

## Curriculum Overview

	Year 7	Year 8	Year 9
Autumn	Overview	Overview	Overview
	Introduction to Science	Introduction to Science	Biology
	Biology	Biology	Chemistry
	Chemistry	Chemistry	Physics
Physics	Physics	Physics	Physics
Cells & Cellular Processes	Cells & Cellular Processes	Materials & Atoms,	Materials & Their Properties
Cell Structure	Biological Reactions	Sound	Mixtures
Solids, Liquids & Gases	Energy	Energy	The Periodic Table
Mixtures & Separations	Light	Energy & Efficiency	Waves & The EM
Energy Stores & Transfers	Energy	Energy	Energy
Introduction, expectations & lab safety	Introduction & expectations	Energy transfers & diagrams	Eukaryotic Cells
Equipment	Lab safety	Energy efficiency	Visualising cells
Bunsen Burner License	Equipment	Revision	Microscopy calculations
Boiling Water	Bunsen burner license	DS1	Specialised cells
Sandwell Council KS2 Transition 1	Boiling water	DIRT	The discovery of DNA & DNA in eukaryotic cells
Sandwell Council KS2 Transition 2	Writing a method	DIRT	Extracting DNA from fruit
Representing Data	Unicellular organisms	DIRT	Prokaryotic cells
Interpreting Data	Unicellular organisms and diffusion	DIRT	Diffusion & active transport
Using and Rearranging Formula	Aerobic respiration and uses	DIRT	Osmosis
STEM Career Introduction	Heart rate and exercise investigation	DIRT	Investigating osmosis 1
Assessment	Effect of pH/temperature on anaerobic respiration	DIRT	Investigating osmosis 2
DIRT	Photosynthesis, its products and factors effecting	DIRT	Assessment
Scale & Size	Adaptations of leaves for photosynthesis	DIRT	DIRT
Microscope licence (daphnia or salt vs sugar)	Limiting factors of photosynthesis investigation	DIRT	The particle model & changes of state
Animal & plant cells	Revision	DIRT	Mixtures
Visualising animal cells & scientific drawing	Assessment	DIRT	Filtration
Visualising plant cells & magnification calculations	DIRT	DIRT	Crystallisation
Bacteria cells	Atomic Structure	DIRT	Distillation 1
Assessment	Periodic Table	DIRT	Distillation 2
DIRT	Formulae	DIRT	Chromatography
Physical & chemical properties (investigating properties)	Assessment	DIRT	Potable water
Solids, liquids & gasses (investigation)	DIRT	DIRT	Sub-atomic particles & structure of the atom
Solids, liquids & gasses (theory)	DIRT	DIRT	Electron shells
Changes of state	DIRT	DIRT	Isotopes
Diffusion	DIRT	DIRT	Mendeleev
Pure and impure	DIRT	DIRT	The modern periodic table
Solubility	DIRT	DIRT	Assessment
Separation of an insoluble solid	DIRT	DIRT	DIRT
Separation of a soluble solid	DIRT	DIRT	Energy Stores and Transfers
Chromatography	DIRT	DIRT	Energy Efficiency
Distillation	DIRT	DIRT	DS1 Exam
Assessment	DIRT	DIRT	DIRT
DIRT	DIRT	DIRT	Energy Resources
Food and Fuel	DIRT	DIRT	Energy Stores and Transfers
Energy Stores and Transfers	DIRT	DIRT	Energy Efficiency
Energy Efficiency	DIRT	DIRT	DS1
DS1 Exam	DIRT	DIRT	DIRT
DIRT	DIRT	DIRT	Stored energies: GPE
Energy Resources	DIRT	DIRT	Stored energies: KE
Energy transfers & diagrams	DIRT	DIRT	Energy resources
Energy efficiency	DIRT	DIRT	Describing waves
Revision	DIRT	DIRT	Measuring waves in a liquid & solid 1
DS1	DIRT	DIRT	Measuring waves in a liquid & solid 2
DIRT	DIRT	DIRT	Refraction
Stored energies: GPE	DIRT	DIRT	Investigating refraction
Stored energies: KE	DIRT	DIRT	Refraction write-up
Energy resources	DIRT	DIRT	Refraction
Describing waves	DIRT	DIRT	Investigating refraction
Measuring waves in a liquid & solid 1	DIRT	DIRT	Refraction write-up
Measuring waves in a liquid & solid 2	DIRT	DIRT	Refraction
Refraction	DIRT	DIRT	Investigating refraction
Investigating refraction	DIRT	DIRT	Refraction write-up
Refraction write-up	DIRT	DIRT	Refraction





# Curriculum Overview

Summer

## Overview

Biology	Organisms & Their Interactions With The Environment	Ecosystems	Key words
			Energy flow
			Pyramids
			Bioaccumulation
			Predator-prey relationships
			Seasonal & daily influences on ecosystems
			Human influences on ecosystems
			Biodiversity & classification
			Sampling practical
			Assessment
			DIRT
			Chemistry
Gas tests			
Assessment			
DIRT			
Physics	Matter & Materials	Measuring Density	SI units
			Density
			Measuring mass, volume & density (including irregular shapes)
			Assessment
			DIRT
			Exam and DIRT
			Revision
			DS3
			DIRT

**Skills**  
**Sampling** - use appropriate techniques, apparatus, and materials during fieldwork  
**Measuring mass, volume and density** - present observations and data using appropriate methods

**Disciplinary Knowledge**  
 - apply mathematical concepts and calculate results

## Overview

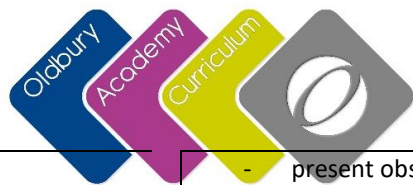
Physics	Forces & Fields	Earth & Space	Seasons	
			Gravity	
			Satellite Orbits	
			Assessment	
		Magnets	Magnetic forces	
			Magnetic fields	
			Electromagnets	
			Assessment	
		Static Electricity	Static electricity	
			Static electricity uses & dangers	
			Revision	
			Assessment	
DIRT				
Biology	Organisms & Their Interactions With the Environment		The Producers	Plant structures including roots and stem
				Gas exchange and transport in plants
				Plant adaptations
		Classification of plants		
		Plant reproduction		
		Classification & biodiversity		
		External influences on ecosystems		
		Farming		
		Revision		
		Assessment		
		DIRT		
		Chemistry		Our Earth & Its Atmosphere
Properties of metals				
Metal uses				
Revision				
DS3 Assessment				
DIRT				
DIRT				
Metal reactions				
How can our school recycle?				
Assessment				
DIRT				
Physics	Matter & Materials		Solids, Liquids & Gases	
		States of matter		
		Investigating states of matter		
		Changes of state		
		Assessment		
		DIRT		

**Skills**  
**Investigating states of matter** – make predictions based off scientific knowledge

## Overview

Physics	Forces & Fields	Describing Motion	Vectors and scalars			
			Describing motion: using equations			
			Describing motion: distance time graphs			
			Describing motion: calculating acceleration 1			
			Describing motion: calculating acceleration 2			
			Describing motion: velocity time graphs			
		Forces & Matter	Determining speed			
			Bending and stretching			
			Springs theory			
			Springs practical			
			Springs evaluation			
			Assessment			
Biology	Organisms & Their Interactions With the Environment	Evolution	Variation and adaptation			
			Measuring variation			
			Evolution and natural selection			
			Evidence for evolution			
			Evidence for evolution			
			Extinction			
		Exam and DIRT	Assessment			
			DIRT			
			Revision			
			DS3			
			DIRT			
			Chemistry	Our Earth & Its Atmosphere	The Atmosphere	Composition of the atmosphere
Percentage of oxygen in the air						
Global warming: research						
Global warming: research						
Global warming: article						
Assessment						
DIRT						
Physics	Matter & Materials	Atomic Structure				Structure of the atom
						Isotopes
						Electron shells
						The atomic model over time
						Assessment

**Skills**  
**Springs** - making predictions based off scientific knowledge



## Curriculum Overview

- present observations and data using appropriate methods, including tables and graphs
- interpret observations and data, including identifying patterns and using observations, measurements and data to draw conclusions
- present reasoned explanations, including explaining data in relation to predictions and hypotheses
- evaluate data, showing awareness of potential sources of random and systematic error
- identify further questions arising from their results
- understand and use SI units and IUPAC (International Union of Pure and Applied Chemistry) chemical nomenclature
- use and derive simple equations and carry out appropriate calculations
- undertake basic data analysis including simple statistical techniques

### **Assessment**

4 X 'Big Idea' End of Topic Assessment with follow-up DIRT lesson

1 X Data Sweep Summative Assessment with follow-up question level analysis and DIRT lesson

16 X Recall Tests

## Year 10

## Year 11

Autumn

### Overview

<b>Biology</b>	<b>Key Concepts in Biology</b>	Specialised cells
		Microscopy
		Enzyme action
		Enzyme activity
		Movement of substances
		Osmosis
		Assessment
		DIRT
		<b>Cells and Control</b>
	Growth in Animals and Plants	
	Stem Cells	
	The Nervous System	
	EoU Assessment	
	DIRT	
	<b>Genetics</b>	
		DNA
		Inheritance
		Genetic Diagrams
		Variation
		EoU Assessment
DIRT		
<b>Natural Selection and GMOs</b>	Evidence for Evolution	
	Natural Selection	
	Classification	
	Artificial Selection	
	Genes in Agriculture and Medicine	
	Evaluation	
	Assessment	
	DIRT	
	<b>DS1 Exa</b>	DS1 B1 Exam
DIRT		
<b>Health, Disease and the Development of Medicine</b>	Non-communicable Diseases	
	CVD	
	Communicable Diseases	
	Defence against disease	
	Immunisation	
	Antibiotics	
	EoU Assessment	
	DIRT	

### Overview

<b>Biology</b>	<b>Plant Structures and Their Function</b>	Photosynthesis	
		Factors that Affect Photosynthesis	
		Light Intensity and Photosynthesis	
		Absorbing Water and Mineral Ions	
		Transpiration and Translocation	
		EoU Assessment	
		DIRT	
		<b>Animal Coordination, Control and</b>	Hormones
			Hormonal Control of Metabolic Rate
	The Menstrual Cycle		
	Hormones and The Menstrual Cycle		
	Blood Glucose and Diabetes		
	EoU Assessment		
	DIRT		
	<b>Exchange and Transport in</b>	Efficient Transport and Exchange	
		The Circulatory System and The Heart	
		Cellular Respiration	
		Respiration Rates	
		EoU Assessment	
		DIRT	
<b>Ecosystems and Material Cycles</b>		Ecosystems	
	Abiotic Factors and Communities		
	Quadrats and Transects		
	Biotic Factors and Communities		
	Paratism and Mutualism		
	Biodiversity and Humans		
	Preserving Biodiversity		
	The Carbon and Water Cycle		
	The Nitrogen Cycle		
<b>Exam &amp; DIRT</b>	<b>DS1 Exam</b>	B2 Paper	
		DIRT	

### Disciplinary Knowledge

- using scientific theories and explanations to develop hypotheses
  - planning experiments to make observations, test hypotheses or explore phenomena
  - applying a knowledge of a range of techniques, apparatus, and materials to select those appropriate both for fieldwork and for experiments
  - carrying out experiments appropriately, having due regard to the correct manipulation of apparatus, the accuracy of measurements and health and safety considerations
  - presenting observations and other data using appropriate methods
  - translating data from one form to another
  - carrying out and representing mathematical and statistical analysis
  - representing distributions of results and making estimations of uncertainty
  - recognising when to apply a knowledge of sampling techniques to ensure any samples collected are representative
  - making and recording observations and measurements using a range of apparatus and methods
- evaluating methods and suggesting possible improvements and further investigations.
  - interpreting observations and other data, including identifying patterns and trends, making inferences and drawing conclusions
  - presenting reasoned explanations, including relating data to hypotheses being objective, evaluating data in terms of accuracy, precision,
  - repeatability and reproducibility and identifying potential sources of random and systematic error
  - developing their use of scientific vocabulary and nomenclature recognising the importance of scientific quantities and understanding how they are determined using SI units and IUPAC chemical nomenclature unless inappropriate
  - using prefixes and powers of ten for orders of magnitude (e.g. tera, giga, mega, kilo, centi, milli, micro and nano)

#### Assessments

4 X End of Topic Assessment with follow-up DIRT lesson  
 1 X Data Sweep Summative GCSE Assessment with follow-up question level analysis and DIRT lesson  
 16 X Recall Tests

Spring

#### Overview

<b>Chemistry</b>	<b>Key Concepts in Chemistry</b>	Atomic structure
		Isotopes
		The periodic table
		Ions & ionic bonding
		Covalent bonding
		Giant covalent
		Metallic bonding
		EoU Assessment
		DIRT
	<b>States of Matter &amp; Separation</b>	States of Matter
		Separation Techniques
		Assessment
		DIRT
	<b>Acids, Alkalis and Calculations Involving Masses</b>	Acids, Alkalis and Indicators
		Looking at Acids
		Bases and Salts
		Preparing Copper Sulphate
		Alkalis and Balancing Equations
		Investigating Neutralisation
		Reactions of Acids
		Solubility
		Masses and Empirical Formulae
		Conservation of Mass

#### Overview

<b>Chemistry</b>	<b>Groups in the Periodic Table, Rates of Reaction, Thermodynamics</b>	Group 1
		Group 7
		Halogen Reactivity
		Group 0
		Rates of Reaction
		Factors Affecting Rates
		Investigating Reaction Rates
		Catalysts and Activation Energy
		Exothermic and Endothermic Reactions
		Energy Changes in Reaction
		EoU Assessment
		DIRT
		<b>Fuels, Earth and the Early Atmosphere</b>
	Fractional Distillation	
	Alkanes	
	Complete and Incomplete Combustion	
	Combustible Fuels and Pollution	
	Breaking Down Hydrocarbons	
	The Early Atmosphere	
	The Atmosphere Today	
	Climate Change	
	EoU Assessment	
	DIRT	
	<b>D S</b>	
	<b>Revision</b>	

## Curriculum Overview

<b>Obtaining and Using Metals &amp; Equilibrium</b>	Moles	<b>Exam and DIRT</b>	<b>Physics</b>	<b>C2 PAPER</b>		
	Electrolysis			<b>DIRT</b>		
	Electrolysis of Copper Sulphate			<b>Forces Doing Work</b>	Work and Power	
	<b>DS2 C1 Exam</b>				Objects Affecting Each Other	
	<b>DIRT</b>			EoU Assessment		
	Products from Electrolysis			<b>Electricity and Circuits</b>	DIRT	
	Reactivity				Electric Circuits	
	Ores				Current and Potential Difference	
	Oxidation and Reduction				Current, Charge and Electricity	
	LCAs				Resistance 1	
	Equilibrium				Resistance 2	
	Assessment				<b>Investigating Resistance</b>	
	DIRT				Transferring Energy	
					Power	
					Transferring Energy by Electricity	
	Electrical Safety					
	EoU Assessment					
	DIRT					
	<b>Magnetism and Electromagnetism</b>	Magnets and Magnetic Fields				
		Electromagnetism				
		Magnetic Forces				
		Transformers				
		Transformers and Energy				
		EoU Assessment				
	DIRT					
	<b>Particles, Forces and Matter</b>	Particles and Density				
		<b>Investigating Densities</b>				
		Energy and Changes of State				
		Energy Calculations				
		<b>Investigating Water</b>				
		Gas Temperature and Pressure				
		Bending and Stretching				
		<b>Investigating Springs</b>				
	Extension and Energy Transfers					

### Disciplinary Knowledge

- |   |   |
|---|---|
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|---|---|



- recognising when to apply a knowledge of sampling techniques to ensure any samples collected are representative
- making and recording observations and measurements using a range of apparatus and methods

- using prefixes and powers of ten for orders of magnitude (e.g. tera, giga, mega, kilo, centi, milli, micro and nano)

### Assessments

- 4 X End of Topic Assessment with follow-up DIRT lesson
- 1 X Data Sweep Summative GCSE Assessment with follow-up question level analysis and DIRT lesson
- 16 X Recall Tests

Summer

### Overview

<b>Physics</b>	<b>Motion</b>	Vectors and Scalars
		Distance/Time Graphs
		Acceleration
		Velocity/Time Graphs
		EoU Assessment
		DIRT
	<b>Motion and Forces</b>	Resultant Forces
		Newton's First Law
		Mass and Weight
		Newton's Second Law
		Investigating Acceleration
		Newton's Third Law
		Momentum
		Stopping Distances & Crash Hazards
		EoU Assessment
		DIRT
	<b>Conservation of Energy &amp; Waves</b>	Energy Stores and Transfers
		Energy Efficiency
		Keeping Warm
		Stored Energies
		Energy Resources
		Describing Waves
		Wave Speeds
		Investigating Waves
		Refraction
		DS3 Physics Exam
DIRT		
<b>Light and the</b>	EM Waves	
	Investigating Refraction	
	EM Spectrum, Uses and Dangers	
<b>Radioactivity</b>	Atomic Model	
	Electrons and Orbits	
	Background Radiation	

### Overview

Bespoke Revision + GCSE Assessments

## Curriculum Overview

	Type of Radiation Radioactive Decay Half-life Radiation Dangers EoU Assessment DIRT	
<b>Disciplinary Knowledge</b>		
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<b>Assessments</b> 4 X End of Topic Assessment with follow-up DIRT lesson 1 X Data Sweep Summative GCSE Assessment with follow-up question level analysis and DIRT lesson 16 X Recall Tests	<b>Assessments</b> External GCSE Assessments	