HIGHFIELDS SCHOOL

CURRICULUM OVERVIEW 2023-2024

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SUBJECT: GCSE PHYSICS (SINGLE) **EXAMINATION BOARD:** OCR GATEWAY A

AUTUMN TERM - YEAR 9	SPRING TERM - YEAR 9	SUMMER TERM – YEAR 9
P1: Matter 1.1 The particle model 1.2 Changes of state 1.3 Pressure **Potential Practical Activities** • Measurement of length, volume and mass, and using them to calculate density • Use of a data logger to record the heating curve for ice • Working out the specific heat capacities of different metals • Investigating the Pressure law and Boyle's law	**P2: Forces** 2.1 Motion 2.2 Newton's Laws 2.3 Forces in action **Potential Practical Activities** • Investigation of trolleys on ramps at an angle and whether this affects speed • Investigation of acceleration • Measurement of the velocity of ball bearings in glycerol at different temperatures or with ball bearings of differing sizes • Use of light gates, masses and trolleys to investigate the link between force and acceleration • Use of light gates to measure momentum of colliding trolleys • Comparisons of behaviour of springs and elastic bands when loading and unloading with weights	**P2: Forces** 2.1 Motion 2.2 Newton's Laws 2.3 Forces in action **Potential Practical Activities** • Investigation of trolleys on ramps at an angle and whether this affects speed • Investigation of acceleration • Measurement of the velocity of ball bearings in glycerol at different temperatures or with ball bearings of differing sizes • Use of light gates, masses and trolleys to investigate the link between force and acceleration • Use of light gates to measure momentum of colliding trolleys • Comparisons of behaviour of springs and elastic bands when loading and unloading with weights
ASSESSMENT Mid-unit tests will be held at the end of unit 1.1 and unit 1.2 A whole topic P1 test will be held at the end of unit 1.3	**ASSESSMENT** Mid-unit tests will be held at the end of unit 2.1 and unit 2.2 A whole topic P2 test will be held at the end of unit 2.3 End of Year 9 exam based on past exam questions covering P1-P2	**ASSESSMENT** Mid-unit tests will be held at the end of unit 2.1 and unit 2.2 A whole topic P2 test will be held at the end of unit 2.3 End of Year 9 exam based on past exam questions covering P1-P2

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AUTUMN TERM - YEAR 10	SPRING TERM - YEAR 10	SUMMER TERM - YEAR 10
P3: Electricity 3.1 Static and charge 3.2 Simple circuits **Potential Practical Activities** • Use of a Van de Graaff generator • Use of the gold leaf electroscope and a charged rod • Building of circuits to measure potential difference and current in both series and parallel circuits • Investigation of the effect of length on resistance in a wire • Investigation of I-V characteristics of circuit elements • Investigation of resistance of a thermistor and L.D.R. • Investigation of the power of a photocell	**P4: Magnetism and magnetic fields** 4.1 Magnets and magnetic fields 4.2 Uses of magnetism **Potential Practical Activities** • Plotting of magnetic fields around different shaped magnets • Investigation of the magnetic field around a current-carrying wire and a current-carrying solenoid • Investigation of the factors that can affect the motor effect • Construction of simple motors • Demonstration of induction using a strong magnet, a wire and galvanometer • Building of a step-up and step-down transformer to investigate their effects	**P5: Waves in matter** 5.1 Wave behaviour 5.2 The electromagnetic spectrum 5.3 Wave interaction **P6: Radioactive decay – waves and particles** 6.1 Physics on the move 6.2 Powering Earth **Potential Practical Activities** **P5** • Observing sound waves on an oscilloscope • Investigation of reflection and refraction • Investigation of electromagnetic waves on chocolate in a microwave to measure wavelength • Use a microwave emitter and absorber to demonstrate behaviour of waves • Use of a phone camera to look at the infra-red emitter on a remote control • Investigation using convex and concave lenses. • Use of coloured filters and light sources to investigate how filters work **P6** • Use of a Geiger Muller tube and radioactive sources to investigate activity • Demonstration of fluorescence with black light lamp and tonic water • Using dice to model random decay and half-life. • Use of a Geiger Muller tube, sources and aluminium plates of varying thicknesses to investigate change in count rate

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ASSESSMENT A mid-unit test will be held at the end of unit 3.1 A whole topic P3 test will be held at the end of unit 3.2	**ASSESSMENT** A mid-unit test will be held at the end of unit 4.1 A whole topic P4 test will be held at the end of unit 4.2	**ASSESSMENT** End of Year 10 exam based on past exam questions covering P1-P6

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AUTUMN TERM - YEAR 11	SPRING TERM - YEAR 11	SUMMER TERM - YEAR 11
P7: Energy 7.1 Work done 7.2 Power and efficiency **Potential Practical Activities** • Exploring energy stores and transfers in different objects • Use of light gates and data loggers to investigate kinetic energy and gravitational energy • Use of a joule meter to calculate specific heat capacity of a metal block • Investigation of energy changes and efficiency of bouncy balls • Investigation of rate of cooling with insulated and non-insulated copper cans	**P8: Global challenges** 8.1 Physics on the move 8.2 Powering Earth 8.3 Beyond Earth **Potential Practical Activities** • Investigation of reaction time • Investigation of stopping distances • Investigation of crumple zones and safety features in cars • Demonstration of a steam engine and discussion of the transfer of energy taking place • Use of a model power line to demonstrate the energy losses at lower voltage and higher current • Comparison A.C. and D.C. output traces • Comparison of temperature changes inside sealed transparent containers with different gases inside • Building a model of the solar system	**Revision and intervention Modules P1 to P8**
ASSESSMENT A mid-unit test will be held at the end of unit 7.1 A whole topic P7 test will be held at the end of unit 7.2	**ASSESSMENT** Mid-unit tests will be held at the end of unit 8.1 and unit 8.2 A whole topic P8 test will be held at the end of unit 8.3	**ASSESSMENT** **Final GCSE examinations** Two 1 hour 45 minutes written papers each worth 50% of the GCSE Paper 1 assesses content from Topics 1 – 4 Paper 2 assesses content from Topics 5 – 8, with assumed knowledge of Topics 1 – 4 Each paper has 2 sections: Section A contains multiple choice questions. This section of the paper is worth 15 marks Section B includes short answer question styles (practical, maths, structured questions) and an extended six-mark Level of Response question. This section of the paper is worth 75 marks.

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