

	Content	Concepts	Connections	Competences
Autumn Body Systems	<p>Describe the roles of the skeleton. Recall the structure of the human skeleton and name key bones in the skeleton. Outline the roles of ligaments and tendons. Describe the structure of a synovial joint. Describe different types of joint and explain how they affect movement (ball and socket and hinge) Outline the different types of muscles found in the body. Explain how muscle contraction causes movement of bones. Investigate the force exerted by different muscle groups.</p> <p>Describe the structure of the human lungs.</p> <p>Define diffusion and explain the factors that affect the rate of gas exchange/ diffusion.</p> <p>Describe the structure of the alveolus and explain its adaptations for gas exchange.</p> <p>Describe how breathing in and out occurs (mechanism of ventilation)</p>	<p>Adaptation</p> <p>The relationship between structure and function.</p> <p>Use of models to explain biological phenomena</p> <p>Skeletal systems allow movement and provide support.</p> <p>Muscles can only contract and so must usually work in antagonistic pairs.</p> <p>Diffusion The importance of concentration gradients in diffusion</p> <p>Gas exchange surfaces increase surface area for diffusion</p> <p>Cellular respiration is a chemical reaction inside cells that releases energy for the cell to use.</p>	<p>Levers, forces/ moments in physics.</p> <p>Rates in physics → speed</p> <p>Art Autumn term Nature and design topic Link to spring term work on figure a proportion</p>	<p>Draw a labelled diagram of the lungs and an alveolus.</p> <p>To be able to critically analyse the data collected from limited samples. (e.g. lung volumes within 1 class)</p>

	<p>Compare the composition of inhaled and exhaled air. Suggest explanations for the reasons for these differences.</p> <p>Investigate lung volumes. Investigate the relationship between exercise and lung capacity.</p> <p>Describe the effects of smoking and asthma on gas exchange.</p> <p>Analyse data related to smoking and cancer.</p> <p>Suggest reasons for the effects that smoking has on the health of smokers.</p> <p>Recall the word and symbol equation for aerobic and anaerobic respiration.</p> <p>Distinguish between breathing and respiration</p> <p>Describe the roles of energy within cells.</p> <p>Recall the formula for anaerobic respiration in humans and compare it to aerobic respiration</p> <p>Investigate the effect of exercise on the body including heart rate and breathing rate.</p>	<p>The relationship between volume and pressure</p> <p>Cause and effect. (exercise vs breathing rate)</p> <p>The concept of rate of reaction.</p> <p>That Microbes can be used by humans to make useful substances (fermentation)</p>		<p>To be able to analyse and select appropriate data from secondary sources.</p>
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	<p>Explain the changes that occurs during and after exercise including the idea of oxygen debt.</p> <p>Recall the formula for anaerobic respiration in micro-organisms (yeast)</p> <p>Outline the uses of microbes in food production using fermentation Investigate the effect of a factor on the respiration of yeast Describe the effect and explain it in terms of respiration.</p>			<p>To be able to evaluate data collected from practical work including the effect of exercise and fermentation by microbes in relation to its reliability, accuracy and validity.</p>
<p>Spring Genetics and evolution</p>	<p>1 Recognise the wide variety of living organisms in the world and the need to be able to classify them into different groups based on their similarities/ differences.</p> <p>Classify animals into the major taxonomic groups for both vertebrates and invertebrates.</p> <p>Define the term species</p>	<p>1</p>	<p>RS ethics? E.g. biodiversity</p> <p>Art body forms/ body measurements.</p> <p>MATHS – discrete and continuous date, norm distribution curves, bar charts.</p>	<p>Record process and present data relating to variation.</p> <p>Analysing evidence for evolution.</p>

	<p>Identify ways in which organisms of the same species may differ from one another.</p> <p>Classify types of variation as either continuous or discontinuous Collect data to show continuous and discontinuous variation.</p> <p>Explain the different causes for the 2 types of variation in terms of the environment and genetics.</p> <p>2 Explain why identical twins show the same characteristics</p> <p>Describe the link between a cell, nucleus, chromosome and gene.</p> <p>Outline the structure of DNA</p> <p>Recall the history of the discovery of its structure</p> <p>Explain how inheritance (nature) and environment (nurture) act together to produce an individual's characteristics.</p> <p>3</p>	<p>The concept of a species as a distinct group of organisms</p> <p>The Gene as the unit of inheritance.</p> <p>The universality of DNA to all organisms and its role as a code.</p> <p>The concept of using models to explain complex ideas or structures (Crick and</p>		<p>Draw diagrams to show the arrangement/ location of nucleus, chromosomes, DNA and Gene</p> <p>Label parts of the DNA molecule.</p>
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	<p>Recognise that all living things reproduce and that reproduction can be asexual or sexual.</p> <p>Give the similarities and differences between cell division and sexual reproduction</p> <p>Outline how cells divide during mitosis.</p> <p>Explain why sperm and eggs contain only half the amount of genetic material that is found in the other cells of an organism.</p> <p>State what is meant by a mutation.</p> <p>Explain how the inheritance of characteristics is controlled by dominant and recessive alleles</p> <p>Describe some genetic disorders</p> <p>Predict or explain the outcomes of genetic crosses between different individuals using genetic diagrams.</p> <p>Give examples of how variation within a population may affect the survival of an individual.</p> <p>Identify factors that may affect the survival of an organism.</p>	<p>Watson's work on DNA structure.</p> <p>The idea that many scientific discoveries are the result of collaboration between individuals and groups of scientists. (Crick, Watson and Franklin)</p> <p>The idea of Cell division as the mechanism of growth of multicellular organisms</p>	<p>MATHS – probability.</p>	
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	<p>Explain how Natural selection may lead to changes in the variation seen in a population.</p> <p>Explain how natural selection may lead to evolution.</p> <p>Define what is meant by artificial selection.</p> <p>Outline characteristics that animals and plants may be selected for.</p> <p>Describe what is meant by the term extinction.</p> <p>Explain why some species have or may become extinct.</p> <p>Suggest reasons why the number of species becoming extinct is increasing.</p> <p>Define the term Biodiversity.</p> <p>Explain why biodiversity is important.</p> <p>Outline how Biodiversity can be increased or maintained through conservation and the use of seed banks.</p>	<p>The importance of variation in the survival of species.</p> <p>The concept of evolution.</p> <p>The importance of time in evolution.</p> <p>That ideas/ hypotheses take time to become accepted or for old theories to be rejected. That this requires evidence to support them or falsify them. (with regard to Darwin's theory of evolution)</p>		<p>Use basic genetic crosses to show how sex is determined and how simple dominant or recessive characteristics are inherited.</p> <p>Use the idea of natural selection to explain why a species may change over time</p>
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		<p>The concept of Biodiversity and its importance for future generations</p> <p>The concept of extinction (and the importance of it)</p>		
<p>Summer Everything from plants!</p>	<p>Can identify organisms that are classified as plants including: Mosses Ferns Conifers and Angiosperms Can explain why these organisms are classified as plants.</p> <p>To identify that some organisms are photosynthetic but are not classified as plants (e.g. algae and cyanobacteria)</p> <p>Describe the structure of a typical angiosperm, roots, stem, leaves Are all parts green? The leaves and parts above ground are green.</p> <p>Describe and explain the structure of a leaf and adaptations for photosynthesis.</p> <p>Recall the word and symbol equation for photosynthesis</p>	<p>Idea of grouping living organisms depending on certain characteristics</p> <p>Division of labour within a whole organism</p> <p>Principles of gas exchange and diffusion.</p>	<p>Physics Year 7 light colours and absorption/reflection.</p> <p>Possible geography links to afforestation/deforestation???</p> <p>Link to year 7 work on the different organs and systems in the human body</p>	<p>Can identify a living organism as being a plant or plant like (algae)</p> <p>Can label a diagram of a typical plant and state the function of each part</p> <p>Labelling and annotation of diagrams</p> <p>Use equipment safely to carry out experiments to test leaves for starch.</p>

	<p>Investigate photosynthesis through testing for the presence of starch in leaves.</p> <p>Recall the key factors needed for photosynthesis</p> <p>Investigate the factors needed for photosynthesis</p> <p>Explain why light, carbon dioxide, chlorophyll and water are needed by plants</p> <p>Suggest how changing these factors may affect the growth of the plant</p> <p>Suggest how differences in the rate of photosynthesis may affect competition between plant species. (link to ecology Yr 7)</p> <p>Explain why some species of plants grow in different places or at different times of the year</p> <p>Recall the events in the carbon cycle from year 7</p> <p>Explain how the rate of photosynthesis limits food chains and the carbon cycle</p> <p>Suggest how the impact of humans may affect the carbon cycle.</p>	<p>Relating structure to function</p> <p>Using sunlight energy to make sugars/food The green parts contain chlorophyll that absorbs light energy to use for P/S</p> <p>Sugars can be changed into storage molecules/starch</p> <p>The use of Biochemical testing to identify products of photosynthesis (iodine starch test)</p> <p>The concept of inter and intraspecific competition.</p>	<p>Yr 7 Ecology competition.</p>	<p>Application of ideas to novel situations. Synthesis skills.</p> <p>Linking ideas from different areas of biology.</p>
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			Year 7 Ecology: carbon cycle.	Synthesis and application of ideas.
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