MOOR PARK HIGH SCHOOL: CURRICULUM

Key Stage 4 Long Term Planning

Year 9 INTENT:

Faculty Area: Physics Single Science

Year 9	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
	AQA Physics Collins - Chapter 3 Particle model of matter		AQA Physics Collins - Chapter 4 Atomic Structure		AQA Physics Collins - Chapter 1 Energy	
Connections to prior learning	3.1.4 Pressure Investigate how pressure from your foot onto the ground varies with different footwear Pressure acts in a fluid in all directions. It increases with depth due to the increased weight of fluid, and results in an upthrust. Objects sink or float depending on whether the weight of the object is bigger or smaller than the upthrust. Different stresses on a solid object can be used to explain observations where objects scratch, sink into or break surfaces. Use the formula: fluid pressure, or stress on a surface = force (N)/area (m2). 3.5.1 Particle model Relate the features of the particle model to the properties of materials in different states Properties of solids, liquids and gases can be described in terms of particles in motion but with differences in the arrangement and movement of these same particles: closely spaced and vibrating (solid), in random motion but in contact (liquid), or in random motion and widely spaced (gas). Observations where substances change temperature or state can be described in terms of particles gaining or losing energy.		3.5.3 Periodic table Sort elements using chemical data and relate this to their position in the periodic table The elements in a group all react in a similar way and sometimes show a pattern in reactivity. As you go down a group and across a period the elements show patterns in physical properties. Metals are generally found on the left side of the table, non-metals on the right. Group 1 contains reactive metals called alkali metals. Group 7 contains non-metals called halogens. Group 0 contains unreactive gases called noble gases.		Compare the running costs of fluorescent and filament light bulbs We pay for our domestic electricity usage based on the amount of energy transferred. Electricity is generated by a combination of resources which each have advantages and disadvantages. Calculate the cost of home energy usage, using the formula: cost = power (kW) x time (hours) x price (per kWh). 3.3.2 Energy transfer Explain the energy transfers in a hand-crank torch We can describe how jobs get done using an energy model where energy is transferred from one store at the start to another at the end. When energy is transferred, the total is conserved, but some energy is dissipated, reducing the useful energy. 3.3.4 Heating and cooling Investigate how to prevent heat loss by conduction, convection and radiation The thermal energy of an object depends upon its mass, temperature and what it's made of. When there is a temperature difference, energy transfers from the hotter to the cooler object. Thermal energy is transferred through different pathways, by particles in conduction and	

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			convection, and by radiation.
Knowledge	Changes of state and the particle model Internal energy and energy transfers Particle model and pressure	Atomic structure Atoms and isotopes Atoms and radiation Hazards and uses of radioactive emissions and of background radiation Nuclear fission and fusion	Energy changes in a system, and the ways energy is stored before and after such changes Calculations to include kinetic energy, elastic potential energy and gravitational potential energy. Conservation and dissipation of energy
Skills	Make models of solids, liquids and gases Investigate the heating curve for water by heating some ice in a beaker Plan a practical to investigate the rate of heating of various metals using a joulemeter to determine the energy input.	Demonstrate the penetration of alpha, beta and gamma radiation. Link the penetration of each type of radiation to the nature of the radiation and the uses of the radioactive sources. Plan an experiment to determine the type of radiation emitted by an unknown radioactive source. Produce a risk assessment Produce a timeline to show how our ideas about atoms have changed since ancient Greek times. Research decontamination techniques for workers exposed to radioactive sources. Evaluate the use of the uranium-lead ratio to determine the age of rocks Investigate the causes of the Chernobyl and Fukushima nuclear disasters.	Plan and carry out an investigation to find the amount of energy transferred when various electrical appliances are in use. Compare the ways that different energy resources are used. The uses to include transport, electricity generation and heating. Write descriptions and explanations and present ideas Work critically with primary and secondary evidence Evaluate data and working methods. Research the different types of energy resources that are available to generate electricity.
Assessment	End of unit test for Chapter 3 Particle model of matter	End of unit test for Chapter 4 - Atomic Structure	End of unit test for Chapter 1 Energy
Homework	GCSE past paper exam questions Analysis / Evaluation of investigations Extended answer questions	GCSE past paper exam questions Analysis / Evaluation of investigations Extended answer questions	GCSE past paper exam questions Analysis / Evaluation of investigations Extended answer questions
Cultural enrichment including Trips, Visits, Experiences, Extra-curricular	**<u>School and University Network</u>** Trip 1-Health and Medicine Trip 2-Law and Business Trip 3-Media and Higher Education		
Literacy	Critically evaluate the models used to describe and explain the behaviour of solids, liquids and gases. Draw diagrams to show the particle arrangement of solids, liquids and gases. Research how the gas pressure in a submarine stops it	Research the types of food irradiated, and the sources of radiation used in this process. Justify the use of radioactive sources Use simple modelling techniques to show that the number of protons in an isotope of an element	Compare three of the machines investigated showing their similarities and differences and present the findings to the group. Evaluate the benefits and drawbacks of using lower power devices such as compact fluorescent lamps (CFLs).

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	from crushing at depth. Evaluate newspaper articles of local fires that have involved gas canisters exploding and the reasons for the explosion in terms of gas pressure. Keywords: Change in Thermal Energy, Chemical Changes, Condensation, Density, Evaporation, Freezing, Gas Temperature, Internal Energy, Latent Heat, Pascals, Physical Changes, Pressure, Capacity, Specific Latent Heat of Fusion, Specific Latent Heat, Sublimation	remains constant but the number of neutrons changes. Evaluate the use of different shielding materials for use when handling radioactive sources Evaluate the use of irradiating fruit in terms of cost of goods and potential risk due to the exposure of workers and consumers of the irradiation process Keywords: Activity, Alpha Particle, Atomic Number, *Background Radiation, Becquerel, Beta Particle, Bohr Model, *Chain Reaction, Count-Rate, Energy Levels, *Fission Products, Gamma Ray, Half-Life, Irradiation, Isotopes, Mass Number, Negative Ions, Neutrons, *Nuclear Explosions, *Nuclear Fission, *Nuclear Fusion, Nucleus, Plum Pudding Model, Positive Ions, Protons, Radioactive Contamination, Radioactive Decay, *Sieverts, *Spontaneous Fission,	Evaluate the use of various types of insulation in the home. Prepare a presentation on different types of light bulb Role-play a meeting between a group of local councillors/MPs, local environmental groups and electricity companies trying to get a new power station built. Ask students to explore questions such as: Why do the wheels of a bike get very hot when braking hard? Keywords: Energy, Closed System, Conservation of Energy, Efficiency, Elastic Potential Energy, Fossil Fuels, Gravitational Potential Energy, Joule, Kinetic Energy, Power, Renewable Energy Resource, Specific Heat Capacity, Spring Constant, System, Thermal Conductivity, Waste Energy, Watt, Work Done
Numeracy	Equation for density should be known. Evaluate data on the melting points and boiling points of different substances linked to the strength of the forces between the particles. Use temperature sensors/data loggers to record the temperature at fixed intervals, Equation for specific heat capacity should be known. Convert to SI units and use standard form in their answers Interpret a heating or cooling graph to explain what is happening at each stage of the graph. Rearrange the equation for pressure and volume	Calculate the size of an atom given the size of the nucleus and the scale of the nucleus compared to the atom. Produce a table showing the mass number, atomic number and number of neutrons for an element Calculate the mass number for a particular element given the number of protons and neutrons in the atom. Rearrange the equation to find number of protons or number of neutrons and the mass number. Nuclear decay equations Determination of half-life using calculations and graphical methods Convert quantities into SI units	Calculate the kinetic energy of a moving object, stored by a stretched spring and an object raised above ground level. Calculate elastic potential energy Calculate gravitational potential energy: Use calculations to show how the overall energy in a system is redistributed when the system is changed. Calculate the increase in stored energy when a substance is heated. Carry out calculations involving specific heat capacity Carry out calculations to determine power, using energy transferred divided by time and work done divided by time. Calculate the efficiency of a machine as either a decimal or a percentage. Rearrange the equation to determine the total power input the machine or the useful power output.
CIAG	What workplace skills does physics develop? Critical thinking: The ability to scrutinise information you're presented with is important not only for	What workplace skills does physics develop? Critical thinking: The ability to scrutinise information you're presented with is important not only for	What workplace skills does physics develop? Critical thinking: The ability to scrutinise information you're presented with is important not only for scientists

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	scientists but for lawyers, police, medics, journalists and more. Data analysis: From actuaries and financial advisors to social media specialists and market researchers, data analysis is one of the most sought after skills. Problem solving: Complex problem solving is vital for engineers, researchers, marketers, social workers, designers, and even customer service workers. Attention to detail: From nurses and scientists to accountants and writers, attention to detail is vital to carrying out many roles safely and effectively. Future Morph resources aim to show students that there is a wide choice of options open to those who study sciences	scientists but for lawyers, police, medics, journalists and more. Data analysis: From actuaries and financial advisors to social media specialists and market researchers, data analysis is one of the most sought after skills. Problem solving: Complex problem solving is vital for engineers, researchers, marketers, social workers, designers, and even customer service workers. Attention to detail: From nurses and scientists to accountants and writers, attention to detail is vital to carrying out many roles safely and effectively. NCW STEM lessons – where can science take you?	but for lawyers, police, medics, journalists and more. Data analysis: From actuaries and financial advisors to social media specialists and market researchers, data analysis is one of the most sought after skills. Problem solving: Complex problem solving is vital for engineers, researchers, marketers, social workers, designers, and even customer service workers. Attention to detail: From nurses and scientists to accountants and writers, attention to detail is vital to carrying out many roles safely and effectively. Future Morph Careers Quest-students quiz exhibitors at The Big Bang Fair about their chosen career, why they chose it and what it involves

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Key Stage 4 Long Term Planning

Year 10

Curriculum Area: Physics Single Science

Year 10	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Syllabus	AQA Physics Collins - Chapter 2 Electricity		AQA Physics Collins - Chapter 5 Forces		AQA Physics Collins - Chapter 6 Waves	
Connections to prior learning	3.2.1 Voltage and resistance Compare the voltage drop across resistors connected in series in a circuit We can model voltage as an electrical push from the battery, or the amount of energy per unit of charge transferred through the electrical pathway. In a series circuit, voltage is shared between each component. In a parallel circuit, voltage is the same across each loop. Components with resistance reduce the current flowing and shift energy to the surroundings. Calculate resistance using the formula: resistance (Ω) = potential difference (V) ÷ current (A). 3.2.2 Current Compare and explain current flow in different parts of a parallel circuit Current is a movement of electrons and is the same everywhere in a series circuit. Current divides between loops in a parallel circuit, combines when loops meet, lights up bulbs and makes components work. Around a charged object, the electric field affects other charged objects, causing them to be attracted or repelled. The field strength decreases with distance. Two similarly charged objects repel, two differently charged objects attract.		3.1.1 Speed Investigate variables that affect the speed of a toy car rolling down a slope If the overall, resultant force on an object is non-zero, its motion changes and it slows down, speeds up or changes direction. Use the formula: speed = distance (m)/time (s) or distance-time graphs, to calculate speed. A straight line on a distance-time graph shows constant speed, a curving line shows acceleration. Explain the way in which an astronaut's weight varies on a journey to the moon Mass and weight are different but related. Mass is a property of the object; weight depends upon mass but also on gravitational field strength. Every object exerts a gravitational force on every other object. The force increases with mass and decreases with distance. Gravity holds planets and moons in orbit around larger bodies. Use the formula: weight (N) = mass (kg) x gravitational field strength (N/kg). g on Earth = 10 N/kg. On the moon it is 1.6 N/kg. 3.1.3 Contact forces Investigate factors that affect the size of frictional or drag forces When the resultant force on an object is zero, it is in equilibrium and does not move, or remains at		3.4.1 Sound Relate changes in the shape of an oscilloscope trace to changes in pitch and volume Sound consists of vibrations which travel as a longitudinal wave through substances. The denser the medium, the faster sound travels. The greater the amplitude of the waveform, the louder the sound. The greater the frequency (and therefore the shorter the wavelength), the higher the pitch. Sound does not travel through a vacuum. 3.4.2 Light Use ray diagrams to model how light passes through lenses and transparent materials When a light ray meets a different medium, some of it is absorbed and some reflected. For a mirror, the angle of incidence equals the angle of reflection. The ray model can describe the formation of an image in a mirror and how objects appear different colours. When light enters a denser medium it bends towards the normal; when it enters a less dense medium it bends away from the normal. Refraction through lenses and prisms can be described using a ray diagram as a model. Construct ray diagrams to show how light reflects off mirrors, forms images and refracts.	

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		constant speed in a straight line. One effect of a force is to change an object's form, causing it to be stretched or compressed. In some materials, the change is proportional to the force applied. 3.3.3 Work Explain how an electric motor raising a weight is doing work Work is done and energy transferred when a force moves an object. The bigger the force or distance, the greater the work. Machines make work easier by reducing the force needed. Levers and pulleys do this by increasing the distance moved, and wheels reduce friction.	Light travels at 300 million metres per second in a vacuum. Different colours of light have different frequencies. The speed of sound in air is 330 m/s, a million times slower than light. 3.4.3 Wave effects Relate the impact of different types of waves on living cells to their frequency and the energy carried by the wave When a wave travels through a substance, particles move to and fro. Energy is transferred in the direction of movement of the wave. Waves of higher amplitude or higher frequency transfer more energy. 3.4.4 Wave properties Use the wave model to explain observations of the reflection, absorption and transmission of waves A physical model of a transverse wave demonstrates it moves from place to place, while the material it travels through does not, and describes the properties of speed, wavelength and reflection.
Knowledge	Current, potential difference and resistance Series and parallel circuits Domestic uses and safety Energy transfers Static electricity	Forces and their interactions Work done and energy transfer Forces and elasticity Moments, levers and gears Pressure and pressure differences in fluids Forces and motion Momentum	Waves in air, fluids and solids Electromagnetic waves Black body radiation
Skills	Construct circuit diagrams using standard symbols. Demonstrate models of electricity Draw a circuit that can be used to measure the current, voltage, resistance in a circuit	Draw vector diagrams for vectors where the size and direction of the arrow represents the size and direction of the vector. Investigate contact and non-contact forces. Research uses of springs in compression and in tension. Investigate the spring constants of springs in compression and in tension Draw distance – time graphs of a journey described by another Compare the accelerations of different vehicles.	Draw diagrams to show the features of transverse and longitudinal waves. Investigate the laws of reflection, refraction, diffraction

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		Draw force diagrams to show Newton's third law Creative writing: Produce a leaflet to encourage motorists to switch off mobile phones before driving. Presentation: Present an argument for or against the compulsory use of seat belt in cars.	
Assessment	End of unit test for chapter 2 - Electricity	End of unit test for Chapter 5 - Forces	End of unit test for Chapter 6 - Waves
Homework	GCSE past paper exam questions Analysis / Evaluation of investigations Extended answer questions	GCSE past paper exam questions Analysis / Evaluation of investigations Extended answer questions	GCSE past paper exam questions Analysis / Evaluation of investigations Extended answer questions
Cultural enrichment including Trips, Visits, Experiences, Extra-curricular	**<u>School and University Network</u>** Trip 1- Magnets and Motors Trip 2- Life on Mars		
Literacy	Model the effect of resistance on a circuit. Explain real world applications of thermistors, LDRs, thermostats and switching on lights. Research what resistance is and why some materials have no resistance Research the use of direct and alternating potential difference. Find out why the USA used direct potential difference, then changed to an alternating potential difference. Keywords: Alternating Potential Difference, Amperes (Amps), Attraction, Coulomb, Diode, Direct Potential Difference, Earth Wire, *Electric Field Lines, *Electric Field, Electrical Current, Electrical Work, Filament Lamp, Insulation, Light Dependent Resistor (LDR), Live Wire, Mains Electricity,	Use vector diagrams to illustrate: resolution of forces; equilibrium situations and determine the resultant of two forces including magnitude and direction Evaluate the best spring to use for a given situation when given the spring constants of the springs. analyse the data to find why high spring constants are more suited for some functions than springs with low spring constants Keywords: Acceleration, *Atmosphere, Braking Distance, Centre of Mass, Changes of Momentum, Conservation of Momentum, Contact Forces, Displacement, Distance, Elastic Deformation, Elastic Limit, Elastic Potential Energy, Equilibrium,	Construct labelled ray diagrams to illustrate the reflection of a wave at a surface. Research the parts of the electromagnetic spectrum Plan an investigation to find out which sun screen is the most effective. Explain the precautions taken in a hospital when carrying out an X-ray. Produce a leaflet to show the uses and dangers of electromagnetic radiation. Research the use of lenses to correct short-sightedness and long-sightedness. Research how the Earth's atmosphere absorbs emits and reflects radiation. Find out how different gases in the atmosphere affect the rate of absorption, emission and reflection of radiation.

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	Neutral Wire, Non-Contact Force, Ohmic Conductor, Ohms, Parallel, Potential Difference, Repulsion, Series, *Static Charge, Step-Down Transformers, Step-Up Transformers, The National Grid, Thermistor, Volt	*Floating, *Fluid, Forces, Inertia, Inertial Mass, Limit of Proportionality, *Moment, Momentum, Newton's First Law, Newton's Second Law, Newton's Third Law, Non-Contact Forces, Deformation, *Pressure in a Column, Resolution of Forces, resultant Force, *Resultant Moment, Scalar Quantities, *Sinking, Speed, Spring Constant, Stopping Distance, Thinking Distance, Upthrust, Vector Quantities, Velocity, Weight, Work Done,	Keywords: Amplitude, Angle of Incidence, Colour Filters, *Constant Temperature, Convex Lens, Diffuse, Reflection, *Echo Sounding, Electromagnetic Waves, Focal Length, Frequency, Hertz, *Human Hearing, Infrared Radiation, Ionising Radiation, Lens, Longitudinal Waves, Magnification, Microwaves, *P-Waves, Period, Radiation Dose, Radio Waves, *Reflection, *S-Waves, *Sound Waves, Specular Reflection, waves, *Ultrasound Scanning, *Ultrasound Waves, Ultraviolet, Visible Light, Wave Speed, Wavelength
Numeracy	Equation for electric current as the rate of flow of charge should be known Equation linking potential difference, current and resistance should be known. Current-potential difference graphs for electrical components Formula for working out the resistance in a series and parallel circuit Equations for electrical power should be known Equations for energy transfer should be known	Identify the limit of proportionality on a graph showing the force applied against extension. Calculate the amount of energy stored by various objects including stretched springs and objects raised above the ground Calculate the pressure at the surface of a fluid when given the applied force and the surface area that the force is applied to. Rearrange the equation to find the two other unknowns. Calculate the speed of an object given the distance travelled and the time taken. Rearrange the equation to find either unknown quantity. Draw and interpret distance – time graphs. Calculate the speed of an object from a distance – time graph Calculate the speed of an object that is accelerating from a distance – time graph by finding the tangent to the curve at a given point then finding the gradient of the tangent C Calculate the acceleration of a vehicle when given the initial and final speed and the time taken for the change in speed to occur. Rearrange the equation to find other unknown quantities.	Calculate the wavelength of a wave from a labelled diagram of a wave. Equation linking the wave speed, frequency and wavelength should be known. Calculate the speed of a wave. Rearrange the equation to find any unknown given the other two values. Perform calculations on ultrasound scans using the equation: distance = speed x time user data loggers to measure the intensity of ultraviolet light Draw conclusions from given data about the risks and consequences of exposure to radiation. Calculate the magnification of a lens using the magnification equation.

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		Draw and interpret velocity – time graphs. Calculate the distance travelled using the area under the line on a velocity – time graph. calculate the final velocity of an object at constant acceleration. Calculate the resultant force acting on an object calculate the force that acts on an object when the momentum of that object changes Find patterns between the speed of a vehicle and the thinking distance Give the correct units of weight and mass.	
CIAG	What workplace skills does physics develop? Critical thinking: The ability to scrutinise information you're presented with is important not only for scientists but for lawyers, police, medics, journalists and more. Data analysis: From actuaries and financial advisors to social media specialists and market researchers, data analysis is one of the most sought after skills. Problem solving: Complex problem solving is vital for engineers, researchers, marketers, social workers, designers, and even customer service workers. Attention to detail: From nurses and scientists to accountants and writers, attention to detail is vital to carrying out many roles safely and effectively.	What workplace skills does physics develop? Critical thinking: The ability to scrutinise information you're presented with is important not only for scientists but for lawyers, police, medics, journalists and more. Data analysis: From actuaries and financial advisors to social media specialists and market researchers, data analysis is one of the most sought after skills. Problem solving: Complex problem solving is vital for engineers, researchers, marketers, social workers, designers, and even customer service workers. Attention to detail: From nurses and scientists to accountants and writers, attention to detail is vital to carrying out many roles safely and effectively. NCW STEM lessons – where can science take you?	What workplace skills does physics develop? Critical thinking: The ability to scrutinise information you're presented with is important not only for scientists but for lawyers, police, medics, journalists and more. Data analysis: From actuaries and financial advisors to social media specialists and market researchers, data analysis is one of the most sought after skills. Problem solving: Complex problem solving is vital for engineers, researchers, marketers, social workers, designers, and even customer service workers. Attention to detail: From nurses and scientists to accountants and writers, attention to detail is vital to carrying out many roles safely and effectively. Year 10: Careers in Physics Lesson (Step Up resources)

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Key Stage 4 Long Term Planning

Year 11

Curriculum Area: Physics Single Science

Year 11	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1
Syllabus	AQA Physics Collins - Chapter 7 Electromagnetism	AQA Physics Collins - Chapter 8 Space	Revision in preparation for GCSE exams	Revision in preparation for GCSE exams	
Connections to prior learning	3.2.3 Electromagnets Investigate ways of varying strength of an electromagnet An electromagnet uses the principle that a current through a wire causes a magnetic field. Its strength depends on the current, the core and the number of coils in the solenoid. The magnetic field of an electromagnet decreases in strength with distance. 3.2.4 Magnetism Explore the magnetic field pattern around different types or combinations of magnets Magnetic materials, electromagnets and the Earth create magnetic fields which can be described by drawing field lines to show the strength and direction. The stronger the magnet, and the smaller the distance from it, the greater the force a magnetic object in the field experiences. Two 'like' magnetic poles repel and two 'unlike' magnetic poles	3.7.2 Universe Relate observations of changing day length to an appropriate model of the solar system The solar system can be modelled as planets rotating on tilted axes while orbiting the Sun, moons orbiting planets and sunlight spreading out and being reflected. This explains day and year length, seasons and the visibility of objects from Earth. Our solar system is a tiny part of a galaxy, one of many billions in the Universe. Light takes minutes to reach Earth from the Sun, four years from our nearest star and billions of years from other galaxies.			

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	attract. Field lines flow from the north-seeking pole to the south-seeking pole.				
Knowledge	Permanent and induced magnetism forces and fields The motor effect Induced potential Transformers and the National Grid	Solar system stability of orbital motions satellites Red-shift			
Skills	Investigate and draw the shape of the magnetic field pattern around a permanent magnet. Find the magnetic field pattern of a solenoid using iron filings or a plotting compass Investigate both the size and direction of the force on a conductor in a magnetic field Model the National Grid.	Design a rocket that could take the human race to another solar system within the Milky Way Research the lifecycle of a star similar to the Sun. Model red-shift			
Assessment	End of unit test for Chapter 7 - Electromagnetism	End of unit test for Chapter 8 - - Space			
Homework	GCSE past paper exam questions Analysis / Evaluation of investigations Extended answer questions	GCSE past paper exam questions Analysis / Evaluation of investigations Extended answer questions			
Cultural enrichment including Trips, Visits, Experiences, Extra-curricular	**<u>School and University Network</u>** Trip 1-Young Scientist Centre (details to be confirmed) Trip 2-Young Scientist centre				

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Literacy	Explain how the behaviour of a magnetic compass is related to evidence that the core of the Earth must be magnetic. Explain how a moving-coil loudspeaker and headphones Research to find how the generator in a power station differs from a simple generator (coil of wire spinning between two magnets). Research and present information on the use of isolating transformers in bathrooms Keywords: Alternator, Attraction, Current-Carrying Wires, Dynamo, Electric Motor, Electromagnet, Fleming's Left-Hand Rule, Generator Effect, Induced Magnet, Magnetic Compass, Magnetic Field Lines, Magnetic Field, Magnetic Materials, Magnetic Poles, Microphone, Motor Effect, Permanent Magnet, Solenoid, Step-Down Transformer, Step-Up Transformer, Tesla, Transformer	Research information about the solar system to find out where humans could possibly escape to in case of a large asteroid impact. Produce a flow chart to show the lifecycle of large and small stars Keywords: *Artificial Satellites, Big Bang Theory, *Circular Orbits, *Dark Energy, *Dark Mass, *Main Sequence, Star, *Milky Way Galaxy, *Natural Satellites, *Nebula, *Protostar, *Red Giant Star, *Red-Shift, *Star Life Cycle, *Supernova, *White Dwarf			
Numeracy	Recall and use Fleming's left-hand rule. Calculate the force on a conductor in a magnetic field. Draw/interpret graphs of potential difference generated in the coil against time. Perform calculations to determine the potential	Evaluate data on the orbital speeds of planets and use this to predict the orbital radius, assuming a circular orbit.			

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	difference on the primary or secondary coil or the number of turns on the primary or secondary coil when given the other values.				
CIAG	What workplace skills does physics develop? Critical thinking: The ability to scrutinise information you're presented with is important not only for scientists but for lawyers, police, medics, journalists and more. Data analysis: From actuaries and financial advisors to social media specialists and market researchers, data analysis is one of the most sought after skills. Problem solving: Complex problem solving is vital for engineers, researchers, marketers, social workers, designers, and even customer service workers. Attention to detail: From nurses and scientists to accountants and writers, attention to detail is vital to carrying out many roles safely and effectively. Year 11: Studying science at KS5 lesson	What workplace skills does physics develop? Critical thinking: The ability to scrutinise information you're presented with is important not only for scientists but for lawyers, police, medics, journalists and more. Data analysis: From actuaries and financial advisors to social media specialists and market researchers, data analysis is one of the most sought after skills. Problem solving: Complex problem solving is vital for engineers, researchers, marketers, social workers, designers, and even customer service workers. Attention to detail: From nurses and scientists to accountants and writers, attention to detail is vital to carrying out many roles safely and effectively. NCW STEM lessons – where can science take you?			