

Science



Year 7 Curriculum Map



Year 7 – Autumn Term 1

Transition

7A - Cells, Tissues, Organs & Systems

7G - Particle Model

Prior Learning	<p>Transition From key stage 2, pupils should be able to plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary and take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.</p> <p>7A - Cells, Tissues, Organs & Systems From key stage 2, pupils should be able to describe the life cycles common to a variety of animals, including humans (birth, growth, development, reproduction and death), and to a variety of plants (growth, reproduction and death); identify and name the main parts of the human circulatory system, and explain the functions of the heart, blood vessels and blood (including the pulse and clotting); describe the life process of reproduction in some plants and animals; use results from experiments as evidence.</p> <p>7G - Particle Model From key stage 2, pupils should be able to understand that some materials will dissolve in liquid to form a solution and describe how to recover a substance from a solution; use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating.</p>
What will I learn?	<p>Transition This unit is an introduction to science and begins by focussing on the health and safety requirements of a science lab. This extends into naming and using the equipment safely and continues into recording data whilst heating water. Finally, the scientific method is introduced looking at the variable is fair testing.</p> <p>7A - Cells, Tissues, Organs & Systems This unit starts by reminding pupils about the features of organisms, and then looks at organs, tissues and cells. These ideas are then built back up in order to look at organs once again, in the context of organ systems. Throughout the unit, pupils are encouraged to compare what we know now about the structure of organisms with what people believed in the past.</p> <p>7G - Particle Model This unit develops an understanding of the different properties of solids, liquids and gases within the context of waste management and disposal. Scientific method and ideas on experiments, observation, hypotheses and theories are discussed, leading to an understanding of the particle theory of matter. Further applications of the particle theory are investigated using the context of waste and waste disposal.</p>
How will I be assessed?	<p>Transition Formative – recall 5 questions to identify gaps in knowledge and understanding, low stakes quick quizzing, mid-topic assessment, homework tasks, verbally in class, practical assessments of fair testing and using a Bunsen burner safely. Summative – 1 baseline assessments and 1 end of topic test</p> <p>7A - Cells, Tissues, Organs & Systems Formative – recall 5 questions to identify gaps in knowledge and understanding, low stakes quick quizzing, mid-topic assessment, homework tasks, verbally in class. Summative – end of topic test.</p> <p>7G - Particle Model Formative – recall 5 questions to identify gaps in knowledge and understanding, low stakes quick quizzing, mid-topic assessment, homework tasks, verbally in class. Summative – end of topic test.</p>

<p>Next Steps</p>	<p>Transition All subsequent topics.</p> <p>7A - Cells, Tissues, Organs & Systems 8A - Food & Nutrition 8C - Breathing & Respiration 8D - Unicellular Organisms 8B - Plants & their Reproduction B1 - Cell Biology B2 – Organisation</p> <p>7G - Particle Model 8I - Fluids C1 - Atomic structure and the periodic table C2 - Bonding, structure, and the properties of matter P3 - Particle Model</p>
<p>Opportunities for Independent Learning</p>	<p>Transition BBC Bitesize – Apparatus and techniques BBC Bitesize – Hazards and risks</p> <p>7A - Cells, Tissues, Organs & Systems BBC Bitesize - Living Organisms Microscopes Pupils have access to Seneca for practice questions in the cells, tissues and organs section: https://app.senecalearning.com/</p> <p>7G - Particle Model BBC Bitesize - States of Matter States of Matter quiz Pupils have access to Seneca for practice questions in the particles section: https://app.senecalearning.com/</p>
<p>Personal Development and CEIAG</p>	<p>Transition Pupils will explore hazard symbols of chemicals and equipment not just found in the lab but at home as well and learn the precautions needed to use them safely.</p> <p>7A - Cells, Tissues, Organs & Systems Pupils will learn how healthy organ systems function and there are plenty of opportunities to explore career in the health care services, biologist and scientific researcher.</p> <p>7G - Particle Model Pupils will have further opportunities to identify the risks involved in using potentially hazardous chemicals/apparatus and develop their knowledge and confidence at using them safely. Explore career opportunities in the chemical industry.</p>
<p>Enrichment Opportunities (Cultural Capital)</p>	<p>Transition Science Club (ask teacher for more information) Research a famous scientist Design a safety poster to be displayed in the lab</p> <p>7A - Cells, Tissues, Organs & Systems Operation Ouch! (CBeebies) Using a pocket microscope to magnify objects at home Make a model cell (animal or plant)</p> <p>7G - Particle Model Making models of particles in solids, liquids and gases Using diffusion to produce a Skittles rainbow</p>




Year 7 – Autumn Term 2

7K - Forces

7B - Sexual Reproduction

Prior Learning	<p>7K - Forces From key stage 2, pupils should be able to describe different kinds of forces, including magnetism, gravity, upthrust and friction, and be able to classify these as contact or noncontact forces; identify the effect of drag forces that act between moving surfaces; describe why moving objects that are not driven tend to slow down.</p> <p>7B - Sexual Reproduction From key stage 2 and previous units, pupils should be able to describe the life process of reproduction in some plants and animals; describe the changes as humans develop to old age; understand the concept of the cell (7A); recall that some cells are specialised (7A).</p>
What will I learn?	<p>7K - Forces This unit revises the concepts of forces and their effects and extends pupils' knowledge of friction, gravity and springs. These ideas are presented using a theme of outdoor sports, such as climbing and mountain biking, to link to ideas about forces, friction and pressure.</p> <p>7B - Sexual Reproduction This unit explores sexual reproduction in animals, in the context of efforts being made by zoos to prevent endangered species becoming extinct. However, the central focus for learning is the human reproductive system and sexual reproduction in humans. Pupils will be use seed dispersal methods to consolidate the types of variables</p>
How will I be assessed?	<p>7K - Forces Formative – recall 5 questions to identify gaps in knowledge and understanding, low stakes quick quizzing, mid-topic assessment, homework tasks, verbally in class. Summative – end of topic test.</p> <p>7B - Sexual Reproduction Formative – recall 5 questions to identify gaps in knowledge and understanding, low stakes quick quizzing, mid-topic assessment, homework tasks, verbally in class. Summative – end of topic test.</p>
Next Steps	<p>7K – Forces 9I - Force and Motion P5 - Forces KS4 Combined and Separates</p> <p>7B - Sexual Reproduction 8B - Plants & their Reproduction B6 - Inheritance and variation</p>
Opportunities for Independent Learning	<p>7K - Forces BBC Bitesize - Forces Balanced and unbalanced forces video clip Forces quiz 1 Forces quiz 2 Pupils have access to Seneca for practice questions in the forces section https://app.senecalearning.com/</p> <p>7B - Sexual Reproduction BBC Bitesize - Human Reproduction Reproduction video clips Pupils have access to Seneca for practice questions in the reproduction section https://app.senecalearning.com/</p>

Personal Development and CEIAG	<p>7K - Forces Pupils will have further opportunities to identify the risks involved in using potentially hazardous apparatus and develop their knowledge and confidence at using it safely. Explore career opportunities in sports science and mechanical engineering</p> <p>7B - Sexual Reproduction This is an ideal opportunity for pupils to develop age-appropriate understanding of healthy relationships through appropriate relationship and sex education and there are plenty of opportunities to explore careers in the health care services, midwifery and scientific research.</p>
Enrichment Opportunities (Cultural Capital)	<p>7K - Forces History of Sir Isaac Newton video clip Manchester Museum of Science and Industry Institute of Physics - Do try this at home! James Dyson Foundation challenges - 4 Balloon kebabs; 11 Inertial eggs</p> <p>7B - Sexual Reproduction www.zoolab.uk Growing plants from seeds linked to HSW Fundraising to support the conservation of endangered animals (WWF, RSPB) Chester Zoo</p>

	<p>Year 7 – Spring Term 1</p> <p>7H - Atoms, Elements & Compounds</p> <p>7I – Energy</p>
Prior Learning	<p>7H - Atom, Elements & Compounds From previous units, pupils should be able to identify different kinds of mixtures, including solutions, and describe ways of separating mixtures (7E); describe the difference between chemical and physical changes (7F); recognise differences between solids, liquids and gases, in terms of ease of flow and maintenance of shape and volume (7G); describe the properties of the different states of matter in terms of particle kinetics, including gas pressure and diffusion (7G).</p> <p>7I - Energy Energy is not explicitly covered in the key stage 2 curriculum. From key stage 2, pupils should be able to recall that temperature is a measure of how hot or cold something is and be able to use thermometers to measure temperature; be able to describe some materials as thermal conductors and some as thermal insulators; have seen materials burning and understand that burning is an irreversible change; recall that plants need sunlight to grow and that animals, including humans, need food.</p>
What will I learn?	<p>7H - Atom, Elements & Compounds This unit uses the context of resources from the Earth and atmosphere to introduce ideas about the make-up of matter. It expands on particle theory and explains the differences between atoms, and molecules, elements and compounds. It looks at the symbols and formulae for elements and compounds. The involvement of chemical reactions in the formation and decomposition of compounds is also covered. It links these with the more abstract ideas of particle models, naming compounds and word equations</p> <p>7I - Energy This unit uses a theme park to introduce the idea that stores of energy are needed to make most things happen. It looks at food, energy stores and transfers, and energy resources in terms of non-renewable fuels and renewable resources.</p>

<p>How will I be assessed?</p>	<p>7H - Atom, Elements & Compounds Formative – recall 5 questions to identify gaps in knowledge and understanding, low stakes quick quizzing, mid-topic assessment, homework tasks, verbally in class. Summative – end of topic test.</p> <p>7I - Energy Formative – recall 5 questions to identify gaps in knowledge and understanding, low stakes quick quizzing, mid-topic assessment, homework tasks, verbally in class. Summative – end of topic test.</p>
<p>Next Steps</p>	<p>7H - Atom, Elements & Compounds 8E - Combustion 8F - Periodic table C1 - 10 Fundamental knowledge and understanding for Combined and Triple Chemistry at GCSE</p> <p>7I - Energy 7J - Current electricity 8K - Energy transfers P1 - Energy</p>
<p>Opportunities for Independent Learning</p>	<p>7H - Atom, Elements & Compounds BBC Bitesize – Atoms, Elements & Compounds Atoms and elements video clip Pupils have access to Seneca for practice questions in the Atoms, Elements & Compounds section https://app.senecalearning.com/</p> <p>7I - Energy BBC Bitesize Energy http://www.darvill.clara.net/altenerg/index.htm Pupils have access to Seneca for practice questions in the Energy section https://app.senecalearning.com/</p>
<p>Personal Development and CEIAG</p>	<p>7H - Atom, Elements & Compounds Pupils will have further opportunities to identify the risks involved in using potentially hazardous chemicals/apparatus and develop their knowledge and confidence at using them safely. Explore career opportunities in the chemical industry and an earth scientist</p> <p>7I - Energy Explore career opportunities in energy careers, energy production and careers and nutritionist</p>
<p>Enrichment Opportunities (Cultural Capital)</p>	<p>7H - Atom, Elements & Compounds Periodic Table song</p> <p>7I - Energy Heysham Power Station visitor centre Manchester Museum of Science and Industry Institute of Physics - Do try this at home!</p>




Year 7 – Spring Term 2

7J – Current Electricity

7C – Muscles and Bones

Prior Learning	<p>7J – Current Electricity From key stage 2, pupils should be able to construct simple circuits and use them to find out whether materials are conductors or insulators; know how switches work; draw circuit diagrams and construct circuits from diagrams using conventional symbols; be able to investigate the effect of changing components in a circuit on the brightness of bulbs; describe the effects of changing the voltage of a battery; describe the effects of short circuits and the use of fuses. Pupils will also have looked at some simple electrostatic phenomena, e.g. hair standing up on end when rubbed with a balloon.</p> <p>7C – Muscles and Bones From key stage 2, pupils should be able to identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood. From previous year 7 units, pupils may be able to describe the relationship between cells, tissues, organs and organ systems (7A); recall the organs in and functions of the main human organ systems (7A); recall that some cells are adapted to their functions (7A); recall respiration as a life process (7A).</p>
What will I learn?	<p>7J – Current Electricity This unit looks at the measurement of current and how it behaves in series and parallel circuits, and at voltage and resistance. Various models for thinking about what is happening in circuits are explored, and the unit concludes by looking at how we use electricity safely</p> <p>7C – Muscles and Bones This unit uses a ‘fitness’ theme to cover three important organ systems: the gas exchange system, the circulatory system and the locomotor system. The various effects of drugs on these systems are also considered, together with their effects on the nervous system. Names of Bones are covered at key stage 3 but not needed at key stage 4. Pupils are introduced to these but not expected to learn them.</p>
How will I be assessed?	<p>7J – Current Electricity Formative – recall 5 questions to identify gaps in knowledge and understanding, low stakes quick quizzing, mid-topic assessment, homework tasks, verbally in class. Summative – end of topic test.</p> <p>7C – Muscles and Bones Formative – recall 5 questions to identify gaps in knowledge and understanding, low stakes quick quizzing, mid-topic assessment, homework tasks, verbally in class. Summative – end of topic test.</p>
Next Steps	<p>7J – Current Electricity 9J - Force fields and electromagnets P2 - Electricity KS4 Combined and Separate P7 - Magnetism and electromagnetism KS4 Combined and Separate</p> <p>7C – Muscles and Bones 8C - Breathing and respiration B1 - Cells/Diffusion B2 - Organisation /structure of alveoli/components of the blood/ B4 - Bioenergetics/Respiration</p>

<p>Opportunities for Independent Learning</p>	<p>7J – Current Electricity BBC Bitesize - Electricity Electricity video clips Pupils have access to Seneca for practice questions in the electricity sections https://app.senecalearning.com/</p> <p>7C – Muscles and Bones BBC Bitesize – Skeletal and muscular systems, Respiration, Drugs BBC Teach video clip - How do our muscles and bones work? Education quizzes - Skeleton, Joints and Muscles Health Careers Pupils have access to Seneca for practice questions in the muscles section https://app.senecalearning.com/</p>
<p>Personal Development and CEIAG</p>	<p>7J – Current Electricity Pupils will explore the risks associated with using electrical equipment not just found in the lab but at home as well and learn the precautions needed to use them safely. Explore career opportunities in electricity such as an electrician and National Grid worker.</p> <p>7C – Muscles and Bones There are plenty of opportunities to explore careers in the health care services and develop their understanding of the law (illegal drugs) and the different ways substance abuse poses a risk to a person’s wellbeing. Explore career opportunities in health and physiotherapists. Pupils are asked to take the careers quiz as part of their homework to see which health care professional they might be choose in the future Health Careers </p>
<p>Enrichment Opportunities (Cultural Capital)</p>	<p>7J – Current Electricity Imagine That! Museum (Liverpool) Make a fruit battery James Dyson Foundation challenges - 10 Lenz’s Law</p> <p>7C – Muscles and Bones Operation Ouch! (CBeebies) Eureka! The National Children's Museum (Halifax) Chicken leg dissection</p>

	<p>Year 7 – Summer Term 1 7E – Mixtures and Separation 7F – Acids and Alkalis</p>
<p>Prior Learning</p>	<p>7E – Mixtures and Separation From key stage 2, pupils should understand how some materials dissolve in liquid to form a solution; describe how to recover a substance from a solution; use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating; demonstrate that dissolving, mixing and changes of state are reversible changes.</p> <p>7F – Acids and Alkalis From key stage 2, pupils should be able to recall some examples of reversible and irreversible changes; recall what happens when acids are mixed with bicarbonate of soda. Also, from having studied topic 7E (Mixtures & Separation), pupils should be able to describe how a solution is formed from a solute and a solvent; describe how to obtain soluble solids from a solution.</p>

<p>What will I learn?</p>	<p>7E – Mixtures and Separation This unit revises and builds on work in key stage 2 on materials, specifically on mixtures, solutions and separation techniques using the context of providing clean drinking water. This provides to introduce the methods of working in a science lab, which will differ from the science learning experience that most students will have had previously.</p> <p>7F – Acids and Alkalis This unit looks at acids and alkalis and how they are described using a pH number. It looks at neutralisation reactions and some of their uses, and also introduces standard hazard symbols.</p>
<p>How will I be assessed?</p>	<p>7E – Mixtures and Separation Formative – recall 5 questions to identify gaps in knowledge and understanding, low stakes quick quizzing, mid-topic assessment, homework tasks, verbally in class. Summative – end of topic test.</p> <p>7F – Acids and Alkalis Formative – recall 5 questions to identify gaps in knowledge and understanding, low stakes quick quizzing, mid-topic assessment, homework tasks, verbally in class. Summative – end of topic test.</p>
<p>Next Steps</p>	<p>7E – Mixtures and Separation 8F - Periodic Table C1 - Atomic structure and the periodic table C2 - Bonding, structure, and the properties of matter</p> <p>7F – Acids and Alkalis 8F - Periodic Table C3 - Chemical Changes C4 - Energy Changes</p>
<p>Opportunities for Independent Learning</p>	<p>7E – Mixtures and Separation Bitesize - separating mixtures Filtration and distillation video clip Pupils have access to Seneca for practice questions in the Mixtures and Separation section https://app.senecalearning.com/</p> <p>7F – Acids and Alkalis BBC Bitesize - Acids & Alkalis Science in Action - Acids & alkalis video clip Scientific Eye video clip - Acids & alkalis video clip Pupils have access to Seneca for practice questions in the Acids & Alkalis https://app.senecalearning.com/</p>
<p>Personal Development and CEIAG</p>	<p>7E – Mixtures and Separation Pupils will be made aware of the availability of clean drinking water in developing countries and careers relating to water treatment. Explore career opportunities in the chemical industry, chemical production, a chef and fuel production</p> <p>7F – Acids and Alkalis Pupils will explore hazard symbols of chemicals and equipment not just found in the lab but at home as well and learn the precautions needed to use them safely. Explore career opportunities in the chemical industry, farming and pharmaceuticals.</p>
<p>Enrichment Opportunities (Cultural Capital)</p>	<p>7E – Mixtures and Separation Research task – different ways of producing clean drinking water in developing countries Fundraising to support water charities Chromatography at home using a coffee filter</p> <p>7F – Acids and Alkalis Making red cabbage indicator at home to test pH of household substances. Science Buddies home experiments</p>



Year 7 – Summer Term 2

7D - Ecosystems

7L - Sound

Prior Learning	<p>7D - Ecosystems From key stage 2, pupils should be able to describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals. From previous units, pupils should be able to recall that plants need light to make food by photosynthesis (7A); describe how energy is released from food by respiration, which usually needs oxygen from the air and releases carbon dioxide as a waste gas (7A).</p> <p>7L – Sound From key stage 2, pupils should be able to name a variety of sound sources; recall that sounds get fainter with distance; explain that sounds are made by vibrations; link the size of an object with the pitch of the sound it produces; link the volume of a sound with the size of the vibrations producing it. From previous units, pupils should be able to recall that animals need to attract mates (7A, 7D); ultrasound scans are used to make images of a developing foetus (7B); some animals are only active at night and have adaptations for this (7D).</p>
What will I learn?	<p>7D - Ecosystems With a general theme about explorers, this unit looks at ecosystems and the factors that affect them. This includes the impact of human activity and the importance of biodiversity. It also looks at variation and how organisms are adapted to their function.</p> <p>7L – Sound This unit looks at how sounds are made, transmitted and detected, some uses of sound and compares sound waves with waves on the surface of water.</p>
How will I be assessed?	<p>7D - Ecosystems Formative – recall 5 questions to identify gaps in knowledge and understanding, low stakes quick quizzing, mid-topic assessment, homework tasks, verbally in class. Summative – end of topic test.</p> <p>7L – Sound Formative – recall 5 questions to identify gaps in knowledge and understanding, low stakes quick quizzing, mid-topic assessment, homework tasks, verbally in class. Summative – end of topic test.</p>
Next Steps	<p>7D - Ecosystems 8D – Unicellular Organisms 8B – Plants & the Reproduction B7 - Ecosystems B6 - Inheritance</p> <p>7L – Sound P6 - Waves</p>
Opportunities for Independent Learning	<p>7D - Ecosystems BBC Bitesize - Ecosystems & Habitats Ecosystems video clips Pupils have access to Seneca for practice questions in the Ecosystems section https://app.senecalearning.com/</p>

	<p>7L – Sound BBC Bitesize – Sounds Waves Transverse and longitudinal waves video clip Pupils have access to Seneca for practice questions in the Sound section https://app.senecalearning.com/</p>
<p>Personal Development and CEIAG</p>	<p>7D - Ecosystems In part of this topic pupils will explore the variation amongst people and how individual characteristics make people unique. This will provide an opportunity to promote equality and to enable their understanding that difference is a positive, not a negative. Explore career opportunities in ecology.</p> <p>7L – Sound Pupils will have further opportunities to identify the risks involved in using potentially hazardous apparatus and develop their knowledge and confidence at using it safely. In addition to this, there are opportunities to explore careers in sound production, e.g. sound effects, and health care services that use sound, e.g. audiology, sonography, physiotherapy.</p>
<p>Enrichment Opportunities (Cultural Capital)</p>	<p>7D - Ecosystems Watch wildlife documentary to further explore a whole variety of ecosystems and the adaptations of the organisms that live within them BBC iPlayer</p> <p>7L – Sound Further research into how animals communicate Top 10 Animal Sounds Manchester Museum of Science and Industry Institute of Physics – Do try this at home - https://www.iop.org/explore-physics/at-home/episode-1-rubber-band-bass-guitar</p>