

Science Faculty Curriculum Overview

KS4 offers the opportunity for students to expand and apply the knowledge developed over Y7-9, for example applying knowledge of human cell structure and inheritance from KS3 and applying this knowledge in to understanding a wide range of scientific processes and phenomena including genetics, genetic diseases and punnet squares as well as selective breeding, genetic engineering, evolution and biodiversity.

To support retrieval of the key concepts developed prior to year 10, students in KS4 are given the opportunity to recall and retrieve key knowledge through strategic homework, retrieval and set revision periods before whole school assessments. Although, students are exposed to an ever-increasing level of exam questions to support preparation for final examinations, the curriculum is still designed to develop a curiosity for science, by going beyond the mark scheme.

KS4, offers students the opportunity to select triple science as an option, these students follow the same teaching order as trilogy, however, with additional content. Both triple science and trilogy aim to develop students' readiness for next steps including an increased profile for further education/training in the scientific field.

Students are assessed throughout the curriculum to determine that appropriate intervention is put in place to address misconceptions. To support students in developing their scientific understanding, certain lessons have assessments linked to them. These assessments are part of the learning journey, and staff mark these to provide students with feedback to act upon. The curriculum also utilises peer and self-assessment to ensure students are aware of their successes and how to progress further.

Year 10

Term 1	Term 2	Term 3
Respiration	Bioenergetics (photosynthesis)	Electricity
New Skills	New Skills	
Calculating change in breathing/heart rate	Light intensity and how to measure the rate of photosynthesis	Recalled Skills
Investigating aerobic respiration in living organisms	Testing leaves for starch using ethanol in a safe manner	Building simple circuits (yr7 Electromagnets)
Interpreting graphs of the body's response to exercise	Evidence for transpiration through xylem using celery	Using an Ammeter and Voltmeter (yr7 Electromagnets)
	Investigating stomata – practical (nail varnish)	
Recalled Skills	Measuring transpiration rates	Recalled Knowledge
Changes during exercise	How to use a potometer	Static electricity (yr7 Electromagnets)
	How to use the inverse square law	I, V & R (yr7 Electromagnets)
		series circuits (yr7 Electromagnets)
New Knowledge	Recalled Skills	parallel circuits (yr/ Electromagnets)
Word & symbol equations for aerobic & anaerobic respiration	Drawing graphs	Skills: Enquiry processes.
How an oxygen debt builds up during anaerobic respiration in	Finding means and estimating	Asking science questions
Your muscles.	Now Knowledge	Planning investigations
Metabolic reactions and the role of the liver	Limiting factors of photosynthesis	Applyoing patterns
Becalled Knowledge	Liniting factors of photosynthesis	Final string data
The differences between perchic and apperchic respiration	How evaporation and transpiration are controlled in plants	Evaluating data
		New Skills
Practical Opportunities	Recalled Knowledge	Lising variable resistor
Investigating respiration in living organisms	The basic principles of photosynthesis (Ecosystems Y8 –	Describing AC and DC on CRO screen
Making lactic acid – anaerobic activities	nhotosynthesis)	Wiring a plug
Testing fitness – Harvard Step Test	The role of the leaf stomata in gas exchange in plants.	
	(Ecosystems Y8 – leaves)	New Knowledge
	How evaporation and transpiration are controlled in plants.	Static electricity
Infection and response	(Ecosystems Y8 – leaves)	Electric current and potential difference
New Skills		Resistance
Interpreting correlations	Practical Opportunities	Potential difference - Current characteristics
How to prepare uncontaminated culture of bacteria on sterile	Required practical – light intensity and the rate of	Series and parallel circuit.
agar plates	photosynthesis	
Calculating the number of bacteria in a population	Testing leaves for starch	Ac and DC and the national grid.
Required practical- Investigating the effect of disinfectants		Household wiring and 3 pin plug
and antibiotics	Chemical changes	Electrical power and potential difference. Choosing a fuse.
Calculating the effect of disinfectants and antibiotics on	Recalled knowledge	E=Pt, P=VI and P=I ² R
bacterial growth	Mass is conserved in chemical reactions	Electrical current and energy transfer. Q=It
	Recall that everything is made of particles (KS2 Science, Y7	Breatical One artumitica
Recalled Skills	Matter, The particle model) State that all materials are mode up of one or more elements	Practical Opportunities
Calculating area using $A = \pi r^2$	(V7 Matter Inside particles)	friction
Order of magnitude (V9 – Biology B1 – cell structure 8	Recall differences between atoms elements and compounds	Circuit tests: Variable resistor and torch hulb. Adjust slider
(19 - Dividy) $(19 - Dividy) D = Cell Structure & transport)$	$(\sqrt{7.8.9} \text{ term 1})$	measure current/note effects
ransport	Recall how to use chemical symbols and formulae to	Investigating potential differences in series and parallel
New knowledge	represent elements and compounds (v7 8.9 term 1)	circuits
non mougo		onouno.

The role of bacteria and other pathogens in human and plant	Recall how to represent chemical reactions using formulae	RP How does the resistance of a wire depend on its length?
diseases, and how to calculate the effect of antibacterial	and chemical equations (y7,8,9 term 1)	Resistors in series and parallel.
chemicals by measuring the area of zones of inhibition	Breaking down a compound using heat is known as thermal	RP Investigating V – I characteristics of different
The impact developing new drugs / drug testing	decomposition (y8 matter)	components.
Double blind trials	Simple acids and alkalis (y7 reactions)	Investigating an alternating potential difference using an
The importance of peer review	Bases will neutralise acids. (y7 reactions)	oscilloscope
How to produce monoclonal antibodies & their uses	Salts form when acids and bases react (y7 reactions)	Wiring a plug
How exercise and smoking can affect the health of other	Energy cannot be created or destroyed	
systems of the body	Energy changes take place during chemical reactions	
The effects of recreational drugs on behaviour, health & life		Energy changes
processes	Recalled skills:	Recalled knowledge
	Writing word equations (y7,8 reactions)	Mass is conserved in chemical reactions
Recalled Knowledge	Recognising symbol equations (y7,8 reactions)	Recall that everything is made of particles (KS2 Science, Y7
The importance of bacteria in the human digestive system	Difference between exothermic and endothermic reactions	Matter, The particle model)
(Organisms Y8 – bacteria & enzymes in digestion)	(reactions y8)	State that all materials are made up of one or more elements
Binary fission (Organisms Y7 – unicellular organisms)	Energy progress in a reaction can be displayed using a	(Y7 Matter, Inside particles)
Acid production in the stomach (Biology Y9 – B3 –	reaction profile diagram. (reactions y8)	Recall differences between atoms, elements and
Organisation & the digestive system)		compounds. (y7,8,9 term 1)
Blood and clotting (Biology Y9 – B4 – Organising plants &	General Scientific Enquiry Skills.	Recall how to use chemical symbols and formulae to
animals)	Ask scientific questions	represent elements and compounds. (y7,8,9 term 1)
The structure of the breathing system (Biology Y9 – B4 –	Plan investigations	Recall how to represent chemical reactions using formulae
Organising plants & animals)	Record data	and chemical equations (y7,8,9 term 1)
The importance of the phloem (Biology Y9 – B4 – Organising	Analyse patterns in data	Breaking down a compound using heat is known as thermal
plants & animals)	Evaluate data	decomposition (y8 matter)
The consequences of imbalances in the diet (Organisms Y8 –	Give conclusions related to the data	Simple acids and alkalis (y7 reactions)
unhealthy diets)		Bases will neutralise acids. (y7 reactions)
The impact of exercise and smoking on the human gas	New Knowledge	Salts form when acids and bases react (y7 reactions)
exchange system (Organisms Y8 – smoking)	What happens in electrolysis	Energy cannot be created or destroyed
The types of food people need to keep them healthy and the	What type of substance can be electrolysed.	Energy changes take place during chemical reactions
impact of poor diet on non-communicable (Organisms Y8 –	Products of electrolysis	
nutrients)	What happens to ions during electrolysis?	Recalled skills:
	How water effects the products of electrolysis	Writing word equations (y7,8 reactions)
Practical Opportunities	Know uses for the products of electrolysis of brine.	Recognising symbol equations (y7,8 reactions)
Required practical- Investigating the effect of disinfectants	Extraction of aluminium	Difference between exothermic and endothermic reactions
and antibiotics	I riple: Chemical cells and fuel cells	(reactions y8)
		Energy progress in a reaction can be displayed using a
	New Skills	reaction profile diagram. (reactions y8)
Energy	Recognise that electrolytes must be molten or in aqueous	
Energy	solution	General Scientific Enquiry Skills.
Recalled Skills	Explain the movement of ions within the electrolyte.	Ask scientific questions
Use of thermometer/Use of stop clock. (yr7 Energy)	H tier. Halt equations to represent the reactions at the	Plan investigations
Conduction, Convection & Radiation (yr8 Energy)	electrodes	Record data
Testing Insulation experiment (yr8 Energy)	How to predict the products of the electrolysis of aqueous	Analyse patterns in data
Finding energy in fuel & food (yr7 Energy)	Solution.	Evaluate data
	How to investigate the electrolysis of aqueous solution using	Give conclusions related to the data
	inert electroaes.	New Kasuda das
Kinetic Theory of matter (yr8 Energy)		New Knowledge
Energy and temperature (yr8 Energy)	Practical Opportunities	

Conduction/Convection/Infra-red radiation (yr8 Energy)	Investigating the electrolysis of aqueous solutions	Endothermic and endothermic reactions and their transfer of
Insulation (yr8 Energy)		energy
Energy resources. (yr7 Energy)		Uses of exothermic and endothermic energy changes.
Generating electricity (vr7 Energy)	Radioactivity	The activation energy of a reaction
Benewable & nep renewable sources (vr7 Energy)	Recalled Skills	Know the difference between hand making and hand
Renewable & non-renewable sources. (yr/Energy)	Recalled Skills	
Work done = Energy transferred & work done by a force.	Drawing electron configuration (Y9 structure of the atom)	breaking.
(yr8 Energy)		Know that there is a certain amount of energy associated
Machines Measuring: ramps, gears, pulleys and levers	Recalled Knowledge	with each bond.
(vr8 Energy)	Pressure in liquids & gases) (vr8 Forces)	
(yro Energy) Chemical energy in feed and fuels (yr7 Energy)	Stress (Dressure on calid surface) (ur9 Forece)	New Skille
Chemical energy in 1000 and ideis (yr/ Energy)	Stress (Pressure on solid surface). (yro Forces)	
Energy and power (yrr8 Energy)	Structure of the atom (Y9 structure of atom)	To distinguish endothermic and exothermic reactions by
Energy adds up (yr7 Energy)		observing the temperature change
Energy dissipation (vr7 Energy)	Skills: Enquiry processes.	Recognising activation energy when drawing reaction profiles
	Asking science questions	for a reaction
	Diapping investigations	Identifying evethermic and endethermic reactions from
	Flamming investigations	identifying exothermic and endothermic reactions from
Skills: Enquiry processes.	Recording data	energy
Asking science questions	Analysing patterns	H tier – the impact of bonding breaking and bond making on
Planning investigations	Evaluating data	overall energy change.
Recording data		Calculate overall energy change in reactions
Applying potterno	New Skille	Calculate overall energy change in reactions.
Analysing patterns	New Skills	
Evaluating data	Measuring radiation using Geiger Muller tube	Practical Opportunities
		Investigating temperature changes in a variety of reactions
New Skills	New Knowledge	
Finding specific heat capacity	Models of the atom	
Calculating power of boster and anargy transforred	Discovery of the puelous	Potos of reaction
Calculating power of heater and energy transferred.	Discovery of the flucteus	Rates of reaction
Calculating work, gravitational potential energy, kinetic	Using the periodic table and definition of an isotope. alpha,	Recalled knowledge
energy and elastic potential energy.	beta & gamma radiation and decay	Mass is conserved in chemical reactions
	Half-life	Recall that everything is made of particles (KS2 Science, Y7
		Matter The particle model)
Now Knowledge	Practical Opportunities	Chamical rections produce new substances as products v 8
	Fractical Opportunities	chemical rections produce new substances as products y,o
Kinetic theory of matter	Demo alpha, beta & gamma	reactions)
Energy transfer by conduction		Chemical reactions may release gases. (y8 reactions)
Energy transfer by convection		Chemical reactions may produce products which are solids.
Energy transfer by radiation		(v8 reactions
Inculation		Some reactions are reversible (v7.8 matter, reactions)
		Some reactions are reversible (yr,o matter, reactions)
Changes in energy stores		
Conservation of energy		Recalled skills:
Definition of work		Writing word equations (y7,8 reactions)
Calculating work done by a Force		Recognising symbol equations (v7.8 reactions)
Calculating gravitational potential energy		Recognising when a chemical reaction takes place
Calculating gravitational potential energy		Recognishing when a chemical reaction takes place
Calculating kinetic energy & elastic potential energy.		
Energy Dissipation		General Scientific Enquiry Skills.
Energy and efficiency		Ask scientific questions
Electrical devices and efficiency		Plan investigations
Energy and Power		Record data
Deving for electricity		Analyza nattarna in data
Paying for electricity		Analyse patierns in data
		Evaluate data
Practical Opportunities		Give conclusions related to the data

Liesting different velopes of water	
Realing unerent volumes of water.	New Knewledge
Conduction through metal rods. Drawing pins, vaseline.	New Knowledge
Demo convection experiments. Snake spinners.	what is meant by the rate of a reaction?
Heating and cooling by IR. Leslies cube IR thermometer	The factors that affect rate of reaction.
Insulation RP	Collision theory
Energy Circus experiment	What a reversible reaction is.
Calculating work e.g. climbing stairs	How to represent reversible reactions
	What happens to the energy transfers in reversible
	reactions?
	How a reversible reaction in a closed system can be at
Quantitative chemistry	equilibrium
Recalled knowledge	H tier- The composition of an equilibrium mixture can be
Mass is conserved in chemical reactions	altered by changing conditions
Pagell that even thing is made of particles (KS2 Science, VZ	
Metter The perticle model)	New Okille
Matter, The particle model)	New Skills
State that all materials are made up of one or more elements	How to collect data on the rate of a chemical reaction.
(Y7 Matter, Inside particles)	How to calculate the mean rate of a chemical reaction
Recall differences between atoms, elements and compounds.	How to calculate the rate of a chemical reaction at a specific
(y7,8,9 term 1)	time.
Recall how to use chemical symbols and formulae to	How to use collision theory to explain the effect of surface
represent elements and compounds. (y7,8,9 term 1)	area, temperature, concentration (pressure in gases) and a
Recall how to represent chemical reactions using formulae	catalyst on reaction rate.
and chemical equations (y7.8.9 term 1)	Determine how changing the pressure affects reversible
Breaking down a compound using heat is known as thermal	reactions involving gases.
decomposition (v8 matter)	Determine hoe changing the temperature affects the
Simple acids and alkalis (v7 reactions)	reversible reaction
Cimple dolds and dikais (yr redolions)	
Pocallod skills:	Practical Opportunities
Writing word equations (VZ 9 reactions)	The different methods can be used to investigate the rate of
Decomposition of the constraints (V7, o reactions)	different reactions
Recognising symbol equations (y7,6 reactions)	different reactions.
Use of indicators to distinguish between acids and alkalis	_
(y7,8 reactions)	Forces
Use of universal indicator to establish pH number (y7,8	Recalled Skills
reactions)	Using newton meter. (yr7 Forces)
Reactions of acid and bases (y7 reactions)	Calculating speed. (yr7 Forces)
Reactions of acid and metal	
Using the periodic table to identify the relative atomic mass of	Recalled Knowledge
an element	Measuring Forces (yr7 Forces)
	Balanced and unbalanced forces (yr7 Forces)
General Scientific Enquiry Skills.	Speed (yr7 Forces)
Ask scientific questions	Distance-time graphs (vr7 Forces)
Plan investigations	Turning forces (vr8 Forces)
Record data	
Analyse patterns in data	Skills: Enquiry processes
Evaluate data	Asking science questions
Evaluate tidia	Asking science questions
Give conclusions related to the data	Planning investigations
	Recording data
New Knowledge	Analysing patterns

What is meant by the relative atomic mass of an element.	Evaluating data
How to calculate the relative atomic mass of an element and	
a compound.	New Skills
H tier, how to calculate the number of moles when given the	Calculating acceleration
mass of a substance	Lising light gates
How to use balanced symbol equations to calculate masses	Using air track
now to use balanced symbol equations to calculate masses	Cinding the Cold
or reactants and products	Finding the Com
what the limiting factor is, in a reaction.	
To calculate the concentration of solutions.	New Knowledge
How some common metals react with water and dilute acids.	Vectors and scalers.
Reactivity series of metals	Newton's 3rd law.
The position of carbon and hydrogen in the reactivity series.	Resultant forces 7 Newton's 1 st Law
Tendency of metal to form a positive ion depends on	Turning forces (moments)
reactivity of the metal.	Finding COM
Reaction between metal and acid.	Parallelogram of forces
Reaction between acid and bases.	Resolution of forces
Reaction between acids and alkalis	
Reaction between acids with carbonates	
Redetion between dolds with earbonates	Practical Opportunities
Now Skills	Dropping cupcake cases
New Skills	Diopping cupcake cases
Deduce an order of reactivity of metals based on	See saws experiment. (moments)
experimental results	Finding COM
Predict reactions of unfamiliar metals given information about	
their relative reactivities.	
H tier – writing ionic equations.	Ecology
H tier – identify the species that have been oxidised or	New Skills
reduced.	Finding the range, the mean, the median and the mode
How to interpret and evaluate processes used to extract	Measuring the population size of a common species using
metals.	sampling techniques
H tier - How to identify redox reactions	Investigating competition in plants
How to predict products from given reactants.	
How to use the formulae of common ions to deduce the	Recalled Skills
formulae of salts	Produce a food chain/web (Ecosystems Y7 – Food chains
Trinle: To calculate vield of a reaction	webs & disruption)
Titration calculations	Interpreting food webs (Ecosystems V7 – Food chains, webs
	disruption)
Practical Opportunities	a distuption)
Charge the reactions of some motols with water and dilute	New Knewledge
Observe the reactions of some metals with water and dilute	New Knowledge
acid.	How to investigate and measure the distribution and
Use of displacement reactions to identify an order of reactivity	abundance of species in a system
How to prepare pure dry crystals of the salts formed in	About the competition between organisms for scarce
neutralisation reactions between acids and insoluble bases	resources, and about the adaptations of organisms that result
How to prepare pure dry crystals of named soluble salts from	from natural selection and enable them to compete
information provided	successfully in specific environments
Investigate neutralisation	About the material cycles in nature that return chemicals from
	the bodies of organisms in the soil, water and air
	5
Particle model	

Recalled Skills	About the levels of organisation within an ecosystem,
Use of thermometer	including the cyclical relationships between predators and
Use of stop clock	their prey.
Calculating stress (Pressure on surface). (yra Forces)	the importance of decomposition and the factors that affect
Lise of displacement can (vr7 matter)	The reasons for the human population evplosion and its
ose of displacement our (yr/ matter)	impact in terms of pollution of the land, water, and air.
Recalled Knowledge	Some of the ways people interact with their environment, and
Pressure in liquids & gases). (yr8 Forces)	how these ways can have negative or positive effects on
Stress (Pressure on solid surface). (yr8 Forces)	biodiversity.
	What is meant by food security and the measures that can be
Skills: Enquiry processes.	taken to make food production both more efficient and
Asking science questions	sustainable
Planning investigations	Decelled Knowledge
Analysing patterns	Adaptations in plants & animals (Genes V7 - Adapting to
Evaluating data	change)
	Competition for resources between individuals and species
New Skills	(Genes Y8 – extinction)
Cooling curve for Salol	That plants and animals have different requirements from
Measuring specific Latent heat	their environments (Ecosystems Y7 – competition)
	Darwin's theory and about natural selection (Genes Y8 –
New Knowledge	natural selection)
Density Required	I hat plants need mineral ions and water from the soil, carbon
Solids, Liquids and gases	dioxide from the air, and light to make the chemicals they
Internal energy	Factors that affect the growth of bacterial populations
Latent heat	(Organisms Y7 – unicellular organisms)
Gas pressure & temperature	
	Practical Opportunities
Practical Opportunities	Required practical - measuring the population size of a
Heating Ice Water /Water vapour	common species using sampling techniques
Cooling curve for salol	Investigating competition in plants
Demo Latent heat of Fusion & Vaporisation. Latent heat of	
Demo Press in liquids & gases	
Density Required Practical	

Year 11

Term 1	Term 2	Term 3
Paper 1 Revision	Evolution/adaptations	
Biology/Physics	New Skills	
	Genetic diagrams – punnet squares	

Paper 2 Revision	How inheritance works	
Chemistry	Meiosis diagrams	
	How to use genetic family trees	
Nervous system/hormones	Using timescales – standard form	
New Skills		
How to carry out an investigation into reaction times	Recalled Skills	
How to find the blind spot	Simple reproduction (Genes Y7 – human reproduction)	
	What is DNA (Genes Y8 – DNA)	
Recalled Skills	Methods of inheritance (Genes Y7 – inheritance)	
Organs of the reproductive system (Genes Y7 – the	Selective breeding (Genes Y8 – genetic modification)	
menstrual cycle)	Using timescales – standard form (Biology B1- The world of	
Fertilisation (Genes Y7 – fertilisation & implantation)	the microscope)	
The menstrual cycle in simplistic terms (Genes Y7 – the		
menstrual cycle)		
New Knewledge	How Charles Darwin built up the evidence for his theory of	
The differences between concern and motor neurones and	evolution by natural selection and some of the madern	
their roles in coordination and control	acceptance of his liteas, as well as some of the modern	
About the arrangement of tissues in the endocrine organs	About new DNA-based systems for classifying organisms	
and how they are adapted to their functions.	About new Drat based systems for classifying organisms.	
How the structure of enzymes are related to their functions	Recalled Knowledge	
and how different factor affect the rate of enzyme controlled	The nucleus of the cell and the chromosomes it contains.	
reactions.	(Biology B1 – Cell structure & transport; B2 – Cell division)	
How reproduction is controlled by normones and now	About mitosis and the cell cycle (Biology B2 – Cell division)	
How bermones work together to control the monetrual evelo	How inheritance works (Conce V9 – human reproduction)	
and how they can be used in the artificial control of fertility	How hielogical ideas develop. (all units)	
Main areas of the brain	About the characteristics of eukaryotic and prokaryotic cells	
Main parts of the human eve and how light is focussed	and the differences between animal, bacterial and plant cells.	
Short –sightedness/long sightedness	(Biology B1 – cell structure & transport)	
Kidney function, dialysis and transplants	Genetics, punnet squares, selective breeding	
Control of temperature		
Control of water balance - ADH	Practical Opportunities	
Recalled Knowledge	N/A	
The basic structure of neurones $(Y9 - Biology B1 - cell$		
structure & transport)		
That tissues can be organised into organs with particular	Energy changes	
functions in the body (Y9 – Biology B3 – organisation & the	Recalled knowledge	
digestive system)	Mass is conserved in chemical reactions	
That enzymes act as biological catalysts. (Y9 – Biology B3 –	Recall that everything is made of particles (KS2 Science, Y7	
organisation & the digestive system)	Matter, The particle model)	
The basic processes of human reproduction. (Genes Y7 –	State that all materials are made up of one or more elements	
human reproduction)	(Y7 Matter, Inside particles)	
I he male and female reproductive organs. (Genes Y7 –	Recall differences between atoms, elements and compounds.	
numan reproduction)	(<i>y</i> /,8,9 term 1)	
Bractical Opportunities	recall now to use chemical symbols and formulae to	
riaciical opportunities		

Poquired practical. How to carry out an invastigation into	Pocall how to represent chemical reactions using formulae	
Required practical - How to carry out an investigation into	Recall now to represent chemical reactions using formulae	
reaction times	and chemical equations (y7,8,9 term 1)	
How to find the blind spot	Breaking down a compound using heat is known as thermal	
	decomposition (y8 matter)	
Reproduction/Genetics	Simple acids and alkalis (y7 reactions)	
New Skills	Bases will neutralise acids. (y7 reactions)	
Genetic diagrams – punnet squares	Salts form when acids and bases react (y7 reactions)	
How inheritance works	Energy cannot be created or destroyed	
Meiosis diagrams	Energy changes take place during chemical reactions	
How to use genetic family trees		
Using timescales – standard form	Recalled skills:	
	Writing word equations (v7.8 reactions)	
Recalled Skills	Recognising symbol equations (V7.8 reactions)	
Simple reproduction (Conec V7 human reproduction)	Difference between exothermic and endothermic reactions	
Matic DNA (Conce V9 DNA)		
What is DINA (Genes Yo – DINA)	(reactions yo)	
ivietnous of inneritance (Genes Y/ – Inneritance)	Energy progress in a reaction can be displayed using a	
Selective breeding (Genes Y8 – genetic modification)	reaction profile diagram. (reactions y8)	
Using timescales – standard form (Biology B1- The world of		
the microscope)	General Scientific Enquiry Skills.	
	Ask scientific questions	
New Knowledge	Plan investigations	
About the DNA that makes up the chromosomes, about the	Record data	
variants of the genes known as alleles, and how all the DNA	Analyse patterns in data	
of an organism can be analysed.	Evaluate data	
About meiosis in cell division and the formation of gametes.	Give conclusions related to the data	
How information is passed from one generation to another		
and how to use genetic diagrams, direct proportion, simple	New Knowledge	
ratios, and probability to predict the outcome of a genetic	Endothermic and endothermic reactions and their transfer of	
cross	energy	
About the importance of selective breeding in the	Uses of exothermic and endothermic energy changes	
development of plants and animals and the increasing use of	The activation energy of a reaction	
denetic engineering to introduce desirable characteristics	Know the difference between bond making and bond	
	hreaking	
	Know that there is a certain amount of anoral accodiated with	
Recalled Knowledge	each hond	
The nucleus of the coll and the chromosomes it contains		
(Pielogy P1 Coll structure & transports P2 Coll division)	Now Skills	
(Divide P_{1} = Cell structure & transport, D_{2} = Cell division)	To distinguish and thermis and exclusions to the termine termine to the termine te	
About mitosis and the cell cycle (Diology $DZ = Cell division)$	ro distinguisti endottiennic and exothermic reactions by	
The process of reproduction (Genes Y7 - reproduction)	Observing the temperature change	
How inneritance works (Genes Y8 – human reproduction)	Recognising activation energy when drawing reaction profiles	
How biological ideas develop. (all units)	tor a reaction.	
About the characteristics of eukaryotic and prokaryotic cells,	identifying exothermic and endothermic reactions from	
and the differences between animal, bacterial and plant cells.	energy	
(Biology B1 – cell structure & transport)	H tier – the impact of bonding breaking and bond making on	
	overall energy change.	
Practical Opportunities	Calculate overall energy change in reactions.	
N/A		
	Practical Opportunities	

	Investigating temperature changes in a variety of reactions
Chemical changes	investigating temperature changes in a valiety of reduitoris
Chemical changes	
Pecalled knowledge	
Mass is conserved in chemical reactions	Wayos and Electromagnetic spectrum
Nass is conserved in chemical reactions Recall that eventthing is made of particles (KS2 Science, VZ	Recalled Skills
Netter The perticle model	Recalled Skills
Maller, The particle model)	Describe motion of waves using a sinky. (yro waves)
State that all materials are made up of one or more elements	
(Y7 Matter, Inside particles)	Light Reflection/Refraction (yr/ weaves)
Recall differences between atoms, elements and compounds.	The eye and vision (yr/ waves)
(y7,8,9 term 1)	Colour (yr/ waves)
Recall how to use chemical symbols and formulae to	
represent elements and compounds. (y7,8,9 term 1)	Recalled Knowledge
Recall how to represent chemical reactions using formulae	Longitudinal wave; sound waves (yr7&8 waves)
and chemical equations (y7,8,9 term 1)	Transverse waves; water waves and electromagnetic
Breaking down a compound using heat is known as thermal	spectrum (yr8 waves)
decomposition (y8 matter)	Radiation and energy (yr8 waves)
Simple acids and alkalis (y7 reactions)	Ripple tank to demonstrate Reflection and Refraction
Bases will neutralise acids. (y7 reactions)	(yr7 waves)
Salts form when acids and bases react (y7 reactions)	Sound waves and speed (yr7 waves)
Energy cannot be created or destroyed	Loudness & amplitude/Frequency and pitch(yr8waves)
Energy changes take place during chemical reactions	The ear and hearing (yr7 waves)
55 5 1 5	Light Reflection/Refraction (vr7 waves)
Recalled skills:	The eve and vision (vr7 waves)
Writing word equations (v7.8 reactions)	Colour (vr7 waves)
Recognising symbol equations (v7.8 reactions)	
Difference between exothermic and endothermic reactions	Skills: Enquiry processes
(reactions v8)	Asking science questions
Energy progress in a reaction can be displayed using a	Planning investigations
reaction profile diagram (reactions v8)	Recording data
reaction prome diagram. (reactions yo)	Analysing patterns
Conoral Scientific Enguiny Skills	Evaluating data
Ack scientific questions	Evalualing uala
Ask scienting questions	Now Skills
Proord data	New JINIS Deparibe wayon in a ringle tank
	Describe waves in a ripple tank
Analyse patterns in data	Observe standing waves in a string
Evaluate data	Description and discourses from the sti
Give conclusions related to the data	Drawing ray diagrams for reflection
	Drawing ray diagrams for lenses
New Knowledge	
What happens in electrolysis	New Knowledge
What type of substance can be electrolysed.	Transverse and longitudinal waves.
Products of electrolysis	Basic wave form and wave equation v=f x lambda
What happens to ions during electrolysis?	Reflection and refraction.
How water effects the products of electrolysis	Waves in ripple tank and standing wave.
Know uses for the products of electrolysis of brine.	Sound waves
Extraction of aluminium	
Triple: Chemical cells and fuel cells	Electromagnetic spectrum; uses and dangers

	Communication using electromagnetic waves	
New Skills	Medical uses of electromagnetic waves	
Recognise that electrolytes must be molten or in aqueous	Use of X Rays in medicine	
solution		
Explain the movement of ions within the electrolyte.	Reflection	
H tier. Half equations to represent the reactions at the	Refraction	
electrodes	Light and colour	
How to predict the products of the electrolysis of aqueous	Lenses	
solution	Lise of lenses	
How to investigate the electrolysis of aqueous solution using		
now to investigate the electrolysis of aqueous solution using	Prestical Opportunities	
	Practical Opportunities	
Prestinal Organization idea	Demo transvers and longitudinal waves with slinky. Videos	
Practical Opportunities	Theory on basic wave form. Label wave. CRO and signal gen	
Investigating the electrolysis of aqueous solutions	RP waves in a ripple tank	
	RP reflection and refraction through block	
	Demo sound waves with sig gen and loudspeaker	
	Sound in a vacuum Finding speed of sound by echo	
Motion and forces		
Forces	Model spectrum with devices	
Recalled Skills		
Using newton meter. (yr7 Forces)		
Calculating speed. (yr7 Forces)	Electromagnetism	
	Recalled Skills	
Recalled Knowledge	Plotting magnetic fields around permanent magnet.	
Measuring Forces (vr7 Forces)	(vr8 electromagnets)	
Balanced and unbalanced forces (vr7 Forces)	Electromagnets (vr8 electromagnets)	
Speed (yr7 Forces)		
Distance-time graphs (vr7 Forces)	Pecalled Knowledge	
Turning forees (vr9 Forees)	Recalled Knowledge	
Vectors and easlers	Magnetic fields around a permanent magnet (ur?	
Vectors and scalers.	Magnetic fields around a permanent magnet (yro	
Newton's 3rd law.	electromagnets)	
Resultant forces / Newton's 1 st Law	Magnetic effect of a current (yr8 electromagnets)	
Turning forces (moments)	Electromagnets (yr8 electromagnets)	
Finding COM		
Parallelogram of forces	Stars, planets and satellites (yr7 earth)	
Resolution of forces	Solar system (yr7 earth)	
	Skills: Enquiry processes.	
Skills: Enquiry processes.	Asking science questions	
Asking science questions	Planning investigations	
Planning investigations	Recording data	
Recording data	Analysing patterns	
Analysing patterns	Evaluating data	
Evaluating data	-	
Ĭ	New Skills	
New Skills	Plotting magnetic fields around an electromagnet.	
Calculating acceleration	Motor effect	
Using light gates	Generator effect	
		l

Using air track		
	New Knowledge	
New Knowledge	Permanent magnets & magnetic fields	
	Magnetic effect of a current	
Speed investigation & equations	Electromagnets	
Acceleration investigation & equations	The motor effect	
distance vs velocity time graphs.		
velocity vs time graphs	Generator effect. AC generator	
Using motion graphs to find vel, acc and distance travelled	Transformers & national grid.	
	Big bang theory	
Practical Opportunities	Expanding universe and red shift	
	Life history of a star & formation of elements by fusion	
Finding speed of trolley down ramp	Planetary nebula, formation of planets and satellites.	
Finding acceleration of trolley using ticker tape		
	Practical Opportunities	
	Permanent magnets, magnetic mtls & fields	
	Plotting field around bar magnets.	
	what effect strength of an electromagnet	
	Demo the motor effect	
	Demo electromagnetic induction (generator effect)	
	Demo Transformers.	