

Curriculum Overview

Subject: Science

Year Group: 9



Students are introduced to the importance of Science in the world around them. Students will develop the powerful knowledge needed to go beyond the common understanding of science to a deeper, more rounded world view. With a focus on key concepts, apparatus and techniques students will develop the subject disciplinary knowledge needed to think, write, communicate and relate scientific ideas to the wider world. Students will follow the national curriculum and have opportunities to undertake open ended investigations in term 2 developing analytical and rational thought processes.

TERM 1	TERM 2	TERM 3
<p>KNOWLEDGE/SKILLS Biology: Non-communicable diseases, cancer, smoking, alcohol, diet and exercise. Chemistry: Atoms and its' history, mixtures, distillation, chromatography, chemical equations, atomic structure, ions, isotopes, development of Periodic Table, alkali metals, halogens. Physics: Work done, kinetic, gravitational potential, elastic potential energy stores. Energy dissipation, efficiency, appliances, power.</p> <p>Skills:</p> <ul style="list-style-type: none"> • Development of scientific thinking (modelling). • Experimental skill and strategies (risks and variables) • Analysis and evaluation (graphing) • Use of scientific vocabulary, units and symbols. 	<p>KNOWLEDGE/SKILLS Biology: Cell division, growth and differentiation, stem cells, blood, heart, gas exchange, tissues and organs in plants, transport in plants, transpiration. Chemistry: Earths' atmosphere, greenhouse gasses, climate change, pollution. Physics: Conduction, convection, radiation, specific heat capacity, insulating buildings.</p> <p>Skills:</p> <ul style="list-style-type: none"> • Development of scientific thinking (modelling). • Experimental skill and strategies (risks and variables) • Analysis and evaluation (graphing) • Use of scientific vocabulary, units and symbols. 	<p>KNOWLEDGE/SKILLS Biology: Communities, organisms in their environment, competition in animals and plants, adaptations, human population explosion, pollution, deforestation, global warming, biodiversity, feeding relationships, carbon cycle. Chemistry: The Earths' resources, water safe to drink, reduce, reuse, recycle. Physics: n/a</p> <p>Skills:</p> <ul style="list-style-type: none"> • Development of scientific thinking (modelling). • Experimental skill and strategies (risks and variables) • Analysis and evaluation (graphing) • Use of scientific vocabulary, units and symbols.
<p>KEY ASSESSMENTS Half term 1: Conservation and dissipation of energy test, Cancer LWQ Half term 2: Periodic table LWQ, Atomic structure and energy resources test</p>	<p>KEY ASSESSMENTS Half term 1: Energy transfer by heating / Cell division test, the Earths' atmosphere LWQ Half term 2: The Heart LWQ, Organising Animals and Plants test</p>	<p>KEY ASSESSMENTS Half term 1: Adaptations, interdependence and competition test, biodiversity and ecosystems LWQ Half term 2: Water safe to drink LWQ The Earths' resources test</p>

Extended reading suggestions and external resources:






KS4 Bitesize Science <https://www.bbc.co.uk/bitesize/subjects/zrkw2hv>

Oak National Academy Lessons <https://classroom.thenational.academy/subjects-by-key-stage/key-stage-4/subjects/combined-science>

Chase High Youtube Playlists <https://www.youtube.com/channel/UCSK4lmJfi5sPH4UBp7cZtyQ>

We actively encourage students to read and research about the wider Scientific word- Planet Earth and Perfect Planet both on BBC iPlayer are examples of where students can engage with Science from the safety and comfort of their own homes.

Science Year 9 Assessment Criteria

	Bronze (CuSn) 	Silver (Ag) 	Gold (Au) 	Platinum (Pt) 
Development of Scientific thinking (modelling)	I can state how a scientific theory has changed over time. I can state an ethical implication of new scientific technology.	I can describe how a scientific theory has changed over time and whether data supports it. I can describe some ethical implications of new scientific technology.	I can describe how multiple scientific theories have developed over time. I can describe some ethical implications of scientific technology and use data to support my answer.	I can explain with an example why new data has led to changes in models/ theories. I can describe the limitations of science and consider any ethical issues that may arise with new technology.
Experimental skills and strategies (Risk and variables)	I can give a basic description of a sampling technique. I can state how to improve investigations.	I can give a basic description of two sampling techniques. I can describe how to improve investigations to obtain more accurate results.	I can give a detailed description of two sampling techniques. I can evaluate a method and suggest improvements to obtain more reliable results.	I can suggest and describe appropriate sampling techniques in a given context. I can evaluate methods and suggest improvements that would allow more reliable and accurate data to be obtained.
Analysis and evaluation (graphing)	I can construct a line graph with correct interval ranges. I can calculate the mean of given data.	I can construct a line graph with correct interval ranges, plotting, axis labels and straight line of best fit. I can calculate the mean of given data with anomalies present.	I can construct and interpret line graphs, bar charts and histograms. I can calculate the mean of data to the appropriate number of significant figures.	I can construct, interpret and determine the area of a line graph. I can calculate the mean, mode, median and range of data to the appropriate number of significant figures.
Use of Scientific vocabulary, units and symbols	I can use simple orders of magnitude (kilo/centi/milli). I can identify the amount of significant figures in a question.	I can interconvert simple orders of magnitude. I can answer to 2 significant figures to one decimal place.	I can use powers of 10 for orders of magnitude. I can round to two significant figures to one decimal place.	I can use prefixes and powers of ten for all orders of magnitude (Tera, giga, mega, kilo, centi, milli, micro and nano). I can round to two significant figures when the answer contains zeros up to five decimal places.