

Year 7

Timing	Unit Title	Key Question	Knowledge	Assessing Understanding
Autumn Half Term 1	What is Science?	How do Scientists work?	- Developing a hypothesis - How to make an experiment accurate and reliable - Plotting graphs - Drawing conclusions - Evaluating a method	Students will be assessed on their ability to: - Recall the knowledge covered - Interpret graphical and experimental data - Make connections between different areas of understanding, explain the scientific processes covered - Evaluate experimental procedures and results Skills - Graph drawing - Data analysis - Description - Explanation - Evaluation - Comparison - Planning and carrying out investigations - Use of microscope - Scientific literacy Assessment point information Students will be assessed using written exam questions in a 30 min paper.
	Cells	What are we made of?	- Organelles within animal and plant cells - Microscopes and making microscope slides - Adaptations of specialised cells	
	States of matter	What are substances made from?	- State that materials are made up of particles - State that the properties of substances can be described in terms of particles in motion - State what toy building bricks are representing when they are used to model substances - Describe the properties of a substance in its three states - State that the properties of substances can be described in terms of the arrangement and movement of its particles - Make relevant observations in order to decide if a substance is in its solid, liquid or gas state - Describe examples of diffusion - State that observations about diffusion can be explained in terms of particles in motion - Describe examples of gas pressure - Use words to explain gas pressure simply - Collect and interpret simple primary data to provide evidence for gas pressure	

	Forces and Motion	What is a force and how do they work?	- Describe what a force is - State what actions forces can do - Use a Newton Meter to measure some forces - Solve problems where there is more than one force acting on an object - Explain the difference between mass and weight - Use a Newton meter to measure the friction between two objects - Explain what causes friction between two surfaces in terms of their microscopic properties - Describe speed as the rate of change of distance - Measure the speed of objects - Solve problems involving the relationship $S=d/t$ - Display and describe a journey on a distance time graph	
Autumn Half Term 2	Tissues and organs	How does the body work?	Hierarchy of organisation from cells to tissues to organs to systems to organisms	
	Atoms and Elements	What are the building blocks on Earth?	- Elements and compounds - Identify and use chemical symbols and formulae for elements and compounds - State what a compound is - Use particle diagrams to classify a substance as an element, mixture, or compound - Name simple compounds - Represent simple compounds using models	
	The Earth in Space	Can we explain how the Earth, moon and sun move in the Solar system?	- Explain that the Earth's rotation causes day and night - Explain why shadows are different lengths at different times of day - State that the earth has an axial tilt of 23.5 degrees	

			● Explain how the tilt of the earth's axis causes seasons ● State properties of the moon such as its gravitational pull being 1/6 Earth's ● Explain that the Phases of the moon are due to the proportion of reflected light that is visible from Earth when the moon is at a particular position in its cycle. ● Classify different objects in the solar system according to their physical features ● Research and display information on the 8 different planets of the solar system	
Spring Half term 1	The Respiratory System	What are gas exchange and respiration? They're not breathing!	● Aerobic and anaerobic respiration in living organisms ● Word equations ● The process of anaerobic respiration in humans and micro-organisms, including fermentation ● The structure and functions of the gas exchange system in humans ● The mechanism of breathing to move air in and out of the lungs, using a pressure model to explain the movement of gases, including simple measurements of lung volume ● the impact of exercise, asthma and smoking on the human gas exchange system ● The role of leaf stomata in gas exchange in plants	Students will be assessed on their ability to: ● Recall the knowledge covered ● Interpret graphical and experimental data, ● Make connections between different areas of understanding, explain the scientific processes covered ● Evaluate experimental procedures and results Skills Particular focus on variables - see task in lesson 10 ● Graph drawing ● Data analysis. ● Description ● Explanation ● Evaluation
	Simple Chemical Reactions	What can we make in different chemical reactions?	● Mass Conservation ● Chemical reactions as the rearrangement of atoms ● Representing chemical reactions using formulae and using equations ● Combustion, decomposition, oxidation and reversible reactions ● Exothermic and endothermic chemical reactions (qualitative)	

			Produce and test for hydrogen, oxygen and carbon dioxide gas	- Comparison - Scientific literacy Assessment point information Students will be assessed using written exam questions in a 30 minute paper.
	Waves	What are the properties and uses of waves?	- Define a wave and describe its properties - Compare transverse waves and longitudinal waves - State that sound waves are made by vibrations - Explain how the amplitude of a sound wave affects its loudness and how the wavelength of a wave affects its pitch - Describe the basic structure of the human ear - Explain why sound travels at different speeds in different media - Define ultrasound and describe some uses - State the equation $\text{speed} = \text{distance}/\text{time}$ to measure the speed of sound	
Spring Half term 2	The Circulatory System	How do we keep blood pumping?	- The role of the circulatory system in providing cells with oxygen and glucose and taking away carbon dioxide. - Identify and describe the blood vessels that transport blood around the body - Label the heart and describe the journey of a blood cell around the body	
	Assessment	How much Chemistry have I learnt so far?	- Test and Assessment Review - Science Week - Thermal Decomposition	
	Simple Chemical Reactions			
	Static Electricity and Charge	What is charge and where does it come from?	- Know that there are two types of electrical charge. - Identify some simple examples of where there is a force on oppositely charged objects	

			- State some uses and hazards of static electricity - Identify current as flow of charges - Define conductors and insulators	
Summer Half term 1	The Reproductive System	Do we need a mate?	- Reproduction in humans (as an example of a mammal), including the structure and function of the male and female reproductive systems, menstrual cycle (without details of hormones), gametes, fertilisation, gestation and birth, to include the effect of maternal lifestyle on the foetus through the placenta - Reproduction in plants, including flower structure, wind and insect pollination, fertilisation, seed and fruit formation and dispersal	Students will be assessed on their ability to: - Recall the knowledge covered - Interpret graphical and experimental data - Make connections between different areas of understanding, explain the scientific processes covered - Evaluate experimental procedures and results Skills - Graph drawing - Data analysis. - Description - Explanation - Evaluation - Comparison - Scientific literacy Assessment point information 30 min in class assessment
	Solutions	What happens when sugar dissolves in tea?	- Describe the process of dissolving using a particle model - Define keywords e.g. solution, solute, solvent, saturated - Explain how solubility is affected by temperature - Explain why a stated physical property must be different in order for a given separation technique to work	
	Circuit Electricity	What can moving charge do and how do we measure it?	- Describe what happens to current in series circuits and parallel circuits - Solve problems in simple series and parallel circuits by determining unknown currents - Define voltage and describe what it does - Measure the voltage in a simple circuit using a voltmeter - Explain a simple idea of resistance - Describe the factors that affect the resistance of a material	

Summer Half term 2	Skeletal System	Are you what you eat? And how do we win the race?	• Structure and functions of the human skeleton, to include support, protection, movement and making blood cells • the function of muscles and examples of antagonistic muscles • The role of tissues in the joint e.g. ligaments, cartilage and tendons	
	Heat, Temperature and Energy	What is the difference between Heat and Temperature?	• Know that all matter is made of tiny particles and draw their arrangement in solids, liquids and gases • Know the difference between heat and temperature. • Know that heat spontaneously moves from hot to cold • Describe the process of conduction and explain why conduction occurs best in solids, particularly metals • Describe the process of convection and explain why it occurs in liquids and gases only • Describe and explain convection cycles and give examples • Describe the process of thermal radiation and explain that it can occur in a vacuum • Describe the influence of surface colour and texture on radiation • Know that good radiating surfaces are good absorbing surfaces	
	Separation techniques	How do you separate your desired product from undesired impurities?	• Define a mixture • Simple techniques for separating mixtures: filtration, evaporation, distillation and chromatography • Justify a chosen technique for separating a mixture of substances • Design a model to explain filtering, and identify advantages and disadvantages of the model • Compare evaporation and distillation • Justify whether evaporation or distillation would be suitable for obtaining given substances from solution • Suggest a combination of methods to separate a complex mixture and justify the choices made	

		How can chemistry techniques help to solve crimes?	• Justify the use of chromatography in different scenarios • Consider how chromatography can be used to monitor the progress of reactions	
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