

Subject: Science **Year** 7 **Ability**

Term / Date(s)	Half-term 1	Half-term 2	Half-term 3	Half-term 4	Half term 5	Half term 6
Topic	Cells Movement Earth Structure	Universe Speed Gravity Respiration 1 Photosynthesis 1	Particle Model Separating Mixtures Energy Transfers	Energy Costs Interdependence	Metals & Non-metals Acids & Alkalis Current	Voltage & Resistance
Topic overview	<p>How the skeletal and muscular system work together to cause movement</p> <p>How multicellular organisms are composed of cells which are organised into tissues, organs and systems to carry out life processes.</p> <p>How specialised cells work together in complex organisms</p> <p>Students will know the three types of rocks and how they link into the rock cycle</p>	<p>Students will be able to model how objects move through the solar system.</p> <p>How the speed of an object relates to the distance it travels and the time taken. Students will also learn the factors that affect the speed of an object</p> <p>The difference between mass and gravity. They will also learn the effects gravity has on other objects and compare the force of gravity on Earth and other planets.</p> <p>How to use word equations to describe aerobic respiration.</p> <p>The importance of photosynthesis and why other organisms are dependent on photosynthesis</p> <p>How to use word equations to represent photosynthesis</p>	<p>Students will learn how to relate the properties of materials in different states to the features of the particle model.</p> <p>Students will how to devise ways to separate mixtures based on their properties.</p> <p>How energy can be transferred from one object to another. Students will also learn how the energy stored in an object depends on its speed, temperature, height or whether it is compressed or stretched</p>	<p>How electricity is generated from a range of resources and be able to calculate the cost of domestic electricity.</p> <p>How to describe that a species' population changes as its predator or prey population changes.</p> <p>Explain effects of environmental changes and toxic materials on a species' population.</p>	<p>Students will learn how to compare and contrast the reactions of Metals and Non-metals and use experimental results to suggest an order of reactivity of various metals.</p> <p>Students will learn about acids and alkalis as classes of chemicals with distinct properties and uses; using indicators to classify solutions as acidic, alkaline or neutral and using the pH scale to compare the acidity and alkalinity of different solutions.</p> <p>The definition of electrical current and how it is affected in series and parallel circuits. Students will learn how objects become charged and the effect of the electric fields these produce.</p>	<p>That voltage is the energy per charge that pushes electrons around a circuit. Students will learn that resistance is the restriction of this flow, and use the formula $V=IR$ to relate the 3 together.</p>

Term / Date(s)	Half-term 1 A	Half term 2B	Half-term 3	Half-term 4	Half-term 5	Half term 6
Topic	Variation Human Reproduction Sound Light	Breathing Digestion	Periodic Table Elements	Contact Forces Pressure	Respiration 2 Photosynthesis 2 Chemical Energy Types of reaction	Work Heating & Cooling Plant Reproduction
Topic overview	<p>That there is variation between individuals of the same species and the effect of this.</p> <p>About the process of the menstrual cycle and pregnancy.</p> <p>That sound travels as a wave and how changing pitch and volume change a wave.</p> <p>How light passes through, reflects back from or is refracted by different materials</p>	<p>How oxygen is brought into the body and subsequently moves into cells, and how carbon dioxide is removed.</p> <p>That the body needs a balanced diet to maintain a healthy life.</p>	<p>How elements are arranged on the periodic table based on their properties.</p> <p>That elements and their compounds have differing properties.</p>	<p>The effects of forces on objects</p> <p>About pressure in solids, liquid and gases</p>	<p>To use word equations to describe aerobic and anaerobic respiration.</p> <p>Describe ways in which plants obtain resources for photosynthesis.</p> <p>To use experimental observations to distinguish exothermic and endothermic reactions and to use a diagram of relative energy levels of particles to explain energy changes observed during a change of state.</p> <p>That mass is conserved over a range of different reactions.</p>	<p>How forces moving on an object is the work done.</p> <p>The effect of mass and temperature on an objects thermal energy</p> <p>Describe the main steps that take place when a plant reproduces successfully.</p>

Term / Date(s)	Half-term 1	Half-term 2	Half-term 3	Half-term 4	Half term 5	Half term 6
Topic	Inheritance Magnets Electromagnets Climate Earth's Resources	Wave Properties Wave Effects Cell Biology	Atomic Structure	Energy	Organisation Bonding & Matter Structure & Bonding	Particle Model Electricity
Topic overview	<p>To understand the inherited characteristics are the result of genetic information (genes) being transferred from parents to offspring during reproduction.</p> <p>How Carbon is recycled through the environment</p> <p>About where raw materials come from in the earth, how these are extracted and recycled</p>	<p>In this section students will learn that cells are the basic unit of all forms of life. In this section we explore how structural differences between types of cells enables them to perform specific functions within the organism.</p>	<p>The development and organisation of the periodic table.</p> <p>How the structure of the atom determines the position of its element on the periodic table.</p>	<p>to recall stores and transfers of energy and apply these to systems.</p> <p>how to quantify changes in energy to systems and how energy is conserved and dissipated.</p> <p>how energy is generated and transported.</p>	<p>In this section students will learn about the human digestive system which provides the body with nutrients and the respiratory system that provides it with oxygen and removes carbon dioxide.</p> <p>The three types of bonding and their structures.</p> <p>Link the structures of simple and giant structures to their properties and characteristics.</p>	<p>to utilise a particle model to predict the behaviour of solids, liquids and gases and their behaviour when exposed to different temperatures and pressures.</p> <p>to calculate changes in thermal energy and energy required for a change in state.</p> <p>That the internal energy of a system and the effect of changes of state and temperature on this.</p> <p>to interpret and construct circuit diagrams.</p> <p>to explain the different types of circuits and components and their effects on circuit behaviours.</p> <p>how to quantify the changes in the electrical circuits.</p> <p>how mains and portable electricity differ.</p>

Term / Date(s)	Half-term 1	Half-term 2	Half-term 3	Half-term 4	Half term 5	Half term 6
Topic	Biology consolidation Physics Consolidation Infection & Response Quantitative Chemistry Chemical Changes Atomic Structure	Bioenergetics Energy Changes Rates of Reaction Forces	Homeostasis & Response Organic Chemistry Waves	Inheritance, Variation & Evolution Chemical Analysis Electromagnetism	Chemistry of the Atmosphere Using Resources Space	Reteach & Revision
Topic overview	<p>In this section, students will learn about plant tissues and how substances are transported through plants. Students will then recap osmosis and apply their knowledge to the required practical. Students will recap enzymes and enzyme action and apply their knowledge to the enzyme action required practical.</p> <p>In this topic, students will apply their knowledge of energy and electricity to required practicals</p> <p>In this topic, students will learn about non-communicable and communicable diseases. They will also learn about how our bodies defend itself against disease and vaccination.</p> <p>How to apply chemical measurements, the conservation of mass and the quantitative interpretation of chemical equations to unfamiliar situations</p> <p>How to predict the products of specific and unfamiliar chemical reactions in the context of oxidation, reduction and redox</p> <p>How to carry out chemical reactions including electrolysis, titrations, and the formation of salts.</p> <p>To recognise the different historical models of the atom and understand how the model has changed overtime. (crossover content with chemistry unit atomic structure)</p>	<p>The next section will explore how plants harness the Sun's energy in photosynthesis in order to make food. This process releases oxygen which has built up over millions of years in the Earth's atmosphere to enable respiration for all living organisms. Students will then look into how both animals and plants use this oxygen to oxidise food in a process called aerobic respiration which transfers the energy that the organism needs to perform its functions.</p> <p>How exothermic and endothermic reactions influence the temperature of the surroundings.</p> <p>How energy changes in a chemical reaction can be measured practically</p> <p>How the particle model and collision theory can be used to explain changes in rate</p> <p>How variables can influence changes in reversible reactions How rates of reaction can be measured practically. To categorise forces and apply Newton's laws. To describe both quantitatively and qualitatively motion in a line. To apply a range of formulas in various scenarios. To calculate momentum and apply conservation of momentum (HT).</p>	<p>This section will explore how cells require a constant temperature and pH as well as a constant supply of dissolved food and water. We will explore the structure and function of the nervous system and the hormonal system and how they bring about changes. Students will explore the homeostasis topic by looking at hormones involved in puberty, the menstrual cycle and the components of the endocrine system.</p> <p>Triple students will continue to explore homeostasis and how water is controlled in the body including kidney failure and treatment.</p> <p>Students will learn about crude oil and how it is separated. They will learn about alkanes, alkenes, alcohol, carboxylic acids, esters and polymers.</p> <p>to describe, with examples, the behaviour and properties of transverse and longitudinal waves. They will then apply this learning to the electromagnetic spectrum. Triple students will also learn about black body radiation</p>	<p>This section will then look at DNA, chromosomes, mutations and other aspects of genetics which will then explore variation and how that leads to evolution. Variation generated by mutations and sexual reproduction is the basis for natural selection; this is how species evolve. An understanding of these processes has allowed scientists to intervene through selective breeding to produce livestock with favoured characteristics.</p> <p>Students will learn about formulations, how to test for common gases, paper chromatography and how to test for positive and negative ions.</p> <p>to describe the interaction of magnets on each other, magnetic materials and electromagnetic fields.</p>	<p>How the atmosphere of the Earth has evolved and changed over time to become the present atmosphere and then looking at problems that affect the atmosphere.</p> <p>How industries use the Earth's natural resources to manufacture useful products. Chemists seek to minimise the use of limited resources, use of energy, waste and environmental impact in the manufacture of these products.</p> <p>Students will learn about the solar system, life cycle of a star, red shift, and CMBR</p>	

Term / Date(s)	Half-term 1	Half-term 2	Half-term 3	Half-term 4	Half term 5
Topic	Inheritance, variation & Evolution Organic Chemistry Chemical Analysis Forces	Ecology Chemistry of the Atmosphere Using Resources Waves	Reteach & Revision	Reteach & Revision	Reteach & Revision
Topic overview	<p>This section will then look at DNA, chromosomes, mutations and other aspects of genetics which will then explore variation and how that leads to evolution. Variation generated by mutations and sexual reproduction is the basis for natural selection; this is how species evolve. An understanding of these processes has allowed scientists to intervene through selective breeding to produce livestock with favoured characteristics.</p> <p>Students will learn about crude oil and how it is separated. They will learn about alkanes, alkenes, alcohol, carboxylic acids, esters and polymers.</p> <p>Students will learn about formulations, how to test for common gases, paper chromatography and how to test for positive and negative ions.</p> <p>To categorise forces and apply Newton's laws. To describe both quantitatively and qualitatively motion in a line. To apply a range of formulas in various scenarios. To calculate momentum and apply conservation of momentum (HT).</p>	<p>This section will now look at how the Sun is a source of energy that passes through ecosystems. Students will link this to how materials including carbon and water are continually recycled by the living world, being released through respiration of animals, plants and decomposing microorganisms and taken up by plants in photosynthesis. An understanding of how all species live in ecosystems composed of complex communities of animals and plants dependent on each other and that are adapted to particular conditions, both abiotic and biotic is an important underlying theme of this topic.</p> <p>How the atmosphere of the Earth has evolved and changed over time to become the present atmosphere and then looking at problems that affect the atmosphere.</p> <p>How industries use the Earth's natural resources to manufacture useful products. Chemists seek to minimise the use of limited resources, use of energy, waste and environmental impact in the manufacture of these products.</p> <p>to describe, with examples, the behaviour and properties of transverse and longitudinal waves. They will then apply this learning to the electromagnetic spectrum. Triple students will also learn about black body radiation</p>			