and reactions.
5	P5 Electricity and Magnetism	Autumn	1/2	P2 1.1 Charging up P2 1.2 Circuits and current P2 1.3 Potential difference P2 1.4 Series and parallel P2 1.5 Resistance P2 1.6 Magnets and magnetic fields P2 1.7 Electromagnets P2 1.8 Using electromagnets Builds on the ideas of series circuits pupils will have studied at KS2 as well as the ideas of forces already studied at year 7, then developing into how these differ to parallel circuits, how forces cause magnets to attract and repel and how we can create a magnet using electricity.
6	B6 Ecosystems	Autumn/Spring	2/1	B2 2.1 Photosynthesis B2 2.2 Leaves B2 2.3 Plant minerals B2 2.4 Chemosynthesis B2 2.5 Aerobic respiration B2 2.6 Anaerobic respiration B2 2.7 Food chains and webs B2 2.8 Disruption to food chains and webs B2 2.9 Ecosystems Builds on the ideas of food chains pupils will have studied at KS2, as well as cells pupils will have previously studied in year 7, developing into how leaves have stomata cells which are adapted to allow it to get oxygen.

6	C6 Separating Mixtures	Autumn/Spring	2/1	C2 2.1 Mixtures C2 2.2 Solutions C2 2.3 Solubility C2 2.4 Filtration C2 2.5 Evaporation and distillation C2 2.6 Chromatography Builds on the ideas of properties of substances pupils will have covered at KS2, as well as particles and compounds pupils will have previously studied in year 7, developing into how mixtures are different to compounds and how they can be separated based on a substances properties.
6	P6 Energy	Autumn/Spring	2/1	P2 2.1 Food and fuels P2 2.2 Energy adds up P2 2.3 Energy and temperature P2 2.4 Energy transfer: particles P2 2.5 Energy transfer: radiation P2 2.6 Energy resources P2 2.7 Energy and power P2 2.8 Work, energy, and machines Builds on the ideas of forces pupils will have previously studied in year 7 and electricity pupils have studied in year 8, developing into how materials pass on energy through conduction, convection and radiation.
7	B7 Adaptations and Inheritance	Spring/Summer	2/1/2	B2 3.1 Competition and adaptation B2 3.2 Adapting to change B2 3.3 Variation B2 3.4 Continuous and discontinuous variation B2 3.5 Inheritance B2 3.6 Natural selection B2 3.7 Extinction Builds on the ideas of habitats and inheritance pupils will have studied at KS2, as well as the cells topic covered in year 7 and the ecosystems topic studied previously in year 8, developing into how natural selection occurs and how animals adapt to become more successful over the years.
7	C7 Metals and Acids	Spring/Summer	2/1/2	C2 3.1 Acids and metals C2 3.2 Metals and oxygen C2 3.3 Metals and water C2 3.4 Metal displacement reactions

				C2 3.5 Extracting metals C2 3.6 Ceramics C2 3.7 Polymers C2 3.8 Composites Builds on the ideas of uses of materials pupils will have studied at KS2, as well as the particles topic pupils will have covered in year 7. This then develops into the properties they have and how these might be useful for different materials, as well as where we can get these materials from.
7	C8 The Earth	Spring/Summer	2/1/2	C2 4.1 The Earth and its atmosphere C2 4.2 Sedimentary rocks C2 4.3 Igneous and metamorphic rocks C2 4.4 The rock cycle C2 4.5 The carbon cycle C2 4.6 Climate change C2 4.7 Recycling Builds on the ideas of classifying rocks pupils will have studied at KS2, as well as how we can extract and react different substances covered in year 7 and previously in year 8. This then develops into how the different rocks form and why this gives them different properties and uses.
7	P7 Motion and Pressure	Spring/Summer	2/1/2	P2 3.1 Speed P2 3.2 Motion graphs P2 3.3 Pressure in gases P2 3.4 Pressure in liquids P2 3.5 Pressure on solids P2 3.6 Turning forces Builds on the ideas of particles pupils will have previously studied in year 7, developing into how the particle arrangements cause pressure to be felt differently and how we can use this to our advantage, such as a hydraulic press to lift a car.
	Practical Action Projects	Summer	2	Practical action supports communities in tackling their toughest challenges, helping to create a world that works better for everyone. Pupils will be designing some innovative products to solve some of the biggest problems within our world.

				Builds on the ideas that use practical evidence to answer scientific questions and how to analyse our data collected pupils will have continued to develop from KS2 throughout Year 7 and 8, developing into how these can be used in real life examples

Year 9 Delivery

Topic	Term		Content
Biology			
Detection	Autumn	1	B3 3.1 Microscopy B3 3.2 Fingerprinting B3 3.3 DNA Fingerprinting B3 3.4 Blood Typing B3 3.5 Time of Death B3 3.6 Pathology Builds on the ideas of using microscopes to see organisms pupils have previously covered in year 7, developing into how different forensic techniques can be used to identify perpetrators of crimes.
RSE	Autumn	2	1.1 Reproduction and reproductive health 1.2 Contraceptives 1.3 Sexually transmitted diseases Builds on the ideas of reproduction pupils will have studied at KS2 and in year 7, developing into how we can ensure health is maintained during sexual intercourse and how to prevent pregnancy and STIs.
B1 Cell Structure and Transport	Autumn	2	B1.1 The World of the Microscope B1.2 Animal and Plants Cells B1.3 Eukaryotic and Prokaryotic Cells B1.4 Specialisation in Animal Cells B1.5 Specialisation in Plant Cells Builds on the ideas of the different types of cells pupils will have studied in Year 7. This then develops into how substances move throughout cells in different ways and why substances need to enter and leave the cells.
B2 Cell Division			B2.3 Stem Cells B2.4 Stem Cell Dilemmas Builds on the ideas of the different types of cells pupils will have studied in Year 7, as well as the previous cells topic covered in

			Year 9. This then develops why cells need to be specialised and how we can use stem cells to form different types of specialised cell.
B1 Cell Structure and Transport	Spring	2	B1.6 Diffusion B1.7 Osmosis B1.8 Osmosis in Plants B1.9 Active Transport B1.10 Exchanging Materials Builds on the ideas of the different types of cells pupils will have studied in Year 7. This then develops into how substances move throughout cells in different ways and why substances need to enter and leave the cells.
B2 Cell Division	Summer	1	B2.1 Cell Division B2.2 Growth and Differentiation Builds on the ideas of the different types of cells pupils will have studied in Year 7, as well as the previous cells topic covered in Year 9. This then develops why cells need to be specialised and how we can use stem cells to form different types of specialised cell.
B3 Organisation and Digestive System	Summer	2	B3.1 Tissues and Organs B3.2 The Human Digestive System B3.3 The Chemistry of Food B3.4 Catalysts and Enzymes Builds on the ideas of body systems, organs and digestion pupils will have studied in Year 7. This then develops into how catalysts break down substances within food, the different enzymes the body uses and how these make extracting nutrients more efficient.
Chemistry			
Detection	Autumn	1	C3 3.1 Break In C3 3.2 Smelly Problem C3 3.3 Message in a Bottle C3 3.4 Blood Alcohol C3 3.5 Body C3 3.6 Clues in the Carpet Builds on the ideas chromatography and separating mixtures pupils have previously covered in year 8, developing into how

			different forensic techniques can be used to identify perpetrators of crimes.
C1 Atomic Structure	Autumn	2	C1.1 Atoms, Elements and Compounds C1.2 Separating Mixtures C1.3 History of the Atom C1.4 The Atomic Model C1.5 Size and Mass of Atoms Builds on the ideas of atoms, elements and compounds and separating mixtures pupils will have studied in Year 7. This then develops into how the model of the atom was developed and how the subatomic particles are used to give physical and chemical properties.
C1 Atomic Structure	Spring	1	C1.6 Relative Atomic Mass C1.7 Electronic Structure Builds on the ideas of atoms, elements and compounds and separating mixtures pupils will have studied in Year 7. This then develops into how the model of the atom was developed and how the subatomic particles are used to give physical and chemical properties.
C2 The Periodic Table	Spring	2	C2.1 The Periodic Table C2.2 History of The Periodic Table C2.3 Metals and Non-Metals C2.4 Group 0 C2.5 Group 1 Builds on the ideas of trends in the periodic table pupils will have studied at in Year 8. This then develops into how trends link to the electronic structure, as well as a closer look into how the periodic table was constructed over time.
C2 The Periodic Table	Summer	1	C2.6 Group 7 C2.7 (Chemistry Only) Transition Metals Builds on the ideas of trends in the periodic table pupils will have studied at in Year 8. This then develops into how trends link to the electronic structure, as well as a closer look into how the periodic table was constructed over time.
C3 Structure and Bonding	Summer	2	C3.1 States of Matter C3.2 Atoms into Ions C3.3 Ionic Bonding C3.4 Giant Ionic Structures

			C3.5 Covalent Bonding C3.6 Structure of Simple Molecules C3.7 Giant Covalent Structures Builds on the ideas of properties of compounds and materials pupils will have studied in Year 8. This then develops into how chemical bonds form in terms of electrons and how the properties of these bonds are different.
Physics			
New Technology	Autumn	1	P3 1.1 Your Phone P3 1.2 Your House P3 1.3 Intensive Care P3 1.4 Seeing Inside P3 1.5 Your Sports P3 1.6 Your Planet Builds on the ideas of using reflection and refraction pupils have previously covered in year 7, developing into how different current, resistance and how different techniques can be used in the medical industry.
P1 Conservation and Dissipation of Energy	Autumn	2	P1.1 Changes in Energy Stores P1.2 Conservation of Energy P1.3 Energy and Work P1.4 Gravitational Potential Energy Stores P1.5 Kinetic Energy and Elastic Energy Stores Builds on the ideas of energy types pupils will have studied in Year 8. This then develops into how we can improve efficiency and calculate the efficiency of objects.
P1 Conservation and Dissipation of Energy	Autumn	1	P1.6 Energy Dissipation P1.7 Energy and Efficiency P1.8 Electrical Appliances P1.9 Energy and Power Builds on the ideas of energy types pupils will have studied in Year 8. This then develops into how we can improve efficiency and calculate the efficiency of objects.
P2 Energy Transfer By Heating	Spring	2	P2.1 Energy Transfer by Conduction P2.2 (Physics Only) Infrared Radiation P2.3 (Physics Only) More About Infrared Radiation P2.4 Specific Heat Capacity

			P2.5 Heating and Insulating Buildings Builds on the ideas of energy transfers pupils will have studied in Year 8, as well as the previous energy topic covered in Year 9. This then develops into how we can insulate our buildings and why this is important to conserve energy.
P3 Energy Resources	Summer	1	P3.1 Energy Demands P3.2 Energy from Wind and Water P3.3 Power from the Sun and the Earth Builds on the ideas of energy types pupils will have studied in Year 8, as well as the previous energy conservation topic covered in Year 9. This then develops into how we can reduce energy loss and why we need to reduce this.
P3 Energy Resources	Summer	2	P3.4 Energy and the Environment P3.5 Big Energy Issues Builds on the ideas of energy types pupils will have studied in Year 8, as well as the previous energy conservation topic covered in Year 9. This then develops into how we can reduce energy loss and why we need to reduce this.

Assessments take place at end of the teaching blocks – At the end of each block, there is an end of topic assessment, this has been created using the exam papers available on kerboodle. The assessments have been created focussing on the correct balance of mastering, secure and emerging demand questions for Higher / Foundation tiers, using similar weightings seen in GCSE papers with the distribution of high, medium and low demand questions.

Assessment breakdown table

Year	Block	Topics	Term
7	1	Cells Particles Forces	Autumn 2
7	2	Body Systems Atoms, Elements and Compounds Sound	Spring 1
7	3	Reproduction Reactions Light	Summer 1
7	4	Acids and Alkalis Space	Summer 2

7	1-4	End of Year 7 Assessment	Summer 2
8	5	Health and Lifestyle The Periodic Table Electricity and Magnetism	Autumn 2
8	6	Ecosystems Separating Mixtures Energy	Spring 1
8	7	Adaptations and Inheritance Metals and Acids The Earth Motion and Pressure	Summer 2
8	5-7	End of Year 8 Assessment	Summer 2
Year	**Subject**	**Topic**	**Term**
9	Biology	Detection	Autumn 2
9	Chemistry	Detection	Autumn 2
9	Physics	New Technology	Autumn 2
9	Physics	P1 Conservation and Dissipation of Energy Part 1	Autumn 2
9	Biology	B1 Cell Structure and Transport Part 1	Spring 1
9	Chemistry	C1 Atomic Strutcure	Spring 1
9	Physics	P1 Conservation and Dissipation of Energy Part 2	Spring 1
9	Physics	P2 Energy Transfer By Heating	Summer 1
9	Chemistry	C2 The Periodic Table	Summer 1
9	Biology	B1 Cell Structure and Transport Part 2	Summer 2
9	Physics	P3 Energy Resources	Summer 2

Further curriculum support:

Textbooks and workbooks: Activate 1 textbooks. Activate 2 textbooks. Activate 1 workbooks. Activate 2 workbooks. CGP KS3 guides.

Further reading: Why Is Milk White? & 200 Other Curious Chemistry Questions. 100 Things to Know About Science (published by Usborne). “You wouldn’t want to live without… antibiotics!” (Collection of books by the Salariya book company). “Science experiments you can eat” by Vicky Cobb. “Rollercoaster Science” by Jim Wiese. “The totally irresponsible Science kit” by Sean Connolly**.** Almost Astronauts: 13 Women Who Dared to Dream by Tanya Lee Stone. Primates: The Fearless Science of Jane Goodall, Dian Fossey, and Biruté Galdikas by Jim Ottaviani. The Fangirl's Guide to the Galaxy: A Handbook for Girl Geeks by Sam Maggs. Florence Nightingale: The Courageous Life of the Legendary Nurse by Catherine Reef. Why Can't Elephants Jump?: And 113 Other Tantalising Science Questions by the New Scientist. The Boy Who Harnessed the Wind: Creating Currents of Electricity

and Hope by William Kamkwamba. AsapSCIENCE: Answers to the World's Weirdest Questions, Most Persistent Rumors & Unexplained Phenomena by Mitchell Moffit. How to Fossilize Your Hamster: And Other Amazing Experiments for the Armchair Scientist by Mick O'Hare.

Links to helpful sites:

Kerboodle online: https://www.kerboodle.com

Twig World: www.twig-world.com

BBC Bitesize: Biology - https://www.bbc.co.uk/bitesize/subjects/z4882hv

Chemistry - https://www.bbc.co.uk/bitesize/subjects/znxtyrd

Physics - https://www.bbc.co.uk/bitesize/subjects/zh2xsbk

British Science Week: https://www.britishscienceweek.org/

STEM: https://www.stem.org.uk/

STEM Robotics: http://stemrobotics.in/

Dendrite: https://www.dendrite.me/

Race To The Line:
https://www.dendrite.me/competition/view/competitionid/5bed45a207d734cf19729f03

Enrichment activities

Science Club. Term 1: Students will look at the world of forensics, what techniques are used at crime scenes to place suspects at the scene of a crime. They will take part in blood testing (chromatography), finger print analysis (latent and dusting) and analysing blood spatters. Term 2: Pupils will look at different adaptations of animals. They will witness the documentary dissection of elephants, crocodiles, whales and giraffes, as well as researching adaptations themselves. Term 3: Students will look at our solar system and the differences in the planets within it. They will research how the solar system has changed and how it formed.

STEM Club. Term 1: Students will look at engineering in the Pandemic and how STEM subjects have worked together to try and combat coronavirus. Term 2: Students will look at how sustainable we are currently and what we can do to reduce plastic waste and reliability on fossil fuels.

STEM Robotics. Pupils will use coding and Science to build a robot and take part in different challenges with other schools throughout the country.

Y7 Rocket car project – Race for the line. Students are tasked with designing a model rocket car which is then raced along a track using a CO_2 propulsion motor. They will race between the whole year group and the winning team is then invited to the regionals. If they win this they will then compete against all schools in the country in the nationals.

British Science week. Pupils will take part in various activities and lessons based on the theme for the week. The 2020 theme was "Our Diverse Planet" which celebrated the amazing diversity we have throughout the world. From biodiversity to cultural and social diversity, as well as the diversity of knowledge throughout STEM subjects and careers. The 2021 theme was "Innovating For The Future," where pupils looked at the introduction of new methods, ideas, or products and celebrated

the amazing ideas we have to change how we discover and create things in the future. The 2022 theme was “Growth,” where pupils focussed on the amazing ideas developed within Science, how Science has changed over the years and how Science will continue to change to continue discovering things in the future.

Year 7 STEM Day. Students will take part in a series of workshops with outside providers and learn about different careers in Science, Technology, Engineering and Mathematics. Previous providers have been Rolls Royce, discussing sustainable power, the Army showing different team working exercises and Zoolabs, showcasing different exotic animals.

Y8 Big Bang Science trip – NEC. The Fair gives young people the chance to hear from inspiring engineers and scientists from some of the UK’s biggest companies and find out about the opportunities available in science and engineering. Students will be encouraged to join a voyage of discovery of virtual reality, medicine, marine biology, film and TV, space exploration, explosive chemistry, crime-solving, robots, computer coding, microscopic bugs, giant trucks and more.

KS3 - Skype a Scientist event – Roslin Institute, I’m a Scientist – Get me out of here!! And I’m an Engineer – Get me out of here!! Pupils will get to speak with real Scientists where they will discuss their careers. Pupils will have an opportunity to interact with them and ask any questions they might have.

Practical Action. Pupils take part in projects where they link their Science knowledge to real world issues. Ranging from creating innovative uses for plastic waste, to designing a water filtration system for third world countries pupils will apply their learning and develop their problem solving skills by working collaboratively.