SCIENCE			Year: 7/8 Year 1		
AUTUMN		**SPRING**		**SUMMER**	
Half term 1	**Half term 2**	**Half term 3**	**Half term 4**	**Half term 5**	**Half term 6**
Theme/ topic: **Safety introduction** **Adaptation and inheritance**	**Theme/ topic:** **States of matter** **Separation techniques**	**Theme/ topic:** **Waves** **Sound and light**	**Theme/ topic:** **Space** **Earth**	**Theme/ topic:** **Energy**	**Theme/ topic:** **Ecology** **Reproduction**
By the end of this half term pupils will know:					
Differences between organisms cause species to evolve by natural selection of better adapted individuals. The great diversity of organisms is the result of evolution. Tier 3 vocab: Variation, environmental, inherited, adapted, continuous, discrete, offspring	All matter is made up of atoms. The behaviour and structural arrangement of atoms explains the properties of different materials. Materials are either made of a single chemical substance or a mixture of substances. Tier 3 vocab: Melting, boiling, freezing, condensation, evaporation, sublimation, solution, solvent, solute, dissolve	Waves radiate information. Understanding waves helps us to communicate. Tier 3 vocab: Amplitude, wavelength, volume, longitudinal, compressions, rarefactions, peak trough	Understanding the uniqueness of the Earth and the vastness of space gives us perspective and awe The Earth's crust is constantly changing as new rocks are formed and older rock is worn away. Tier 3 vocab: Asteroid, meteor, gravity, orbit, satellite Core, mantle, crust, atmosphere, weathering, sedimentary, metamorphic, igneous	Understand all processes involve energy transfer and the difference between a store and a transfer. Tier 3 vocab: Joules, stores, transfer, gravitational, elastic, magnetic, kinetic, chemical, thermal potential	All organisms, including humans, depend on, interact with and affect the environments in which they live and other organisms that live there. Genetic information is passed from each generation to the next; Tier 3 vocab: Abiotic, biotic, quadrat, transect, biomass, photosynthesis, fermentation, Egg sperm, uterus, testes, pregnancy puberty

They will understand:					
Differences within species Changes in species over time – fossil evidence	The properties of the different states of matter (solid, liquid and gas) in terms of the particle model, including gas pressure changes of state in terms of the particle model the concept of a pure substance mixtures, including dissolving simple techniques for separating mixtures: filtration, evaporation, distillation and chromatography the identification of pure substances	Visualising waves Speed of waves Reflection Refraction and dispersion Similarities and differences of waves that travel through matter and those which go through a vacuum. Colour	The differences between stars and planets, gravity forces between Earth and Moon, and between Earth and Sun our Sun as a star, other stars in our galaxy, other galaxies. The seasons and the Earth's tilt, day length at different times of year, in different hemisphere The composition and structure of the Earth. The rock cycle and the formation of igneous, sedimentary and metamorphic rocks. Earth as a source of limited resources. The composition and changes of the atmosphere.	Processes that involve energy transfer: changing motion, dropping an object, completing an electrical circuit, stretching a spring, metabolism of food, burning fuels. Energy as a quantity that can be quantified and calculated; the total energy has the same value before and after a change.	The interdependence of organisms in an ecosystem, including food webs and insect pollinated crops, the importance of plant reproduction through insect pollination in human food security ♣ how organisms affect, and are affected by, their environment, including the accumulation of toxic materials Reproduction in humans, including the structure and function of the male and female reproductive systems, menstrual cycle, fertilisation, gestation and birth, Reproduction in plants, including flower structure, wind and insect pollination.
They will know how to:					
Interpret observations and data, including identifying patterns and using observations,	Use appropriate techniques, apparatus, and materials during laboratory work, paying	Use appropriate techniques, apparatus, and materials during laboratory work, paying	Make and record observations and measurements using a range of methods for different investigations;	Make and record observations and measurements for different investigations; and evaluate the	Use appropriate techniques such as quadrates and transects. Paying attention to health and safety. Make

measurements and data to draw conclusions Present reasoned explanations, including explaining data in relation to predictions and hypotheses	attention to health and safety Apply mathematical concepts and calculate results Present observations and data using appropriate methods, including tables and graphs	attention to health and safety Present reasoned explanations, including explaining data in relation to predictions and hypotheses	and evaluate the reliability of methods and suggest possible improvements Interpret observations and data, including identifying patterns and using observations, measurements and data to draw conclusions	reliability of methods and suggest possible improvements.	and record observations and measurements for different investigations. Evaluating the reliability of those methods and suggesting improvements.
Link to prior learning					
Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution	Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating	Recognise that light appears to travel in straight lines and explain that objects are seen because they give out or reflect light into the eye. Explain that we see things because light	Objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. describe the movement of the Earth, and other planets, relative to the Sun in the solar system	Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells give reasons for variations in how components function, use recognised. Use symbols when representing a simple circuit in a diagram.	Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. Describe the life process of reproduction in some plants and animals