

Long Term Plan KS3 Science

Year 7

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Unit	Physics: Forces	Chemistry: The Particulate Nature of Matter	Biology: Cells and Organisation	Physics: Energy	Chemistry: Pure and Impure Substances	Biology: Reproduction
NC/Qualification Objectives	Describing motion, Forces	-The particulate nature of matter -Atoms, elements & compounds	-Cells and organisation	-Energy -Energy changes	-Pure and Impure substances	-Reproduction
Enrichment/ Experiences	Toy car investigation, Go karting	Modelling solid, liquid, gas using students as particles.	Building a model cell	Potential to look at renewable energy sources, look into visiting a windfarm.		Gathering and dissecting flowers on the nature reserve.
Cross-curricular links						Link to PSHE, will be recovered at a later point in PSHE.
Keystone Vocabulary	Air resistance; Atmospheric pressure; balanced forces; elastic behaviour; effort; elastic limit; equilibrium, extension; friction; fulcrum; gravitational force; lever; moment; newton; newton meter; normal contact force; pressure; relative speed; speed; unbalanced forces; upthrust; weight; work done.	Atom; accurate; boiling; boiling point; chemical change; chemical formula; collision; compound; compress; concentration; concentration gradient; condensation; conservation of mass; diffusion; element; energy transfer; evaporation; expand; freezing; kilopascal (Kpa); latent heat; matter; melting; melting point; molecule; particle; particle model; physical change; precise; pressure; ratio; repeatable; state of matter; sublimation;	Cell; Uni-cellular; Multi-cellular; Tissue; Organ; Diffusion; Structural adaptations; Cell membrane; Nucleus; Vacuole; Mitochondria; Cell wall	Thermal energy store; Chemical energy store; Kinetic energy store; Gravitational potential energy store; Elastic energy store; Dissipated Thermal conductor; Thermal insulator; Temperature; Thermal energy; Conduction; Convection; Radiation	Solvent; Solute; Dissolve; Solution; Soluble (insoluble); Solubility; Pure substance; Mixture; Filtration; Distillation; Evaporation; Chromatography	Pollen; Ovules; Pollination; Fertilisation; Seed; Fruit; Carpel; Layer; Cell; Fertilisation; sperm; period; menstruation; ovulate.

Long Term Plan KS3 Science

		temperature; thermal expansion; true value; viscosity				
Curriculum End Point / Goal	Pupil will begin to develop an understanding of a range of scientific ideas in the subject disciplines of biology, chemistry and physics. Pupils should begin to see the connections between these subject areas and become aware of some of the big ideas underpinning scientific knowledge and understanding . Pupils will begin to make decisions on appropriate type of scientific enquiry to undertake to answer their own questions and develop a deeper understanding of factors to be considered when collecting, recording and processing data. Pupils will develop their use of scientific vocabulary .					
Scientific Enquiry/Skills	Disciplinary knowledge in science is cumulative. Knowledge is revisited and refined throughout the curriculum.					
	Students will have the opportunity to: Write a scientific report that contains sections in the correct order; Create an accurate and easy to follow practical method; Safely assess the risks and Hazards in an experiment; Annotate diagrams; Make and record accurate observations	Students will have the opportunity to: Pay attention to objectivity and concern for accuracy, precision, repeatability, and reproducibility; select, plan and carry out the most appropriate types of scientific enquiries to test predictions; interpret observations and data, including identifying patterns and using observations, measurements and data to draw conclusions; apply mathematical concepts and calculate results; present reasoned explanations.	Students will have the opportunity to: The role of the scientific community (CRISPR); further use of equations; representing data in tables and graphs (scales given); use a light microscope to observe and draw cells.	Students will have the opportunity to: Further use equations; representing data in tables and graphs (scales given); evaluating data; calculating	Students will have the opportunity to: Application of a model to an application; identifying and using a range of techniques; using scientific ideas to explain phenomena; use evidence from chromatography to identify unknown substances in mixtures; choose the most suitable technique to separate out a mixture of substances.	Students will have the opportunity to: Make and record observations related to flower structure and relate to the mode of pollination.
Knowledge and Learning	Know: <i>Students explore further the idea of speed depending on distance and time. Using this to develop the use of line graphs. They will then use ideas about units and diagrams showing the direction of pushes</i>	Know: <i>Students further explore their ideas of solids, liquids and gases, linking their properties to the particle model and building on their understanding of changes of state. They will then build on their</i>	Know: Multicellular organisms are composed of cells which are organised into tissues, organs and systems to carry out life processes. There are many types of cells. Each has a different structure or	Know: <i>Students begin the unit around energy by considering foods as a store of chemical potential energy, before linking insulating materials to reductions in the transfer of energy. This will follow with a</i>	Know: <i>Students will develop practical skills across a range of contexts using equipment which is potentially unfamiliar. Students are introduced to the idea of risk and hazards and begin to</i>	Know: <i>Students previously learned about the structure of flowering plants the stages of plant reproduction. Here, students explore different mechanisms of pollination, including the adaptations for each.</i>

Long Term Plan KS3 Science

	<p><i>and pulls, friction, air resistance and non-contact forces. This will move on to exploring simple machines before taking the idea that forces can deform elastic objects and exploring the mathematical relationship.</i></p> <p>The Unit delivers this core knowledge through 8 sections. Students begin by describing motion and looking at forces in action, how levers work and the effects of stretch and compression.</p> <p>To extend their knowledge students will build on this in the remaining sections of forces motion and equilibrium, using moments and pressure.</p>	<p><i>knowledge of the concept of mixtures and dissolving with the concept of atoms, elements and compounds.</i></p> <p>This core material is delivered through 6 sections. Students begin by describing the properties of the states of matter, noticing differences and describing properties in terms of the particle model.</p> <p>They will follow this by looking at changes of state, recognising them as reversible changes and explaining the changes in terms of the particle model. After consolidating students' understanding of mixtures and dissolving they will focus on recognising the terms atom, element and compound before identify differences and using simple models.</p> <p>To extend their knowledge, students will build on their knowledge of how particles move to describe diffusion in liquids and gases and how changes of state demonstrate conservation of mass. They will also link energy changes to changes of state in terms of temperature.</p>	<p>feature so it can do a specific job.</p> <p>Facts: Both plant and animal cells have a cell membrane, nucleus, cytoplasm and mitochondria; Plant cells also have a cell wall, chloroplasts and usually a permanent vacuole.</p> <p><i>Movement</i></p> <p>The parts of the human skeleton work as a system for support, protection, movement and the production of new blood cells.</p> <p>Antagonistic pairs of muscles create movement when one contracts and the other relaxes.</p>	<p><i>more quantitative approach to energy transfers and how all energy has to be accounted for.</i></p> <p>The Unit delivers this core knowledge through comparing the energy values of food, and different power ratings of appliances. Students will also look at fuel bills, fuel use and fuel cost before investigating fuels and energy sources. This will lead on to students being exploring heating and thermal equilibrium, introducing a simple energy transfer in the form of the transfer between a hotter object and a cooler object either by conduction or radiation. This will be finished off with some investigation around the use of insulators.</p> <p>Energy transfers will then be expanded upon by comparing amounts of energy transferred, revisiting domestic bills and exploring other processes involving energy transfer including changing motion, dropping objects, completing and electrical circuit, stretching a spring, metabolism of food and burning fuels. The unit is completed by looking</p>	<p><i>recognise their role in staying safe.</i></p> <p>Students will extend their knowledge of separation techniques to include filtration and evaporation. The concept of dissolving, solubility and the law of conservation of mass are applied to separation techniques and they will explore what a mixture is on a particle level. This also builds on the understanding of changes of state.</p> <p>Finally, students will explore further separation techniques; distillation, which will further develop the ideas of dissolving, solubility and evaporation, leading to a deeper understanding of the difference between evaporation and boiling.</p> <p>Chromatography will further develop ideas of purity, and how this can relate to identifying unknown substances.</p>	<p>Students will the look at different methods of seed dispersal, and analyse experimental data and methods linked with seed dispersal.</p> <p>Following on from plant reproduction, students will look at Human reproduction. They will learn about male and female reproductive parts and compare reproductive organs in plants and animals.</p> <p>Students will describe the changes occurring in puberty before looking in more detail at the menstrual cycle and links to infertility.</p> <p>Finally, they will explore the development of the foetus, the role of the mother in this and factors which affect foetal development.</p>
--	--	---	--	--	---	---

Long Term Plan KS3 Science

				<p>at the conservation of energy, at how energy can be quantified and calculated, comparison of starting and final conditions in a systems, and using physical processes and mechanisms to explain intermediate steps that bring about changes.</p>		
<p>Curriculum End Point / Goal</p>	<p>Pupil will begin to develop an understanding of a range of scientific ideas in the subject disciplines of biology, chemistry and physics. Pupils should begin to see the connections between these subject areas and become aware of some of the big ideas underpinning scientific knowledge and understanding. Pupils will begin to make decisions on appropriate type of scientific enquiry to undertake to answer their own questions and develop a deeper understanding of factors to be considered when collecting, recording and processing data. Pupils will develop their use of scientific vocabulary.</p>					