

## Year 7 BIOLOGY Curriculum Map

Term	Topic/Unit title	Essential knowledge and skills (what students should <i>know, understand and be able to do</i> by the end of the unit/topic)
<b>Autumn 1&amp;2</b>	Cells to organisms	<ul style="list-style-type: none"> <li>• Label the following on an animal cell: nucleus, cytoplasm and cell membrane</li> <li>• Label the following on a plant cell: nucleus, cytoplasm, cell membrane, cell wall, vacuole and chloroplast.</li> <li>• State the differences between an animal and plant cell</li> <li>• State the jobs of the following: nucleus, cytoplasm, cell membrane, cell wall, vacuole and chloroplast.</li> <li>• Describe what a specialised cell is and explain how each of the following animal specialised cells are adapted for their job: nerve cell, red blood cell and ciliated epithelial cell</li> <li>• Explain how each of the following plant specialised cells are adapted for their job: palisade cell and root hair cell</li> <li>• Describe the link between cells, tissues and organs.</li> <li>• Label human organs: brain, stomach, small intestine, large intestine, heart and lungs.</li> <li>• Describe the jobs of the following organ systems: skeletal system, muscular system, circulatory system and the gas exchange system</li> <li>• Explain the role of the skeleton, tendons, ligaments and muscles.</li> <li>• Explain how muscles work in antagonistic pairs to cause movement.</li> <li>• Explain why the roles of the heart and lungs are essential to humans</li> </ul> <p><i>Skills 1. use a microscope safely to look at slides prepared yourself.</i></p> <p><i>skills 2. make a scientific, labelled drawing of an image from a microscope slide.</i></p> <p><i>Skills 3. carry out an investigation to measure the strength of different muscles.</i></p> <p><b>Working scientifically skills are interwoven across the three sciences and throughout Key Stage 3, with many skills being revisited on multiple occasions. Essential skills that will be developed in this way are found in the end of key stage checklist (see below)</b></p>

<p><b>Autumn 2 &amp; Spring 1</b></p>	<p>Human reproduction</p>	<ul style="list-style-type: none"> <li>• Know that the sex cells are sperm and eggs. Sperm are made in the testes. Eggs are made in the ovaries.</li> <li>• Label male reproductive organ: penis, urethra, sperm duct, testes, scrotum.</li> <li>• Label female reproductive organ: vulva, labia, vagina, urethra, clitoris, cervix, uterus, oviduct, ovaries.</li> <li>• Recall changes that take place in males and females during puberty. State that these changes are caused by hormones.</li> <li>• Describe the stages of the menstrual cycle</li> <li>• Compare the advantages and disadvantages of different period products (pads, reusable pads, tampons, period pants and menstrual cups)</li> <li>• State how fertilisation takes place in the body or by IVF</li> <li>• Describe how the baby develops during pregnancy into an embryo, then a foetus</li> <li>• Explain the role of the umbilical cord, placenta and amniotic sac in supplying nutrients to the baby and removing waste from the baby.</li> </ul> <p><b>Working scientifically skills are interwoven across the three sciences and throughout Key Stage 3, with many skills being revisited on multiple occasions. Essential skills that will be developed in this way are found in the end of key stage checklist (see below)</b></p>
<p><b>Spring 2 &amp; Summer 1</b></p>	<p>Variation &amp; classification</p>	<ul style="list-style-type: none"> <li>• Explain what variation is.</li> <li>• Describe variation between different species.</li> <li>• Describe variation between members of the same species.</li> <li>• Give examples of continuous and discontinuous variation.</li> <li>• Know that variation can be caused by genes (inherited), the environment or a combination of them both.</li> <li>• Give examples of variation caused by genes and/or the environment</li> <li>• List the 5 kingdoms of life and some simple characteristics of each.</li> <li>• Explain why all living things are given a scientific name.</li> <li>• Know the difference between a vertebrate and an invertebrate</li> <li>• List the 5 vertebrate classes and the main features of each.</li> <li>• Identify and compare some invertebrate groups.</li> <li>• Use a variety of classification keys to identify unknown organisms.</li> </ul> <p><i>Skills 1 - Carry out measurements of variation in plants or animals.</i></p>

		<p><i>Skills 2 – Use bar charts and line graphs to display and interpret data on variation.</i></p> <p><i>Skills 3 – Plan and carry out an investigation to see which conditions woodlice prefer.</i></p> <p><b>Working scientifically skills are interwoven across the three sciences and throughout Key Stage 3, with many skills being revisited on multiple occasions. Essential skills that will be developed in this way are found in the end of key stage checklist (see below)</b></p>
<p><b>Summer 2</b></p>	<p>Plant reproduction</p>	<ul style="list-style-type: none"> <li>• Explain the stages in the life cycle of a flowering plant.</li> <li>• Label the following organs in a plant: roots, stem, flower, leaves.</li> <li>• Label the following parts of flower: petals, style, stigma, carpel, anther, filament, pollen, ovary, ovule, sepals.</li> <li>• Explain the function of each of these parts.</li> <li>• Know which are the male and female parts of a flower.</li> <li>• Explain different ways pollen can be transferred from flower to flower.</li> <li>• Explain how the pollen reaches the ovule and leads to fertilisation.</li> <li>• Explain different ways how seeds are spread.</li> <li>• Explain why seeds need to be spread out from the parent plant in terms of competing for resources.</li> <li>• Explain what germination is.</li> <li>• Describe the conditions needed for germination.4</li> </ul> <p><i>Skills 1 – be able to dissect a flower carefully and label the main parts.</i></p> <p><i>Skills 2 - Plan and carry out an investigation into methods of seed dispersal.</i></p> <p><b>Working scientifically skills are interwoven across the three sciences and throughout Key Stage 3, with many skills being revisited on multiple occasions. Essential skills that will be developed in this way are found in the end of key stage checklist (see below)</b></p>

## Year 8 BIOLOGY Curriculum Map

Term	Topic/Unit title	Essential knowledge and skills <i>(what students should know, understand and be able to do by the end of the unit/topic)</i>
Autumn 1&2	Environment	<ul style="list-style-type: none"> <li>• Define: habitat, ecosystem, population, biodiversity</li> <li>• Define: herbivore, carnivore, omnivore</li> <li>• Define: predator, prey, producer</li> <li>• Identify producer, primary consumer, secondary consumer and tertiary consumer in a food chain or web.</li> <li>• Draw a food chain correctly (including arrows in the right direction)</li> <li>• Interpret information from a food web (including what would happen to other organisms if one animal or plant went up or down in numbers)</li> <li>• Interpret and sketch a pyramid of numbers.</li> <li>• Explain why a predator-prey graph goes up and down in cycles.</li> <li>• Explain what an adaptation is.</li> <li>• Give examples of adaptations in animals and explain how they help the animal survive.</li> <li>• Give examples of adaptations in plants and explain how they help the plant survive.</li> <li>• Explain how humans have affected ecosystems, in both negative and positive ways.</li> <li>• (Sets 1&amp;2 only: Explain what happens to poisons (such as pesticides) in food chains in bioaccumulation).</li> </ul> <p><i>Skills 1 – Identify IV, DV and CVs in an investigation into adaptations to reduce heat loss.</i></p> <p><i>Skills 2 – accurately measure the temperature of a liquid using a thermometer.</i></p> <p><i>Skills 3 – Plot a line graph accurately, with labelled axes and equal intervals.</i></p> <p><i>Skills 4 – Use a quadrat to carry out random sampling of a plant species</i></p> <p><b>Working scientifically skills are interwoven across the three sciences and throughout Key Stage 3, with many skills being revisited on multiple occasions. Essential skills that will be developed in this way are found in the end of key stage checklist (see below).</b></p>

<p><b>Autumn 2 &amp; Spring</b></p>	<p>Microbes</p>	<ul style="list-style-type: none"> <li>• Know that the 4 types of microbes are: bacteria, viruses, fungi and protists.</li> <li>• Know that some microbes are helpful and useful and some can cause disease. Microbes that cause disease are called pathogens.</li> <li>• Know that viruses are not living and have to get inside cells to replicate.</li> <li>• Know that fungi can be single or made of many cells and are often useful.</li> <li>• Know that bacteria are single cells that don't have a nucleus but have a cell wall. Bacteria reproduce by doubling.</li> <li>• Know that protists are their own kingdom and know that malaria is an infectious disease caused by a protist.</li> <li>• Give examples of how bacteria and fungi are useful to us.</li> <li>• Explain different ways pathogens can be spread.</li> <li>• Describe the physical defences of the body.</li> <li>• Know that white blood cells are important in our immune system</li> <li>• Know that white blood cells can make antibodies or take in and destroy (engulf) pathogens.</li> <li>• Know that white blood cells have a memory, and can respond very quickly if they seem the same pathogen again.</li> <li>• Know that a vaccine contains a dead or weakened form of a pathogen.</li> <li>• Explain how a vaccine works.</li> <li>• Look at graphs about vaccines and immunity and understand them.</li> <li>• Explain different ways to reduce bacteria growing on food.</li> </ul> <p><i>Skills 1 - Use aseptic technique whilst carrying microbiology practical work</i>  <i>Skills 2 – Sample and grow bacteria safely in a Petri dish</i>  <i>Skills 3 – Plan and carry out an investigation into effective handwashing.</i></p> <p><b>Working scientifically skills are interwoven across the three sciences and throughout Key Stage 3, with many skills being revisited on multiple occasions. Essential skills that will be developed in this way are found in the end of key stage checklist (see below).</b></p>
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<p><b>Summer</b></p>	<p>Nutrition &amp; digestion</p>	<ul style="list-style-type: none"> <li>• Name the 7 food groups</li> <li>• Give examples of different foods from the 7 food groups</li> <li>• Explain what each food group does in the body</li> <li>• Explain what is meant by a balanced diet</li> <li>• Explain why different people need different amounts of energy and food.</li> <li>• Present nutritional data in a bar graph</li> <li>• Understand what calcium, vitamin D and iron are needed for in the body</li> <li>• Know how to carry out food tests to identify sugar, starch and protein in food samples</li> <li>• Describe the adaptations herbivores and carnivores have in their skulls and teeth</li> <li>• Know that digestion is when large food molecules are broken into smaller ones and absorbed into the blood</li> <li>• Identify the digestive system organs of the digestive system on a body – mouth, salivary glands, oesophagus, stomach, pancreas, small and large intestines.</li> <li>• Explain the function (job) of each of the digestive organs.</li> <li>• Know that enzymes are chemicals made by the body that help to digest large food molecules into smaller ones.</li> <li>• Know that the different food groups need different enzymes to break them down.</li> <li>• Know that enzymes can work faster or slower in different pHs and temperatures.</li> <li>• Explain how the small intestine is adapted to absorb food by having villi and carrying out peristalsis.</li> </ul> <p><i>Skills 1 – carry out food test to identify starch, sugar and protein</i>  <i>Skills 2 – carry out an investigation into the action of digestive enzymes</i></p> <p><b>Working scientifically skills are interwoven across the three sciences and throughout Key Stage 3, with many skills being revisited on multiple occasions. Essential skills that will be developed in this way are found in the end of key stage checklist (see below)</b></p>
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### Year 9 BIOLOGY Curriculum Map

Term	Topic/Unit title	Essential knowledge and skills <i>(what students should know, understand and be able to do by the end of the unit/topic)</i>
<b>Autumn 1 &amp; Autumn 2</b>	Plants & photosynthesis (9 lessons)	<ul style="list-style-type: none"> <li>• Label the following on a plant cell: nucleus, cytoplasm, cell membrane, cell wall, vacuole and chloroplast.</li> <li>• State in which part of a plant photosynthesis takes place</li> <li>• State in which part of a plant cell photosynthesis takes place</li> <li>• Write the word equation for photosynthesis</li> <li>• Explain why plants photosynthesise</li> <li>• Name the two transport vessels in plants and state what they transport</li> <li>• State the role of stomata</li> <li>• Explain where stomata are found</li> <li>• Explain why stomata sometimes close (extension)</li> <li>• State what plants take from the soil (2 answers)</li> <li>• Identify an independent and dependent variable in an experiment</li> <li>• State how plants store the glucose they make in photosynthesis</li> </ul> <p><i>Skills 1. Safely dissect a plant and do a labelled, biological drawing</i></p> <p><i>Skills 2. Use a microscope to view a clear image of a stomata</i></p> <p><i>Skills 3. Carry out a full investigation into the effect of light on photosynthesis in algal beads</i></p> <p><b>Working scientifically skills are interwoven across the three sciences and throughout Key Stage 3, with many skills being revisited on multiple occasions. Essential skills that will be developed in this way are found in the end of key stage checklist (see below)</b></p>
<b>Autumn 2</b>	Respiration (2 lessons)	<ul style="list-style-type: none"> <li>• Respiration is when energy is released in cells</li> <li>• All living things respire</li> <li>• Aerobic respiration requires oxygen</li> <li>• The chemical equation for aerobic respiration is glucose + oxygen → carbon dioxide + water</li> </ul>

		<ul style="list-style-type: none"> <li>• The respiration of yeast can be useful in brewing because it makes ethanol</li> <li>• The respiration of yeast can be useful in baking because it releases carbon dioxide (to make dough rise)</li> <li>• The chemical equation for anaerobic respiration in yeast is glucose → carbon dioxide + ethanol</li> <li>• Anaerobic respiration can take place when the oxygen has run out</li> <li>• Tell the difference between the equation for photosynthesis and the equation for aerobic respiration</li> </ul> <p><i>Skills 1: Ethically handle woodlice to investigate the production of carbon dioxide in aerobic respiration</i></p> <p><i>Skills 2: Write scientific conclusions using evidence (PEE =Point Evidence Explain)</i></p> <p><b>Working scientifically skills are interwoven across the three sciences and throughout Key Stage 3, with many skills being revisited on multiple occasions. Essential skills that will be developed in this way are found in the end of key stage checklist (see below)</b></p>
<p><b>Autumn 2 &amp; Spring 1&amp;2</b></p>	<p>Health (8 lessons)</p>	<ul style="list-style-type: none"> <li>• Label the parts of the lungs correctly, including: trachea, bronchi, bronchioles, alveoli, diaphragm, ribs</li> <li>• Describe where gas exchange takes place in the lungs and which gases are exchanged</li> <li>• Name the muscle which helps you breathe (and explain how)</li> <li>• Label the parts of the heart correctly: right atrium, right ventricle, left atrium, left ventricle, artery, vein</li> <li>• Describe the circulation of blood around the body, including where the body collects oxygen and drops it off</li> <li>• Describe (and explain) the relationship between exercise, breathing rate and heart rate</li> <li>• State how nicotine, tar and carbon monoxide in cigarettes can affect the lungs</li> <li>• Give examples of diseases associated with smoking cigarettes</li> <li>• Name 2 organs affected by alcohol</li> <li>• Define drug addiction and withdrawal</li> <li>• Label male and female reproductive organ: penis, urethra, sperm duct, testes, scrotum, vulva, labia, vagina, clitoris, cervix, uterus, oviduct, ovaries.</li> </ul>

		<ul style="list-style-type: none"> <li>• Can name 3 contraceptives, including one which prevents the spread of sexually transmitted infections</li> </ul> <p><i>Skills 1. Can measure pulse and breathing rate</i></p> <p><b>Working scientifically skills are interwoven across the three sciences and throughout Key Stage 3, with many skills being revisited on multiple occasions. Essential skills that will be developed in this way are found in the end of key stage checklist (see below)</b></p>
<b>Spring 2</b>	Genes, DNA & Evolution (3 lessons)	<ul style="list-style-type: none"> <li>• Define a gene</li> <li>• Know the difference between genes, DNA &amp; chromosomes</li> <li>• Name some of the scientists involved in researching the structure of DNA</li> <li>• Know where genes, DNA &amp; chromosomes are stored</li> <li>• Know the difference between continuous and discontinuous variation and can give examples for each</li> <li>• Define a species</li> <li>• Explain the process of selective breeding</li> <li>• Give examples of why selective breeding might be used</li> <li>• Explain what is meant by ‘survival of the fittest’</li> <li>• Explain why it is important for species to be able to change over time</li> <li>• Define the term extinction</li> <li>• Explain what seed banks are and why they are important</li> </ul> <p><b>Working scientifically skills are interwoven across the three sciences and throughout Key Stage 3, with many skills being revisited on multiple occasions. Essential skills that will be developed in this way are found in the end of key stage checklist.</b></p>
<b>By the end of KS3</b>	<p><b>Working Scientifically Skills have been developed across Y7, 8 and 9. These are the WS we would expect most students to have acquired by the end of key stage 3.</b></p> <ul style="list-style-type: none"> <li>• Identify the independent variable and dependent variable in an investigation</li> <li>• Identify control variables in an investigation</li> <li>• Understand the term valid as an investigation in which variables are controlled and there are many repeats</li> </ul>	

	<ul style="list-style-type: none"> <li>• Understand the terms anomalous/anomaly</li> <li>• Identify anomalies and understand they should be excluded from a mean calculation</li> <li>• Know how to calculate a mean</li> <li>• Understands the difference between repeatable and reproducible</li> <li>• Understands the term 'control' and knows when you might use a control</li> <li>• Can write a risk assessment</li> <li>• Can write a scientific conclusion using both data and explanations (PEE= Point, Evidence, Explain)</li> </ul>	
<b>Spring 2 &amp; Summer</b>	GCSE Work - Ecology (13 lessons)	<p>Specification</p> <p><a href="https://filestore.aqa.org.uk/resources/biology/specifications/AQA-8461-SP-2016.PDF">https://filestore.aqa.org.uk/resources/biology/specifications/AQA-8461-SP-2016.PDF</a></p> <p>4.7 Ecology (the rest of the ecology unit is taught in the summer term of year 10)</p> <p>including:</p> <p>4.7.1 Adaptations, interdependence and competition</p> <p>4.7.2.1 Levels of organisation</p> <p>4.7.4 Trophic levels in an ecosystem</p> <p>Required practical activity 9: measure the population size of a common species in a habitat. Use sampling techniques to investigate the effect of a factor on the distribution of this species.</p>