



# SUBJECT

# CURRICULUM SEQUENCING

**“Through a love of Science, our students gain the skills, knowledge and curiosity to battle the challenges of today and solve the problems of tomorrow”**

## EXAM BOARD RATIONALE

At Cottingham High School, we have chosen the AQA Examination Board for both our combined and separate sciences at GCSE. From a teaching perspective, the reasons for our choice are that the specification has been written in conjunction with over a thousand science teachers and the specification itself follows a logical teaching order to support our sequencing of materials. Opportunities for skill development are also listed in the specification. From a student perspective, we believe strongly that AQA will provide our students with the best possible outcome. AQA has the largest entry for Science (separate and combined) and exams that are accessible to all our students. Several staff members are also experienced exam markers for AQA, giving them further in-depth knowledge of how the students are assessed and the key terminology the examiners are looking for. To further support the transition of learners through secondary school, we have chosen and adapted the AQA KS3 Scheme of Work to underpin our KS3. The schemes begin with the fundamentals in Science, building on them within Y8 to support that transition to KS4. For example, in Biology in Y7 students will look at human reproduction and variation, then build upon this in Y8 looking at inheritance. These both act as a precursor to content covered in years 9, 10 and 11.

## KEY SUBJECT SKILLS

We have chosen a model that reflects the key working scientifically (WS) skills from the KS4 national curriculum. These have been mapped over KS3 and KS4. Below, using the examination board specification for support.

<b>WS 1.1</b>	<b>WS 1.2</b>	<b>WS 1.3</b>	<b>WS 1.4</b>	<b>WS 1.5</b>	<b>WS 1.6</b>		
Understand how scientific methods and theories develop over time.	Use a variety of models such as representational, spatial, descriptive, computational and mathematical to solve problems, make predictions and to develop scientific explanations and understanding of familiar and unfamiliar facts.	Appreciate the power and limitations of science and consider any ethical issues which may arise.	Explain everyday and technological applications of science; evaluate associated personal, social, economic and environmental implications; and make decisions based on the evaluation of evidence and arguments.	Evaluate risks both in practical science and the wider societal context, including perception of risk in relation to data and consequences.	Recognise the importance of peer review of results and of communicating results to a range of audiences.		
<b>WS 2.1</b>	<b>WS 2.2</b>	<b>WS 2.3</b>	<b>WS 2.4</b>	<b>WS 2.5</b>	<b>WS 2.6</b>	<b>WS 2.7</b>	
Use scientific theories and explanations to develop hypotheses.	Plan experiments or devise procedures to make observations, produce or characterise a substance, test hypotheses, check data or explore phenomena.	Apply a knowledge of a range of techniques, instruments, apparatus, and materials to select those appropriate to the experiment.	Carry out experiments appropriately having due regard for the correct manipulation of apparatus, the accuracy of measurements and health and safety considerations.	Recognise when to apply a knowledge of sampling techniques to ensure any samples collected are representative.	Make and record observations and measurements using a range of apparatus and methods.	Evaluate methods and suggest possible improvements and further investigations.	
<b>WS 3.1</b>	<b>WS 3.2</b>	<b>WS 3.3</b>	<b>WS 3.4</b>	<b>WS 3.5</b>	<b>WS 3.6</b>	<b>WS 3.7</b>	<b>WS 3.8</b>
Presenting observations and other data using appropriate methods.	Translating data from one form to another.	Carrying out and represent mathematical and statistical analysis.	Representing distributions of results and make estimations of uncertainty.	interpreting observations and other data (presented in verbal, diagrammatic, graphical, symbolic or numerical form), 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.	Communicating the scientific rationale for investigations, methods used, findings and reasoned conclusions through paper-based and electronic reports and presentations using verbal, diagrammatic, graphical, numerical and symbolic forms.
<b>WS 4.1</b>	<b>WS 4.2</b>	<b>WS 4.3</b>	<b>WS 4.4</b>	<b>WS 4.5</b>	<b>WS 4.6</b>		
Use scientific vocabulary, terminology and definitions.	Recognise the importance of scientific quantities and understand how they are determined.	Use SI units (eg kg, g, mg; km, m, mm; kJ, J) and IUPAC chemical nomenclature unless inappropriate	Use prefixes and powers of ten for orders of magnitude (eg tera, giga, mega, kilo, centi, milli, micro and nano).	Interconvert units.	Use an appropriate number of significant figures in calculation.		

## BASELINE EXPECTATIONS

### Knowledge and Skills Expectations

#### Key Stage 2

#### Year 6

Students should have a comprehensive understanding of key scientific content covered as part of the KS2 national curriculum.

#### **Learners were taught:**

##### Living Things and Their Habitats

describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals

give reasons for classifying plants and animals based on specific characteristics.

##### Animals including Humans

- identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood
- recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function
- describe the ways in which nutrients and water are transported within animals, including humans

##### Evolution and Inheritance

- recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago
- recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents
- identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution

##### Light

- recognise that light appears to travel in straight lines
- use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye
- explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes
- use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.

##### Electricity

- associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit
- compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches
- use recognised symbols when representing a simple circuit in a diagram.

## Key Stage 3

### Year 7

As students all arrive at CHS with different amounts of experience, knowledge and skills within the science discipline, we have an introductory set of lessons to allow students to establish a consistent baseline across the school. Following this, students will begin our KS3 Science curricula where they will cover all aspects of the national curriculum for KS3 science by the end of Year 8.

Students will gain a solid understanding of the core content and skills taught in each topic.

#### Forces 1 - Speed and Gravity

Knowledge	Skills	
<ul style="list-style-type: none"> <li>- If the overall, resultant force on an object is non-zero, its motion changes and it slows down, speeds up or changes direction.</li> <li>- Mass and weight are different but related. Mass is a property of the object; weight depends upon mass but also on gravitational field strength.</li> <li>- Every object exerts a gravitational force on every other object. The force increases with mass and decreases with distance. Gravity holds planets and moons in orbit around larger bodies.</li> </ul>	<p>Use the formula: speed = distance (m)/time (s) or distance-time graphs, to calculate speed.</p> <p>Use the formula: weight (N) = mass (kg) x gravitational field strength (N/kg).</p>	
Facts	Keywords	
<ul style="list-style-type: none"> <li>- A straight line on a distance-time graph shows constant speed, a curving line shows acceleration.</li> <li>- The higher the speed of an object, the shorter the time taken for a journey.</li> <li>- g on Earth = 10 N/kg. On the moon it is 1.6 N/kg.</li> </ul>	Speed Average Speed Relative Motion Acceleration Weight	Non-Contact Force Mass Gravitational Field Strength Field

#### Electromagnets 1 – Potential Difference and Resistance and Current

Knowledge	Skills	
<ul style="list-style-type: none"> <li>- We can model voltage as an electrical push from the battery, or the amount of energy per unit of charge transferred through the electrical pathway.</li> <li>- In a series circuit, voltage is shared between each component. In a parallel circuit, voltage is the same across each loop. Components with resistance reduce the current flowing and shift energy to the surroundings.</li> <li>- Current is a movement of electrons and is the same everywhere in a series circuit. Current divides between loops in a parallel circuit, combines when loops meet, lights up bulbs and makes components work.</li> <li>- Around a charged object, the electric field affects other charged objects, causing them to be attracted or repelled. The field strength decreases with distance.</li> </ul>	<p>Calculate resistance using the formula: resistance (<math>\Omega</math>) = potential difference (V) ÷ current (A).</p> <p>Use the formula: weight (N) = mass (kg) x gravitational field strength (N/kg).</p>	
Facts	Keywords	
Two similarly charged objects repel, two differently charged objects attract.	Potential Difference Resistance Electrical Conductor Electrical Insulator Negatively Charged Positively Charged Electrons	Charged up Electrostatic force Current In Series In Parallel Field

### Energy 1 – Energy Costs and Energy Transfer

Knowledge	Skills	
<ul style="list-style-type: none"> <li>- We pay for our domestic electricity usage based on the amount of energy transferred.</li> <li>- Electricity is generated by a combination of resources which each have advantages and disadvantages.</li> <li>- We can describe how jobs get done using an energy model where energy is transferred from one store at the start to another at the end.</li> <li>- When energy is transferred, the total is conserved, but some energy is dissipated, reducing the useful energy</li> </ul>	Calculate the cost of home energy usage, using the formula: cost = power (kW) x time (hours) x price (per kWh)	
Facts	Keywords	
<ul style="list-style-type: none"> <li>- Food labels list the energy content of food in kilojoules (kJ).</li> </ul>	Power Energy Resource Non-renewable Renewable Fossil fuels Thermal Energy Store	Chemical Energy Store Kinetic Energy Store Gravitational Potential Energy store Elastic Energy Store Dissipated

### Waves 1 – Sound and Light

Knowledge	Skills	
<ul style="list-style-type: none"> <li>- Sound consists of vibrations which travel as a longitudinal wave through substances. The denser the medium, the faster sound travels.</li> <li>- The greater the amplitude of the waveform, the louder the sound. The greater the frequency (and therefore the shorter the wavelength), the higher the pitch.</li> <li>- When a light ray meets a different medium, some of it is absorbed and some reflected. For a mirror, the angle of incidence equals the angle of reflection. The ray model can describe the formation of an image in a mirror and how objects appear different colours.</li> <li>- When light enters a denser medium it bends towards the normal; when it enters a less dense medium it bends away from the normal. Refraction through lenses and prisms can be described using a ray diagram as a model.</li> </ul>	Construct ray diagrams to show how light reflects off mirrors, forms images and refracts.	
Facts	Keywords	
<ul style="list-style-type: none"> <li>- Sound does not travel through a vacuum.</li> <li>- The speed of sound in air is 330 m/s, a million times slower than light.</li> <li>- Light travels at 300 million metres per second in a vacuum.</li> <li>- Different colours of light have different frequencies</li> </ul>	Vibration Longitudinal Wave Volume Pitch Amplitude Wavelength Frequency Vacuum Oscilloscope Absorption Auditory Range Echo Incident ray	Reflected ray Normal line Angle of reflection Angle of incidence Refraction Absorption Scattering Transparent Translucent Opaque Convex lens Concave lens Retina

### Matter 1 – Particle Model and Separating Mixtures

Knowledge	Skills	
<ul style="list-style-type: none"><li>- Properties of solids, liquids and gases can be described in terms of particles in motion but with differences in the arrangement and movement of these same particles: closely spaced and vibrating (solid), in random motion but in contact (liquid), or in random motion and widely spaced (gas).</li><li>- Observations where substances change temperature or state can be described in terms of particles gaining or losing energy</li><li>- A pure substance consists of only one type of element or compound and has a fixed melting and boiling point. Mixtures may be separated due to differences in their physical properties.</li><li>- The method chosen to separate a mixture depends on which physical properties of the individual substances are different.</li></ul>	Use techniques to separate mixtures.	
Facts	Keywords	
<ul style="list-style-type: none"><li>- A substance is a solid below its melting point, a liquid above it, and a gas above its boiling point</li><li>- Air, fruit juice, sea water and milk are mixtures.</li><li>- Liquids have different boiling points.</li></ul>	Particle Particle model Diffusion Gas pressure Density Evaporate Boil Condense Melt Freeze Sublime.	Solvent Solute Dissolve Solution Soluble (insoluble) Solubility Pure Substance Mixture Filtration Distillation Evaporation Chromatography

### Reactions 1 – Metals and Non-Metals and Acids and Alkalis

Knowledge	Skills	
<ul style="list-style-type: none"> <li>- Metals and non-metals react with oxygen to form oxides which are either bases or acids.</li> <li>- Metals can be arranged as a reactivity series in order of how readily they react with other substances.</li> <li>- Some metals react with acids to produce salts and hydrogen.</li> <li>- The pH of a solution depends on the strength of the acid: strong acids have lower pH values than weak acids.</li> <li>- Mixing an acid and alkali produces a chemical reaction, neutralisation, forming a chemical called a salt and water.</li> </ul>		
Facts	Keywords	
<ul style="list-style-type: none"> <li>- Iron, nickel and cobalt are magnetic elements.</li> <li>- Mercury is a metal that is liquid at room temperature.</li> <li>- Bromine is a non-metal that is liquid at room temperature.</li> <li>- Acids have a pH below 7, neutral solutions have a pH of 7, alkalis have a pH above 7.</li> <li>- Acids and alkalis can be corrosive or irritant and require safe handling.</li> <li>- Hydrochloric, sulfuric and nitric acid are strong acids.</li> <li>- Acetic and citric acid are weak acids</li> </ul>	Metals Non-metals Displacement Oxidation Reactivity	pH Indicators Base Concentration

### Earth 1 – Earth Structure and the Universe

Knowledge	Skills	
<ul style="list-style-type: none"> <li>- Sedimentary, igneous and metamorphic rocks can be inter converted over millions of years through weathering and erosion, heat and pressure, and melting and cooling.</li> <li>- The solar system can be modelled as planets rotating on tilted axes while orbiting the Sun, moons orbiting planets and sunlight spreading out and being reflected. This explains day and year length, seasons and the visibility of objects from Earth.</li> <li>- Our solar system is a tiny part of a galaxy, one of many billions in the Universe. Light takes minutes to reach Earth from the Sun, four years from our nearest star and billions of years from other galaxies.</li> </ul>		
Facts	Keywords	
<ul style="list-style-type: none"> <li>- The three rock layers inside Earth are the crust, the mantle and the core.</li> </ul>	Rock Cycle Weathering Erosion Minerals Sedimentary Rocks Igneous Rocks Metamorphic Rocks Strata	Galaxy Light year Stars Orbit Exoplanet

## Organisms 1 – Movement and Cells

Knowledge	Skills	
<ul style="list-style-type: none"> <li>- The parts of the human skeleton work as a system for support, protection, movement and the production of new blood cells.</li> <li>- Antagonistic pairs of muscles create movement when one contracts and the other relaxes.</li> <li>- Multicellular organisms are composed of cells which are organised into tissues, organs and systems to carry out life processes.</li> <li>- There are many types of cell. Each has a different structure or feature so it can do a specific job.</li> </ul>	Use a light microscope to observe and draw cells.	
Facts	Keywords	
<ul style="list-style-type: none"> <li>- Both plant and animal cells have a cell membrane, nucleus, cytoplasm and mitochondria.</li> <li>- Plant cells also have a cell wall, chloroplasts and usually a permanent vacuole.</li> </ul>	Joints Bone marrow Tendon Ligament Cartilage Antagonistic muscle pair Cell Unicellular Multicellular Tissue Organ Diffusion Structural adaptations	Cell membrane Nucleus Vacuole Mitochondria Cell wall Chloroplast Cytoplasm Immune System Reproductive System Digestive System Circulatory System Respiratory System Muscular Skeletal System

## Ecosystems 1 – Interdependence and Plant Reproductions

Knowledge	Skills	
<ul style="list-style-type: none"> <li>- Organisms in a food web (decomposers, producers and consumers) depend on each other for nutrients. So, a change in one population leads to changes in others.</li> <li>- The population of a species is affected by the number of its predators and prey, disease, pollution and competition between individuals for limited resources such as water and nutrients.</li> <li>- Plants have adaptations to disperse seeds using wind, water or animals.</li> <li>- Plants reproduce sexually to produce seeds, which are formed following fertilisation in the ovary.</li> </ul>		
Facts	Keywords	
<ul style="list-style-type: none"> <li>- Insects are needed to pollinate food crops.</li> </ul>	Food web Food chain Ecosystem Environment Population Producer Consumer Decomposer	Pollen Ovules Pollination Fertilisation Seed Fruit Carpel

### **Genes 1 – Variation and Human Reproduction**

Knowledge	Skills	
<ul style="list-style-type: none"> <li>- There is variation between individuals of the same species. Some variation is inherited, some is caused by the environment and some is a combination.</li> <li>- Variation between individuals is important for the survival of a species, helping it to avoid extinction in an always changing environment</li> <li>- The menstrual cycle prepares the female for pregnancy and stops if the egg is fertilised by a sperm.</li> <li>- The developing foetus relies on the mother to provide it with oxygen and nutrients, to remove waste and protect it against harmful substances.</li> </ul>		
Facts	Keywords	
<ul style="list-style-type: none"> <li>- The menstrual cycle lasts approximately 28 days.</li> <li>- If an egg is fertilised it settles into the uterus lining.</li> </ul>	Species Variation Continuous variation Discontinuous variation Gamete Fertilisation Ovary Testicle Oviduct Uterus	Ovulation Menstruation Reproductive system Penis Vagina Foetus Gestation Placenta Amniotic Fluid Umbilical chord

### **Year 8**

### **Forces 2 – Contact Forces and Pressure**

Knowledge	Skills	
<ul style="list-style-type: none"> <li>- When the resultant force on an object is zero, it is in equilibrium and does not move, or remains at constant speed in a straight line.</li> <li>- One effect of a force is to change an object's form, causing it to be stretched or compressed. In some materials, the change is proportional to the force applied.</li> <li>- Pressure acts in a fluid in all directions. It increases with depth due to the increased weight of fluid, and results in an upthrust. Objects sink or float depending on whether the weight of the object is bigger or smaller than the upthrust.</li> <li>- Different stresses on a solid object can be used to explain observations where objects scratch, sink into or break surfaces.</li> </ul>	Sketch the forces acting on an object, and label their size and direction.  Use the formula: fluid pressure, or stress on a surface = force (N)/area (m <sup>2</sup> )	
Facts	Keywords	
	Equilibrium Deformation Linear Relationship Newton Resultant Force Friction Tension	Compression Contact force Fluid Pressure Upthrust Atmospheric Pressure

## Electromagnets 2 – Electromagnets and Magnetism.

Knowledge	Skills	
<ul style="list-style-type: none"> <li>- An electromagnet uses the principle that a current through a wire causes a magnetic field. Its strength depends on the current, the core and the number of coils in the solenoid</li> <li>- Magnetic materials, electromagnets and the Earth create magnetic fields which can be described by drawing field lines to show the strength and direction. The stronger the magnet, and the smaller the distance from it, the greater the force a magnetic object in the field experiences.</li> </ul>		
Facts	Key Words	
<ul style="list-style-type: none"> <li>- The magnetic field of an electromagnet decreases in strength with distance.</li> <li>- Two 'like' magnetic poles repel and two 'unlike' magnetic poles attract.</li> <li>- Field lines flow from the north-seeking pole to the south-seeking pole</li> </ul>	Electromagnet Solenoid Core	Magnetic Force Permanent Magnet Magnetic Poles

## Energy 2 – Work and Heating and Cooling

Knowledge	Skills	
<ul style="list-style-type: none"> <li>- Work is done and energy transferred when a force moves an object. The bigger the force or distance, the greater the work. Machines make work easier by reducing the force needed. Levers and pulleys do this by increasing the distance moved, and wheels reduce friction.</li> <li>- The thermal energy of an object depends upon its mass, temperature and what it's made of. When there is a temperature difference, energy transfers from the hotter to the cooler object.</li> <li>- Thermal energy is transferred through different pathways, by particles in conduction and convection, and by radiation</li> </ul>	Use the formula: work done (J) = force (N) x distance moved (m) to compare energy transferred for objects moving horizontally	
Facts	Keywords	
	Work Lever Input force Output force Displacement Deformation	Thermal Conductor Thermal Insulator Temperature Thermal Energy Conduction Convection Radiation

## **Waves 2 – Wave Effects and Wave Properties**

<b>Knowledge</b>	<b>Skills</b>	
<ul style="list-style-type: none"><li>- When a wave travels through a substance, particles move to and fro. Energy is transferred in the direction of movement of the wave. Waves of higher amplitude or higher frequency transfer more energy</li><li>- A physical model of a transverse wave demonstrates it moves from place to place, while the material it travels through does not, and describes the properties of speed, wavelength and reflection</li></ul>		
<b>Facts</b>	<b>Keywords</b>	
	Ultrasound Ultraviolet (UV) Microphone Loudspeaker Pressure Wave	Wave Transverse Wave Transmission

## **Matter 2 – Periodic Table and Elements**

<b>Knowledge</b>	<b>Skills</b>	
<ul style="list-style-type: none"><li>- The elements in a group all react in a similar way and sometimes show a pattern in reactivity.</li><li>- As you go down a group and across a period the elements show patterns in physical properties</li><li>- Most substances are not pure elements, but compounds or mixtures containing atoms of different elements. They have different properties to the elements they contain</li></ul>	Use particle diagrams to classify a substance as an element, mixture or compound and as molecules or atoms. Name simple compounds using rules: change non-metal to -ide; mono, di, tri prefixes; and symbols of hydroxide, nitrate, sulfate and carbonate.	
<b>Facts</b>	<b>Keywords</b>	
<ul style="list-style-type: none"><li>- Metals are generally found on the left side of the table, non-metals on the right.</li><li>- Group 1 contains reactive metals called alkali metals.</li><li>- Group 7 contains non-metals called halogens.</li><li>- Group 0 contains unreactive gases called noble gases.</li><li>- The symbols of hydrogen, oxygen, nitrogen, carbon, hydrogen, iron, zinc, copper, sulfur, aluminium, iodine, bromine, chlorine, sodium, potassium and magnesium.</li></ul>	Periodic Table Physical Properties Chemical Properties Groups Periods	Elements Atom Molecules Compound Chemical Formula Polymer

## Reactions 2 – Chemical Energy and Types of Reaction

Knowledge	Skills	
<ul style="list-style-type: none"> <li>- During a chemical reaction bonds are broken (requiring energy) and new bonds formed (releasing energy). If the energy released is greater than the energy required, the reaction is exothermic. If the reverse, it is endothermic</li> <li>- Combustion is a reaction with oxygen in which energy is transferred to the surroundings as heat and light.</li> <li>- Thermal decomposition is a reaction where a single reactant is broken down into simpler products by heating.</li> <li>- Chemical changes can be described by a model where atoms and molecules in reactants rearrange to make the products and the total number of atoms is conserved</li> </ul>	Write word equations from information about chemical reactions.	
Facts	Keywords	
	Catalysts Exothermic Reaction Endothermic Reaction Chemical Bond	Fuel Chemical Reaction Physical Change Reactants Products Conserved

## Earth 2 – Climate and Earth Resources

Knowledge	Skills	
<ul style="list-style-type: none"> <li>- Carbon is recycled through natural processes in the atmosphere, ecosystems, oceans and the Earth's crust (such as photosynthesis and respiration) as well as human activities (burning fuels).</li> <li>- Greenhouse gases reduce the amount of energy lost from the Earth through radiation and therefore the temperature has been rising as the concentration of those gases has risen.</li> <li>- Scientists have evidence that global warming caused by human activity is causing changes in climate</li> <li>- There is only a certain quantity of any resource on Earth, so the faster it is extracted, the sooner it will run out. Recycling reduces the need to extract resources.</li> <li>- Most metals are found combined with other elements, as a compound, in ores. The more reactive a metal, the more difficult it is to separate it from its compound. Carbon displaces less reactive metals, while electrolysis is needed for more reactive metals</li> </ul>		
Facts	Keywords	
<ul style="list-style-type: none"> <li>- Methane and carbon dioxide are greenhouse gases.</li> <li>- Earth's atmosphere contains around 78% nitrogen, 21% oxygen,</li> </ul>	Global Warming Fossil fuels Carbon sink Greenhouse effect	Natural resources Mineral Ore Extraction Recycling Electrolysis

## Organisms 2 – Breathing and Digestion

Knowledge	Skills	
<ul style="list-style-type: none"> <li>- In gas exchange, oxygen and carbon dioxide move between alveoli and the blood. Oxygen is transported to cells for aerobic respiration and carbon dioxide, a waste product of respiration, is removed from the body.</li> <li>- Breathing occurs through the action of muscles in the ribcage and diaphragm. The amount of oxygen required by body cells determines the rate of breathing.</li> <li>- The body needs a balanced diet with carbohydrates, lipids, proteins, vitamins, minerals, dietary fibre and water, for its cells' energy, growth and maintenance.</li> <li>- Organs of the digestive system are adapted to break large food molecules into small ones which can travel in the blood to cells and are used for life processes</li> </ul>		
Facts	Keywords	
<ul style="list-style-type: none"> <li>- Iron is a mineral important for red blood cells.</li> <li>- Calcium is a mineral needed for strong teeth and bones.</li> <li>- Vitamins and minerals are needed in small amounts to keep the body healthy</li> </ul>	Breathing Trachea Bronchi Bronchioles Alveoli Ribs Diaphragm Lung volume	Enzymes Dietary fibre Carbohydrates Lipids Protein Stomach Small intestine Large intestine Gut bacteria

## Ecosystems 2 – Respiration and Photosynthesis

Knowledge	Skills	
<ul style="list-style-type: none"> <li>- Respiration is a series of chemical reactions, in cells, that breaks down glucose to provide energy and form new molecules. Most living things use aerobic respiration but switch to anaerobic respiration, which provides less energy, when oxygen is unavailable.</li> <li>- Plants and algae do not eat, but use energy from light, together with carbon dioxide and water to make glucose (food) through photosynthesis. They either use the glucose as an energy source, to build new tissue, or store it for later use.</li> <li>- Plants have specially-adapted organs that allow them to obtain resources needed for photosynthesis</li> </ul>		
Facts	Keywords	
<ul style="list-style-type: none"> <li>- Iodine is used to test for the presence of starch.</li> <li>- Yeast fermentation is used in brewing and breadmaking.</li> </ul>	Fertilisers Photosynthesis Chlorophyll Stomata	Aerobic Respiration Anaerobic Respiration

**Genes 2 – Evolution and Inheritance**

Knowledge	Skills	
<ul style="list-style-type: none"> <li>- Natural selection is a theory that explains how species evolve and why extinction occurs.</li> <li>- Biodiversity is vital to maintaining populations. Within a species variation helps against environment changes, avoiding extinction. Within an ecosystem, having many different species ensures resources are available for other populations, like humans</li> <li>- Inherited characteristics are the result of genetic information, in the form of sections of DNA called genes, being transferred from parents to offspring during reproduction.</li> <li>- Chromosomes are long pieces of DNA which contain many genes. Gametes, carrying half the total number of chromosomes of each parent, combine during fertilisation.</li> </ul>		
Facts	Keywords	
<ul style="list-style-type: none"> <li>- The DNA of every individual is different, except for identical twins.</li> <li>- There is more than one version of each gene eg different blood groups</li> </ul>	Population Natural selection Extinct Biodiversity Competition Evolution	Inherited characteristics DNA Chromosomes Gene

**Year 9**

Students will complete 4 transition units in the autumn term to support their transition into GCSE studies. These transition units include:

- Separating mixtures
- Transporting Substance
- Energy Resources
- The Cottingham High School Science Communication Challenge

Following this, students will begin their GCSE studies covering the following topics:

- Cells
- Atomic Structure and the Periodic Table
- Energy
- Organisation
- Bonding and Properties

The triple science entry process will take place in the summer term, preparing students for studying triple in Y10/11

For further detail on subject content, please see the specification - [GCSE Combined Science: Trilogy Specification Specification for first teaching in 2016](#)

## Key Stage 4

<b>Year 10</b>	<p>Students continue their GCSE studies in Y10. Students will need to have a solid grasp of the core content covered in the topics listed below, which will be covered in Year 10</p> <ul style="list-style-type: none"><li>- Infection and Response</li><li>- Bioenergetics</li><li>- Homeostasis</li><li>- Quantitative Chemistry</li><li>- Chemical Changes</li><li>- Energy Changes</li><li>- Rates of Reaction</li><li>- Electricity</li><li>- Particle Model</li><li>- Atomic Structure</li><li>- Forces</li></ul> <p>For further detail on subject content, please see the specification - <a href="#">GCSE Combined Science: Trilogy Specification Specification for first teaching in 2016</a></p>
<b>Year 11</b>	<p>Year 11 focuses around two key areas – finishing teaching content and preparing students effectively for both the PPE and external examinations. As we progress through the year, and through content and revision, students will be able to establish more pertinent links and connections across both the subject and the science curriculum. Students will need to have a solid grasp of the core content covered in the topics listed below, which will be covered in Year 10</p> <ul style="list-style-type: none"><li>- Inheritance, Variation and Evolution</li><li>- Ecology</li><li>- Organic Chemistry</li><li>- Chemical Analysis</li><li>- Earth's Atmosphere</li><li>- Using Resources</li><li>- Motion</li><li>- Waves</li><li>- Magnetism</li><li>- Space (Triple only)</li></ul> <p>For further detail on subject content, please see the specification - <a href="#">GCSE Combined Science: Trilogy Specification Specification for first teaching in 2016</a></p>

## ASSESSMENT

Year	Formative	Summative	Calendared Term	Core Topics to be assessed – All assessments to feature retrieval
<b>7</b>	Each topic will contain: <ul style="list-style-type: none"> <li>- End of topic quiz</li> <li>- Exit ticket style tasks</li> </ul> There will also be an ISA-Style assessment ~once per term, focussing on practical skills.	Termly Assessment in line with the new school wide assessment model, incorporating an end of year assessment too.	Autumn Assessment  Spring Assessment  Summer Assessment	Forces 1, Organisms 1, Matter 1  Forces 1, Organisms 1, Matter 1, Electromagnets 1, Ecosystems 1, Reactions 1, Energy 1(time dependent)  Forces 1, Organisms 1, Matter 1, Electromagnets 1, Ecosystems 1, Reactions 1, Energy 1, Earth 1, Genes 1, Waves 1
<b>8</b>	Each topic will contain: <ul style="list-style-type: none"> <li>- End of topic quiz</li> <li>- Exit ticket style tasks</li> </ul> There will also be an ISA-Style assessment ~once per term, focussing on practical skills.	Termly Assessment in line with the new school wide assessment model, incorporating an end of year assessment too.	Autumn Assessment  Spring Assessment  Summer Assessment	Forces 2, Organisms 2, Matter 2  Forces 2, Organisms 2, Matter 2, Electromagnets 2, Ecosystems 2, Reactions 2, Energy 2 (time dependent)  Forces 2, Organisms 2, Matter 2, Electromagnets 2, Ecosystems 2, Reactions 2, Energy 2, Earth 2, Genes 2, Waves 2
<b>9</b>	Each topic will contain: <ul style="list-style-type: none"> <li>- End of topic assessment</li> <li>- Exit ticket style tasks</li> </ul>	Termly Assessment in line with the new school wide assessment model, incorporating an end of year assessment too.	Autumn Assessment  Spring Assessment  Summer Assessment	Transition Topics – Transporting Substances, Separating Mixtures, Energy Resources.  Transporting Substances, Separating Mixtures, Energy Resource, Cells, Atomic Structure and the Periodic Table  Transporting Substances, Separating Mixtures, Energy Resource, Cells, Atomic Structure and the Periodic Table, Energy, Bonding, Organisation.

10	Each topic will contain: - End of topic assessment - Exit ticket style tasks	Y10 Summer PPE	Summer term	<u>Biology</u> – Paper 1 – Cells, Organisation, Infection and Response, Bioenergetics  <u>Chemistry</u> – Paper 1 – Atomic Structure and the Periodic Table, Bonding and Properties, Quantitative Chemistry, Chemical Changes, Energy Changes.  <u>Physics</u> – Paper 1 – Energy, Electricity, Particle Model, Atomic Structure
11	Each topic will contain: - End of topic assessment - Exit ticket style tasks	Y11 Autumn PPE  Y11 Spring PPE	Autumn term  Spring Term	<u>Biology</u> – Paper 1 – Cells, Organisation, Infection and Response, Bioenergetics <u>Chemistry</u> – Paper 1 – Atomic Structure and the Periodic Table, Bonding and Properties, Quantitative Chemistry, Chemical Changes, Energy Changes. <u>Physics</u> – Paper 1 – Energy, Electricity, Particle Model, Atomic Structure  <u>Biology</u> – Paper 2 – Homeostasis and Response, Inheritance, variation and evolution, Ecology. <u>Chemistry</u> – Paper 2 – Rates of Reaction, Organic Chemistry, Chemical Analysis, Earth’s Atmosphere, Using Resources. <u>Physics</u> – Paper 2 – Forces and Motion, Waves, Magnetism.

## BRIEF VISION BEHIND SEQUENCING

The three disciplines of science have been sequenced separately, however upon delivery they will be intertwined and sequenced by 1-2 teachers per class.

### KEY STAGE 3

Our Key Stage 3 (KS3) Science Syllabus creates engaging lessons and promotes teaching for understanding rather than covering fragmented content. We have written it bespoke in-house, following the AQA KS3 Schemes of Learning for support. By following the framework within this syllabus, it gives a clear understanding of what students need to know by the end of Key Stage 3 (KS3). Using a logical order of objectives, this syllabus uses big questions to equip students for success at GCSE. KS3 incorporates a spiral design where each area builds in complexity. It's easier for students to develop an understanding of a big idea by multiple interactions with the concepts within the idea. By connecting smaller ideas to more abstract ideas, students will be better prepared to apply these concepts when approaching an unfamiliar topic. Each big idea topic contains four smaller topics that build in complexity. For example 'Waves', topics are ordered from simpler, more concrete topics 'Light' and 'Sound', to more abstract ones 'Wave properties' and 'Wave effects'. These have been created to avoid repetition, draw on various scientific skills and use different contexts.

We have then chosen to support the transition of learners from KS3 to KS4, through the introduction of transition units in Year 9. This enables our learners to build confidence in more complex scientific ideas, over a longer period. For these units, we have chosen content from B1, C1 and P1 of the specification. We have also introduced a Science Communication Challenge which helps develop students speaking and listening skills, building toward their GCSE English presentations. Students will then transition to completing the GCSE Syllabus following the completion of these.

### KEY STAGE 4

Our GCSE specifications describe content and processes that students need to demonstrate competence in. These areas are developed in KS3 so that students enter Key Stage 4 (KS4) with a level of proficiency. In most cases, students have been studying science for eight or nine years by the time they start GCSE courses. To reach their potential, they need to study the examined content with a mastery of ideas and skills. We choose to follow the specification in order, for the most part barring a couple of adjustments made by subject specialists. We do this because the specification has been developed with teachers to ensure it is presented clearly, in a logical teaching order. The notable area of adjustment is that specific heat capacity is in P3, not P1. Furthermore, the more practical justifications for teaching in specification order are that:

- It enables us to assess using past exam papers for all PPE's.
- It enables students to follow course content independently using revision guides.
- Reduces cognitive load for staff and students.

Whilst we offer different pathways in terms of Triple Science, as well as combined science higher and foundation, all follow the same chronological sequencing, just with extra content added or removed accordingly.

# SCIENCE CURRICULUM SEQUENCING

		Biology							Chemistry							Physics											
Year	Topic	Assessment	Skills tested				Links	Topic	Assessment	Skills tested			Links	Topic	Assessment	Skills tested			Links								
7	Organisms 1 – Movement and Cells	<b>Assessment</b>	1.1	2.1	3.1	4.1	<b>PRIOR LEARNING:</b>  Upper KS2 National Curriculum:  Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals	<b>Assessment</b>  Homework feedback tasks  Regular AFL classroom activities from classroom teachers.  Note – the topic is only a 4 lesson intro to working safely in a science lab.	<b>Assessment</b>  4.1  <b>PRIOR LEARNING:</b>  Students will have experience using a Science lab and Scientific equipment during open evenings and transition.	<b>Assessment</b>  Termly summative assessment  End of topic quiz.  1-2 exit ticket tasks per topic.  Homework feedback tasks  Regular AFL classroom activities from classroom teachers.  Biology based ISA-style practical skills assessment later on in the year.	1.2	2.2	3.2	4.2	<b>PRIOR LEARNING:</b>  Upper KS2 National Curriculum:  Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object  Identify the effects of air resistance, water resistance and friction, that act between moving surfaces	<b>Assessment</b>  Termly summative assessment  End of topic quiz.  1-2 exit ticket tasks per topic.  Homework feedback tasks  Regular AFL classroom activities from classroom teachers.  Physics based ISA-style practical skills assessment later on in the term.	2.1	3.1	4.1	<b>LINKS TO THE FUTURE:</b>  B1 – Cell Biology B2 - Organisation  GCSE PE – Skeletal system, muscular system, injuries.	2.2	3.2	4.2	<b>LINKS TO THE FUTURE:</b>  P5a Forces and P5b Motion revisit and build on the topics covered within this unit.	2.3	3.3	4.3
		1.3	2.3	3.3	4.3	2.4					3.4	4.4	2.6	3.6			4.6	2.7	3.7		4.7						

## Ecosystems 1 – Interdependence and Plant Reproduction

<b>Assessment</b>	4.1	<b>PRIOR LEARNING:</b>
Termly summative assessment	1.2	Upper KS2 National Curriculum:
End of topic quiz.	2.4	Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals
1-2 exit ticket tasks per topic.	2.6	Give reasons for classifying plants and animals based on specific characteristics.
Homework feedback tasks		
Regular AFL classroom activities from classroom teachers.		

**LINKS TO THE FUTURE:**

B7 – Ecology

## Matter 1 – Particle Model and Separating Mixtures

<b>Assessment</b>	1.1	2.1	3.1	4.1	<b>PRIOR LEARNING:</b>
Termly summative assessment	1.2	2.2		4.2	Upper KS2 National Curriculum:
End of topic quiz.		2.3			Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporate
1-2 exit ticket tasks per topic.		2.4			Demonstrate that dissolving, mixing and changes of state are reversible changes
Homework feedback tasks		2.5			
Regular AFL classroom activities from classroom teachers.		2.6			
Chemistry based ISA-style practical skills assessment later on in the year.		2.7			

**LINKS TO THE FUTURE:**

Transition unit: Separating Mixtures

P3 - Particle Model

## Electromagnets 1 – Potential Difference and Resistance and Current

<b>Assessment</b>		3.1	4.1	<b>PRIOR LEARNING:</b>
Termly summative assessment	1.2	3.2		Upper KS2 National Curriculum:
End of topic quiz.		3.3	4.3	Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit
1-2 exit ticket tasks per topic.	2.6	4.4	4.5	Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches
Homework feedback tasks				Use recognised symbols when representing a simple circuit in a diagram
Regular AFL classroom activities from classroom teachers.				

**LINKS TO THE FUTURE:**

P2 – Electricity

## Genes 1 – Variation and Human Reproduction

**Assessment**

Termly summative assessment

1.2  
1.3

4.1

**PRIOR LEARNING:**

Upper KS2 National Curriculum:

Describe the changes as humans develop to old age.

Describe the life process of reproduction in some plants and animals.

End of topic quiz.

1.5  
1.6

3.5

1-2 exit ticket tasks per topic.

Homework feedback tasks

Regular AFL classroom activities from classroom teachers.

**LINKS TO THE FUTURE:**

B1 – Cells – Mitosis

B6 – Inheritance, Variation and Evolution

## Reactions 1 – Metals and Non-Metals and Acids and Alkalis

**Assessment**

Termly summative assessment

2.3  
2.4

3.1

4.1

**PRIOR LEARNING:**

Upper KS2 National Curriculum:

Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets

End of topic quiz.

2.6

1-2 exit ticket tasks per topic.

Homework feedback tasks

Regular AFL classroom activities from classroom teachers

**LINKS TO THE FUTURE:**

C1 – Atomic Structure and the Periodic Table

C4 – Chemical Changes

## Energy 1 – Energy Cost and Energy Transfer

**Assessment**

Termly summative assessment

1.4

4.1

**PRIOR LEARNING:**

Upper KS2 National Curriculum:

N/A – Energy is not covered within the KS2 national curriculum.

End of topic quiz.

3.3  
3.5

4.3  
4.4  
4.5

1-2 exit ticket tasks per topic.

Homework feedback tasks

Regular AFL classroom activities from classroom teachers.

**LINKS TO THE FUTURE:**

Transition unit – Energy Resources

P1 – Energy

### Earth 1 – Earth Structure and Universe

Assessment	1.1	2.1	4.1	PRIOR LEARNING:
Termly summative assessment	1.2		4.2	
End of topic quiz.	1.3			Describe the movement of the Earth, and other planets, relative to the Sun in the solar system
1-2 exit ticket tasks per topic.				Describe the movement of the Moon relative to the Earth
Homework feedback tasks				Describe the Sun, Earth and Moon as approximately spherical bodies
Regular AFL classroom activities from classroom teachers.				Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.
<b>LINKS TO THE FUTURE:</b>				
Geography – Earth's structure, volcanoes etc. P8 - Space				

### Waves 1 – Sound and Light

Assessment	1.1	2.1	4.1	PRIOR LEARNING:
Termly summative assessment	1.2		4.2	
End of topic quiz.	1.4		4.3	Upper KS2 National Curriculum
1-2 exit ticket tasks per topic.		2.6	3.5	Recognise that light appears to travel in straight lines
Homework feedback tasks				Use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye
Regular AFL classroom activities from classroom teachers.				Explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes
<b>LINKS TO THE FUTURE:</b>				
P6 – Waves				

## Organisms 2 – Breathing and Digestion

<b>Assessment</b>		2.1		4.1	<b>PRIOR LEARNING:</b>
Termly summative assessment	1.2	2.2			Organisms 1 – Y7
	1.3	2.3			
	1.4	2.4			
End of topic quiz.	1.5	2.5			Upper KS2 National Curriculum:
	1.6	2.6			Describe the ways in which nutrients and water are transported within animals, including humans.
		2.7			
1-2 exit ticket tasks per topic.					
Homework feedback tasks					
Regular AFL classroom activities from classroom teachers.					
Biology based ISA-style practical skills assessment later on in the year.					
<b>LINKS TO THE FUTURE:</b>					
B2 – Organisation					

## Matter 2 – Periodic Table and Elements

<b>Assessment</b>	1.1		4.1	<b>PRIOR LEARNING:</b>	
Termly summative assessment	1.2		4.2	Matter 1 – Y7	
End of topic quiz.				Upper KS2 National Curriculum:	
1-2 exit ticket tasks per topic.				Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets	
Homework feedback tasks					
Regular AFL classroom activities from classroom teachers.					
<b>LINKS TO THE FUTURE:</b>					
C1 – Atomic Structure and the Periodic Table					
P4 – Atomic Structure					

## Forces 2 – Contact Forces and Pressure

<b>Assessment</b>		2.1		4.1	<b>PRIOR LEARNING:</b>
Termly summative assessment	1.2	2.2		4.2	Forces 1 – Y7
		2.3		4.3	
End of topic quiz.	1.4	2.4		4.4	Upper KS2 National Curriculum:
		2.5	3.5	4.5	
		2.6	3.6		
		2.7			
1-2 exit ticket tasks per topic.					Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.
Homework feedback tasks					
Regular AFL classroom activities from classroom teachers.					
Physics based ISA-style practical skills assessment later on in the term.					
<b>LINKS TO THE FUTURE:</b>					
P5a – Forces					

## Ecosystems 2 – Respiration and Photosynthesis

<b>Assessment</b>		3.1	4.1	<b>PRIOR LEARNING:</b>
Termly summative assessment	1.2		4.2	Ecosystems 1 – Y7
End of topic quiz.	1.4	2.4	3.5	Upper KS2 National Curriculum:
1-2 exit ticket tasks per topic.		2.6	3.6	Describe the ways in which nutrients and water are transported within animals, including humans.
Homework feedback tasks				
Regular AFL classroom activities from classroom teachers..				
<b>LINKS TO THE FUTURE:</b>				
B4 – Bioenergetics				

## Reactions 2 – Chemical Energy and Types of Reaction

<b>Assessment</b>		2.1	4.1	<b>PRIOR LEARNING:</b>
Termly summative assessment	1.2	2.2		Reactions 1 –Y7
End of topic quiz.	1.4	2.3	2.4	Upper KS2 National Curriculum:
1-2 exit ticket tasks per topic.		2.5	3.5	Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda.
Homework feedback tasks		2.6	3.6	
Regular AFL classroom activities from classroom teachers.		2.7		
Chemistry based ISA-style practical skills assessment later on in the year.				
<b>LINKS TO THE FUTURE:</b>				
C4 - Chemical Changes C5 - Energy Changes				

## Electromagnets 2 – Magnetism and Electromagnetism

<b>Assessment</b>		4.1	<b>PRIOR LEARNING:</b>	
Termly summative assessment	1.2	4.2	Electromagnets 1 - Y7	
End of topic quiz.	1.4	2.4	4.3	Lower KS2 National Curriculum:
1-2 exit ticket tasks per topic.			4.4	Observe how magnets attract or repel each other and attract some materials and not others
Homework feedback tasks			4.5	Compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials
Regular AFL classroom activities from classroom teachers.				Describe magnets as having two poles
<b>LINKS TO THE FUTURE:</b>				
P7 - Magnetism				

## Genes 2 – Evolution and Inheritance

<b>Assessment</b>	1.1	4.1	<b>PRIOR LEARNING:</b>
	1.2		
Termly summative assessment	1.3		Genes 1 – Y7
End of topic quiz.		3.5	Upper KS2 National Curriculum:
1-2 exit ticket tasks per topic.		3.6	Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago
Homework feedback tasks			Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents
Regular AFL classroom activities from classroom teachers..			Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.

**LINKS TO THE FUTURE:**

B6 – Inheritance, Variation and Evolution

## Earth 2 – Climate and Resources

<b>Assessment</b>	1.1	4.1	<b>PRIOR LEARNING:</b>
	1.2		
Termly summative assessment	1.3		Earth 1 – Y7
End of topic quiz.	1.4		
1-2 exit ticket tasks per topic.		3.5	
Homework feedback tasks	1.6	3.6	
Regular AFL classroom activities from classroom teachers.			

**LINKS TO THE FUTURE:**

C9 – Earth's Atmosphere

C10 – Using Resources

## Energy 2 – Work, Heating and Cooling

<b>Assessment</b>	4.1	<b>PRIOR LEARNING:</b>	
Termly summative assessment			Energy 1 – Y7
End of topic quiz.	1.4		
1-2 exit ticket tasks per topic.			
Homework feedback tasks			
Regular AFL classroom activities from classroom teachers.			

**LINKS TO THE FUTURE:**Transition Unit – Energy Resources  
P1 – Energy



9	B1 – Cells	<p><b>Assessment</b></p> <p>1.1 1.2 1.3</p> <p>Termly summative assessment</p> <p>End of topic assessment</p> <p>1-2 exit ticket tasks per topic.</p> <p>Homework feedback tasks</p> <p>Mid-topic quiz where applicable</p> <p>Regular AFL in the classroom</p>	<p>1.1 1.2 1.3</p> <p>4.4</p> <p><b>PRIOR LEARNING:</b></p> <p>Organisms 1 Ecosystems 1 Ecosystems 2</p>	C1 – Atomic Structure and the Periodic Table	<p><b>Assessment</b></p> <p>1.1 1.2</p> <p>Termly summative assessment</p> <p>End of topic assessment</p> <p>1-2 exit ticket tasks per topic.</p> <p>Homework feedback tasks</p> <p>Mid-topic quiz where applicable</p> <p>Regular AFL in the classroom</p>	<p>1.1 1.2</p> <p>4.3 4.4</p> <p>1.6</p> <p><b>PRIOR LEARNING:</b></p> <p>Matter 1 Matter 2 Reactions 1</p>	Transition Topic - Cottingham High School Science Communication Challenge	<p><b>Assessment</b></p> <p>4.1</p> <p>Teacher assessed and peer assessed singular/group presentation to the class on a key area of development in Science.</p> <p>1.3 1.4 1.5 1.6</p> <p><b>PRIOR LEARNING:</b></p> <p>N/A</p>	<p><b>LINKS TO THE FUTURE:</b></p> <p>GCSE Biology: B2 – Organisation B4 – Bioenergetics</p> <p>A Level Biology: 3 Cells Structures 4 Transport Across Membranes 5 Cell Recognition and the Immune System 6 Exchange 7 Mass Transport</p>	<p><b>LINKS TO THE FUTURE:</b></p> <p>GCSE Chemistry: C2 – Bonding and Properties C4 – Chemical Changes</p> <p>A Level Chemistry: Atomic Structure Periodicity Group 2 Group 7 Transition Metals</p>	<p><b>LINKS TO THE FUTURE:</b></p> <p>GCSE English Speaking presentation.</p> <p>Any future public speak appearance.</p> <p>Languages speaking exams</p>
	B2 - Organisation	<p><b>Assessment</b></p> <p>1.2 1.3 1.4 1.5</p> <p>2.1 2.4 2.5 2.6</p> <p>3.1 3.2 3.5</p> <p>Termly summative assessment</p> <p>End of topic assessment</p> <p>1-2 exit ticket tasks per topic.</p> <p>Homework feedback tasks</p> <p>Mid-topic quiz where applicable</p> <p>Regular AFL in the classroom</p>	<p>2.1 2.4 2.5 2.6</p> <p>3.1 3.2 3.5</p> <p><b>PRIOR LEARNING:</b></p> <p>Organisms 1 Organisms 2</p>	C2 – Bonding, Structure and the Properties of Matter	<p><b>Assessment</b></p> <p>1.2 1.4</p> <p>Termly summative assessment</p> <p>End of topic assessment</p> <p>1-2 exit ticket tasks per topic.</p> <p>Homework feedback tasks</p> <p>Mid-topic quiz where applicable</p> <p>Regular AFL in the classroom</p>	<p>1.2 1.4</p> <p><b>PRIOR LEARNING:</b></p> <p>Matter 2</p>	P1 - Energy	<p><b>Assessment</b></p> <p>1.4</p> <p>Termly summative assessment</p> <p>End of topic assessment</p> <p>1-2 exit ticket tasks per topic.</p> <p>Homework feedback tasks</p> <p>Mid-topic quiz where applicable</p> <p>Regular AFL in the classroom</p>	<p><b>PRIOR LEARNING:</b></p> <p>Energy 1 Energy 2</p>	<p><b>LINKS TO THE FUTURE:</b></p> <p>A Level Biology: 5 Cell recognition and the immune system 6 Exchange 7 Mass transport 8 DNA, genes and protein synthesis 14 Response to stimuli 15 Nervous co-ordination and muscles 16 Homeostasis</p>	<p><b>LINKS TO THE FUTURE:</b></p> <p>A Level Physics Stretching materials, air resistance and friction, magnetism and generating electricity.</p> <p><b>Note – Specific Heat Capacity is taught as part of P3 Particles.</b></p>

10	B3 – Infection and Response	<p><b>Assessment</b></p> <p>End of topic assessment</p> <p>1-2 exit ticket tasks per topic.</p> <p>Homework feedback tasks</p> <p>Mid-topic quiz where applicable</p> <p>Regular AFL in the classroom</p> <p>June PPE</p>	<p>1.4</p> <p>1.6</p>	<p><b>PRIOR LEARNING:</b></p> <p>Organisms 2</p>	C3 – Quantitative Chemistry	<p><b>Assessment</b></p> <p>End of topic assessment</p> <p>1-2 exit ticket tasks per topic.</p> <p>Homework feedback tasks</p> <p>Mid-topic quiz where applicable</p> <p>Regular AFL in the classroom</p> <p>June PPE</p>	<p>1.2</p> <p>3.4</p>	<p>4.1</p> <p>4.2</p> <p>4.3</p> <p>4.5</p> <p>4.6</p>	<p><b>PRIOR LEARNING:</b></p> <p>Reactions 2</p>	P2 – Electricity	<p><b>Assessment</b></p> <p>End of topic assessment</p> <p>1-2 exit ticket tasks per topic.</p> <p>Homework feedback tasks</p> <p>Mid-topic quiz where applicable</p> <p>Regular AFL in the classroom</p> <p>June PPE</p>	<p>1.2</p> <p>1.4</p> <p>1.5</p>	<p>2.1</p> <p>2.2</p> <p>2.3</p> <p>2.4</p> <p>2.5</p> <p>2.6</p> <p>2.7</p> <p>3.1</p> <p>3.2</p> <p>3.3</p> <p>3.4</p> <p>3.5</p> <p>3.6</p> <p>3.7</p> <p>3.8</p>	<p><b>PRIOR LEARNING:</b></p> <p>Electromagnets 1</p>
	<p><b>LINKS TO THE FUTURE:</b></p> <p>A Level Biology: 5 Cell Recognition and the Immune System</p>	<p><b>LINKS TO THE FUTURE:</b></p> <p>A Level Chemistry: Amount of Substance</p>	<p><b>LINKS TO THE FUTURE:</b></p> <p>A Level Physics: Current Voltage Static Resistance Electromagnetism Electrical Energy</p>											
10	B4 – Bioenergetics	<p><b>Assessment</b></p> <p>End of topic assessment</p> <p>1-2 exit ticket tasks per topic.</p> <p>Homework feedback tasks</p> <p>Mid-topic quiz where applicable</p> <p>Regular AFL in the classroom</p> <p>June PPE</p>	<p>1.4</p> <p>2.5</p> <p>2.6</p>	<p><b>PRIOR LEARNING:</b></p> <p>Organisms 1 Ecosystems 2</p>	C4 – Chemical Changes	<p><b>Assessment</b></p> <p>End of topic assessment</p> <p>1-2 exit ticket tasks per topic.</p> <p>Homework feedback tasks</p> <p>Mid-topic quiz where applicable</p> <p>Regular AFL in the classroom</p> <p>June PPE</p>	<p>1.2</p> <p>2.6</p>	<p>2.1</p> <p>2.2</p> <p>2.3</p> <p>2.4</p> <p>2.6</p>	<p><b>PRIOR LEARNING:</b></p> <p>Reactions 1 Reactions 2</p>	P3 – Particle Model	<p><b>Assessment</b></p> <p>End of topic assessment</p> <p>1-2 exit ticket tasks per topic.</p> <p>Homework feedback tasks</p> <p>Mid-topic quiz where applicable</p> <p>Regular AFL in the classroom</p> <p>June PPE</p>	<p>1.2</p> <p>2.3</p> <p>2.4</p> <p>2.6</p> <p>2.7</p> <p>2.8</p>	<p>2.1</p> <p>2.2</p> <p>2.3</p> <p>2.4</p> <p>3.5</p> <p>3.6</p> <p>3.7</p> <p>3.8</p>	<p><b>PRIOR LEARNING:</b></p> <p>Matter 1</p>
	<p><b>LINKS TO THE FUTURE:</b></p> <p>A Level Biology</p> <p>3 Cell Structure 4 Transport Across Membranes 11 Photosynthesis</p>	<p><b>LINKS TO THE FUTURE:</b></p> <p>A Level Chemistry</p> <p>Redox Reactions Electrochemistry</p>	<p><b>LINKS TO THE FUTURE:</b></p> <p>A Level Physics</p> <p>Particles Kinetic Theory Density</p> <p><b>Note – Specific Heat Capacity is taught here as part of P3 Particles.</b></p>											

10	B5 – Homeostasis and Response	<b>Assessment</b> End of topic assessment 1-2 exit ticket tasks per topic. Homework feedback tasks Mid-topic quiz where applicable Regular AFL in the classroom	1.1 1.3 1.4	<b>PRIOR LEARNING:</b> Organisms 1 Ecosystems 1	C5 – Energy Changes	<b>Assessment</b> End of topic assessment 1-2 exit ticket tasks per topic. Homework feedback tasks Mid-topic quiz where applicable Regular AFL in the classroom June PPE	2.1 2.2 2.3 2.4 2.6	<b>PRIOR LEARNING:</b> Reactions 2	P4 – Atomic Structure	<b>Assessment</b> End of topic assessment 1-2 exit ticket tasks per topic. Homework feedback tasks Mid-topic quiz where applicable Regular AFL in the classroom June PPE.	1.1 1.2 1.4 1.5 1.6	4.1 4.4	<b>PRIOR LEARNING:</b> Matter 1
		<b>LINKS TO THE FUTURE:</b> A Level Biology 14 Responding to Stimuli 15 Nervous Coordination and Muscles 16 Homeostasis	<b>LINKS TO THE FUTURE:</b> A Level Chemistry Energetics Bond Energies Thermodynamics	<b>LINKS TO THE FUTURE:</b> A Level Physics Radioactive Decay Fission and Fusion Nuclear Equations Half-Life									
10		<b>Assessment</b> End of topic assessment 1-2 exit ticket tasks per topic. Homework feedback tasks Mid-topic quiz where applicable Regular AFL in the classroom Feb PPE	1.2 1.3 1.4	<b>PRIOR LEARNING:</b> Reactions 2	C6 – Rates of Reaction	<b>Assessment</b> End of topic assessment 1-2 exit ticket tasks per topic. Homework feedback tasks Mid-topic quiz where applicable Regular AFL in the classroom Feb PPE	2.1 2.2 2.3 2.4 2.6 2.7	<b>PRIOR LEARNING:</b> Reactions 2	P5a - Forces	<b>Assessment</b> End of topic assessment 1-2 exit ticket tasks per topic. Homework feedback tasks Mid-topic quiz where applicable Regular AFL in the classroom Feb PPE	2.1 2.2 2.3 2.4 2.6 3.5 3.8	3.1 3.2 3.3 4.5 4.6	<b>PRIOR LEARNING:</b> Forces 1 Forces 2
		<b>LINKS TO THE FUTURE:</b> A Level Chemistry Kinetics	<b>LINKS TO THE FUTURE:</b> A Level Physics Mass Weight Moments Scalar and Vector Newtons Laws										

11	B6 – Inheritance, Variation and Evolution	<p><b>Assessment</b></p> <p>End of topic assessment</p> <p>1-2 exit ticket tasks per topic.</p> <p>Homework feedback tasks</p> <p>Mid-topic quiz where applicable</p> <p>Regular AFL in the classroom</p> <p>Feb PPE</p>	<p>1.1</p> <p>1.2</p> <p>1.3</p> <p>1.4</p>	<p><b>PRIOR LEARNING:</b></p> <p>Genes 1</p> <p>Genes 2</p>	C7 – Organic Chemistry	<p><b>Assessment</b></p> <p>End of topic assessment</p> <p>1-2 exit ticket tasks per topic.</p> <p>Homework feedback tasks</p> <p>Mid-topic quiz where applicable</p> <p>Regular AFL in the classroom</p> <p>Feb PPE</p>	<p>1.2</p>	<p>4.1</p>	<p><b>PRIOR LEARNING:</b></p> <p>Matter 2</p>	P5b - Motion	<p><b>Assessment</b></p> <p>End of topic assessment</p> <p>1-2 exit ticket tasks per topic.</p> <p>Homework feedback tasks</p> <p>Mid-topic quiz where applicable</p> <p>Regular AFL in the classroom</p> <p>Feb PPE</p>	<p>1.2</p> <p>1.5</p> <p>2.1</p> <p>2.2</p> <p>2.3</p> <p>2.4</p> <p>2.6</p> <p>2.7</p> <p>2.8</p> <p>3.1</p> <p>3.2</p> <p>3.3</p> <p>3.4</p> <p>3.5</p> <p>3.6</p> <p>3.7</p> <p>3.8</p>	<p><b>PRIOR LEARNING:</b></p> <p>Forces 1</p>
	<p><b>LINKS TO THE FUTURE:</b></p> <p>A Level Biology</p> <p>8 DNA, Genes and Protein Synthesis</p> <p>9 Genetic Diversity</p> <p>10 Biodiversity</p> <p>20 Gene Expression</p> <p>21 Recombinant DNA Technology</p>	<p><b>LINKS TO THE FUTURE:</b></p> <p>A Level Chemistry</p> <p>Organic Chemistry inc. mechanisms and functional groups.</p>	<p><b>LINKS TO THE FUTURE:</b></p> <p>A Level Physics</p> <p>Newton's Laws</p>										
11	B7 - Ecology	<p><b>Assessment</b></p> <p>End of topic assessment</p> <p>1-2 exit ticket tasks per topic.</p> <p>Homework feedback tasks</p> <p>Mid-topic quiz where applicable</p> <p>Regular AFL in the classroom</p> <p>Feb PPE</p>	<p>1.2</p> <p>1.3</p> <p>1.4</p> <p>1.5</p> <p>1.6</p> <p>2.1</p> <p>2.2</p> <p>2.3</p> <p>2.6</p>	<p><b>PRIOR LEARNING:</b></p> <p>Organisms 1</p> <p>Ecosystems 1</p> <p>Earth 2</p>	C8 – Chemical Analysis	<p><b>Assessment</b></p> <p>End of topic assessment</p> <p>1-2 exit ticket tasks per topic.</p> <p>Homework feedback tasks</p> <p>Mid-topic quiz where applicable</p> <p>Regular AFL in the classroom</p> <p>Feb PPE</p>	<p>1.4</p> <p>2.4</p> <p>2.6</p>	<p>3.1</p> <p>3.2</p> <p>3.3</p> <p>4.1</p>	<p><b>PRIOR LEARNING:</b></p> <p>Reactions 1</p> <p>Reactions 2</p>	P6 - Waves	<p><b>Assessment</b></p> <p>End of topic assessment</p> <p>1-2 exit ticket tasks per topic.</p> <p>Homework feedback tasks</p> <p>Mid-topic quiz where applicable</p> <p>Regular AFL in the classroom</p> <p>Feb PPE</p>	<p>1.2</p> <p>1.4</p> <p>1.5</p> <p>2.6</p> <p>2.7</p> <p>3.1</p> <p>3.5</p> <p>3.8</p> <p>4.2</p> <p>4.3</p>	<p><b>PRIOR LEARNING:</b></p> <p>Waves 1</p> <p>Waves 2</p>
	<p><b>LINKS TO THE FUTURE:</b></p> <p>A Level Biology</p> <p>9 Genetic Diversity</p> <p>10 Biodiversity</p> <p>13 Energy and Ecosystems</p> <p>18 Populations and Evolutions</p> <p>19 Populations in Ecosystems</p>	<p><b>LINKS TO THE FUTURE:</b></p> <p>A Level Chemistry</p> <p>Instrumental Methods including Mass Spec and NMR</p>	<p><b>LINKS TO THE FUTURE:</b></p> <p>A Level Physics</p> <p>Wave Speed</p> <p>Waves Equation</p> <p>Refraction</p> <p>Internal Reflection</p>										

11		<b>C9 – Earth’s Atmosphere</b>	<b>Assessment</b> End of topic assessment 1-2 exit ticket tasks per topic.  Homework feedback tasks  Mid-topic quiz where applicable  Regular AFL in the classroom  Feb PPE	<table border="1"> <tr><td>1.1</td><td></td><td>4.1</td></tr> <tr><td>1.2</td><td></td><td></td></tr> <tr><td>1.3</td><td></td><td></td></tr> <tr><td>1.4</td><td></td><td></td></tr> <tr><td>1.5</td><td>3.5</td><td></td></tr> <tr><td>1.6</td><td>3.6</td><td></td></tr> </table>	1.1		4.1	1.2			1.3			1.4			1.5	3.5		1.6	3.6		<b>PRIOR LEARNING:</b>  Earth 1 Earth 2	<b>P7 - Magnetism</b>	<b>Assessment</b> End of topic assessment 1-2 exit ticket tasks per topic.  Homework feedback tasks  Mid-topic quiz where applicable  Regular AFL in the classroom  Feb PPE	<table border="1"> <tr><td>2.2</td></tr> </table> <b>PRIOR LEARNING:</b>  Electromagnets 2	2.2		
1.1		4.1																											
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1.3																													
1.4																													
1.5	3.5																												
1.6	3.6																												
2.2																													
11		<b>C10 – Using Resources</b>	<b>Assessment</b> End of topic assessment 1-2 exit ticket tasks per topic.  Homework feedback tasks  Mid-topic quiz where applicable  Regular AFL in the classroom  Feb PPE.	<table border="1"> <tr><td></td><td></td><td>3.2</td></tr> <tr><td>1.3</td><td>2.3</td><td></td></tr> <tr><td>1.4</td><td>2.4</td><td></td></tr> <tr><td>1.5</td><td>2.5</td><td></td></tr> <tr><td></td><td>2.6</td><td></td></tr> <tr><td></td><td>2.7</td><td></td></tr> </table>			3.2	1.3	2.3		1.4	2.4		1.5	2.5			2.6			2.7		<b>PRIOR LEARNING:</b>  Earth 2	<b>P8 - Space (Triple Only)</b>	<b>Assessment</b> End of topic assessment 1-2 exit ticket tasks per topic.  Homework feedback tasks  Mid-topic quiz where applicable  Regular AFL in the classroom  Feb PPE	<table border="1"> <tr><td>1.1</td></tr> <tr><td>1.2</td></tr> <tr><td>1.3</td></tr> </table> <b>PRIOR LEARNING:</b>  Earth 1	1.1	1.2	1.3
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