KS3 Curriculum Plan

INTENT – Why are we doing what we are doing?

"If I have seen further, **it is by standing on the shoulders of giants**."
Sir Isaac Newton (Born 25th December 1642, Grantham Lincolnshire)

At Waltham Toll Bar we aim to enthuse and produce the next generation of scientists. In KS3, the Science curriculum establishes an understanding of the key disciplinary and substantive knowledge required to understand the scientific world around us. Students will have lessons in the three different disciplines of Science: Biology, Chemistry and Physics. Our very first topic will give students an insight into 'How Scientists Work' and these skills will be developed, practiced and embedded as they move through the key stage and onto key stage 4 and 5. These disciplinary skills give the students the tools to access and unlock knowledge through investigatory techniques. Throughout KS3, the students will progress through a substantive knowledge rich curriculum that builds the foundational concepts of science which underpin our everyday life. These foundational concepts and key themes will be embedded through retrieval practice across all of KS3 and built upon as they progress through the years. The students will begin to cover topics that develop their inquiring minds and these topics will be interleaved with the key disciplinary knowledge required to become a successful scientist. Students will continue to explore scientific concepts and analyse data they have obtained as they approach a new range of enquiry questions as the years progress. The challenge of having students to work like a scientist increases throughout the key stage as they begin to combine aspects of the 'How Scientists Work' key theme as well as accessing and analysing scientific texts throughout every topic.

Our locality is very important to our science curriculum in all key stages. We are extremely fortunate that our school is based in Grimsby and in extreme close proximity to the Humber bank which has strong links to the renewable sector. Alongside this, students study the production of electricity in Year 8 and our proximity to the DRAX Biomass power station gives a real opportunity to visit and demonstrate the scale of electricity production for the area. Data obtained from N.E. Lincs council allows us to really delve into the issues in the local area such as obesity and air pollution.

Progressing from year 9, all students are required to take at least Combined Science at GCSE. Students who have developed an analytical and scientific inquiry-based way of thinking throughout the KS3 science curriculum may opt to select Separate Science in their options in order to further discover the scientific world around us.

IMPLEMENTATION - Year 7

Term	**Unit Title**	**Unit Enquiry Question** *Should be the basis of the entire unit, the thing that drives the unit.*	**Intent** *Purpose of the specific unit.*	**Core Disciplinary (Skills) Knowledge Gained**	**Core Substantive (Content) Knowledge Gained**	**Careers Links**	**"Need to Know"** *Core content required to be covered during this unit.*	**"Neat to Know"** *Things that would be good for students to know but not essential. Will not feature in assessments etc.*
Autumn Term 1 & 2 September – December	**Forces & Motion**	*How do objects effect other objects?* *Cause and effect*	This Physics topic will introduce forces and motion. It will allow students to understand forces as a push or pull. How to draw free force body diagrams to represent forces on objects and introduce Newton and his laws. Students will learn how to measure force and be introduced to Hooke's law. Students will also look at careers that link with the topics taught, such as mechanical engineering. Forces is a fundamental concept that is needed in the next stage of learning.	***Variables*** Drawing results tables Taking measurements Graphs Reading scientific articles Lab safety Using lab equipment	• What are forces? • Friction • Practical investigations • Balanced & unbalanced forces • Mass Vs Weight • Squashing & stretching – Particle model • Hooke's Law	Games programming Avionics engineer, Mechanical engineer, Computer programmer, Military officer, Robotic technician	Describe how forces arise as an interaction between two objects Measure forces using a newton meter and record values. Identify where friction is useful and not useful Describe that mass is matter we are made from and measured in Kg or g. Describe that weight is a force and is measured in Newton's. Explain what happens to bonds when objects are squashed or stretched. Describe the Force vs Extension as a Linear relationship.	*Reading/Scientist Literacy skills on Robert Hooke* *Community link to Sir Isaac Newton*

	Links between Units: Enables students to make the link between energy and forces If a force moves something work is done, that's just another way of saying energy is being transferred. Indeed, every energy transfer is accompanied by some force							
Spring Term 1 & 2 January – March	**Energy**	How does energy make things happen? Energy stores and transfers)	This Physics topic will introduce energy. This topic will allow students to understand how energy makes things happen when it is transferred from one object/material to another. It is a huge building block that provides basic knowledge for more advanced learning later in their school career. The topic provides cross curricular links such as Biology (energy in food), Citizenship (energy and cost), Students will gain insight into careers that link with the topics being taught, such as a gas network engineer, radiographer, process operator and wind turbine technician. Scientific skills lessons will include planning a practical, so students can work on these skills across different Sciences and topics. A community link lesson will be taught, looking at renewable energy in our community as renewable energy has a strong community link to North East Lincolnshire.	**<u>Make and record observations and measurements using a range of methods.</u>** **<u>Describe the method used.</u>** Drawing results tables Taking measurements Graphs Reading scientific articles Lab safety Using lab equipment	• Energy stores and transfers • Conduction • Insulation • Convection • Radiation • Energy resources • Power Stations • Renewable energy • Energy & Power • Cost of Energy	Engineer, power station technician, Renewable energy technician	Understand & describe how energy is stored Describe how energy is transferred by particles in conduction Describe how an insulator can reduce energy transfer. Describe how energy is transferred by particles in convection Explain how energy is transferred by radiation Describe the difference between a renewable and a non-renewable energy resource Explain what efficiency is and why efficiency is important Describe the link between power, fuel use and the cost of using domestic appliances	*Reading/Scientist Literacy skills on James Prescott Joule* *Community link* NELinc is Renewable energy Hub & Myenergi
	Links between Units: Enables students to make the link between motion of the waves being due to the energy that the particles contain. Wave is a common term for a number of ways energy can be transferred e.g., electromagnetic waves can transfer energy through vibrations of electric and magnetic fields. Sound and water transfer energy through the vibration of particles							
Summer Term 1 & 2 April – July	**Radiation & Waves**	How have waves helped us to develop methods of communication?	This Physics topic will introduce light & sound. This topic will allow students to understand the difference between	**<u>Light:</u>** **<u>Make and record observations and measurements using a range of methods.</u>**	• Describe features of waves • Light & reflection	Engineering (camera systems, computer systems, software) Endoscopy, Radiographer, Medical imaging, Optic fibres	Describe the different types of waves and their features define a wave, describe features of a	*Describe how a microphone detects sound* *Through demonstration can*

			light waves and waves in matter, how waves travel and what happens to the waves on its journey, also why and how we detect sound. Students will understand why we see things before we can hear them, comparing the speed of light with the speed of sound. Students will understand how marine animals communicate with each other underwater by sound and how doctors use ultrasounds to look at babies in the womb. Students will also look at careers that link with the topics taught, such as music producer, Ear doctor (ENT), physiotherapist and doctor.	**Describe the method used.** **Sound:** **Concluding** Drawing results tables Taking measurements Graphs Reading scientific articles Lab safety Using lab equipment	• Light & refraction • The eye & the camera • Colour • Sound & energy transfer • Loudness 7 pitch • Detecting sound • Echoes & Ultrasound	(telecommunications), Telescopes and satellite technicians, TV and camera technicians, Meteorological science, Oceanography, Sound designer & mixer, acoustician, Audio engineer, Audiologist (medical), live sound engineer, game audio implementer, studio producer & engineer, Broadcasting, Sound design (collect edit and create sound effects) Video game sound engineer,	wave and properties of a wave. Describe how all waves: water, seismic or electromagnetic (including light) can reflect& refract Can use practical equipment to show the reflection of light in a mirror. Describe and explain what happens when light is refracted Describe how the eye works Explain what happens when light travels through a prism Describe how sound is produced Describe the link between loudness and amplitude frequency and pitch Describe how the ear works, what ultra sound is and what an echo is	*recall how a microphone works.*

IMPACT – What do we want students to know at the end of Year 7?

By the end of year 7 students should have a sound knowledge of Forces, Energy and Waves. Students should be able to apply knowledge from each key area to practical investigations which will help them throughout their KS3 and KS4 learning journey. Examples of this are Hooke's law – extension of a spring and Insulation – preventing energy transfer. Students should be able to explain with examples that forces affect objects in different ways and that those forces applied need energy to make the activity happen and that energy is also needed for waves to travel. Students should also have a basic understanding of the importance of key physics content like cause and effect and transfer of energy. Students will be formatively assessed through a range of methods including, but not limited to, the use of cold calling, mini whiteboards and end of unit assessments. The data gathered will be used to inform future planning of the curriculum and assessments.

IMPLEMENTATION - Year 8

Term	Unit Title	Unit Enquiry Question *Should be the basis of the entire unit, the thing that drives the unit.*	Intent *Purpose of the specific unit.*	Core Disciplinary (Skills) Knowledge Gained	Core Substantive (Content) Knowledge Gained	Careers Links	"Need to Know" *Core content required to be covered during this unit.*	"Neat to Know" *Things that would be good for students to know but not essential. Will not feature in assessments etc.*
Autumn Term 1 & 2 September – December	**Electricity**	Does electricity help us to develop technology?	The next topic of study in physics is electricity. Electricity teaches us about everyday tasks e.g., boiling a kettle as well as how electricity underpins everything, we do. Without the technological advances in technology due to electricity the world at work would be much more difficult and a lot less interesting. Students will be introduced to many careers throughout the topics such as electrical engineers (from your home to the NASA space station)	Variables – Control variables – what are kept the same. These are to ensure the experiment is <u>valid.</u> Drawing results tables Taking measurements Graphs Reading scientific articles Lab safety Using lab equipment	• Introduction to electricity • Charge • Current • Potential difference • Series 7 parallel circuits • Resistance • Magnetism • Electromagnets	Electrical engineer, Aeronautical engineer, electronics engineer, computer science, power plant operator, electrical installation in a variety of settings.	The difference between conductors and insulators in terms of moving electrons. How objects interact with an electric field Define current, charge and potential difference Draw and label circuit diagrams, both series and parallel and state how current potential difference and resistance change Practically investigate resistance of a wire. Describe how magnetic fields interact and how an electromagnet is made.	Making a motor Flemings LHR Scientists - literacy on Michael Faraday & Nikola Tesla
	Links between Units: enable students to see that electricity can be used in space e.g., Electric charges and magnets are manifestations of certain types of matter, most particularly electrons. Since matter carries energy (via Einstein's famous relation that energy is mass times the speed of light squared), such objects will have a **gravitational field**.							
Spring Term 1 & 2 January – March	**Space**	Where did life begin?	The next topic of study in physics is space. This topic helps students understand that theories develop over time and that they have to be constantly review to consider new evidence and ideas. Student s will observe the wonders of the Universe to include our galaxy 'The Milky Way, our Solar System	Taking measurements Reading scientific articles	• The Universe • The solar System • The earth • The moon	Astronomer, Astrophysicist, Cosmologist, Photon physicist, Astronaut Meteorologist, telescope engineer	Describe the structure of the Universe and what can be found inside it. Explain and describe our galaxy the 'Milky Way'. Name objects in the Solar system including similarities and differences between the planets of the Solar system. State how the Solar System was formed. Explain the motion of the Sun, Moon and	*Reading/Scientist Literacy skills on Carl Sagan* *community link astronomy* *black holes*

			and everything that is contained in side it. Student will spend time considering events on Our planet Earth such as changing seasons and the phases of the Moon. During their scientific enquiry they will be introduced to careers such as astronomy and cosmology.				stars across the night sky. Describe the phases of the Moon.	
	Links between Units: Enables students to see the difference between pressure in solids liquids and gases and how in the vacuum of space there are no particles and astronauts have to take this into consideration for space exploration							
Summer Term 1 & 2 April – July	**Motion & Pressure**	Does the motion of an object affect everyday life?	This Physics topic looks at motion and pressure. This topic looks at speed and motion graphs, acceleration, pressure in liquids and solids. The topic provides cross curricular links such as Chemistry (particles), Maths (analysing graphs, calculations) and English (literacy skills developed using the QWC longer answer questions). Extra lessons within the Physics discipline have a heavy focus on developing numeracy skills.	**<u>Make and record observations and measurements using a range of methods. Describe the method used.</u>** **<u>Concluding</u>** Drawing results tables Taking measurements Graphs Reading scientific articles Lab safety Using lab equipment	• Kinetic energy • Speed • Distance Time Graphs • Acceleration • Pressure in gases • Pressure in solids • Pressure in liquids • Turning forces	Games programming, Avionics engineer, Mechanical engineer, Computer programmer, Military officer, Robotic technician	Describe & calculate kinetic energy Interpret distance time and speed time graphs Practically investigate speed and acceleration Describe factors that affect pressure in gas liquid and solids. Describe moments (turning forces) and use simple examples to demonstrate this	*Reading/Scientist Literacy skills on Blaise Pascal* *Community link Road safety* *Light gates*

IMPACT – What do we want students to know at the end of Year 8?

By the end of year 8 students should have built on the knowledge they gained in year 7. Students have used many different methods of scientific inquiry to approach tasks and they will build on these and develop even further. Students will learn that are many approaches to answer questions and they should be more critical in their analysis and further deepen their concluding and evaluating skills. Students will have gained a sound knowledge of electricity, space and motion & pressure. Students should be able to apply knowledge from each key area to practical investigations which will help them throughout their KS3 and KS4 learning journey. Examples of this are Ohm's law – resistance and Speed – road safety. Students should be able to explain with examples how electricity travels and how it is importantly linked to so many of the everyday activities we do on earth and out in space. Students will be formatively assessed through a range of methods including, but not limited to, the use of cold calling, mini whiteboards and end of unit assessments. The data gathered will be used to inform future planning of the curriculum and assessments.

IMPLEMENTATION - Year 9

Term	Unit Title	Unit Enquiry Question *Should be the basis of the entire unit, the thing that drives the unit.*	Intent *Purpose of the specific unit.*	Core Disciplinary (Skills) Knowledge Gained	Core Substantive (Content) Knowledge Gained	Careers Links	"Need to Know" *Core content required to be covered during this unit.*	"Neat to Know" *Things that would be good for students to know but not essential. Will not feature in assessments etc.*
Autumn Term 1 & 2 September – December	**Waves**	Do Waves help us communicate?	The continuation of the wave's topic helps us build on and develop the skills gained in year 7. This offers a comprehensive look at the waves of the electromagnetic spectrum and how they behave. Waves are an integral part of our daily lives and we function only because of them. Students are educated about the advantages and disadvantages of the technology that has been developed because of waves and are given the opportunity to make decisions about owning such technology.	Drawing results tables Taking measurements Graphs Reading scientific articles Lab safety Using lab equipment	• What is a wave and properties? • The wave equation • Practically assessed grades • Reflection and refraction in water • The electromagnetic spectrum • Functions of specific waves • Atomic structure and ionisation	Engineering (camera systems, computer systems, software) Endoscopy, Radiographer, Medical imaging, Optic fibres (telecommunications), Telescopes and satellite technicians, TV and camera technicians, Meteorological science, Oceanography,	Describe the different types of waves (transverse & longitudinal) and their properties Recall and use the equation wave speed = wavelength x frequency Describe evidence that for both ripples on water surfaces and sound waves in air, it is the wave and not the water or air itself that travels Describe the main groupings of the electromagnetic spectrum – radio, microwave, infrared, visible (red to violet), ultraviolet, X-rays and gamma rays, that these range from long to short wavelengths, from low to high frequencies, and from low to high energies. Recall that in each atom its electrons are arranged at different distances from the nucleus, that such arrangements may change with absorption or emission of electromagnetic radiation, and that atoms can become ions by loss of outer electrons	Case study Community link reading task Scientist research - Galileo
	Links between Units: Creates the link between general properties of waves and wave types so a differentiation can be made between light and sound							

Spring Term 1 & 2 January – March	**Light & Sound**	Do waves help us communicate?	The continuation of the wave's topic helps us build on and develop the skills gained in year. Continuing on from waves students are taught about how waves behave when they meet different surfaces. Through practical application students can see first-hand how real-life application comes from experimental work in the lab. Students are given every opportunity to learn these skills with a view to future employment.	Drawing results tables Taking measurements Graphs Reading scientific articles Lab safety Using lab equipment	• Amplitude, wavelength, frequency • Longitudinal & transverse waves • Reflection • Refraction • Dispersion • Sound	Sound designer & mixer, acoustician, Audio engineer, Audiologist (medical), live sound engineer, game audio implementer, studio producer & engineer, Broadcasting, Sound design (collect edit and create sound effects) Video game sound engineer,	Describe wave motion in terms of amplitude, wavelength & frequency. Recall and use the wave speed equation Describe the difference between transverse and longitudinal waves Practically investigate the reflection, refraction and dispersion of light. Describe the effects of transmission, and absorption of waves at material interfaces show how changes, in speed, frequency and wavelength, in transmission of sound waves from one medium to another, are inter-related	Community link – audiology department reading task Literacy - Emily Lazar - Specialty: Mastering Engineer
	Links between Units: Enables students to make the link between waves such as light, water and sound and how they can be distributed to the world using electricity and distribution. **Waves contain kinetic energy**. By using turbines, the kinetic energy of waves can be transferred into electrical energy. Wave power does not use up any fuels and so it is a great source of clean, renewable energy source.							
Summer Term 1 & 2 April – July	**Electricity & Distribution**	Is the everyday world a consequence of electrical charge?	The continuation of the electricity topic helps us build on and develop the skills gained in year 8. This topic will follow on from waves and Climate change. It will allow students to see how energy is generated and distributed across the UK. It is of paramount importance that students understand not only how much energy is used but also how it is wasted. In the future they will have to be prepared for managing their own energy bills and during this topic they will be educated how to do this. Renewable energy plays a large part in North east Lincolnshire and	Drawing results tables Taking measurements Graphs Reading scientific articles Lab safety Using lab equipment	• Energy stores & transfers • Energy 7 power • Cost of energy • Conduction, convection & radiation • Efficiency • Insulation • Power stations • Renewable energy • The National grid • Transformers • Wiring a plug	Electrical engineer, Renewable energy technician, Energy advisor, Renewable energy land scout, Power station, Project engineer, Mechanical fitter	Describe how energy in chemical stores in batteries, or in fuels at the power station, doing work on domestic devices Describe how energy is transferred by an electric current. Calculate the cost of energy supplied by electricity given the power rating, the time and the cost per kWh Use data to calculate the efficiency of various energy transfers. Describe, with examples system changes, where energy is dissipated, so that it is stored in less useful ways Explain ways of reducing unwanted energy transfer	Community link – research task on local energy company Literacy task - Thomas Young, William Rankine, James Prescott Joule

			provides many jobs opportunities. Students can see how renewable energy will potentially change their future and will allow them to make decisions about what they want our future world to look like.				Describe the main energy resources (including fossil fuels, nuclear fuel, biofuel, wind, hydroelectricity, the tides and the Sun) Recall that, in the National Grid, transformers are used to transfer electrical power Recall the differences in function between the live, neutral and earth mains wires	

IMPACT – What do we want students to know at the end of Year 9?

By the end of year 9 students should have built on the knowledge they gained in year 7 and 8. At the end of year 9 the quality and variety of language that students hear and speak are key factors in developing their scientific vocabulary and articulating scientific concepts clearly and precisely. Students have now developed further objectivity and concern for accuracy, precision, repeatability and reproducibility. As well as understand that scientific methods and theories develop as earlier explanations are modified to take account of new evidence and ideas, together with the importance of publishing results and peer review. This will prepare students for the complexity of KS4 and the application elements within the physics specification. Students will be formatively assessed through a range of methods including, but not limited to, the use of cold calling, mini whiteboards and end of unit assessments. The data gathered will be used to inform future planning of the curriculum and assessments.

LINKS – How does our curriculum link between the year groups?

Should already be in place on the key themes document requested by EHJ last year for website.

Key Theme	Year 7	Year 8	Year 9	Years 10 & 11 (GCSE)
How Science Works	Understand that scientific methods and theories will develop as earlier explanations are modified to take account new evidence and ideas.	Understand that scientific methods and theories will develop as earlier explanations are modified to take account new evidence and ideas together with the importance of publishing results and peer review	Understand that scientific methods and theories will develop as earlier explanations are modified to take account new evidence and ideas with the importance of publishing results and peer review can influence the credibility of a theory or discovery.	Students will build upon their KS3 knowledge and understand the ways in which scientific methods and theories develop over time. By using a variety of concepts and models to develop scientific explanations and understanding. Students will be appreciating the power and limitations of science and considering ethical issues which may arise. As well as explaining every day and technological applications of science; evaluating associated personal, social, economic and environmental implications; and making decisions based on the evaluation of evidence and arguments.
Forces & Motion	Physics will focus on forces and motion; specifically at forces as pushes or pulls and the interaction between two objects. They will spend time doing practical skills that will help them understand how objects deform, stretch and squash. Numeracy and literacy skills will play a big part in science this term, as well as leadership, teamwork, resilience that will be required throughout tasks, which will include but not be limited to; practical work, QWC tasks, then problem solving and independent tasks.	Physics will focus on speed, acceleration, pressure and turning forces. Students will explore Newton's laws and observe how objects interact to cause a change. Students will be able to build links with citizenship for road safety as well as maths when interpreting motion graphs and completing calculations.	Students will learn the importance of magnets and electromagnets. How they are used in nearly all modern technology. They will develop an understanding of how electricity works and what we need to do to ensure it's used safely. Maths's skills to calculate force and motion. Rearranging equations Converting units Students will compare, evaluate and analyse data. Act upon feedback and make appropriate changes to their work. Develop and use specific vocabulary	Students will build upon their KS3 knowledge moving forward their ideas from statements to detailed explanations, descriptions, conclusions and evaluations. Students will develop their ideas on forces and become more confident and secure in their understanding. Students will continue to see forces as pushes and pulls but will develop this into better ways of presenting data such as force vector diagrams and motion graphs. Higher level mathematical skills will be used to show gradient work and higher-level calculations
Energy	Students will learn the importance of energy changes and transfers. How they are used in nearly all modern technology. They will develop an understanding of how energy is used in the home and how much it costs. Maths's skills to calculate energy transfers. Rearranging equations Converting units Skills such as leadership, teamwork and resilience will be required throughout tasks included but not limited to: practical work, QWC tasks, problem solving and independent work. Numeracy and literacy skills will also be included in this part of the course.	Physics will focus on Energy in food and how energy can affect temperature Physics will focus on methods of transferring energy including conduction, convection and radiation, then moving on to look at different energy sources. Physics will focus on energy, then moving on to scalars and vectors, speed and motion graphs.	Students will learn about how to reduce energy loss in the home as well as looking at alternative sources of energy and electricity. They will go on to research and learn about how we can make our energy sustainable and more affordable to help save the planet. Through looking at energy costs students will also need to think about economic impacts on families and companies. Students will focus on renewable and non-renewable methods of generating electricity. They will go on to research and learn about how we can make our energy sustainable and more affordable to help save the planet. Through looking at energy costs students will also need to think about economic impacts on families and companies.	Students will build on their knowledge of energy. They will development scientific ideas to show how energy usage has changed up to present day. Students will explain how much energy is needed to change the state of an object. This will include energy transfers in solids liquids and gases. Also why is it important to be able to calculate the density of an object and look at real world scenarios. This can then be linked back to the wave's topic (e.g., Global warming) and how the calorific content can be used to show energy in food
Radiation and Waves	Physics will look predominantly at light and sound waves. This will include the reflection, refraction and dispersion of light through different mediums and how different materials alter the light that passes through. It will also include the eye, colour and how a pinhole camera works.	Students will spend time here studying our Universe and what it contains e.g. our sun as a star, other stars in our galaxy, other galaxies. Students will use maths's skills and equations such as	This offers a comprehensive look at the waves of the electromagnetic spectrum. Students will analyse information on the purpose and function of the electromagnetic spectrum. This will include information on the function of the waves individually to include climate change, the ozone layer and general uses of the electromagnetic	Students will build upon their KS3 knowledge moving forward their ideas from statements to detailed explanations, descriptions, conclusions and evaluations Students will develop their ideas on waves and become more confident and secure in their understanding of the electromagnetic spectrum.

	Physics will also focus on sound and how it travels. Practical work will be a key focus in this unit and this will allow students to develop the key skills like leadership and teamwork, alongside resilience and organisational skills.	weight = mass x gravitational field strength (g), on Earth g=10 N/kg, to show differences between planets and stars. Students will make qualitative judgements on gravity forces between Earth and Moon, and between Earth and sun This will include developmental tasks where students add to work on a weekly basis	spectrum both in everyday life and in the medical sector. Students will compare properties and evaluate and analyse data. Students will learn to evaluate the limitations of scientific models, act upon feedback and make appropriate changes to their work. Students will develop specific physics vocabulary and use maths skills to use and rearrange equations.	This will be specific to uses, dangers, emission and detection as well as having a secure knowledge of the waves individually. E.g., how an Xray machine works and how radio waves are communicated over distances.
Radioactivity	Before radioactivity can be learnt students must first learn the fundamental knowledge behind the atom. In subsequent years this knowledge will be built upon to understand why some elements are radioactive.	An introduction to nuclear power and the production of waste gives students the first insight into ionising radiation and the problems associated alongside this.	They will consider the social, environmental and ethical implications of nuclear power. They will also explore the range of uses of nuclear radiation and relate these to industry. Students will focus on this non-renewable method of generating electricity and the impact this has in the UK. They will go on to research and learn about how we can use nuclear power as a stop gap whilst we work out how to make our energy sustainable and more affordable to help save the planet. Through looking at energy costs students will also need to think about economic impacts on families and companies.	Students will learn about the phenomena of radioactivity, the various changes that take place inside of the nucleus of a radioisotope. Students will consider the risks associated with nuclear radiation and measures that can be taken to reduce this risk. Students will focus on the practical uses of radioactive materials. How they are used and the risks and benefits involved They will consider the social, environmental and ethical implications of nuclear power and nuclear weapons. They will also explore the range of uses of nuclear radiation and relate these to industry and medicine. Separate science students will focus on nuclear fission and nuclear fusion.

ONE PAGE SUMMARIES – How will each unit look like?

Each unit will have a one-page summary which will be used to focus planning of the unit, planning of individual lessons and the delivery of these lessons. These summaries will be used by all members of the department to understand the required content and think rigorously about their planning and practice.

Lots of this can be taken from earlier on in the document but some will need to be created from scratch or taken from own SoW documents.

YEAR: TIME:	UNIT TITLE:	ENQUIRY QUESTION:
	AIMS OF THIS UNIT (SUBSTANTIVE KNOWLEDGE):	

LINKS			
HOW DOES THIS LINK TO OUR LAST UNIT?		HOW DOES THIS LINK TO THE NEXT UNIT?	

TITLE OF LESSON										
LESSON AIM(S)										
KEY FEATURES OF LESSON										
ASSESSMENT OPPORTUNITIES										

KEY SKILLS (DISCIPLINARY KNOWLEDGE)	CAREERS OPPORTUNITIES	TIER 2 & 3 VOCABULARY	STRETCH AND CHALLENGE OPPORTUNITIES	QUESTIONS TO CONSIDER WHEN PLANNING AND DELIVERING EACH LESSON

				• **INTENT:**
				  ○ **What is the intention of this lesson?**
				  ○ **How does this lesson build on from the previous lesson?**
				  ○ **How does this lesson link to the forthcoming lesson?**
				  ○ **How does this lesson link to forthcoming topics in this Key Stage and the forthcoming Key Stages?**
				  ○ **Why is this being taught now?**
				  ○ **Why is this being taught in the way it is?**
				• **IMPLEMENTATION:**
				  ○ **Is tier 3 vocabulary being effectively taught in this lesson?**
				  ○ **How can I effectively assess students within this lesson?**
				  ○ **Are students recalling prior knowledge effectively?**
				  ○ **Is the right level of support being given for all students?**
				  ○ **Are students being pushed enough in this lesson?**
				  ○ **Are misconceptions prompted, prevented and/or addressed effectively?**
				• **IMPACT:**
				  ○ **How will I know students have achieved the aims of the lesson?**
				  ○ **Do students have the opportunity to develop their personal knowledge?**
				  ○ **What skills will students develop during this lesson?**