

Year 7 Science Learning Programme

Term	Topics	By the end of the topic I will be able to.....	I will also be developing my investigative skills
Autumn 1	Introduction to science	<ul style="list-style-type: none"> Identify how to work safely in a lab and to create some basic risk assessments Know the function of some basic equipment and know where it is kept. 	<p>Communication in science by writing a plan for an investigation</p> <p>Practical skills by identifying key variables</p>
	Speed	<ul style="list-style-type: none"> Know if the overall, resultant force on an object is non-zero, its motion changes and it slows down, speeds up or changes direction. Illustrate a journey with changing speed on a distance-time graph, and label changes in motion. 	<p>Numeracy skills by using the formula: speed = distance (m)/time (s) or distance-time graphs, to calculate speed.</p>
	Particle model	<ul style="list-style-type: none"> Explain unfamiliar observations about gas pressure in terms of particles. Explain the properties of solids, liquids and gases based on the arrangement and movement of their particles. Explain changes in states in terms of changes to the energy of particles. Draw before and after diagrams of particles to explain observations about changes of state, gas pressure and diffusion. 	<p>Relate the features of the particle model to the properties of materials in different states</p>
Autumn 2	Cells	<ul style="list-style-type: none"> Explain why multi-cellular organisms need organ systems to keep their cells alive. Suggest what kind of tissue or organism a cell is part of, based on its features. Explain how to use a microscope to identify and compare different types of cells. Explain how uni-cellular organisms are adapted to carry out functions that in multi-cellular organisms are done by different types of cell. 	<p>Identify the principal features of a cheek cell and describe their functions</p>
	Movement	<ul style="list-style-type: none"> Explain how a physical property of part of the skeleton relates to its function. Explain why some organs contain muscle tissue. Explain how antagonistic muscles produce movement around a joint. Use a diagram to predict the result of a muscle contraction or relaxation. 	<p>Explore how the skeletal system and muscular system in a chicken wing work together to cause movement</p>
	Human reproduction	<ul style="list-style-type: none"> Explain whether substances are passed from the mother to the foetus or not. Use a diagram to show stages in development of a foetus from the production of sex cells to birth. Describe causes of low fertility in male and female reproductive systems. Identify key events on a diagram of the menstrual cycle 	<p>Relate advice to pregnant women to ideas about transfer of substances to the embryo</p>

Spring 1	Separating mixtures	<ul style="list-style-type: none"> • Explain how substances dissolve using the particle model. • Use the solubility curve of a solute to explain observations about solutions. • Use evidence from chromatography to identify unknown substances in mixtures. • Choose the most suitable technique to separate out a mixture of substances. 	Devise ways to separate mixtures, based on their properties
	Sound	<ul style="list-style-type: none"> • Explain observations where sound is reflected, transmitted or absorbed by different media. • Explain observations of how sound travels using the idea of a longitudinal wave. • Describe the amplitude and frequency of a wave from a diagram or oscilloscope picture. • Use drawings of waves to describe how sound waves change with volume or pitch. 	Relate changes in the shape of an oscilloscope trace to changes in pitch and volume
	Light	<ul style="list-style-type: none"> • Use ray diagrams of eclipses to describe what is seen by observers in different places. • Explain observations where coloured lights are mixed or objects are viewed in different lights. • Use ray diagrams to describe how light passes through lenses and transparent materials. • Describe how lenses may be used to correct vision. 	Use ray diagrams to model how light passes through lenses and transparent materials
Spring 2	Earth structure	<ul style="list-style-type: none"> • Explain why a rock has a particular property based on how it was formed. • Identify the causes of weathering and erosion and describe how they occur. • Construct a labelled diagram to identify the processes of the rock cycle. 	Model the processes that are responsible for rock formation and link these to the rock features <ul style="list-style-type: none"> • Analyse patterns • Discuss limitations • Draw conclusions
	Gravity	<ul style="list-style-type: none"> • Draw a force diagram for a problem involving gravity. • Deduce how gravity varies for different masses and distances. • Compare weight on Earth with weight on different planets using the formula. 	Numeracy skills by using the formula: weight (N) = mass (kg) x gravitational field strength (N/kg). Explain the way in which an astronaut's weight varies on a journey to the moon
Summer 1	Universe	<ul style="list-style-type: none"> • Describe the appearance of planets showing their position in relation to the Earth and Sun. • Explain why places on the Earth experience different daylight hours and amounts of sunlight during the year. • Describe how space exploration and observations of stars are affected by the scale of the universe. • Explain the choice of particular units for measuring distance. 	Relate observations of changing day length to an appropriate model of the solar system <ul style="list-style-type: none"> • Analyse patterns • Draw conclusions • Present data

	Interdependence	<ul style="list-style-type: none"> Describe how a species' population changes as its predator or prey population changes. Explain effects of environmental changes and toxic materials on a species' population. Combine food chains to form a food web. Explain issues with human food supplies in terms of insect pollinators. 	Use a model to investigate the impact of changes in a population of one organism on others in the ecosystem
	Plant reproduction	<ul style="list-style-type: none"> Describe the main steps that take place when a plant reproduces successfully. Identify parts of the flower and link their structure to their function. Suggest how a plant carried out seed dispersal based on the features of its fruit or seed. Explain why seed dispersal is important to survival of the parent plant and its offspring. 	Use models to evaluate the features of various types of seed dispersal
Summer 2	Electricity - Voltage and resistance	<ul style="list-style-type: none"> Draw a circuit diagram to show how voltage can be measured in a simple circuit. Use the idea of energy to explain how voltage and resistance affect the way components work. Use the ratio of voltage to current to determine the resistance. Use an analogy like water in pipes to explain why part of a circuit has higher resistance. 	Compare the voltage drop across resistors connected in series in a circuit
	Electricity - Current	<ul style="list-style-type: none"> Describe how current changes in series and parallel circuits when components are changed. Turn circuit diagrams into real series and parallel circuits, and vice versa. Describe what happens when charged objects are placed near to each other or touching. Use a sketch to describe how an object charged positively or negatively became charged up. 	Compare and explain current flow in different parts of a parallel circuit
	Acids and alkalis	<ul style="list-style-type: none"> Identify the best indicator to distinguish between solutions of different pH, using data provided. Use data and observations to determine the pH of a solution and explain what this shows. Explain how neutralisation reactions are used in a range of situations. Describe a method for how to make a neutral solution from an acid and alkali 	Devise an enquiry to compare how well indigestion remedies work