Key Stage 3– Respite Years 7 & 8

		HT1 Cells / Materials	HT2 Temperature / Variation	HT3 Atoms, molecules, compounds / Current	HT4 Health & disease / Acids & alkalis / pH scale	HT5 How we see / Food chains	HT6 Air / Forces
Learning outcomes/composite knowledge: Pupils will be able to…		**BLO1:** Observe cells under the microscope **CLO2:** Identify properties of common materials and investigate properties of composite materials	**PLO1:** Explain how heat energy is transferred across different surfaces **BLO2:** Explain the factors affecting variation	**CLO1:** Identify atoms, elements, molecules and compounds. **PLO2:** Define current	**BLO1:** Identify factors affecting physical and mental health **CLO2:** Explain the properties of acids and alkalis. **CLO3:** Identify neutralisation reactions	**PLO1:** Explain how humans see **BLO2:** Describe how energy is transferred in a food chain and food web	**CLO1:** Explain the effect of air pollutants to the well-being of humans **PLO2:** Explain the effect of contact forces
Know ledge Com pone nts	Substantive Knowledge:	**Know that all living things are made from cells** **Know that microscopes are used to magnify specimens** **Know that cellular organelles carry out life processes** **Know that there are two types of microscopes: light and electron.** **Know that microscopes have the different components with specific functions** **Know the basic properties of materials including hardness and strength** **Know that composite materials are made from two or more different types of material.** **Know that composite materials are synthetic and**	**Know that energy is transferred by heating from a hotter region to a cooler region.** **Know that the temperature of the hotter region decreases, and the temperature of the cooler region increases.** **Know that heat energy is transferred by conduction In solids.** **Know that heat energy is transferred by convection in liquids .** **Know that variation is the differences between individuals of the same species, caused by genetic and environmental factors.** **Know that surveys into variation give data that are continuous, which means to come in a range, or**	**Know that atoms are the building blocks of everything.** **Know that atoms can form strong bonds with each other, making molecules.** **Know that a pure substance made from only one type of atom is called an element. Elements are listed on the periodic table.** **Know that elements can combine to make compounds.** **Know that everything in the known universe is made up of the elements found on the periodic table. There are over 100 different elements,**	**Know what it means to be mentally and physically healthy.** **Know that mental health issues include stress, anxiety and depression** **Know that a disease causes health problems by affecting an organism's body, organs, tissue or cells.** **Know the types of pathogens in the world today.** **Know that diseases can be caught, develop over time or be inherited.** **Know that the pH scale shows how acidic a substance is. It can be measured using a pH meter which gives a numerical value.**	**Know that both cameras and the human eye use lenses to focus light.** **Know that both cameras and the human eye contain material that is sensitive to light: in the eye this is the retina.** **Know that white light is a combination of all the colours in the light spectrum.** **Know that all organisms in an ecosystem depend on each other.** **Know that food chains show the feeding relationships between organisms.** **Know that food chains show the flow of energy**	**Know that some human activities release polluting gases into the atmosphere.** **Know that these gases can have immediate impacts on the environment and human health, and long-term effects on the planet.** **Know that a force is a push or a pull that acts on an object due to the interaction with another object.** **Know that forces are divided into contact forces and non-contact forces.**

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		are made by a chemical process. **Know that composite materials are designed for specific uses.**	**discontinuous, which means to come in groups.** Know that DNA carries genetic information in the form of 23 chromosomes from each parent.	which are made up of atoms. **Know that particle diagrams are used to help explain elements, compounds an d mixtures.** **Know that some elements exist as individual atoms, but some bond together to form molecules of atoms of the same element.** **Know that circuit diagrams are used to show how electrical components ar e connected in a circuit.** **Know that individual circuit components are represented using circuit symbols.** Know that ammeters are used to measure the current flowing through components. **Voltmeters are used to measure the potential difference across components**	**Know that the pH scale ranges from 0 (very acidic) through 7 (neutral) to 14 (very alkaline).** Know that pH can also be measured using an indicator and comparing the colour with a comparison chart. **Know that an acid and alkali will neutralise each other and produce a salt and water.**	from one organism to another. **Know that food chains show the feeding relationships between organisms.** Know that food webs show how all the food chains in an ecosystem interact.	
	Disciplinary Knowledge:	**Know that scientists use microscopes to magnify images**	**Know that temperature is measured in degrees**	**Know how to categorise atoms, elements,**	**Know how to use a table to compare factors affecting mental and physical health.**	**Know how to represent energy transfer by drawing arrows in a food chain.**	**Know how to classify pollutants using a table.**

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		Know how to identify and label parts of a microscope Know how to use a microscope to observe pre-prepared slides Know how to calculate the total magnification of a light microscope Know how to calculate the eyepiece, objective, or total magnification Know that cell length is measured in nanometers Know how to test a material for hardness and strength Know how to gather information on properties of different materials using a results table.	Celsius using a thermometer Know how to use a thermometer to collect data on temperature. Know how to use degrees Celsius when concluding results. Know how to draw a temperature x time graph. Know how to record data on discontinuous variation using a results table. Know how to plot discontinuous data in using a bar chart.	molecules and compounds using a table. Know how to identify the number of atoms in a molecule. Know how to write word equations. Know how to build a simple electrical circuit Know how to use an ammeter to measure current Know how to draw a simple circuit diagram. Know how to use the SI unit for current ampere (A) Know how to use a table to describe differences in current.	Know how to use litmus paper to identify if a substance is an acid or an alkali. Know how to use the pH scale to identify if a substance is an acid or an alkali. Know that the volume of a liquid is measured using a measuring cylinder in cm3. Know how to use apparatus to neutralise HCl using NaOH.	Know how to use a prism to observe and identify the colours in the visible light spectrum.	Know how to identify the number of atoms in a molecule in common air pollutants. Know that a force is measured in newtons (N). Know that the size of arrows in a force diagram represent the strength of a force.

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	Know how to create a conclusion from data on composites.					
National Curriculum reference	Cells as the fundamental unit of living organisms, including how to observe, interpret and record cell structures using a light microscope Properties of ceramics, polymers and composites (qualitative).	Conservation of energy and reversibility, in melting, freezing, evaporation, sublimation, condensation Heredity as the process by which genetic information is transmitted from one generation to the next	A simple (Dalton) atomic model Differences between atoms, elements and compounds Current electricity Electric current, measured in amperes, in circuits, series and parallel circuits, currents add where branches meet and current as flow of charge Potential difference, measured in volts, battery and bulb ratings; resistance, measured in ohms, as the ratio of potential difference (p.d.) to current Differences in resistance between conducting and	The effects of recreational drugs (including substance misuse) on behaviour, health and life processes. Defining acids and alkalis in terms of neutralisation reactions The pH scale for measuring acidity/alkalinity; and indicators Reactions of acids with metals to produce a salt plus hydrogen Reactions of acids with alkalis to produce a salt plus water	The characteristics of sound waves. Light waves travelling through a vacuum; speed of light The transmission of light through materials: absorption, diffuse scattering and specular reflection at a surface The interdependence of organisms in an ecosystem, including food webs and insect pollinated crops	How organisms affect, and are affected by, their environment, including the accumulation of toxic materials. The production of carbon dioxide by human activity and the impact on climate Using force arrows in diagrams, adding forces in one dimension, balanced and unbalanced forces

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			insulating components (quantitative).			
Common misconceptions	Pupils often get the functions of fine focusing and coarse focusing wheels mixed up. Pupils often use hardness and strength synonymously Pupils often think that composites contain only one material.	Pupils often think that energy can be created and destroyed. Pupils often think that they can inherit different numbers of chromosomes due to their commonly inherited characteristics	Pupils don't often know that particles refer to atoms or molecules. Pupils often think that current can be introduced into an object.	Pupils often think that eating healthy food only affects physical but not mental health. Pupils often think that all acids burn through skin. Pupils often think tap water is objectively neutral.	Pupils often think that the lens is responsible for creating vision. Pupils often think that energy from food is only used by the organism who has fed on another organism, but is released into the environment and passed through the food chain.	Pupils often think that carbon dioxide is the only air pollutant. Pupils often think that gravity and magnetism are contact forces.
Exemplar Composite Task(s)	**BLO1**: Label a diagram of a light microscope and explain the functions of each part. **BLO1:** Calculate magnification using the equation $M_T = M_E \times M_O$ (range of questions) **CLO2:** Collect data on the properties of composite materials .	**PLO3:** Plot a graph from temperature x time data **BLO2:** Use a results table to record data on discontinuous variation of pupils in the class. **BLO2:** Plot results on discontinuous data in a bar chart.	**CLO1:** Draw, label and colour different diagrams of atoms, molecules and compounds. **CLO1:** Identify atoms and molecules in the periodic table. **PLO1:** Build a simple electrical circuit. **PLO1:** Observe and record differences in current	**BLO1:** Create a poster describing things we can do to increase mental and physical health. **CLO2:** Give examples of substances to represent each Ph in the scale. **CLO3:** Observe a neutralisation reaction in the lab	**PLO1:** Identify the colours in white light using a prism. **PLO1:** Label parts of the human eye involved in seeing. **BLO2:** Draw a food chain for 3 different habitats showing how energy is transferred between organisms in an ecosystem. **BLO2:** Draw a food web, showing how energy is transferred within one ecosystem	**CLO1:** Describe the common pollutants in air. **PLO2:** Identify balanced and unbalanced forces using a force diagram.

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