Deyes High School Curriculum Rational

Science

DEYES HIGH SCHOOL

LYDIATE LEARNING TRUST

Overarching curriculum, intent for SCIENCE KS3

- For all pupils to understand and develop a breadth of in-depth knowledge in biology, chemistry and physics, that challenges pupils' thinking and is ambitious for all.
- For all pupils to experience practical science, that allows substantive knowledge to link with disciplinary knowledge. Enhancing scientific enquiry, employability and a love of science.
- For all pupils to develop their scientific literacy, numeracy and autonomy to apply scientific knowledge to solve modern problems in the world around us.
- For all pupils to have a culturally rich experience that allows limitless futures no matter their background.

Key Stage 3 Science

Key stage 3 science offers an ambitious curriculum across year 7-9 and embeds the essential knowledge of the national curriculum and beyond so that all students are challenged no matter their background. We base our sequence around big ideas from the Best Evidence Science Teaching (BEST) and adapt this method to match our own intent. Our topics develop in challenge so that prior knowledge is built upon whilst interlinking with each other so essential knowledge is reinforced and developed as pupils progress from year 7 to year 11.

	Content Taught	NC Ref	Essential Knowledge	Assessment	Rationale and sequence
Year 7					
In year 7, science is taught by a single teacher in most cases. This is so the big ideas of science are developed, and the topics build upon each other to increase overall essential knowledge and understanding.					
HT1	**Energy 1: Energy Stores and Resources**	NC: Working Scientifically WS1a WS1b	-What is energy? -Energy Stores -Conservation of energy -Chemical Energy	**Energy Formative Assessment:** Daily, Weekly and Monthly Reviews focussing on reviewing	The unit 'Energy' is fundamental and underpins the knowledge needed for all other topics pupils will learn across KS3 Science. Therefore, this is the first unit of

	This unit of work will be taught over approximately 10 lessons. Pupils will learn about energy and the different energy stores.	WS2a WS2b WS2c WS2d WS3b WS4b NC: Physics P1.1a P1.1b P1.1c P1.1d P1.1e	-Energy in moving objects -Work Done -Efficiency -Power -Energy Sources -Environmental effects of energy. ***Essential knowledge reading for consolidation*:** BBC Bitesize Energy	material on Essential Knowledge. Use of TLaC techniques in lessons to check pupil understanding of essential knowledge during each lesson. **Energy Summative Assessment:** End of Topic "Bring it All Together" task with application and culmination of understanding of the topic. Homework: Knowledge questions on the key knowledge required for this unit of work. Understanding of the curriculum assessed in cumulative test during school assessment points, using questions written to mirror structure and command words for exam boards, using KS3 Testbase SATs questions as a basis.	work we choose to teach in Science. This is a brand-new topic that has never been studied before in KS2 which provides the pupils with a challenging and consistent start.
HT1	**Atoms 1: The Particle Model** This unit of work will be taught over approximately 6	NC: Working Scientifically WS3a WS3b WS3c WS3d	-The Particle Model -Changes of State -Melting & Freezing -Evaporation & Condensing -Pressure? -Density	**Atoms 1 Formative Assessment:** Daily, Weekly and Monthly Reviews focussing on reviewing material on Essential Knowledge.	Once pupils have developed their essential knowledge of energy, including potential energy, thermal energy and kinetic energy, pupils can now apply this to particles. The next unit taught in year 7 is The Particle Model. This builds on the essential knowledge already developed and applies

	lessons. Pupils will learn about the particle model and why changes of state occur	NC: Chemistry C1a C1b	***Essential knowledge reading for consolidation*:** BBC Bitesize Atoms 1	Use of TLaC techniques in lessons to check pupil understanding of essential knowledge during each lesson. **Atoms 1 Summative Assessment:** End of Topic "Bring it All Together" task with application and culmination of understanding of the topic. Homework: Knowledge questions on the key knowledge required for this unit of work. Understanding of the curriculum assessed in cumulative test during school assessment points, using questions written to mirror structure and command words for exam boards, using KS3 Testbase SATs questions as a basis.	their understanding of energy to particles, the energy of particles in each state of matter and how this energy changes during changes of state.
HT2	**Cells 1: Cell Structure** This unit of work will be taught over approximately 8 lessons.	NC: Working Scientifically WS4b NC: Biology B1.1a B1.1b B1.1c B1.1d	-Setting up and using a light microscope -Structure & function of animal and plant cells -Structure & function of specialised cells -Diffusion: substances entering and leaving cells -Systems	**Cells 1 Formative Assessment:** Daily, Weekly and Monthly Reviews focussing on reviewing material on Essential Knowledge. Use of TLaC techniques in lessons to check pupil	During Half Term 2, pupils will learn the unit 'Cells'. With a unit of work completed in Physics and Chemistry, pupils will now begin their first Biology unit, Cells. Pupils will then look at how substances/particles can diffuse into cells and how temperature affects the rate of diffusion.

	During this unit, pupils will learn how cells are the fundamental unit of living organisms. Pupils will prepare and observe their own cells under the microscope.	B1.1e B1.1f	**Essential Reading: Reading for consolidation.** Cells 1: Animal & Plant Cells 1 Specialised Animal Cells 1: Specialised Plant **Reading for breadth. Robert Hooke** Robert Hooke Facts for Kids (kiddle.co)	understanding of essential knowledge during each lesson. **Cells 1 Summative Assessment:** End of Topic "Bring it All Together" task with application and culmination of understanding of the topic. Homework: Knowledge questions on the key knowledge required for this unit of work. Understanding of the curriculum assessed in cumulative test during school assessment points, using questions written to mirror structure and command words for exam boards, using KS3 Testbase SATs questions as a basis.	
HT2	**Space 1: The Earth In The Universe** This unit of work will be taught over approximately 8 lessons. Pupils will focus on why we have	NC: Physics P6a P6b P6c P6d	-The structure of the Solar System -Why do we get day and night? -Why do we have seasons?	**Space 1 Formative Assessment:** Daily, Weekly and Monthly Reviews focussing on reviewing material on Essential Knowledge. Use of TLaC techniques in lessons to check pupil understanding of essential knowledge during each lesson.	With less daylight moving towards the end of HT2, it is a great opportunity to explain to pupils why this has occurred. Pupils will learn why there is less day light compared to September, why has it become colder and why do we see the moon with different phases. This time of year provides pupils with the opportunity to see different Planets during the evening and early morning, and what are the stars we see in the night sky.

	day and night, our position in the Solar System and why we have seasons.		***Essential knowledge reading for consolidation*:** Space 1: Days, Seasons & Years	**Space 1 Summative Assessment:** End of Topic "Bring it All Together" task with application and culmination of understanding of the topic. Homework: Knowledge questions on the key knowledge required for this unit of work. Understanding of the curriculum assessed in cumulative test during school assessment points, using questions written to mirror structure and command words for exam boards, using KS3 Testbase SATs questions as a basis.	
HT3	**Atoms 2: Atoms Elements and Compounds** This unit of work will be taught over approximately 8 lessons.	NC: Working Scientifically NC: Chemistry C2a C2b C2c C2d	-What is an atom -What is an element -What is a mixture -What is a compound ***Essential knowledge reading for consolidation*:** Atoms 2	**Atoms 2 Formative Assessment:** Daily, Weekly and Monthly Reviews focussing on reviewing material on Essential Knowledge. Use of TLaC techniques in lessons to check pupil understanding of essential knowledge during each lesson.	Now pupils have developed their essential knowledge of 'Particles', they can build on this to explore particles in greater detail. Pupils will learn 'particles' as atoms, which can combine with other atoms to form compounds. Pupils will distinguish between atoms, elements, compounds and mixtures.

				<u>Atoms 2 Summative Assessment:</u> End of Topic "Bring it All Together" task with application and culmination of understanding of the topic. Homework: Knowledge questions on the key knowledge required for this unit of work. Understanding of the curriculum assessed in cumulative test during school assessment points, using questions written to mirror structure and command words for exam boards, using KS3 Testbase SATs questions as a basis. .	
HT3	**Human Health 1:** **Health and Exercise** This unit of work will comprise over approximately 7 lessons. **Cross connectivity:**	NC: Working Scientifically NC: Biology B1.1f B1.2a B1.2b B1.2c B1.4a B1.4b B1.4c	-Exercise -Organisation -Skeleton/Muscles/Joints -Biomechanics -Exercise -Gas Exchange -Asthma/Smoking **<u>Essential Reading:</u>** **Reading for consolidation** Exercise 1	**<u>Human Health 1 Formative Assessment:</u>** Daily, Weekly and Monthly Reviews focussing on reviewing material on Essential Knowledge. Use of TLaC techniques in lessons to check pupil understanding of essential knowledge during each lesson. **<u>Human Health 1 Summative Assessment:</u>**	During this unit of work, pupils will build on what they have been taught so far, particularly from ''Cells 1''. Pupils will look at how our bodies are organised from cells to multi-cellular organisms.

	PE curriculum study of biomechanics in YR11. Muscular and skeletal systems in YR10. Energy systems/respiration in YR10. Respiratory system in YR10.		Exercise 2 **Reading for breadth.** Michael Jordan Facts for Kids (kiddle.co)	End of Topic "Bring it All Together" task with application and culmination of understanding of the topic. Homework: Knowledge questions on the key knowledge required for this unit of work. Understanding of the curriculum assessed in cumulative test during school assessment points, using questions written to mirror structure and command words for exam boards, using KS3 Testbase SATs questions as a basis.	
HT4	**Electricity 1: Circuits** This unit of work will be taught over approximately 7 lessons.	NC: Working Scientifically NC: Physics P4.1a P4.1b P4.1c P4.2a P4.2b	-Scientific attitudes -Experimental skills and investigations -Analysis and evaluation - Static electricity - Circuit symbols and diagrams -Current and potential difference Series and parallel circuits -	**Electricity 1 Formative Assessment:** Daily, Weekly and Monthly Reviews focussing on reviewing material on Essential Knowledge. Use of TLaC techniques in lessons to check pupil understanding of essential knowledge during each lesson. **Electricity 1 Summative Assessment:** End of Topic "Bring it All Together" task with application	During this unit, pupils will build on prior knowledge at KS2 looking at electricity. Pupils will now investigate the current, potential difference and resistance in both series and parallel circuits. Pupils will also investigate the magnetic field of current and electromagnets.

			***Essential knowledge reading for greater breadth*:** **Benjamin Franklin**	and culmination of understanding of the topic. Homework: Knowledge questions on the key knowledge required for this unit of work. Understanding of the curriculum assessed in cumulative test during school assessment points, using questions written to mirror structure and command words for exam boards, using KS3 Testbase SATs questions as a basis.	
HT5	**Separation 1: Separating Mixtures** This unit will be taught over approximately 6 lessons.	NC: Working Scientifically WS2a WS2b WS2c WS2d NC: Chemistry C3d	-What is a pure & impure substance -Filtration -Evaporation -Distillation -Chromatography ***Essential knowledge reading for consolidation*:** Separating Mixtures	**Separation 1 Formative Assessment:** Daily, Weekly and Monthly Reviews focussing on reviewing material on Essential Knowledge. Use of TLaC techniques in lessons to check pupil understanding of essential knowledge during each lesson. **Separation 1 Summative Assessment:** End of Topic "Bring it All Together" task with application and culmination of understanding of the topic.	During this unit, pupils will build on their understanding from the previous Chemistry topics. Pupils will apply their knowledge of the particle model and kinetic theory to how substances are separated. Pupils will learn to develop how to plan and carry out scientific enquiries to test predictions, including identifying independent, dependent and control variables. Pupils will use simple techniques for separating mixtures including: filtration, evaporation, distillation and chromatography.

				Homework: Knowledge questions on the key knowledge required for this unit of work. Understanding of the curriculum assessed in cumulative test during school assessment points, using questions written to mirror structure and command words for exam boards, using KS3 Testbase SATs questions as a basis. .	
HT5	**Inheritance 1: Reproduction** This unit will be taught over approximately 8 lessons.	NC: Working Scientifically NC: Biology B1.5a B1.5b B1.6a	-Variation -Reproduction/systems -Menstrual Cycle -Fertilisation -Gestation/birth -Maternal Lifestyle -Plant reproduction -Flow Structure -Pollination -Seed Dispersal **Essential Reading:** **Reading for consolidation:** Human Reproduction 1 Human Reproduction 2 **Reading for breadth:** Miriam Menkin	**Formative Assessment:** Daily, Weekly and Monthly Reviews focussing on reviewing material on Essential Knowledge. Use of TLaC techniques in lessons to check pupil understanding of essential knowledge during each lesson. **Inheritance 1 Summative Assessment:** End of Topic "Bring it All Together" task with application and culmination of understanding of the topic. Homework: Knowledge questions on the key knowledge required for this unit of work.	Once pupils have developed their essential knowledge of Cells 1 and Human Health 1, they can then begin to apply this to Inheritance. Pupils can now begin to apply the knowledge of gametes to fertilisation. Pupils will then be able to apply this further by looking at how substances can pass between mother and child. Pupils will then learn how fertilisation takes place in plants.

			The female scientist who changed human fertility forever - BBC Future	Understanding of the curriculum assessed in cumulative test during school assessment points, using questions written to mirror structure and command words for exam boards, using KS3 Testbase SATs questions as a basis.	
HT6	**Forces 1: Forces and their effects** This unit will be taught over approximately 8 lessons.	P2.2a P2.2b P2.2d P2.2e P2.2f P2.2g P2.2h P2.3b	-Forces -Force diagrams -Contact and non-contact forces -Friction -Air resistance -Equilibrium -Resultant force -Hooke's law ***Essential knowledge reading for consolidation*:** Forces	**<u>Forces 1 Formative Assessment:</u>** Daily, Weekly and Monthly Reviews focussing on reviewing material on Essential Knowledge. Use of TLaC techniques in lessons to check pupil understanding of essential knowledge during each lesson. **<u>Forces 1 Summative Assessment:</u>** End of Topic "Bring it All Together" task with application and culmination of understanding of the topic. Homework: Knowledge questions on the key knowledge required for this unit of work. Understanding of the curriculum assessed in cumulative test during school	The unit of forces builds on pupil's prior knowledge from KS2 and develops this further with practical examples and applications. Forces 1 builds on from the knowledge of gravity and weight learned in Space 1 and provides essential knowledge for motion 1 in year 8 and forces and motion topic in year 9. Forces 1 also provides prior knowledge for magnetism 1 in year 8 so students understand non-contact forces.

				assessment points, using questions written to mirror structure and command words for exam boards, using KS3 Testbase SATs questions as a basis.	
YEAR 8					
In year 8, students begin to have specialist teachers in either biology, chemistry and physics. As such, topics are taught in slightly varying orders across each term. In each term, students will rotate between the biology, chemistry or physics topic depending on which teacher specialism they have.					
HT1	**Cells 2: Cell Transport** This unit will be taught over approximately 4 lessons. **Cross connectivity:** PE curriculum: study of respiration/diffusion in YR10.	NC: Working Scientifically NC: Biology B1.1d	-Diffusion -Osmosis -Active Transport **Essential Reading:** **Reading for consolidation:** Cell Transport 1 ***Reading for breadth:*** Henrietta Lacks - Students | Britannica Kids | Homework Help	**Cells 2 Formative Assessment:** Daily, Weekly and Monthly Reviews focussing on reviewing material on Essential Knowledge. Use of TLaC techniques in lessons to check pupil understanding of essential knowledge during each lesson. **Cells 2 Summative Assessment:** End of Topic "Bring it All Together" task with application and culmination of understanding of the topic. Homework: Knowledge questions on the key knowledge required for this unit of work.	In this unit pupils will build on what they were taught in Year from Cells 1 in relation to diffusion. Pupils will begin to look at how substances can travel across a semi-permeable membrane. Pupils will be introduced to the idea of other cell transport mechanisms such as diffusion and active transport.

				Understanding of the curriculum assessed in cumulative test during school assessment points, using questions written to mirror structure and command words for exam boards, using KS3 Testbase SATs questions as a basis.	
HT1	**Waves 1: Light & Sound Waves** This unit will be taught over approximately 10 lessons.	NC: Working Scientifically NC: Physics P3.1a P3.2a P3.2b P3.2c P3.2d P3.3a P3.4a P3.4b P3.4c	-Energy transferred by waves -Types of waves -Sound waves -Hearing -Light waves - Reflection - Refraction - Colour **Essential Reading:** Light & Sound 1	**<u>Waves 1 Formative Assessment:</u>** Daily, Weekly and Monthly Reviews focussing on reviewing material on Essential Knowledge. Use of TLaC techniques in lessons to check pupil understanding of essential knowledge during each lesson. **<u>Waves 1 Summative Assessment:</u>** End of Topic "Bring it All Together" task with application and culmination of understanding of the topic. Homework: Knowledge questions on the key knowledge required for this unit of work. Understanding of the curriculum assessed in cumulative test during school	During this unit, pupils will build on what they have been taught at KS2 with regards to Light and Sound. Pupils will explain observations of how sounds travels using the idea of a longitudinal wave, and light travels as a transverse wave. Pupils will use apparatus such as an oscilloscope to demonstrate the amplitude and frequency of waves, and how sound waves change with volume or pitch. Pupils will also look at light waves to investigate how light is reflected and refracted as it moves through different mediums.

				assessment points, using questions written to mirror structure and command words for exam boards, using KS3 Testbase SATs questions as a basis.	
HT2	**Atoms 3: Periodic Table** This unit will be taught over approximately 7 lessons.	NC: Working Scientifically WS1a WS1b WS2c WS2d NC: Chemistry C6b C6d C4f C4g	-Mendeleev's Periodic Table -Group 1 -Group 2 -Group 7 -Group 0 **Essential Reading:** The Periodic Table	**Atoms 3 Formative Assessment:** Daily, Weekly and Monthly Reviews focussing on reviewing material on Essential Knowledge. Use of TLaC techniques in lessons to check pupil understanding of essential knowledge during each lesson. **Atoms 3 Summative Assessment:** End of Topic "Bring it All Together" task with application and culmination of understanding of the topic. Homework: Knowledge questions on the key knowledge required for this unit of work. Understanding of the curriculum assessed in cumulative test during school	During this unit, pupils will build on what they have learned from Atoms 1 and 2. They will now begin to explore the groups of the periodic table and look at patterns in reactivity following experimental analysis.

				assessment points, using questions written to mirror structure and command words for exam boards, using KS3 Testbase SATs questions as a basis.	
HT2	**Human Health 2: Nutrition** This unit will be taught over approximately 4 lessons. **Cross connectivity:** Food Technology curriculum: study of Eat Well Plate Yr7. Study of diet /nutrition in YR9. PE curriculum: Study of diet and nutrition in YR11.	NC: Working Scientifically NC: Biology B1.3a B1.3b B1.3c B1.3d	-Food Groups -Balanced Diet -Unbalanced Diet -Adaptations of the digestive system. **Essential Reading: Reading for consolidation** **Diet 1** **Reading for breadth.** James Lind Facts for Kids (kiddle.co)	**Human Health Formative Assessment:** Daily, Weekly and Monthly Reviews focussing on reviewing material on Essential Knowledge. Use of TLaC techniques in lessons to check pupil understanding of essential knowledge during each lesson. **Human Health Summative Assessment:** End of Topic "Bring it All Together" task with application and culmination of understanding of the topic. Homework: Knowledge questions on the key knowledge required for this unit of work. Understanding of the curriculum assessed in cumulative test during school assessment points, using questions written to mirror structure and command words	During this unit, pupils will build on Human Health 1 and Cells 2 from Year 7 to apply their knowledge of organ systems to the digestive system. Pupils will look at the adaptations of the digestive system.

				for exam boards, using KS3 Testbase SATs questions as a basis.	
HT3	**Particles & Matter 1: The Particle Model** This unit will be taught over approximately 7 lessons.	NC: Working Scientifically NC: Physics P2.3a P5.1a P5.1b P5.1c P5.1d P5.1e P5.2a	Particle model Particle motion Changes of state Gas pressure Density Thermal energy transfer ***Essential knowledge reading for consolidation*:** Particle Model	**Particles & Matter 1 Formative Assessment:** Daily, Weekly and Monthly Reviews focussing on reviewing material on Essential Knowledge. Use of TLaC techniques in lessons to check pupil understanding of essential knowledge during each lesson. **Particles & Matter 1 Summative Assessment:** End of Topic "Bring it All Together" task with application and culmination of understanding of the topic. Homework: Knowledge questions on the key knowledge required for this unit of work. Understanding of the curriculum assessed in cumulative test during school assessment points, using questions written to mirror structure and command words for exam boards, using KS3 Testbase SATs questions as a basis.	During this unit, pupils will build on their prior knowledge in Year 7 to explain the differences in arrangements, in motion and in closeness of particles explaining changes of state with regards to internal energy. Pupils will look at similarities and differences including density between the different states of matter. Pupils will look at the history of explaining particle movement in gases, and the work that Robert Brown conducted to explain Brownian motion.

HT3	**Chemical Reactions 1: Chemical Reactions** This unit will be taught over approximately 10 lessons.	NC: Working Scientifically WS1a WS1b WS2c WS2d NC: Chemistry C4a C4b C4c C4h	-Oxidation Reactions -Combustion Reactions -Thermal Decomposition -Reactivity Series -Displacement Reactions -Extracting Metals -Catalysts ***Essential knowledge reading for consolidation*:** Chemical Reactions	**Chemical Reactions 1 Formative Assessment:** Daily, Weekly and Monthly Reviews focussing on reviewing material on Essential Knowledge. Use of TLaC techniques in lessons to check pupil understanding of essential knowledge during each lesson. **Chemical Reactions 1 Summative Assessment:** End of Topic "Bring it All Together" task with application and culmination of understanding of the topic. Homework: Knowledge questions on the key knowledge required for this unit of work. Understanding of the curriculum assessed in cumulative test during school assessment points, using questions written to mirror structure and command words for exam boards, using KS3 Testbase SATs questions as a basis.	During this unit, pupils will develop their understanding further on chemical reactions from what they had been taught in Year 7. Pupils will now begin to give examples and explain whether reactions are combustion, thermal decomposition, oxidation, or displacement. Pupils will be able to make predictions of the products formed during a chemical reaction, and explain observations about the change in mass of reactants and products.
HT4	**Bioenergetics 1:**	NC: Working Scientifically	-Plant organs/mineral uptake	**Bioenergetics 1 Formative Assessment:**	During this unit, pupils will build their knowledge and understanding from what

	Photosynthesis This unit will be taught over approximately 7 lessons. **Cross connectivity:** Geography curriculum: Study of ecosystems in YR10.	NC: Biology B1.3a B1.3b B1.3c B1.3d	-Photosynthesis equation -Reactants/products -Leaf adaptation -Carbohydrate production **Essential Reading: Reading for consolidation.** Photosynthesis **Reading for breadth.** Jan Ingenhousz Jan Ingenhousz and his discovery of the photosynthesis equation is celebrated in a Google Doodle (alphr.com)	Daily, Weekly and Monthly Reviews focussing on reviewing material on Essential Knowledge. Use of TLaC techniques in lessons to check pupil understanding of essential knowledge during each lesson. **Bioenergetics 1 Summative Assessment:** End of Topic "Bring it All Together" task with application and culmination of understanding of the topic. Homework: Knowledge questions on the key knowledge required for this unit of work. Understanding of the curriculum assessed in cumulative test during school assessment points, using questions written to mirror structure and command words for exam boards, using KS3 Testbase SATs questions as a basis.	they had learnt from many of the topics taught in Biology, Chemistry and Physics. For example, pupils will apply prior knowledge from Cells and Chemical Reactions to understand that the dependence of almost all life on Earth comes from photosynthetic organisms. Pupils will be introduced to the idea of carbohydrate production and use within the plant system.
HT4	**Magnetism 1: The effects of magnets**	NC: Working Scientifically NC: Physics P4.3a	Magnets Magnetic fields Magnets on Earth Compasses Electromagnets	**Magnetism 1 Formative Assessment:** Daily, Weekly and Monthly Reviews focussing on reviewing	During this unit, pupils will build on their knowledge from Forces 1 in Year 7. Here, pupils will begin to explore magnetism from basic magnetism in bar

	This unit will be taught over approximately 7 lessons.	P4.3b P4.3c P4.3d P2.1a P2.1b P2.1c	Electromagnets practical Uses of electromagnetism ***Essential knowledge reading for consolidation*:** Magnets 1	material on Essential Knowledge. Use of TLaC techniques in lessons to check pupil understanding of essential knowledge during each lesson. **Magnetism 1 Summative Assessment:** End of Topic "Bring it All Together" task with application and culmination of understanding of the topic. Homework: Knowledge questions on the key knowledge required for this unit of work. Understanding of the curriculum assessed in cumulative test during school assessment points, using questions written to mirror structure and command words for exam boards, using KS3 Testbase SATs questions as a basis.	magnets, how magnetic fields support life on Earth to uses of electromagnets.
HT5	**Chemical Changes 1: Endothermic and exothermic reactions**	NC: Working Scientifically NC: Chemistry C5a C5b	-Exothermic Reactions -Endothermic Reactions ***Essential knowledge reading for consolidation*:**	**Chemical Changes 1 Formative Assessment:** Daily, Weekly and Monthly Reviews focussing on reviewing material on Essential Knowledge.	During this unit, pupils will build on Chemical Reactions 1 to explore exothermic and endothermic reactions. Here pupils will apply their learning to understanding of why chemical reactions occur.

	This unit will be taught over approximately 5 lessons.		Exothermic & Endothermic	Use of TLaC techniques in lessons to check pupil understanding of essential knowledge during each lesson. **Chemical Changes 1 Summative Assessment:** End of Topic "Bring it All Together" task with application and culmination of understanding of the topic. Homework: Knowledge questions on the key knowledge required for this unit of work. Understanding of the curriculum assessed in cumulative test during school assessment points, using questions written to mirror structure and command words for exam boards, using KS3 Testbase SATs questions as a basis.	
HT5	**Ecology 1: Interdependence** This unit will be taught over approximately 4 lessons.	NC: Working Scientifically NC: Biology B2.1b B3.1a B3.1b B3.1c	-Interdependence -Food webs/chains -Bioaccumulation/toxins -Food security/pollination **Essential Reading:**	**Ecology 1 Formative Assessment:** Daily, Weekly and Monthly Reviews focussing on reviewing material on Essential Knowledge. Use of TLaC techniques in lessons to check pupil	During this unit, pupils will begin to pull their knowledge from a range of units taught to date. Now they have the essential knowledge of plants/photosynthesis and pollination, they can begin to apply this learning to how other organisms depend on plants for survival.

	Cross connectivity: Geography curriculum: Study of ecosystems in YR10.		**Reading for consolidation:** Interdependence **Reading for breadth.** Rachel Carson Rachel Carson Facts for Kids (kiddle.co)	understanding of essential knowledge during each lesson. **Ecology 1 Summative Assessment:** End of Topic "Bring it All Together" task with application and culmination of understanding of the topic. Homework: Knowledge questions on the key knowledge required for this unit of work. Understanding of the curriculum assessed in cumulative test during school assessment points, using questions written to mirror structure and command words for exam boards, using KS3 Testbase SATs questions as a basis.	
HT6	**Motion 1: Moving Objects** This unit will be taught over approximately 8 lessons.	NC: Working Scientifically NC: Physics P2.1a P2.1b P2.1c	-Forces and motion -Speed -Speed practical -Relative motion -Distance time graphs -Acceleration -Effect of forces on motion -Stopping distance	**Motion 1 Formative Assessment:** Daily, Weekly and Monthly Reviews focussing on reviewing material on Essential Knowledge. Use of TLaC techniques in lessons to check pupil understanding of essential knowledge during each lesson.	During this unit, pupils will apply what they have learnt from Forces 1 to begin to explain what forces cause motion within objects.

			***Essential knowledge reading for consolidation*:** Moving Objects	**Motion 1 Summative Assessment:** End of Topic "Bring it All Together" task with application and culmination of understanding of the topic. Homework: Knowledge questions on the key knowledge required for this unit of work. Understanding of the curriculum assessed in cumulative test during school assessment points, using questions written to mirror structure and command words for exam boards, using KS3 Testbase SATs questions as a basis.	
HT6	**Earth Chemistry 1: Atmosphere & Rocks** This unit will be taught over approximately 5 lessons.	NC: Working Scientifically NC: Chemistry C8a C8b C8c	-Composition of Earth's atmosphere -Structure of Earth -Formation of Sedimentary Rock -Formation of Igneous Rock -Formation of Metamorphic Rock	**Earth Chemistry 1 Formative Assessment:** Daily, Weekly and Monthly Reviews focussing on reviewing material on Essential Knowledge. Use of TLaC techniques in lessons to check pupil understanding of essential knowledge during each lesson. **Earth Chemistry 1 Summative Assessment:**	Pupils will build on their prior knowledge at KS2 to look at the formation of different types of rock including sedimentary, metamorphic and igneous. Pupils will learn that these rocks are continually being broken down and new rocks formed described by the rock cycle.

			***Essential knowledge reading for consolidation*:** The Earth	End of Topic "Bring it All Together" task with application and culmination of understanding of the topic. Homework: Knowledge questions on the key knowledge required for this unit of work. Understanding of the curriculum assessed in cumulative test during school assessment points, using questions written to mirror structure and command words for exam boards, using KS3 Testbase SATs questions as a basis.	

YEAR 9					
In year 9, students are taught by specialist teachers in biology, chemistry and physics. Pupils further develop their essential knowledge of the key stage 3 topics, building on prior learning from year 7 and 8. Year 9 gives pupils the opportunity to relate multiple topics which will allow them to apply essential knowledge in a new and more ambitious way. The content allows for a further step up in challenge, bringing together essential knowledge from all of key stage 3 and links the substantive and disciplinary knowledge to develop mastery in preparation for moving to future topics in key stage 4. As such, the sequence is set to specialise in each separate science.					
Biology					
HT1 & HT2	**Bioenergetics 2: Respiration** **Cross connectivity:** PE curriculum: Study of respiration and energy systems in YR10.		Aerobic respiration Anaerobic respiration Fermentation **Reading for breadth.**	**<u>Formative Assessment:</u>** Daily, Weekly and Monthly Reviews focussing on reviewing material on Essential Knowledge. Use of TLaC techniques in lessons to check pupil understanding of essential knowledge during each lesson.	This learning leads from content studied in Yr7 Cells 1 cell structure relating to diffusion and YR7 Human Health 1 Health and Exercise unit focusing upon gas exchange In this section we explore how both animals and plants use oxygen to oxidise food in a process called

			Antoine Lavoisier Antoine Lavoisier Facts for Kids (kiddle.co)	**Bioenergetics 2 Summative:** End of Topic "Bring it All Together" task with application and culmination of understanding of the topic. Homework: Knowledge questions on the key knowledge required for this unit of work. Understanding of the curriculum assessed in cumulative test during school assessment points, using questions written to mirror structure and command words for exam boards, using KS3 Testbase SATs questions as a basis.	aerobic respiration which transfers the energy that the organism needs to perform its functions. Conversely, anaerobic respiration does not require oxygen to transfer energy. During vigorous exercise the human body is unable to supply the cells with sufficient oxygen and it switches to anaerobic respiration. This process will supply energy but also causes the build-up of lactic acid in muscles which causes fatigue.
HT3 & HT4	**Human Health 3: Digestion** **Cross connectivity:** Food Technology curriculum: Study of the Eat Well Plate Yr7. Study of diet/nutrition Yr9.		Enzymes Digestion Food Tests **Reading for breadth.** **Ivan Pavlov** Ivan Pavlov Facts for Kids (kiddle.co)	**Formative Assessment:** Daily, Weekly and Monthly Reviews focussing on reviewing material on Essential Knowledge. Use of TLaC techniques in lessons to check pupil understanding of essential knowledge during each lesson. **Summative Assessment:**	This unit leads on from YR8 Human Health 2 Nutrition topic which focused upon the structure, function and adaptations of the digestive system alongside nutrition and diet. In this section pupils will be introduced to the idea of examples of biological enzymes within the digestive system, enzyme action and

	PE curriculum: study of diet/nutrition YR11. Study of energy/respiration Yr10.			End of Topic "Bring it All Together" task with application and culmination of understanding of the topic. Homework: Knowledge questions on the key knowledge required for this unit of work. Understanding of the curriculum assessed in cumulative test during school assessment points, using questions written to mirror structure and command words for exam boards, using KS3 Testbase SATs questions as a basis.	factors which affect the rate of enzyme controlled reactions.
HT5	**Inheritance 2: DNA and Natural Selection**		Variation – continuous/discontinuous Inheritance DNA – Watson/Crick Difference between species Natural selection Extinction and environmental change Maintaining biodiversity Gene banks **Wider reading:**	**<u>Formative Assessment:</u>** Daily, Weekly and Monthly Reviews focussing on reviewing material on Essential Knowledge. Use of TLaC techniques in lessons to check pupil understanding of essential knowledge during each lesson. **<u>Summative Assessment:</u>** End of Topic "Bring it All Together" task with application and culmination of understanding of the topic. Homework: Knowledge questions on the key knowledge required for this unit of work.	This unit leads from Yr7 Inheritance 1 Reproduction unit. Pupils have studied variation, fertilisation and plant reproduction. This unit develops pupils understanding of variation further by exploring the structure and role of DNA and its importance in variation. Natural Selection and extinction are explored and the need to maintain and protect biodiversity through modern day techniques I.e. gene banks.

			Reading for consolidation. Inheritance and genetics - KS3 Biology - BBC Bitesize **Reading for depth.** **James Watson** **Francis Crick** **Rosalin Franklin** Francis Crick Facts for Kids (kiddle.co) James D. Watson Facts for Kids (kiddle.co) Rosalind Franklin Facts for Kids (kiddle.co)	Understanding of the curriculum assessed in cumulative test during school assessment points, using questions written to mirror structure and command words for exam boards, using KS3 Testbase SATs questions as a basis.	
HT6	**Ecology 2: Community** **Cross connectivity:** Geography curriculum: Study of ecosystems in YR10.		Communities Biotic/abiotic factors Adaptations Trophic levels Biomass/pyramids Cycling materials **Reading for breadth.** **Jane Goodhall** Jane Goodall Facts for Kids (kiddle.co)	**Formative Assessment:** Daily, Weekly and Monthly Reviews focussing on reviewing material on Essential Knowledge. Use of TLaC techniques in lessons to check pupil understanding of essential knowledge during each lesson. **Summative Assessment:** End of Topic "Bring it All Together" task with application and culmination of understanding of the topic.	This unit leads from prior learning in Yr8 Ecology 1 Interdependence unit where pupils study food webs/chains, bioaccumulation and food security. This unit explores all species live in ecosystems composed of complex communities of animals and plants dependent on each other and that are adapted to particular conditions, both abiotic and biotic. These ecosystems provide essential services that support human life and continued development. Pupils will

				Homework: Knowledge questions on the key knowledge required for this unit of work. Understanding of the curriculum assessed in cumulative test during school assessment points, using questions written to mirror structure and command words for exam boards, using KS3 Testbase SATs questions as a basis.	be introduced to the idea of biomass and how nutrients are cycled within the ecosystem.
Chemistry					
HT1	**Rates of reaction 1: developing practical fluency** Students undertake a range of practicals with emphasis on a variety of skills, looking first at research before an experiment, then the procedures in carrying out an experiment. Following this, data analysis is the focus using rates as a background substantive understanding on which to base the disciplinary understanding.	NC: Working scientifically WS1.a WS1.b WS2.a WS2.b WS2.c WS2.d WS2.e WS3.a WS3.b WS3.c WS3.f WS4.a WS4.c	Scientific research: rates of reaction Scientific methods: effect of concentration Collecting and recording data: analysis of concentration Drawing graphs: effect of temperature Data analysis: effect of temperature **Wider reading:** https://www.twinkl.co.uk/teaching-	**Formative Assessment:** Daily, Weekly and Monthly Reviews focussing on reviewing material on Essential Knowledge. Use of TLaC techniques in lessons to check pupil understanding of essential knowledge during each lesson. **Rates of reaction 1 Summative Assessment:** End of Topic "Bring it All Together" task with application and culmination of understanding of the topic. Homework: Knowledge questions on the key knowledge required for this unit of work. Understanding of the curriculum assessed in cumulative test during school assessment points, using	During year 9, the students focus on fundamental concepts of Chemistry which will form a springboard to allow them to begin KS4 with a good foundation of knowledge. It encompasses a combination of the disciplinary knowledge along with the substantive knowledge described in the KS3 national curriculum. The students start by undertaking a unit designed to focus on working scientifically. This will provide an opportunity to focus on the disciplinary understanding of the process of gathering, presenting and analysing data, as a precursor to future experimental tasks.

			wiki/parts-of-a-science-experiment	questions written to mirror structure and command words for exam boards, using KS3 Testbase SATs questions as a basis.	
HT2	**Atoms 3: Introduction to atomic structure and the periodic table** Students look in depth at the development of understanding of atomic structure, looking at developing models. Following this, how the periodic table was put together by various scientists, finally looking at how atoms are now drawn using the Bohr model.	NC: Chemistry C2.a C2.b C2.c C6.b C6.c	Periodic table History of the modelling of the atom How the periodic table is arranged Drawing atoms **Wider reading:** https://www.lenntech.com/periodic/history/history-periodic-table.htm	**Formative Assessment:** Daily, Weekly and Monthly Reviews focussing on reviewing material on Essential Knowledge. Use of TLaC techniques in lessons to check pupil understanding of essential knowledge during each lesson. **Atoms 3 Summative Assessment:** End of Topic "Bring it All Together" task with application and culmination of understanding of the topic. Homework: Knowledge questions on the key knowledge required for this unit of work. Understanding of the curriculum assessed in cumulative test during school assessment points, using questions written to mirror structure and command words for	Following this, the students are introduced to the structure of the atom and the periodic table to understand the development of models and understanding of fundamental concepts for chemistry.

				exam boards, using KS3 Testbase SATs questions as a basis.	
HT3	**Matter 2: Properties of everyday materials** Students look at traditional and modern uses of ceramics, polymers and composites, considering their production and properties. **Energy changes 1** Students see what happens during a chemical reaction at an atomic level, understanding bond making and breaking. Students then look to evaluate practical methods used to measure energy changes in reactions.	NC: Working scientifically WS1.a NC: Chemistry C7.c NC: Working scientifically WS2.e WS3.c NC: Chemistry C4.a C4.b C5.a C5.b	Properties of ceramics Properties of polymers Properties of composites Making and breaking bonds Endothermic reactions and measuring temperature decrease Exothermic reactions and measuring temperature increase **Wider reading:**	**<u>Formative Assessment:</u>** Daily, Weekly and Monthly Reviews focussing on reviewing material on Essential Knowledge. Use of TLaC techniques in lessons to check pupil understanding of essential knowledge during each lesson. **<u>Matter 2: Summative Assessment:</u>** End of Topic "Bring it All Together" task with application and culmination of understanding of the topic. Homework: Knowledge questions on the key knowledge required for this unit of work. Understanding of the curriculum assessed in cumulative test during school assessment points, using questions written to mirror structure and command words for exam boards, using KS3 Testbase SATs questions as a basis.	Then the students consider properties of materials and their role in their uses, looking specifically at ceramics, polymers and composites, relevant in the KS3 national curriculum. Following this, the students are introduced to the idea of what happens during a chemical reaction in terms of exothermic bond making and endothermic bond making. This provides them with the fundamental understanding of what happens during a chemical reaction on an atomic scale. The students then consider their procedures experimentally to apply and bring together this knowledge from year 8 and this topic.

			https://www.strouse.com/blog/6-hydrogel-uses		
HT4	**Separating substances 2** Students gain a clear understanding of elements, compounds and mixtures and how mixtures are separated. Firstly with insoluble solids, then soluble, two immiscible liquids and ink.	NC: Working scientifically WS2.a WS2.b WS2.c WS2.d WS2.e WS3.d NC: Chemistry C3.d C3.e	Filtration Crystallisation Distillation Chromatography **Wider reading:** https://edu.rsc.org/resources/chromatography/11333.article	**Formative Assessment:** Daily, Weekly and Monthly Reviews focussing on reviewing material on Essential Knowledge. Use of TLaC techniques in lessons to check pupil understanding of essential knowledge during each lesson. **Separating substances 2 Summative Assessment:** End of Topic "Bring it All Together" task with application and culmination of understanding of the topic. Homework: Knowledge questions on the key knowledge required for this unit of work. Understanding of the curriculum assessed in cumulative test during school assessment points, using questions written to mirror structure and command words for exam boards, using KS3 Testbase SATs questions as a basis.	Students then focus on the activity of the particles in separating substances, classifying them to enable them to explain the properties which allow them to be separated.

HT5	**Chemical analysis 1** Students gain an understanding of how gases can be collected and identified using a range of tests, introducing an idea useful in Biology and later in Chemistry.	NC: Working scientifically WS2.a WS2.b WS2.c WS2.d WS2.e WS3.d NC: Chemistry C6.e	Chemical tests: Carbon dioxide Chemical tests: hydrogen Chemical tests: oxygen Chemical tests: flame tests **Wider reading:** https://edu.rsc.org/download?ac=137040	**Formative Assessment:** Daily, Weekly and Monthly Reviews focussing on reviewing material on Essential Knowledge. Use of TLaC techniques in lessons to check pupil understanding of essential knowledge during each lesson. **Chemical analysis Summative Assessment:** End of Topic "Bring it All Together" task with application and culmination of understanding of the topic. Homework: Knowledge questions on the key knowledge required for this unit of work. Understanding of the curriculum assessed in cumulative test during school assessment points, using questions written to mirror structure and command words for exam boards, using KS3 Testbase SATs questions as a basis.	Students look in greater detail at chemical tests for gases. This enables students to understand how chemicals are identified, particularly gases which appear invisible. This will support understanding with respiration and photosynthesis in biology, group 1 metals in chemistry, and reactions of acids in later learning.
HT6	**Earth chemistry 2: Carbon** Students look at the idea of finite resources and what can be done to reduce impact on the	NC: Chemistry C8.d C8.e C8.f	Finite resources Reduce, reuse and recycle Carbon cycle	**Formative Assessment:** Daily, Weekly and Monthly Reviews focussing on reviewing material on Essential Knowledge. Use of TLaC techniques in lessons to check pupil understanding of	Finally, students look at the effect of finite resources and the release of carbon on the atmosphere and ultimately the climate. This incorporates discussion and an opportunity to utilise items from the

	environment. Following this, the carbon cycle allows students to consider where carbon dioxide comes from and ends up, ending by looking at our impact on the environment around us.		Composition of the atmosphere Production of carbon dioxide Human effect on environment ***Essential knowledge reading for greater breadth*:** https://edu.rsc.org/download?ac=140434	essential knowledge during each lesson. **Earth Chemistry 2: Summative Assessment:** End of Topic "Bring it All Together" task with application and culmination of understanding of the topic. Homework: Knowledge questions on the key knowledge required for this unit of work. Understanding of the curriculum assessed in cumulative test during school assessment points, using questions written to mirror structure and command words for exam boards, using KS3 Testbase SATs questions as a basis.	news and current affairs to engage students in topical ideas.
Physics					
HT1	**Energy 2: Changing energy stores** During this unit, students will establish a deeper knowledge and understanding of variables, develop graph skills and the students ability to draw conclusions, whilst also	NC: Physics P1.2a P1.2c P1.3a P1.3b P1.3c	Changes in systems Work done Energy in moving objects Gravitational potential energy Conservation of energy Efficiency ***Essential knowledge reading for greater***	**Formative Assessment:** Daily, Weekly and Monthly Reviews focussing on reviewing material on Essential Knowledge. Use of TLaC techniques in lessons to check pupil understanding of essential knowledge during each lesson. **Energy 2 Summative Assessment:**	During this unit, pupils will build on their prior knowledge from Energy 1 and apply this to real life situations. Pupils will apply essential physics knowledge and link with maths knowledge to use and apply formula. Energy 2 provides the essential knowledge for Energy 3 in year 10 as well as linking to essential knowledge in electricity 2 (electrical

	starting to look at the deeper analysis of results, the planning of experiments and the evaluation of methods and performance in experiments. Students will learn about the types of energy in more depth and learn to calculate different types of energy and apply this to the law of conservation of energy, including efficiency.		***breadth: Julius Robert von Mayer*** Why Julius Robert von Mayer was one of the unluckiest men in science (gizmodo.com)	End of Topic "Bring it All Together" task with application and culmination of understanding of the topic. Homework: Knowledge questions on the key knowledge required for this unit of work. Understanding of the curriculum assessed in cumulative test during school assessment points, using questions written to mirror structure and command words for exam boards, using KS3 Testbase SATs questions as a basis.	work) and forces 3 (mechanical work) later in year 9.
HT2	**Particles and matter 2: Heating and cooling** During this unit, pupils will learn how to calculate density and how a change in temperature affects the particle model of matter. They will apply their	P1.2b P5.1a P5.1b P5.1c P5.2a P5.2b P5.3a P5.3b P5.1d	Density Effect of temperature change on particles Heat transfer as changes in kinetic energy Internal energy The atom History of the structure of the atom	**Formative Assessment:** Daily, Weekly and Monthly Reviews focussing on reviewing material on Essential Knowledge. Use of TLaC techniques in lessons to check pupil understanding of essential knowledge during each lesson.	Particles and matter 2 builds on the essential knowledge from Particles and matter 1 in year 8 and links the the ideas of chemical and internal energy from energy 1 and 2. This topic also allows pupils to link together ideas from chemistry topics on atoms and matter and provides the essential knowledge for year 10

	previous knowledge of kinetic energy to the particle model and apply this to a phenomena known as internal energy. Pupils will deepen their understanding of particles to learn about the structure of the atom, linking with the ideas introduced in chemistry.		***Essential knowledge reading for greater breadth: Robert Boyle*** https://mocomi.com/what-is-boyles-law/	**Particles and Matter 2 Summative Assessment:** End of Topic "Bring it All Together" task with application and culmination of understanding of the topic. Homework: Knowledge questions on the key knowledge required for this unit of work. Understanding of the curriculum assessed in cumulative test during school assessment points, using questions written to mirror structure and command words for exam boards, using KS3 Testbase SATs questions as a basis.	topics of Particles 3 and Atomic structure 3.
HT3 and HT4	**Electricity and Magnetism 2: Using electrical current** Electrical power is a vital part of modern life from the simple light bulb to remote sensing satellite systems. The initial lessons accumulate essential knowledge before bringing it together in lessons that require students to link prior learning and applying it to a practical	P4.1a P4.1b P4.1c P4.3d	Resistance Resistors Measuring current and potential difference Ohms law Generating electricity Electromagnets ***Essential knowledge reading for greater breadth: Georg Ohm*** *https://www.famousscientists.org/georg-ohm/*	**Formative Assessment:** Daily, Weekly and Monthly Reviews focussing on reviewing material on Essential Knowledge. Use of TLaC techniques in lessons to check pupil understanding of essential knowledge during each lesson. **Electricity and Magnetism 2 Summative Assessment:** End of Topic "Bring it All Together" task with application and culmination of understanding of the topic.	An understanding of how electricity and magnetism work is fundamental to future developments in communications, engineering and power systems. This unit, therefore, begins by consolidating understanding of the essential concepts of current and potential difference in year 7, by relating it to resistance and applying it to examples of resistors. The topic forms an essential grounding for electricity 3 and magnetism 3, which are GCSE topics.

	situation. The topic concludes with linking magnetism and electricity together and raises the levels of challenge for students to write about how motors work in everyday life.			Homework: Knowledge questions on the key knowledge required for this unit of work. Understanding of the curriculum assessed in cumulative test during school assessment points, using questions written to mirror structure and command words for exam boards, using KS3 Testbase SATs questions as a basis.	
HT5	**Forces and Motion 2: Newton's laws of motion** Forces govern everything we do and the understanding of them dates back to the 16th century when Isaac Newton developed his 3 laws of motion. This unit will look in to Newton's laws as well as looking at more complex phenomena of moments and pressure, both essential knowledge for wider applications in technology.	P2.2b P2.2c P2.3c P2.4a P2.5a P2.5b	What do forces do Resultant force Forces effect on motion Moments Pressure Pressure in liquids ***Essential knowledge reading for greater breadth: Isaac Newton*** https://kids.kiddle.co/Isaac_Newton	**<u>Formative Assessment:</u>** Daily, Weekly and Monthly Reviews focussing on reviewing material on Essential Knowledge. Use of TLaC techniques in lessons to check pupil understanding of essential knowledge during each lesson. **<u>Forces and Motion 2 Summative Assessment:</u>** End of Topic "Bring it All Together" task with application and culmination of understanding of the topic. Homework: Knowledge questions on the key knowledge required for this unit of work. Understanding of the curriculum assessed in cumulative test during school assessment points, using questions written to mirror	Students initially study forces in year 7, looking in to the types of forces and their applications. This provides the essential knowledge for this topic as pupils further develop ideas on how forces affect motion. The motion topic in year 8 also provides prior knowledge of speed, which is discussed in greater depth during this topic. The forces and motion 3 topic provides essential knowledge for the Forces 4 topic in year 10 and mechanics topic in year 11. The topic also develops mathematical skills addressed in maths when they study graphs and equations of motion. Students will also use transferable essential knowledge in technology when they study levers and gears.

				structure and command words for exam boards, using KS3 Testbase SATs questions as a basis.	
HT6	**Waves and Space 2: Applications of Light** Light and sound are both examples of types of waves (transverse and longitudinal) and understanding them is vital in many applications such as communications and sound engineering. This unit covers the essential knowledge surrounding sound and light waves including the mathematical relationship using the wave equation. Pupils will go on to apply their essential knowledge in colour to look in to the visible and invisible spectrum to further deepen their knowledge of uses of waves.	P3.3a P3.4b P3.4c P3.4d P3.4e P3.4f	Properties of waves relationship between wavelength and frequency Ray diagrams Lenses Speed of light Visible spectrum prisms and colour ***Essential knowledge reading for greater breadth: Olaus Roemer*** https://www.physlink.com/education/askexperts/ae22.cfm	**Formative Assessment:** Daily, Weekly and Monthly Reviews focussing on reviewing material on Essential Knowledge. Use of TLaC techniques in lessons to check pupil understanding of essential knowledge during each lesson. **Waves and Space 2 Summative Assessment:** End of Topic "Bring it All Together" task with application and culmination of understanding of the topic. Homework: Knowledge questions on the key knowledge required for this unit of work. Understanding of the curriculum assessed in cumulative test during school assessment points, using questions written to mirror structure and command words for exam boards, using KS3 Testbase SATs questions as a basis.	Waves and space 2 builds on prior knowledge from year 8 waves 1 when students first encounter the phenomena 'waves.' This topic develops their essential knowledge and applies this to real life situations and uses. The topic also builds on space 1 in year 7 by applying their knowledge of lenses and the speed of light in space (vacuum). This unit uses equation skills encountered in maths and the differences in colour learned in art. The topic is fundamental prior knowledge for the year 10 topic Waves 3 as well as space 3 in year 11 for those students who take separate science.