

Subject	Year 7 Threshold Concepts – Autumn Term	How to support students' learning
Welcome to Science	<p><u>Safety in the laboratory and laboratory apparatus</u></p> <ul style="list-style-type: none"> <li>• Evaluate risks, identifying features of investigations which are considered as hazards and risk and identifying ways to control these <li>• Use appropriate techniques, apparatus, and materials during fieldwork and laboratory work, paying attention to health and safety <li>• Understand and use SI units and IUPAC chemical nomenclature <p><u>Using the Bunsen burner</u></p> <ul style="list-style-type: none"> <li>• Evaluate risks <li>• Use appropriate techniques, apparatus, and materials during fieldwork and laboratory work, paying attention to health and safety <p><u>Predicting and planning an investigation</u></p> <ul style="list-style-type: none"> <li>• Pay attention to objectivity and concern for accuracy, precision, repeatability and reproducibility <li>• Select, plan and carry out the most appropriate types of scientific enquiries to test predictions, including identifying independent, dependent and control variables, where appropriate <li>• Present observations and data using appropriate methods, including tables and graphs <p><u>Describing patterns and evaluating</u></p> <ul style="list-style-type: none"> <li>• Interpret observations and data, including identifying patterns and using observations, measurements and data to draw conclusions <li>• Present reasoned explanations, including explaining data in relation to predictions and hypotheses <li>• Evaluate data, showing awareness of potential sources of random and systematic error 	<p>Encourage your child to visit BBC bitesize to learn about lab safety Working safely in the lab - Working scientifically - KS3 Science - BBC Bitesize - BBC Bitesize</p> <p>Encourage your child to visit BBC bitesize to learn the names of key apparatus and learn how to draw them correctly. KS3 Science - Working Scientifically - Drawing scientific apparatus - BBC Bitesize - BBC Bitesize</p> <p>Learn how to use the Bunsen burner correctly by watching this video How to use a Bunsen burner safely - YouTube</p> <p>Encourage your child to visit BBC bitesize to read about how to plan an investigation, make a prediction, collect results and describe patterns in the data Planning an experiment - Working scientifically - KS3 Science - BBC Bitesize - BBC Bitesize</p> <p>Encourage your child to have a go at one of these kitchen science experiments (with supervision) Kitchen science activities - Science Museum Group Learning</p>

<p>Particles</p>	<p><u>Properties of solids, liquids and gases</u></p> <ul style="list-style-type: none"> Describe the properties of the different states of matter in terms of the particle model <p><u>Heating solids and liquids and diffusion</u></p> <ul style="list-style-type: none"> Know happens to particles when they are heated Describe diffusion in terms of the particle model Describe diffusion and the movement of particles <p><u>Changes of state</u></p> <ul style="list-style-type: none"> Describe changes of state in terms of the particle model Make observations where substances change temperature or state can be described in terms of particles gaining or losing energy <p><u>Gas pressure</u></p> <ul style="list-style-type: none"> Describe gas pressure Explain the effect of gas pressure on containers Describe and explain the effect of temperature on gas pressure in terms of particles <p><u>Pure and impure substances</u></p> <ul style="list-style-type: none"> Define a pure substance and link this to melting and boiling points Define a mixture Describe simple separation techniques Explain filtration in terms of particles <p><u>Solubility</u></p> <ul style="list-style-type: none"> Define the term solubility and determine the solubility of a salt in a given solvent Describe the effect of temperature on solubility 	<ul style="list-style-type: none"> Encourage your child to look around the how to try and identify examples of solids, liquids and gases Encourage your child to watch this video about changes of state Changes of State Properties of Matter Chemistry FuseSchool - YouTube Encourage your child to visit BBC bitesize to learn about gas pressure Gas pressure - BBC Bitesize Encourage your child to visit BBC bitesize to learn about pure and impure substances Pure and impure substances - KS3 Chemistry - BBC Bitesize
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<p><u>Cells</u></p>	<p><u>Methods of separating mixtures</u></p> <ul style="list-style-type: none"> Describe how the following processes work to separate a mixture - Filtration, Evaporation / crystallisation, chromatography, distillation <p><u>Using microscopes</u></p> <ul style="list-style-type: none"> Explain cells as the fundamental unit of living organisms, including how to observe, interpret and record cell structure using a light microscope <p><u>Life processes and cell structure</u></p> <ul style="list-style-type: none"> Describe cells as the fundamental unit of living organisms, including how to observe, interpret and record cell structure using a light microscope State the functions of the cell wall, cell membrane, cytoplasm, nucleus, vacuole, mitochondria and chloroplasts Describe the similarities and differences between plant and animal cells Know that some cells have specialised functions <p><u>Single celled organisms and diffusion</u></p> <ul style="list-style-type: none"> Explain the role of diffusion in the movement of materials in and between cells State the structural adaptations of some unicellular organisms 	<ul style="list-style-type: none"> Watch this video to see distillation apparatus and how it is used Distillation Practical Chemistry Practicals GCSE Science Practicals - YouTube Encourage your child to watch this video about how chromatography can be used to separate colours Key Stage 3 Chemistry - Chromatography - YouTube <p>Encourage your child to visit BBC bitesize to learn about a range of methods used to separate a mixture Separating solids from liquids – filtration - Separating mixtures - KS3 Chemistry Revision - BBC Bitesize</p>
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	<p><u>Cells, tissues, organs and systems.</u></p> <ul style="list-style-type: none">• Understand the hierarchical organisation of multicellular organisms: from cells to tissues to organs to systems to organisms <p><u>Classification, habitats and adaptations.</u></p> <ul style="list-style-type: none">• Understand the basics of the animal classification system.	<p>Encourage students to watch this video to consolidate knowledge: How to use a Microscope Cells Biology FuseSchool - YouTube</p> <p>Encourage students to look through these relevant pages on BBC bitesize: Animal cells and plant cells - Cells to systems - KS3 Biology Revision - BBC Bitesize</p> <p>Encourage students to read through this information and take the relevant topic test Unicellular organisms - Cells to systems - KS3 Biology Revision - BBC Bitesize</p> <p>Encourage your child to draw out the hierarchy of organisation within a human using this video as help GCSE Biology - Levels of Organisation - Cells, Tissues, Organs and Organ Systems #13 - YouTube</p> <p>Encourage your child to learn the key terminology for progression into KS4: KS3 Classification Glossary - Schools (chesterzoo.org)</p>
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<p>Forces – Making objects move</p>	<p><u>Forces</u></p> <ul style="list-style-type: none"> • Identify key forces acting on an object and the equipment used to measure forces • Understand the effect balanced forces can have on an object • Name different types of frictional forces and the effect they have on motion • Describe factors that can increase or decrease resistive forces <p><u>Measuring Speed</u></p> <ul style="list-style-type: none"> • Understand how the speed of an object can change when a balanced force is applied to it. • Determine the speed of an object using simple apparatus (stopwatch and metre ruler) • Calculate the speed of objects <p><u>Distance – Time Graphs</u></p> <ul style="list-style-type: none"> • Describe the journey of an object from a distance-time graph 	<p>Read through this webpage with your child and complete the quiz at the end. Introduction to forces - Forces and movement - KS3 Physics - BBC Bitesize - BBC Bitesize</p> <p>Watch this video to understand the effect of balanced and unbalanced forces: Balanced & Unbalanced Forces Forces & Motion Physics FuseSchool - YouTube</p> <p>Encourage students to carry out their own investigation into air resistance. This link provides a simple experiment they can do at home with objects you can find around the house: https://www.giftofcuriosity.com/wind-resistance-experiments-for-kids/</p> <p>Watch this video to help you understand how to calculate speed. Have a go at calculating speed, it could be while you are running in the garden or on a walk to the shops. Speed Distance Time Forces & Motion Physics FuseSchool - YouTube</p> <p>This video is a good revision resource for distance-time graphs: https://www.youtube.com/watch?v=DkCw2C-DkT0 Ask students to attempt sketching a distance-time graph for a journey they have completed at home.</p>
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	<ul style="list-style-type: none"> • Construct a distance-time graph using data • Interpret a distance-time graph using data to support your understanding <p><u>Speed – Time Graphs</u></p> <ul style="list-style-type: none"> • Describe the journey of an object from a speed-time graph • Construct a speed-time graph using data • Interpret a speed-time graph using data to support your understanding 	<p>This website provides a useful resource to support your student with understanding speed-time graphs: https://www.bbc.co.uk/bitesize/guides/z2b9hv4/revision/4</p>
Energy	<p><u>Energy Stores and Transfers</u></p> <ul style="list-style-type: none"> • Describe the main energy stores • Understanding the conservation of energy and apply it to energy transfers <p><u>Efficiency</u></p> <ul style="list-style-type: none"> • Recall the equation for efficiency • Apply efficiency calculations to energy transfer diagrams • Describe how to use a Sankey diagram to represent efficiency 	<p>Encourage your child to watch this BBC lesson on conservation of energy: Conservation of Energy Physics – Wonders of Life - YouTube</p> <p>Students can revise their knowledge of the energy stores using the information on this page: Energy stores - Energy - KS3 Physics - BBC Bitesize - BBC Bitesize</p> <p>Ask students to predict the efficiency of different objects in the home (e.g. television, light bulb, hair dryer, games console, etc) Encourage students to then research the efficiency of these different devices to see if their prediction matches the information found.</p>

	<p><u>Non-Renewable Energy Resources</u></p> <ul style="list-style-type: none">• Discuss the advantages and disadvantages of non-renewable energy resources:<ul style="list-style-type: none">○ Coal○ Oil○ Gas○ Nuclear <p><u>Renewable Energy Resources</u></p> <ul style="list-style-type: none">• Discuss the advantages and disadvantages of renewable energy resources such as:<ul style="list-style-type: none">○ Solar○ Wind○ Geothermal○ Wave○ Tidal○ Biomass	<p>Students can revise their understanding of non-renewable energy resources using this website: Non Renewable Energy Resources - Shalom Education (shalom-education.com)</p> <p>Encourage your child to look at live information about the electricity being produced in the UK by visiting this website: Dashboard - MyGridGB</p> <p>Encourage your child to have a go at creating a carbon free electricity mix for the UK using this online game: Net Zero Energy Challenge: EnergyMixer</p>
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