



CHORLTON HIGH SCHOOL: CURRICULUM

CHS Curriculum Intent

SUCCESSFUL: Learners who gain deep and powerful knowledge in preparation for life; combining academic rigour, curiosity and creative flair.

CREATIVE: Learners who are imaginative, optimistic and inventive; finding their voice to become effective communicators prepared for lifelong adaptability

HAPPY: Learners who are confident, resilient, well-rounded citizens; they understand the world's communities and are ready to discover their place in it.

CHS Curriculum Area Framework for Learning – Year 10

SUBJECT	Science
INTENT	Students will learn the foundations of chemistry, biology and physics during KS3 and build upon them during KS4, with the intention of raising interest and engagement in the natural world and developing their curiosity.

Year Group	10 JOS					
Rationale/ Narrative	Students continue to explore new subject content in biology, chemistry and physics, tackling more challenging concepts at a greater depth than they have done so previously. Students continue to develop scientific skills, directly linked to their required practicals including forming hypotheses, clear written methods, knowledge and use of scientific equipment as well as presenting and analyzing results.					
	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2



CHORLTON HIGH SCHOOL: CURRICULUM

KNOWLEDGE	<p>5.2 Bonding, structure, and the properties of matter</p> <p>5.2.1.1 Chemical bonds</p> <p>5.2.1.2 Ionic bonding</p> <p>5.2.1.3 Ionic compounds</p> <p>5.2.1.4 Covalent bonding</p> <p>5.2.1.5 Metallic bonding</p> <p>5.2.2.1 The three states of matter</p> <p>5.2.2.2 State symbols</p> <p>5.2.2.3 Properties of ionic compounds</p> <p>5.2.2.4 Properties of small molecules</p> <p>5.2.2.5 Polymers</p> <p>5.2.2.6 Giant covalent structures</p> <p>5.2.2.7 Properties of metals and alloys</p> <p>5.2.2.8 Metals as conductors</p> <p>5.2.3.1 Diamond</p> <p>5.2.3.2 Graphite</p> <p>5.2.3.3 Graphene and fullerenes</p> <p>8464 Physics – 6.3 Particle model of matter</p> <p>6.3.1.1 Density of materials</p> <p>Required practical activity 17: density of objects</p> <p>6.3.1.2 Changes of state</p> <p>6.3.2.1 Internal energy</p> <p>6.3.2.2 Temperature changes and specific heat capacity</p>	<p>8464 Biology 4.3 Infection and response</p> <p>4.3.1.1 Communicable (infectious) diseases</p> <p>4.3.1.2 Viral diseases</p> <p>4.3.1.3 Bacterial diseases</p> <p>4.3.1.4 Fungal diseases</p> <p>4.3.1.5 Protist diseases</p> <p>4.3.1.6 Human defence systems</p> <p>4.3.1.7 Vaccination</p> <p>4.3.1.8 Antibiotics and painkillers</p> <p>4.3.1.9 Discovery and development of drugs</p> <p>8461 Biology - 4.3 Infection and Response</p> <p>4.3.2 <i>Monoclonal antibodies</i></p> <p>4.3.3 <i>Plant disease</i></p> <p>Biology 4.4 Bioenergetics</p> <p>4.4.1.1 Photosynthetic reaction</p> <p>4.4.1.2 Rate of photosynthesis</p> <p>Required practical activity 5 photosynthesis</p> <p>4.4.1.3 Use of glucose</p> <p>4.4.2.1 Aerobic and Anaerobic</p> <p>4.4.2.2 Response to exercise</p> <p>4.4.2.3 Metabolism</p>	<p>8464 Chemistry 5.4 Chemical changes</p> <p>5.4.1.1 Metal oxides</p> <p>5.4.1.2 The reactivity series</p> <p>5.4.1.3 Extraction of metals</p> <p>5.4.1.4 Oxidation and reduction</p> <p>5.4.2.1 Reaction of acids with metals</p> <p>5.4.2.2 Neutralisation of acids and salts</p> <p>5.4.2.3 Soluble salts</p> <p>Required practical activity 8 – salt preparation.</p> <p>5.4.2.4 The pH scale</p> <p>5.4.2.5 Strong and weak acids</p> <p>5.4.3.1 The process of electrolysis</p> <p>5.4.3.2 Electrolysis of ionic compounds</p> <p>5.4.3.3 extraction using electrolysis</p> <p>5.4.3.4 Electrolysis of aqueous solutions</p> <p>Required practical activity 9: electrolysis aqueous solution</p> <p>5.4.3.5 Representation of reactions at electrodes as half equations (HT only)</p> <p>8462 Chemistry 4.4 Chemical Changes</p> <p>4.4.2.5 <i>Titrations</i></p>	<p>8464 Physics 6.2 Electricity</p> <p>6.2.1.1 Standard circuit diagram symbols</p> <p>6.2.1.2 Electrical charge and current</p> <p>6.2.1.3 Current, resistance, and potential difference</p> <p>Required practical activity 15: resistance of a wire / series and parallel resistors.</p> <p>6.2.1.4 Resistors</p> <p>Required practical activity 16: IV characteristics of a resistor / filament bulb / diode</p> <p>6.2.2 Series and parallel circuits</p> <p>6.2.3.1 Direct and alternating potential difference.</p> <p>6.2.3.2 Mains electricity</p> <p>6.2.4.1 Power</p> <p>6.2.4.2 Energy transfers in everyday appliances</p> <p>6.2.4.3 The National Grid</p> <p>8463 Physics 4.2 Electricity</p> <p>4.2.5 <i>Static electricity</i></p> <p>8464 Physics 6.4 Atomic Structure</p> <p>6.4.1.1 The structure of an atom</p> <p>6.4.1.2 Mass number, atomic number and isotopes</p> <p>6.4.1.3 The development of the model of the atom</p>	<p>8464 Chemistry 5.3 Quantitative chemistry</p> <p>5.3.1.1 Conservation of mass and balanced chemical equations</p> <p>5.3.1.2 Relative formula mass</p> <p>5.3.1.3 Mass changes when a reactant or product is a gas</p> <p>5.3.1.4 Chemical measurements.</p> <p>5.3.2.1 Moles (HT only)</p> <p>5.3.2.2 Amounts of substances in equations (HT only)</p> <p>5.3.2.3 Using moles to balance equations (HT only)</p> <p>5.3.2.4 Limiting reactants (HT only)</p> <p>5.3.2.5 Concentration of solutions</p> <p>8462 Chemistry 4.3 Quantitative chemistry</p> <p>4.3.3 <i>Yield and atom economy of chemical reactions</i></p> <p>4.3.4 <i>Using concentrations of solutions in mol/dm³</i></p> <p>4.3.5 <i>Use of amount of substance in relation to volumes of gases</i></p> <p>8464 Chemistry 5.6 The rate and extent of chemical change</p>	<p>8464 Physics 6.5 Forces</p> <p>6.5.1.1 Scalar and vector quantities</p> <p>6.5.1.2 Contact and non-contact forces</p> <p>6.5.1.3 Gravity</p> <p>6.5.1.4 Resultant forces</p> <p>6.5.2 Work done and energy transfer</p> <p>6.5.3 Forces and elasticity</p> <p>Required practical activity 18: force and extension of a spring</p> <p>6.5.4.1.1 Distance and displacement</p> <p>6.5.4.1.2 Speed</p> <p>6.5.4.1.3 Velocity</p> <p>6.5.4.1.4 The distance–time relationship</p> <p>6.5.4.1.5 Acceleration</p> <p>6.5.4.2.1 Newton's First Law</p> <p>6.5.4.2.2 Newton's Second Law</p> <p>Required practical activity 19: force and acceleration</p> <p>6.5.4.2.3 Newton's Third Law</p> <p>6.5.4.3.1 Stopping distance</p> <p>6.5.4.3.2 Reaction time</p> <p>6.5.4.3.3 Factors affecting braking distance 1</p> <p>6.5.4.3.4 Factors affecting braking distance 2</p> <p>6.5.5.1 Momentum is a property of moving objects (HT only)</p> <p>6.5.5.2 Conservation of momentum (HT only)</p>



CHORLTON HIGH SCHOOL: CURRICULUM

	<p>Required practical activity 14 - SHC 6.3.2.3 Changes of state and latent heat 6.3.3.1 Particle motion of gases</p> <p>8463 Physics – 4.3 Particle model of matter 4.3.3.2 <i>Pressure in gases</i> 4.3.3.3 <i>Increasing the pressure of a gas</i></p>		<p>8464 Chemistry 5.5 Energy Changes 5.5.1.1 Exo and Endothermic reactions Required practical activity 10: temperature change in reactions 5.5.1.2 Reaction profiles 5.5.1.3 Energy change of reactions</p> <p>8462 Chemistry – 4.5 Energy Changes 4.5.2 <i>Chemical cells and fuel</i></p>	<p>(common content with chemistry) 6.4.2.1 Radioactive decay and nuclear radiation 6.4.2.2 Nuclear equations 6.4.2.3 Half-lives and the random nature of radioactive decay 6.4.2.4 Radioactive contamination</p> <p>8463 Physics 4.4 Atomic Structure 4.4.3 <i>Hazards and uses of radioactive emissions and of background radiation</i> 4.4.4 <i>Nuclear fission and fusion</i></p>	<p>5.6.1.1 Calculating rates of reactions 5.6.1.2 Factors which affect the rates of chemical reactions Required practical activity 11: rate of reaction 5.6.1.3 Collision theory and activation energy 5.6.1.4 Catalysts 5.6.2.1 Reversible reactions 5.6.2.2 Energy changes and reversible reactions 5.6.2.3 Equilibrium 5.6.2.4 The effect of changing conditions on equilibrium (HT only) 5.6.2.5 The effect of changing concentration (HT only) 5.6.2.6 The effect of temperature changes on equilibrium (HT only) 5.6.2.7 The effect of pressure changes on equilibrium (HT only)</p>	<p>8463 Physics 4.5 Forces 4.5.4 <i>Moments, levers and gears</i> 4.5.5 <i>Pressure and pressure differences in fluids</i></p> <p>8464 Biology 4.5 Homeostasis and response 4.5.1 Homeostasis 4.5.2 The human nervous system Required practical activity 6 reaction time 4.5.3.1 Human endocrine system 4.5.3.2 Control of blood glucose concentration 4.5.3.3 Hormones in human reproduction 4.5.3.4 Contraception 4.5.3.5 The use of hormones to treat infertility (HT only) 4.5.3.6 Feedback systems (HT only)</p> <p>8461 Biology 4.5 Homeostasis and response 4.5.2.2 <i>The brain</i> 4.5.2.3 <i>The eye</i> 4.5.2.4 <i>Control of body temperature</i> 4.5.3.3 <i>Maintaining water and nitrogen balance in the body</i> 4.5.4 <i>Plant hormones</i></p>
--	---	--	--	---	---	---



CHORLTON HIGH SCHOOL: CURRICULUM

						<p>8464 Biology 4.7 Ecology 4.7.1.1 Communities 4.7.1.2 Abiotic factors 4.7.1.3 Biotic factors 4.7.1.4 Adaptations 4.7.2.1 Levels of organisation Required practical activity 7 - sampling 4.7.2.2 How materials are cycled 4.7.3.1 Biodiversity 4.7.3.2 Waste management 4.7.3.3 Land use 4.7.3.4 Deforestation 4.7.3.5 Global warming 4.7.3.6 Maintaining biodiversity</p> <p>8461 Biology 4.7 Ecology 4.7.2.3 Decomposition 4.7.2.4 Impact of environmental change 4.7.4 Trophic levels in an ecosystem 4.7.5 Food production</p>
<p>SKILLS</p>	<p>6.3 Particle model of matter A large part of the unit will focus on mathematical skills, students will be required to recall and use the following equations.</p> $\rho = m / V$ $\Delta E = m c \Delta \theta$ $E = m L_v$ $E = m L_f$	<p>4.3 Infection and response Students will look at the various types of pathogens and the effects that they can have on various organisms. They will study the transmission, symptoms and treatment of the various pathogens.</p> <p>Students will study the action of their own bodies</p>	<p>5.4 Chemical changes and Energy Changes Students will study the reactivity series and learn how to make predictions about the extraction of metals from their ores and study the processes required to do so such as displacement / reduction and electrolysis.</p>	<p>6.2 Electricity Knowledge and use of circuit symbol.</p> <p>Recall and apply: $Q=It$ $V= IR$ $P= VI$ $P= I^2R$ $E= Pt$ $E= QV$</p>	<p>5.3 Quantitative chemistry Use of ratios, fractions and percentages in Chemistry calculations.</p> <p>Use of relative formula mass to calculate the moles in a given mass and vice versa.</p> <p>5.6 The rate and extent of chemical change</p>	<p>6.5 Forces Modelling. Comprehension exercises. Practical completion. Calculations. Using equations. Graph drawing Rearranging equations Using formulae</p> <p>Recall and apply.</p>



CHORLTON HIGH SCHOOL: CURRICULUM

	<p>Students will complete</p> <ul style="list-style-type: none"> RP 17 – density RP 13 – SHC <p>including associated write up / analysis and processing of results</p> <p>Students will use modelling to represent kinetic theory of particles in solids, liquid and gases.</p> <p>5.2 Bonding, structure, and the properties of matter</p> <p>Students will learn whether metals / nonmetals react and how they react together.</p> <p>Calculate charges on ions and work out what other ions will bond together for stability.</p> <p>Work out how covalent substances share electrons to become stable. Based on the type of bonding predictions will be made as to the properties of the compound.</p> <p>Students will be taught the latest developments in the chemistry of graphite, graphene and fullerenes.</p>	<p>defence systems in dealing with pathogens.</p> <p>Interpret data about vaccination / risk factors for specific diseases.</p> <p>4.4 Bioenergetics</p> <p>Students will complete RP 5 – photosynthesis including associated write up / analysis and processing of results.</p>	<p>Students will learn the process of neutralisation and how pH changes accordingly.</p> <p>Students will complete</p> <ul style="list-style-type: none"> RP 8 – salt preparation RP 9 – electrolysis <p>including associated write up / analysis and processing of results.</p> <p>8464 Chemistry 5.5 Energy Changes</p> <p>Students will complete</p> <ul style="list-style-type: none"> RP 10- temperature changes <p>including associated write up / analysis and processing of results.</p>	<p>Students will also be able to distinguish between the advantages / disadvantages and applications of d.c and a.c.</p> <p>Students will carry out and write up aspects of scientific investigations into:</p> <ul style="list-style-type: none"> - testing electrical conductors, - current in series and parallel circuits, - voltage in series and parallel circuits, <p>Students will complete</p> <ul style="list-style-type: none"> RP 15 resistance RP 16 IV characteristics <p>including associated write up / analysis and processing of results.</p> <p>Investigate the effect of light on an LDR and temperature on a thermistor.</p> <p>6.4 Atomic Structure</p> <p>Recognise and use expressions in standard form.</p> <p>Know the nature, uses of and penetrating powers of</p>	<p>Understand the concept of conservation of mass and how this can be used in measuring a rate in a reaction where a gas is given off.</p> <p>Drawing and interpreting appropriate graphs from data to determine rate of reaction.</p> <p>Plot two variables from experimental or other data.</p> <p>Determine the slope and intercept of a linear graph.</p> <p>Draw and use the slope of a tangent to a curve as a measure of rate of change.</p> <p>Students will complete</p> <ul style="list-style-type: none"> RP 11 rate of reaction <p>including associated write up / analysis and processing of results.</p>	<p>Weight = m g Work done = F s F = k e $E_e = (\frac{1}{2}) k e^2$ s = v t $a = \Delta v/t$ $v^2 - u^2 = 2 a s$ F = m a p = m v</p> <p>Students will complete</p> <ul style="list-style-type: none"> RP 6 reaction time RP 7 sampling RP 18 force and extension RP 19 force and acceleration <p>including associated write up / analysis and processing of results.</p> <p>4.5 Homeostasis and response</p> <p>Evaluate information around the relationship between obesity and diabetes, and make recommendations taking into account social and ethical issues.</p> <p>Interpret and explain simple diagrams of negative feedback control.</p>
--	---	---	--	--	---	---



CHORLTON HIGH SCHOOL: CURRICULUM

				<p>alpha, beta and gamma ionising radiations.</p> <p>Use of nuclear equations to show alpha and beta decay.</p> <p>Interpret half-life graphs and use these to calculate half-life of a radioactive source, also to use this information to decide on a suitable half life appropriate for the use of particular ionising radiation in a particular situation.</p> <p>Be able to decide between irradiation and contamination.</p>		<p>Show why issues around contraception cannot be answered by science alone.</p> <p>Model behaviour of chromosomes</p> <p>Use probability, proportion and ratios in relation to inheritance.</p> <p>Interpret information about genetic engineering techniques and to make informed judgements about issues concerning cloning and genetic engineering, including GM crops.</p> <p>4.7 Ecology Using models to explain enzyme action.</p> <p>Students will complete</p> <ul style="list-style-type: none"> RP 7 sampling including associated write up / analysis and processing of results.
ASSESSMENTS	<p>Students will be assessed on: (3 will be selected per term plus Progress test)</p> <p>Aspects of a full practical write up related to</p> <ul style="list-style-type: none"> RP 17 – density RP 13 – SHC 	<p>Students will be assessed on: (3 will be selected per term plus Progress test)</p> <p>Aspects of a full practical write up related to RP 5 – photosynthesis</p>	<p>Students will be assessed on: (3 will be selected per term plus Progress test)</p> <p>Aspects of a full practical write up related to</p>	<p>Students will be assessed on: (3 will be selected per term plus Progress test)</p> <p>Aspects of a full practical write up related to</p> <ul style="list-style-type: none"> RP 15 resistance 	<p>Students will be assessed on: (3 will be selected per term plus Progress test)</p> <p>Aspects of a full practical write up related to</p>	<p>Students will be assessed on: (3 will be selected per term plus Progress test)</p> <p>Aspects of a full practical write up related to</p>



CHORLTON HIGH SCHOOL: CURRICULUM

	End of topic test	End of topic test	<ul style="list-style-type: none">• RP 8 – salt preparation• RP 9 - electrolysis• RP 10- temperature changes End of topic test	<ul style="list-style-type: none">• RP 16 IV characteristics End of topic test	<ul style="list-style-type: none">• RP 11 rate of reaction End of topic tests	<ul style="list-style-type: none">• RP 18 force and extension• RP 19 force and acceleration End of topic tests
--	-------------------	-------------------	--	--	---	---