

Curriculum Map

Subject: KS4 Physics

Year 9	Infinity and Beyond (Sept – early Nov)	Particle Particulars (Nov – Jan)	The Force Awakens (Jan – May)	Surfing the Waves (May – July)
Content- WHAT will be learned? What previous learning can be linked? Why this order/ sequence ?	Builds on space knowledge from KS3. Good starting topic for GCSE – gets them engaged and provides opportunity to build in lots of work on skills needed. This unit introduces 2 key areas of triple content <ul style="list-style-type: none"> • Life Cycle of stars • The Big Bang The rest of the unit covers some key physical concepts, forces, density etc through the topic of space	Builds on knowledge from KS3 and has simpler concepts than some of our other units, so a good year 9 topic. Structure of matter Density (req prac) Pressure and temperature Latent heat <i>Pressure and Volume (T)</i>	This is the first half of the forces topic, which is the largest topic we cover at GCSE. This unit covers just over half of it, allowing opportunities for retrieval practise when we teach the second half. Good unit to really focus in on the maths skills needed. Speed and Velocity Graphs of motions Acceleration Terminal velocity F= ma (req prac) Stopping distance Momentum <i>Newtons Laws (T)</i> <i>Conservation of momentum (T)</i> <i>Car safety (T)</i>	This follows on really nicely from a year 8 unit we do, so putting it in year 9 means students can still recall the work done on it. Wave Properties Wave speed (req prac) Standing wave (req prac) Reflection and refraction EM waves Radiation and danger Cooking with waves <i>Leslie Cube (req prac)</i>
Skills- What will be developed?	Data analysis. Applying knowledge to 6 mark questions – focus on more straightforward recall 6 markers as it's the first GCSE unit.	First required practical we look at – cover skills to do with this and how to answer exam questions on these.	Real focus on the maths skills in this unit and building up unit conversions.	Lots of required practicals in this topic, so building on skills around these – variables, repeats, methods, etc
Key 'How'/'Why' Questions- What powerful knowledge will be gained? What areas/themes/concepts will be explored?	Students look a lot at how ideas change over time and our understanding can only be based on the evidence we currently have.	An understanding of solids, liquids and gases – this can then be built on in later topics.	Understanding of the difference between scalars and vectors. Knowing what forces are and how they affect objects they act on. Understanding of how to use and manipulate equations – this gets used a lot throughout GCSE.	Knowledge of wave properties and being able to apply these to different situations.
SEND- how will support be seen? Seating plans? Simplified questions?	Keyword box for each lesson, glossary pages for each unit, knowledge organisers in booklet, scaffolded tasks and sentence starters where appropriate. Questions progress in difficulty through the course of a lesson.	Keyword box for each lesson, glossary pages for each unit, knowledge organisers in booklet, scaffolded tasks and sentence starters where appropriate. Questions progress in difficulty through the course of a lesson.	Keyword box for each lesson, glossary pages for each unit, knowledge organisers in booklet, scaffolded tasks and sentence starters where appropriate. Questions progress in difficulty through the course of a lesson.	Keyword box for each lesson, glossary pages for each unit, knowledge organisers in booklet, scaffolded tasks and sentence starters where appropriate. Questions progress in difficulty through the course of a lesson.
Assessment- What? Why? Progress checks are formative and assessments are summative	Mid unit 12 mark assessment to formally check understanding. 25 mark end of unit test to assess understanding of the whole unit. Formative assessments are built in throughout, to check understanding before moving on.	25 mark end of unit test to assess understanding of the whole unit. Formative assessments are built in throughout, to check understanding before moving on.	Mid unit 12 mark assessment to formally check understanding. 25 mark end of unit test to assess understanding of the whole unit. Formative assessments are built in throughout, to check understanding before moving on.	Mid unit 12 mark assessment to formally check understanding. 25 mark end of unit test to assess understanding of the whole unit. Formative assessments are built in throughout, to check understanding before moving on.
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Literacy - reading, extended accurate writing and oracy opportunities	Work around life cycle of a star – booklet of information to extract key parts from Opportunities for extended writing in lessons on manned/unmanned space mission, extinction of the dinosaurs and life cycle of stars	Extended writing opportunity when studying density – focus on what a detailed written method looks like	Reading and following a detailed method. Extended writing opportunity when studying $f=ma$ practical – detailed method writing. Momentum work has a focus on extended writing – use of keywords and how to structure these answers. Car safety provides opportunity for extended writing.	Extended writing opportunities for wave properties and all 3 required practicals.
Numeracy /computing skills	Analysing tables of data and using this to support your answers	Use of equations, unit conversion, decimal places	Lots of numeracy – use of equations, unit conversion, significant figures, standard form, decimal places – features in lots of these lessons.	Use of equations, unit conversion, significant figures, standard form, decimal places. Data analysis.
Character development	Respectfully looking at how ideas change over time and might be proven wrong. Mention how some of what we think know could turn out to be wrong in the future.		Respectfully and compassionately talking about car safety and the rules around driving.	
Equality /Diversity opportunities	Look at previous models of the solar system/ideas about space and how different cultures had different ideas			When introducing radioactivity as part of the EM spectrum, mention Marie Curie and her contributions
Homework /Independent learning	Homework starts as fact finding homework and moves on to retrieval based homework later in the topic.	Homework focuses on retrieval, going back to topics previously covered.	Homework focuses on retrieval, going back to topics previously covered.	Homework focuses on retrieval, going back to topics previously covered.
CIAG coverage/links	Links to how technological advancement has allowed for further research into space		Lots of references to how science can be used in industry – e.g. testing car safety	When covering the EM spectrum we talk about what different waves are used for and refer to a number of industries.

Year 10	Jimmy Neutron (Sept – Oct)	Current Affairs (Oct – Feb)	The Flash (March – June)	Waves (June-July) Triple Only
Content- WHAT will be learned? What previous learning can be linked? Why this order/ sequence ?	Builds nicely on content covered in chemistry in year 9 and the radioactivity concept introduced in physics at the end of year 9. Structure of an atom Atomic models Radioactive decay Alpha, beta, gamma Half lives Contamination Fission (T) Fusion (T)	Builds nicely on the electricity work students did at KS3. Another topic with a heavy focus on maths skills – good preparation for the next topic. Circuits V=IR (req prac) Series circuits Parallel circuits Mains electricity Power National grid Static Electricity (T)	One of the more challenging topics covered at GCSE – we build up maths skills ready for this unit. Energy Transfers GPE and KE EPE SHC (req prac) Power Insulation (req prac) (T) Efficiency Energy Resources	Only covered by students doing triple, in place of revision time. Also means these students have a faster pace. Put at the end of year 10 as it has some trickier concept. Lenses (T) Colour (T) Black Bodies (T) Sound and ultrasound (T)
Skills- What will be developed?	Focus on applying information to the question. Calculating half-life is a new skill, which gets a lot of focus.	Drawing circuit symbols and combining them to form a circuit diagram. Lots of work on maths skills – rearranging equations, standard form, unit conversions. Practical skills get a lot of focus in this topic, with lots of opportunity to build circuits.	Lots of work on maths skills – rearranging equations, standard form, unit conversions. Focus on multistage calculations.	Using graphs and tables to get information.
Key 'How'/'Why' Questions- What powerful knowledge will be gained? What areas/themes/concepts will be explored?	Revising powerful knowledge around the structure of an atom, previously gained in chemistry. Introducing what radioactivity actually is and what radioactive decay means.	Circuit building and circuit diagram drawing is a key skill, which gets referred back to frequently.	Important concept of energy stores and conservation of energy. Maths skills and developing these is a key concept for this topic and one which is useful throughout physics.	Key concept of how waves transfer energy – linked to the different areas in this topic.
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Literacy- reading, extended accurate writing and oracy opportunities	Reading – articles to read about Alexander Litvinenko. Lots of opportunities for extended writing in this topic as radiation is often a 6 mark question in our exam papers –	Some opportunities for extended writing around the required practical and the National Grid.	Reading – extracting information when studying energy resources.	

	these are woven in to the scheme of work.			
Numeracy/computing skills	Using graphs to answer questions. Calculations in terms of half-life.	Lots of numeracy – use of equations, unit conversion, significant figures, standard form, decimal places – features in lots of these lessons.	Lots of numeracy – use of equations, unit conversion, significant figures, standard form, decimal places – features in lots of these lessons.	Using graphs and tables to get information.
Character development	Respectful discussion around nuclear power – look at risks and events that have happened. Compassionate conversation around health problems which might require treating with radioactivity (e.g. treatment for cancer)		Respectful discussion around alternative energy resources.	Compassionate conversation around health problems which might require ultrasound.
Equality/Diversity opportunities	Talk about Marie Curie and her contributions to radioactivity research.		Alternative energy resources and environmental impact	Talk about eyesight and colour blindness.
Homework/Independent learning	Homework focuses on retrieval, going back to topics previously covered, including year 9 content.	Homework focuses on retrieval, going back to topics previously covered, including year 9 content.	Homework focuses on retrieval, going back to topics previously covered, including year 9 content.	Homework focuses on retrieval, going back to topics previously covered, including year 9 content.
CIAG coverage/links	Lots of references to jobs which use radioactivity in some way (nuclear power, medicine, etc)	References the National Grid and electricity generation.	Talk about energy resources and that research into battery technology is a big area of focus at the moment.	Links to being an optician.

Year 11	Resistance is Futile (Sept)	May the Force be With You (Oct-Dec)	Finding Faraday (Dec – Feb)
Content- WHAT will be learned? What previous learning can be linked? Why this order/ sequence ?	Short second half of the electricity topic. Good opportunity for retrieval in the run up to first set of mocks, while still covering new content. Characteristics of resistors Diodes, LDRs and Thermistors Potential Dividers V= IR part 2 Electric fields (T)	Second half of the forces topic, with opportunities for retrieval and the more challenging concepts included. Resultant forces Gravity and weight Work done F= kx (req prac) Acceleration part 2 Newtons third law Moments and levers (T) Pressure in a fluid (T) Atmospheric Pressure (T)	A topic which has vary amounts of content depending on which tier students are doing – most decisions around tier have been made by this point. Also allows more revision time for those with less content. Magnets Electromagnets Motor effect Generators (T) Uses of electromagnets (T) Transformers (T)
Skills- What will be developed?	Building on skills around circuit diagrams and circuit practicals gained previously. More work on numeracy skills.	Building on numeracy skills – using and rearranging equations, standard form, significant figures, etc.	Lots of work around vocabulary and the importance of it using it correctly.
Key ‘How’/‘Why’ Questions- What powerful knowledge will be gained? What areas/themes/concepts will be explored?	Building on previous powerful knowledge around circuit diagrams and how circuits work.	Building on previous powerful knowledge around knowing what forces are and how they affect objects they act on. Applying this to a wider range of situations.	Really important concept around Fleming’s Left Hand Rule and applying this to motors and generators. Applying the same ideas about electromagnets to a range of situations.
SEND- how will support be seen? Seating plans? Simplified questions?	Keyword box for each lesson, glossary pages for each unit, knowledge organisers in booklet, scaffolded tasks and sentence starters where appropriate. Questions progress in difficulty through the course of a lesson.	Keyword box for each lesson, glossary pages for each unit, knowledge organisers in booklet, scaffolded tasks and sentence starters where appropriate. Questions progress in difficulty through the course of a lesson.	Keyword box for each lesson, glossary pages for each unit, knowledge organisers in booklet, scaffolded tasks and sentence starters where appropriate. Questions progress in difficulty through the course of a lesson.
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Literacy- reading, extended accurate writing and oracy opportunities	Opportunity for extended writing around the required practical – have to be able to write a detailed method.	Opportunity for extended writing around the required practical – have to be able to write a detailed method.	Reading – uses of electromagnets. Opportunities for extended writing around how different uses work.
Numeracy/computing skills	Use of equations, unit conversion, significant figures, standard form, decimal places	Lots of numeracy – use of equations, unit conversion, significant figures, standard form, decimal places – features in lots of these lessons.	Use of an equation.

Character development		Respectful language used when talking about mass and weight and their definitions.	Resourceful – students are encouraged to think up all the ways we can use electromagnets and how it could be done.
Equality /Diversity opportunities		When talking about Newton’s Laws, there is an opportunity to talk about the fact other scientists don’t get the same recognition, even though they may have made equally important discoveries.	
Homework /Independent learning	Homework focuses on retrieval, going back to topics previously covered, including year 9 and 10 content.	Homework focuses on retrieval, going back to topics previously covered, including year 9 and 10 content.	Homework focuses on retrieval, going back to topics previously covered, including year 9 and 10 content.
CIAG coverage/links		Links to engineering – moments, pressure, etc.	Lots of mention of what electromagnets are used for and these links to different careers. More references to electricity generation.