Curriculum Map

Subject: Triple Science – Physics (GCSE Physics only topics are in RED) **Year Group: 11**

	Autumn 1/Autumn 2	Autumn 2	Autumn 2/Spring 1	Spring 2	Summer
Content	**1 Review of Year 10 topics** **2 Conservation of Energy** Energy stores and systems -Changes in energy -Energy changes in systems -Power -Conservation and dissipation of energy -Efficiency Review of Year 10 topics	**Electric Circuits** 3.circuit symbols and diagrams 4. series circuits 5. parallel circuits 6. Electric current 7. Potential difference and resistance 8. Resistance RP 9. Resistors in series and parallel RP 10. Thermistors and LDR's 11.IV characteristics RP Ch4 Electric Circuits Static Electricity Charging by friction The force between two charged objects Non-Contact forces	**1 Electricity at Home** The difference between alternating current and direct current What is meant by the live wire and the neutral wire in a mains circuit The colours of live, neutral and mains circuits fuses **2 Radioactivity** 1.The discovery of the nucleus 2. Discovery of protons, neutrons and electrons 3. Alpha, Beta and Gamma 4. Activity and half-life 5 Nuclear issues Ch6 Radioactivity Nuclear Radiation in Medicine What radioactive isotopes are used for in medicine What type of nuclear radiation can be used for medical imaging How to use radioactivity to destroy cancer cells Nuclear fission The difference between spontaneous and induced fission What a chain reaction is	**Electromagnetism** 1.Permanent and induced magnetism, magnetic forces and fields 2.Magnetic fields 3.Electromagnetism 4.Fleming's left-hand rule 5.Electric motors Ch15 Electromagnetism Applications of electromagnetism in devices The generator effect Solenoid rule Simple AC generators Simple DC generators (dynamos) Transformers Transformers and the National Grid Ch16 Space Formation of the Solar System Protostars and stars The stability of the Sun Life history of stars Planets, staellites and orbits The expanding universe Redshift The beginning of the universe The future of the universe	**Review and Revise**

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			What nuclear fusion is How nuclei can be made to fuse together Where the sun's energy comes from Safety issues surrounding nuclear fission and radioactivity		
Skills		Equation application 1.Recall and apply equations for; charge flow, Ohm's Law, resistance in series and parallel circuits, power, energy transferred. Practical Experiments 1.To determine how length of a wire affects its resistance 2.to investigate the effect of adding resistors in series and parallel 3.to investigate the IV characteristics of some devices. Ch4 Electric Circuits Apply understanding of atomic structure to explain what is transferred when objects become charged Practical investigation – the forces between two charged objects	Equation application 1. Students should be able to calculate alpha decay and beta decay 2.Students should be able to calculate half-life of a substance Ch7 Radioactivity Identify the factors involved in choosing which radioactive isotope to use for a particular job Compare different types of medical scan and assess the risks and benefits of each Compare spontaneous and induced fission Make informed judgements about the future of nuclear fission and nuclear fusion Analyse safety issues surrounding the whole nuclear topic	Equation application 1.Students should be able to apply the equation for force = magnetic flux density × current × length 2.students should be able to calculate the ratio of the potential differences across the primary and secondary coils of a transformer Vp and Vs depends on the ratio of the number of turns on each coil, np and ns. Ch15 Electromagnets Investigate the strength of an electromagnet Work out how different devices that use electromagnets work Investigate simple generators How simple AC generators are made and how they work How simple DC generators are made and how they work Make a model transformer	

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				Use the transformer equation in calculations Calculate transformer efficiency Understand transformers and what they are used for Understand how transformers fit into the national grid Ch16 Space Identify different objects in space – planets, stars, satellites, meteors, galaxies etc Classify stars Predict the future of different types of stars Describe the orbits of satellites Gain insight into how people know that distant galaxies are moving away from the Earth Understand and use the Big Bang theory Assess the evidence that the universe was created in a Big Bang	
Key questions	In which ways can energy be stored? How is energy stored and transferred? What is conservation of energy? What is 'work' in physics, how is it related to energy	What is an electric current? What is potential difference and what is resistance? How are series circuits and parallel circuits different?	What is the difference between direct current and alternating current? What is the National Grid? How do you wire a plug? What is the relationship between power and energy?	What is induced magnetism? What is an electromagnet? What is the motor effect? Ch15 Electromagnets What can electromagnets be used for?	

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	and how can it be calculated? What is useful energy, what is wasted energy, and how is energy dissipated? How is efficiency calculated? What is power and how is it calculated?	What are the characteristics of different circuit components? Ch4 Electric Circuits Statics What happens when two insulating materials are rubbed together? What is transferred when objects become charged? What happens when charges are brought together?	How can we apply our understanding of efficiency to the home? What are radioactive sources? What are the different types of radiation and what are their properties? How was the nuclear model of the atom established and accepted? What happens during radioactive decay? What uses and what dangers do radioactive substances have? What is half life and how can it be determined? Ch7 Radioactivity What types of nuclear radiation can be used for medical imaging? How can they reduce the risks associated with radioactive isotopes in medical imaging? How can a chain reaction be controlled in a nuclear reactor? Where does the sun's energy come from? What future might nuclear fission and nuclear fusion have?	How do devices that use electromagnets work? What is meant by magnetic flux density? How can you induce a potential difference in a wire? How can you deduce the direction of an induced current? How does the induced potential difference of an AC generator vary over time? Why do transformers only work with AC? Why are transformers never 100% efficient? Ch16 How was the Solar System formed? How is energy released by the Sun? Why do stars become unstable? What happens to stars, including the Sun? How do planets and satellites stay in orbit? What is the evidence for the Big Bang? Why do people think the universe is expanding? What possible futures are there for the universe?	

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Assessment	Formative 'low stakes' assessments to take place more frequently throughout the term. This could be in the form of a range methods: Quiz Homework task Microsoft Forms short tests In class short tests Questions and answer sessions Spelling tests Group work tasks Peer assessments Literacy and numeracy activities End of term summative assessments PPE		Formative 'low stakes' assessments to take place more frequently throughout the term. This could be in the form of a range methods: Quiz Homework task Microsoft Forms short tests In class short tests Questions and answer sessions Spelling tests Group work tasks Peer assessments Literacy and numeracy activities End of term summative assessments PPE		
Literacy/ Numeracy/ SMSC/ Character	Using scientific models to explain physical phenomena. Applying scientific understanding to real world examples. Using scientific equations to carry out calculations. Plotting graphs and bar charts. Interpreting data presented graphically.		Using scientific models to explain physical phenomena. Applying scientific understanding to real world examples. Using scientific equations to carry out calculations. Plotting graphs and bar charts. Interpreting data presented graphically. Using standard form confidently.		Using past exam papers to develop exam technique. Learning to correct common mistakes in written work and in calculations. Writing out all of your working in calculations.