Science

We intend to equip our young people with the knowledge needed to understand the world and technology around them. We aim to encourage curiosity in the natural, physical and chemical world around them; and to foster critical thinking. We strive to provide our young people with a chance to broaden their horizons and provide multiple routes into STEM careers.

Year 7 Science

Term One

Content of study	Lab Safety Movement Cells
What are the aims and objectives of this term?	**Lab Safety:** • Explain how to correct unsafe behaviour in a lab • Explain how to work safely with acids • Describe how to use a Bunsen burner safely • Describe the uses of different scientific equipment • Explain how to plan an accurate and precise scientific experiment • State the definition of the independent, dependent and control variables **Movement:** The parts of the human skeleton work as a system for support, protection, movement and the production of new blood cells. Antagonistic pairs of muscles create movement when one contracts and the other relaxes. **Cells:** Multicellular organisms are composed of cells which are organised into tissues, organs and systems to carry out life processes. There are many types of cell. Each has a different structure or feature so it can do a specific job. **Skill** Use a light microscope to observe and draw cells. **Knowledge** Both plant and animal cells have a cell membrane, nucleus, cytoplasm and mitochondria. Plant cells also have a cell wall, chloroplasts and usually a permanent vacuole.
How will this term's content help with future learning?	All future practical work will require the safety aspects and basic lab skills taught in this unit. All AQA KS3 Science content feeds into our AQA GCSE Programme. It forms the building blocks required to be successful at GCSE and A Level.
Resources	https://www.bbc.co.uk/bitesize
Links to the national curriculum/specification	National Curriculum: *https://www.gov.uk/government/publications/national-curriculum-in-england-science-programmes-of-study/national-curriculum-in-england-science-programmes-of-study#key-stage-3* Specification: *https://www.aqa.org.uk/subjects/science/ks3/science-3/specification*
Assessments	Students are assessed through an end of unit test paper.

Term Two

Content of study	Voltage and Resistance

	Current Particle Model
What are the aims and objectives of this term?	**<u>Voltage and Resistance:</u>** 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. 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. **Skill** Calculate resistance using the formula: resistance (Ω) = potential difference (V) . current (A). **<u>Current:</u>** 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. Around a charged object, the electric field affects other charged objects, causing them to be attracted or repelled. The field strength decreases with distance. **Knowledge** Two similarly charged objects repel, two differently charged objects attract. **<u>Particle Model</u>** 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). Observations where substances change temperature or state can be described in terms of particles gaining or losing energy. **Knowledge** A substance is a solid below its melting point, a liquid above it, and a gas above its boiling point.
What previous knowledge is required?	Some students may have covered solids, liquids and gases, as well as simple circuits at Key Stage 2.
How will this term's content help with future learning?	All AQA KS3 Science content feeds into our AQA GCSE Programme. It forms the building blocks required to be successful at GCSE and A Level.
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Links to the national curriculum/specification	National Curriculum: *https://www.gov.uk/government/publications/national-curriculum-in-england-science-programmes-of-study/national-curriculum-in-england-science-programmes-of-study#key-stage-3* Specification: *https://www.aqa.org.uk/subjects/science/ks3/science-3/specification* https://www.gov.uk/government/publications/national-curriculum-in-england-science-programmes-of-study/national-curriculum-in-england-science-programmes-of-study#key-stage-3
Assessments	Students are assessed through an end of unit test paper focusing on the topics mentioned above and their basic principles. There are also some recall questions from previous terms.
Term Three	
Content of study	Metals Acids and Alkalis

	Variation Energy Costs and Transfers
What are the aims and objectives of this term?	**Metals:** Metals and non-metals react with oxygen to form oxides which are either bases or acids. Metals can be arranged as a reactivity series in order of how readily they react with other substances. Some metals react with acids to produce salts and hydrogen. **Knowledge** Iron, nickel and cobalt are magnetic elements. Mercury is a metal that is liquid at room temperature. Bromine is a non-metal that is liquid at room temperature. **Acids and Alkalis:** The pH of a solution depends on the strength of the acid: strong acids have lower pH values than weak acids. Mixing an acid and alkali produces a chemical reaction, neutralisation, forming a chemical called a salt and water. **Knowledge** Acids have a pH below 7, neutral solutions have a pH of 7, alkalis have a pH above 7. Acids and alkalis can be corrosive or irritant and require safe handling. Hydrochloric, sulfuric and nitric acid are strong acids. Acetic and citric acid are weak acids. **Energy costs:** We pay for our domestic electricity usage based on the amount of energy transferred. Electricity is generated by a combination of resources which each have advantages and disadvantages. **Skill** Calculate the cost of home energy usage, using the formula: cost = power (kW) x time (hours) x price (per kWh). **Knowledge** Food labels list the energy content of food in kilojoules (kJ). **Variation:** There is variation between individuals of the same species. Some variation is inherited, some is caused by the environment and some is a combination. Variation between individuals is important for the survival of a species, helping it to avoid extinction in an always changing environment.
What previous knowledge is required?	Most students will have covered the basics of acids and alkalis and be able to name some household acids and/or alkalis.
How will this term's content help with future learning?	All AQA KS3 Science content feeds into our AQA GCSE Programme. It forms the building blocks required to be successful at GCSE and A Level.
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Links to the national curriculum/specification	National Curriculum: *https://www.gov.uk/government/publications/national-curriculum-in-england-science-programmes-of-study/national-curriculum-in-england-science-programmes-of-study#key-stage-3* Specification: *https://www.aqa.org.uk/subjects/science/ks3/science-3/specification* https://www.gov.uk/government/publications/national-curriculum-in-england-science-programmes-of-study/national-curriculum-in-england-science-programmes-of-study#key-stage-3

Assessments	Students are assessed through an end of unit test paper focusing on the topics mentioned above and their basic principles. There are also some recall questions from previous terms.
Term Four	
Content of stud	Human Reproduction
What are the aims and objectives of this term?	**Human Reproduction:** **Knowledge** The menstrual cycle prepares the female for pregnancy and stops if the egg is fertilised by a sperm. The developing foetus relies on the mother to provide it with oxygen and nutrients, to remove waste and protect it against harmful substances. The menstrual cycle lasts approximately 28 days. If an egg is fertilised it settles into the uterus lining.
What previous knowledge is required?	Students will know little about human reproduction in the biological sense – this is an introductory topic
How will this term's content help with future learning?	All AQA KS3 Science content feeds into our AQA GCSE Programme. It forms the building blocks required to be successful at GCSE and A Level.
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Assessments	Students are assessed through an end of unit test paper focusing on the topics mentioned above and their basic principles. There are also some recall questions from previous terms.
Term Five	
Content of study	Speed Gravity Sound
What are the aims and objectives of this term?	**Speed:** If the overall, resultant force on an object is non-zero, its motion changes and it slows down, speeds up or changes direction. **Skill** Use the formula: speed = distance (m)/time (s) or distance-time graphs, to calculate speed. **Knowledge** A straight line on a distance-time graph shows constant speed, a curving line shows acceleration. The higher the speed of an object, the shorter the time taken for a journey. **Gravity:** Mass and weight are different but related. Mass is a property of the object; weight depends upon mass but also on gravitational field strength.

	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. **Skill** Use the formula: weight (N) = mass (kg) x gravitational field strength (N/kg). **Knowledge** Gravity on Earth is 10 N/kg. On the moon it is 1.6 N/kg. **Sound:** Sound consists of vibrations which travel as a longitudinal wave through substances. The denser the medium, the faster sound travels. 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. **Knowledge** Sound does not travel through a vacuum. The speed of sound in air is 330 m/s, a million times slower than light.
What previous knowledge is required?	Students will already know the basics of energy – this topic will explore energy use in our everyday lives. Students will already know about human reproduction in the biological sense – this topic extends that concept to introduce genetics to explain why we are all different.
How will this term's content help with future learning?	All AQA KS3 Science content feeds into our AQA GCSE Programme. It forms the building blocks required to be successful at GCSE and A Level.
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Assessments	Students are assessed through an end of unit test paper focusing on the topics mentioned above and their basic principles. There are also some recall questions from previous terms.
Term Six	
Content of study	Interdependence Plant Reproduction Earth Structure Universe
What are the aims and objectives of this term?	**Interdependence:** 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. 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. **Knowledge** Insects are needed to pollinate food crops. **Plant Reproduction** Plants have adaptations to disperse seeds using wind, water or animals.

	Plants reproduce sexually to produce seeds, which are formed following fertilisation in the ovary. **Knowledge** Flowers contain the plant's reproductive organs. Pollen can be carried by the wind, pollinating insects or other animals. **Earth Structure:** Sedimentary, igneous and metamorphic rocks can be inter converted over millions of years through weathering and erosion, heat and pressure, and melting and cooling. **Knowledge** The three rock layers inside Earth are the crust, the mantle and the core. **Universe:** 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. 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.
What previous knowledge is required?	Students will already have some knowledge of the Earth and Space and may have cover plant reproduction at KS2.
How will this term's content help with future learning?	All AQA KS3 Science content feeds into our AQA GCSE Programme. It forms the building blocks required to be successful at GCSE and A Level.
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Links to the national curriculum/specification	National Curriculum: *https://www.gov.uk/government/publications/national-curriculum-in-england-science-programmes-of-study/national-curriculum-in-england-science-programmes-of-study#key-stage-3* Specification: *https://www.aqa.org.uk/subjects/science/ks3/science-3/specification* https://www.gov.uk/government/publications/national-curriculum-in-england-science-programmes-of-study/national-curriculum-in-england-science-programmes-of-study#key-stage-3
Assessments	Students are assessed through an end of unit test paper focusing on the topics mentioned above and their basic principles. There are some recall questions from previous terms.