

Curriculum Map Year 7 - Science

	Topic	Key Knowledge <i>What will students know by the end of this topic?</i>	Key Skills <i>What skills will students have developed by the end of this topic?</i>	Assessment Opportunities <i>How will student progress be measured? What are the key assessment pieces?</i>
Half Term 1	Scientific Skills 1	- How to plan and carry out a scientific investigation related to boiling different volumes of water. - Knowing the names and uses of the main science practical apparatus - Knowing how to use a bunsen burner - Knowing definitions for some key science investigation terminology - How to access and use Microsoft Teams to complete entry and exit quizzes.	An introduction to planning and carrying out scientific enquiries which includes development of the following skills: - Evaluating risks. - Selecting, drawing and naming appropriate scientific apparatus. - Labelling a diagram of a Bunsen burner. - Using specialised scientific apparatus, including Bunsen burners. - Making predictions, asking questions and developing a line of enquiry. - Identifying variables. - Using data to draw conclusions. - Presenting reasoned explanations (in relation to prediction and hypothesis). - Evaluating the reliability of methods and suggesting possible improvements. Identifying further questions arising.	Assessment 1: Baseline assessment to check prior learning from KS2
	Skills 2 To be spread throughout the year	Introduction to more complex key vocabulary needed into GCSE Know how to arrange variables in a table - How to draw a line graph	- Awareness of accuracy, precision, repeatability, reproducibility and anomalous results. - Presenting observations in graphs. - Interpreting observations (patterns). - Evaluating data, showing awareness of potential sources of random and systematic error. - Evaluating the reliability of methods from graphical data - Identifying further questions arising.	
	Cells, Tissues and Organs	- Structure of plant and animal cells. - Function of cell organelles. - Structure and function of a microscope. - How to prepare and view cells under a microscope. - Examples of specialised cells and how they are adapted.	- Recall key terminology. - Accurate labelling of diagrams (cells and microscope). - How to focus and correctly use a microscope to view cells. - Carry out basic magnification calculations.	- Pre-topic homework to assess prior knowledge from KS2. - Starter tasks to review prior learning.

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		- Examples of unicellular organisms and how they are adapted. - Role of diffusion in cells. - How cells, tissues, organs and organ systems work together. -	- Begin to develop the skills required for cell drawing (Make and record observations). - Apply knowledge of cells to contextual examples. Apply knowledge of diffusion to contextual examples.	- Revision homework tasks to reinforce keywords and definitions. End of topic quiz.
	Particle Model (completed in half term 2)	- How to use the particle model to describe elements. - States of matter including properties, arrangement of particles and the changes that occur during state changes. - Energy changes during changes of state. - The ice/water anomaly. - Diffusion in terms of Brownian motion and diffusion in liquids and gases. - The origin of gas pressure. - The difference between physical and chemical changes in terms of the combining and rearrangement of different atoms.	- Recall key terminology. - Interpreting and manipulating data concerning conservation of mass. - Make and record measurements for heating / cooling curves. - Begin to develop the skills required for identifying substances using the particle model. - Apply knowledge of particles to contextual examples including gas pressure. - Apply knowledge of diffusion to contextual examples. Begin to understand changes in substances in terms of the combination and rearrangement of particles.	- Pre-topic homework to assess prior knowledge from KS2. - Starter tasks to review prior learning. - Revision homework tasks to reinforce keywords and definitions - End of topic quiz.
Half Term 2	Forces and Motion 1: Forces	-	- Use arrows to represent forces in diagrams. - Identify forces diagrams as representing balanced and unbalanced forces. - Add forces in one dimension to determine resultant force. - Explain why an object is in equilibrium (e.g., weight held by a stretch spring or supported by a surface). - Plan & carry out investigation of how friction varies for different surfaces. This will include: -Identifying variables -Presenting observations using a bar chart - Use key experimental words e.g., systematic error.	- Pre-topic homework to assess prior knowledge from KS2. - Starter tasks to review prior learning. - Revision homework tasks to reinforce keywords and definitions. - End of topic quiz.
	Atoms, Elements & The Periodic Table	- The structure of the periodic table (metals & non-metals). - The principles behind the modern (Mendeleev) periodic table.	- Recall key terminology. - Understanding how theories develop based upon the manipulation of large amounts of information. - Being critical of own and others conclusions.	- Pre-topic homework to assess prior knowledge from KS2.

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		- The differences between metals and non-metals. - The physical properties of selected elements. - The simple (Dalton) atomic model.	- Making and recording accurate observations. - Making predictions using scientific knowledge and understanding. - Develop skills in identifying substances using the particle model.	- Starter tasks to review prior learning. - Revision homework tasks to reinforce keywords and definitions. - End of topic quiz. Assessment 2: Cells, Particle Model and Key Skills
Half Term 3	Forces and Motion 2: Motion	- Know and use the units and formula to calculate speed. - Galileo's experiment about how objects fall. - A resultant force is needed to cause objects to stop or start moving or to change speed or direction. - How the motion of an object changes depending on the size and direction of the resultant force. - How air and water resistance change with speed and shape. - How to describe the relative motion of vehicles passing one another.	- Apply mathematical concepts and calculate results. - Represent a journey on a distance-time graph. - Interpret a distance-time graph. - Take experimental measurements that demonstrate forces changing motion. - Explain how air and water resistance affect an object's motion. - Use of key experimental words: -repeatability & reproducibility -random error	- Pre-topic homework to assess prior knowledge from KS2. - Starter tasks to review prior learning. - Revision homework tasks to reinforce keywords and definitions. - End of topic quiz.
	Human Reproduction	- The structure and function of the male and female reproductive systems. - The stages of the menstrual cycle. - The adaptations of the sperm and egg. - The stages involved in fertilisation, gestation, and birth. - The effect of maternal lifestyle on the foetus.	- Recall key terminology. - Accurate labelling of diagrams. - Evaluate risk.	- Pre-topic homework to assess prior knowledge from KS2. - Starter tasks to review prior learning. - Revision homework tasks to reinforce keywords and definitions.

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				End of topic quiz. Assessment 3: Forces, Atoms and Elements, core skills
Half Term 4	Chemical Reactions 1	- How to recognise elements, compounds and mixtures from particle diagrams and know that they are pure substances. - The difference between physical and chemical changes in terms of the combining and rearrangement of different atoms. - The theory of conservation of mass. - The difference between exothermic and endothermic reactions. - What happens when metals react with water. - What happens during combustion reactions and thermal decomposition reactions. -	- Recall key terminology. - Using correct chemical nomenclature from the periodic table when writing word and symbol equations. - Using a wider range of more complex laboratory apparatus when carrying out experiments and paying attention to health & safety. - Making and recording accurate observations and using them to draw conclusions. - Apply knowledge of particles and the law of conservation of mass to contextual examples of chemical reactions.	- Pre-topic homework to assess prior knowledge from KS2. - Starter tasks to review prior learning. - Revision homework tasks to reinforce keywords and definitions. - End of topic quiz.
	Energy 1: Stores , changes and household bills (to complete in half term 5)	- A fuel stores energy that can be transferred by heating. - The names of six energy stores (chemical, kinetic, gravitational potential, elastic potential and thermal). - An energy store of some kind is necessary for something to happen. - When something happens, energy is transferred between energy stores. - Energy can be quantified, and this quantity is conserved. - Simple machines enable a smaller force to be used over a longer distance. - Energy transferred by a force = force x distance (moved in the direction of the force). - The units for energy and power used in the lab and in the home. - How gas and electricity are used in the home.	- Identify which energy stores are changing for a variety of situations. - Compare the amount of energy in different stores before and after a change. - Write a risk assessment for burning fuels practical. - Apply mathematical concepts to determine amount of energy in different stores so as to conserve energy. - Compare power ratings of appliances in watts & kilowatts. - Compare amount of energy transferred in joules & kilojoules. - Apply mathematical concepts and calculate results. - Calculate the amount of energy transferred by household appliances in kWhours. - Calculate the cost of using household appliances.	- Pre-topic homework to learn the names of energy stores & Microsoft Teams quiz about those names - Starter tasks to review prior learning. - Revision homework tasks to reinforce keywords and definitions.

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		- Some ways to reduce domestic fuel bills. -	-	- End of topic quiz. Assessment 4: Graph skills, Motion and Human Reproduction
Half Term 5	Waves 1: Sound.	- Know that sound is produced by vibrations of objects. - Describe the properties of transverse and longitudinal waves. - Sound is a longitudinal wave. - The keywords: amplitude, wavelength, frequency and pitch. - The unit of frequency is Hz. - How frequency affects pitch. - How amplitude affects loudness. - Sound needs a medium to travel. - Ultrasound waves are used for cleaning and in physiotherapy. - The vibrations of soundwaves can be detected by the ear drum and by a microphone diaphragm. - Sound waves can transfer information by conversion to electrical signals by a microphone. - Sound waves can be produced by vibrations in a loudspeaker.	- Compare the speed of sound in air, water and solids. - Explain what an echo is. - Identify materials that absorb sound well. - Measure frequency using 'simple harmonic motion'. - Apply mathematical concepts & calculate results. - Use of key experimental words: -Precision -Accuracy - Construct own results table.	- Pre-topic homework to assess prior knowledge from KS2. - Starter tasks to review prior learning. - Revision homework tasks to reinforce keywords and definitions. - End of topic quiz. - Assessment 5: Exam Week. All concepts covered from year so far
Half Term 6	Plant Reproduction	- Structures and functions of a flower. - The process of reproduction including pollination, fertilisation, seed and fruit formation and seed dispersal. - The importance of plant reproduction in human food security. -	- Recall key terminology. - Accurate labelling of flower head. - How to carry out a flower head dissection, with awareness of risks. - Seed dispersal investigation to cover: - Repeatability, Reproducibility. - Develop a line of enquiry and make predictions. - Select, plan and carry out a scientific enquiry. - Variables.	- Pre-topic homework to assess prior knowledge from KS2. - Starter tasks to review prior learning. - Revision homework tasks to reinforce keywords and definitions.

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			- Calculate results and present in table. - Use data to draw conclusions with explanations (Link to prediction). - Sources of random error - Evaluate method and suggest improvements.	- End of topic quiz. -
	Ecology	- The factors that affect organism distribution. - How to construct food chains, food webs and pyramids of number. - The factors that organisms compete for. - Adaptions of plants and animals to their environment. - How to interpret predator-prey cycles. - How organisms depend on each other for survival. - Why changes to a habitat can impact plants and animals.	- Recall key terminology. - To construct food chains, food webs and pyramids of number, to scale. - Interpret graphs showing predator-prey cycles. - Apply theoretical knowledge to contextual examples. - Apply sampling techniques in an investigation. Skills to include: - Select, plan and carry out a scientific enquiry. - Make and record observations. - Present observations in table and graph. - Interpret observations and draw conclusions. -	- Pre-topic homework to assess prior knowledge from KS2. - Starter tasks to review prior learning. - Revision homework tasks to reinforce keywords and definitions. - End of topic quiz.
	Energy 2: Heating and Cooling	- Energy is transferred by heating from hotter to cooler objects. - Energy transfer by heating tends to reduce the temperature difference between two objects. - Thermal equilibrium is reached when two objects reach the same temperature. - The process of conduction. - Energy can be transferred by radiation.	- Identify good thermal conductors and insulators. - Explain why convection can happen in gases and liquids but not in solids. - Present observations in a line graph. -	- Pre-topic homework to assess recall and understanding of solids, liquids & gases from Particle Model topic (delivered in Half Term 2). - Starter tasks to review prior learning. - Revision homework tasks to reinforce keywords and definitions. - End of topic quiz.

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				Assessment 6: Sound, Plant Reproduction