

Term → Year ↓	Term1a	Term 1b	Term 2a	Term 2b	Term 3a	Term 3b
7	<p>Cells & microscopy Find out about cells, the building blocks of all living things. Discover how a red blood cell is different from a sperm cell or a plant cell and how all these cells are specialised to carry out their specific jobs.</p> <p>What skills will you develop?</p> <ul style="list-style-type: none"> ◆ Learn how to prepare a slide to view under a light microscope and develop your practical skills to earn your microscope licence. 	<p>Nutrition and digestion Learn how cells are organised into tissues, organs, organ systems and organisms. Discover how organs in your digestive system work together to break down your food using chemicals called enzymes.</p> <p>Find out what makes up a healthy diet and what the consequences are of an unhealthy one.</p> <p>Learn how diffusion plays an important role in the absorption of food and how important a large surface area is for efficient absorption</p> <p>What skills will you develop?</p> <ul style="list-style-type: none"> ◆ ◆ Learn how to detect the presence of fats, carbohydrates and proteins in your food. 	<p>Movement Discover how your skeleton, joints and muscles work together to allow you to move.</p> <p>Reproduction in plants Learn the names and jobs of all the parts of a flower and then discover the fascinating ways plants have developed to reproduce and disperse their seeds around the globe.</p> <p>What skills will you develop?</p> <ul style="list-style-type: none"> ◆ ◆ Learn how to dissect a flower and produce a detailed scientific drawing. ◆ ◆ Design and carry out your own experiment to determine the effect of mass on seed dispersal, here you will learn how to control variables and how to plot a line graph of your results. 	<p>Reproduction in animals In this topic you will find out about the changes the human body goes through during puberty and learn the structure of human reproductive organs.</p> <p>You will also discover the sequence of events that occur during the menstrual cycle to prepare a women's body to carry a baby.</p> <p>Lastly you will find out the journey a sperm cell makes to fertilise an egg and learn how the fertilised egg makes its way to the womb where it can implant and grow into a baby.</p> <p>What skills will you develop?</p> <ul style="list-style-type: none"> ◆ Plot a line graphs and describing trends of unfamiliar data sets. 	<p>Reproduction in animals continued... Discover how twins are formed and how the foetus grows and develops in the womb.</p> <p>Learn how organisms differ in how long it takes their babies to develop inside their mother and how many babies they have at one time. Consider the advantages and disadvantages of the different strategies employed by different organisms.</p> <p>Inheritance & DNA Learn about the structure and function of DNA, chromosomes and genes. Carry out your own research into how the structure of DNA was discovered.</p> <p>What skills will you develop?</p> <ul style="list-style-type: none"> ◆ Plot bar and line graphs and describe trends of unfamiliar data sets. ◆ Follow a scientific method to extract DNA from strawberries. ◆ Gain an understanding of how different scientists worked together and contributed to the discovery of the structure of DNA. 	<p>Inheritance & DNA continued... Discover how the environment and your genes influence your characteristics.</p> <p>Learn the difference between discontinuous and continuous variation and how to represent different types of variation within a species as a bar graph or as a histogram.</p> <p>Learn how to use a Punnet square to find out the possible characteristics of offspring and develop your mathematical skills by learning how to calculate ratios. You will discover how two brown eyed parents can have a child with blue eyes!</p> <p>What skills will you develop?</p> <ul style="list-style-type: none"> ◆ Calculate ratios and probabilities from Punnet squares. Plot a bar graph and histogram and describe trends.
8	<p>Plant organisation Recap your knowledge of plant and animal cell structure and discover how plant cells are organised into tissues and organs including the specialised cells and tissues that make up a leaf.</p> <p>Find out how plants obtain carbon dioxide and water so that they can carry out photosynthesis to produce their own food. Discover how they use vessels to transport water, minerals and sugars to different parts of the plant.</p> <p>What skills will you develop?</p> <ul style="list-style-type: none"> ◆ Calculate change in mass whilst carrying out an experiment to investigate water loss from plants. ◆ View and draw plant sections down a microscope. ◆ Carry out an investigation to determine whether stomata density differs for different plants 	<p>Ecosystem processes Learn how different factors can limit the speed (rate) at which photosynthesis can take place.</p> <p>Discover how organisms at the bottom of our oceans make food in the absence of light!</p> <p>Learn how plants use the glucose they make in photosynthesis to provide them with energy and materials to grow and develop.</p> <p>What skills will you develop?</p> <ul style="list-style-type: none"> ◆ ◆ Carry out an investigation on the effect of light intensity on the rate of photosynthesis using pondweed. ◆ ◆ Use algal balls to investigate how light intensity effects the rate of photosynthesis and use a hydrogen carbonate indicator to determine the relative amount of carbon dioxide used up or released by photosynthesis and respiration. ◆ Identify and describe trends on graphs plotted of your experimental results. 	<p>Ecosystem processes continued... Discover how your cells transfer energy from the food you eat using oxygen in a process called aerobic respiration.</p> <p>Find out how your cells can still transfer energy in the absence of oxygen e.g. when you carrying out strenuous exercise. Find out how other organisms carry out anaerobic respiration when no oxygen is available and how we have utilised these processes to make bread and alcohol.</p> <p>Minerals use & abuse Learn how plants use different minerals to grow and discover how farmers can use different types of fertilisers to improve the yield of their crops.</p> <p>Understand that when used in too high quantities fertilisers can have serious consequences on plant and animal life in waterways.</p> <p>What skills will you develop?</p> <ul style="list-style-type: none"> ◆ Develop your scientific writing skills by explaining the process of eutrophication using your knowledge of photosynthesis and respiration to explain the process. ◆ Develop your data analysis skills by describing trends and interpreting graphs on crop yields. 	<p>Energy transfer in ecosystems Learn about Ecological terms including populations, ecosystems, niche, interdependence, and trophic levels.</p> <p>Understand how food chains and food webs show energy transfer in ecosystems and have a go at creating your own food webs.</p> <p>Discover how organisms depend on one another to survive (interdependence) and make predictions about population changes in food webs for different scenarios.</p> <p>Learn how predator and prey populations can change over time.</p> <p>What skills will you develop?</p> <ul style="list-style-type: none"> ◆ Learn how to draw pyramids of number and be able to explain what they represent. ◆ Plot graphs showing predator prey relationships and describe and explain the trends. 	<p>Competition, adaptation & natural selection Understand how organisms compete for resources and how they are adapted to the environment in which they live including how they adapt to changes in the environment.</p> <p>Recap from year 7 how genetics and the environment influence how organisms vary within and between species.</p> <p>Discover how natural selection allows organisms to evolve over time so that they become better adapted to their environment.</p> <p>What skills will you develop?</p> <ul style="list-style-type: none"> ◆ Learn how Charles Darwin and Alfred Wallace developed their theory of evolution, the importance of the peer review process and how scientific advances have helped to support the theory. 	<p>Biodiversity Learn what biodiversity is and why it is so important.</p> <ul style="list-style-type: none"> ◆ Discover how humans are effecting biodiversity including deforestation & bioaccumulation of insecticides in food chains. ◆ ◆ Learn how scientists at the University of Birmingham are currently investigating the effect of increased carbon dioxide levels on tree growth at the BiFOR FACE facility. <p>Find out how scientists are trying to protect species from extinction and maintain biodiversity through conservation projects, captive breeding and gene banks.</p> <p>What skills will you develop?</p> <ul style="list-style-type: none"> ◆ ◆ Learn how to use sampling techniques such as quadrats to measure the distribution of plant species. ◆ Analyse data from the BiFOR FACE facility on the effect of increased carbon dioxide levels on fungal infection of leaves. ◆ ◆ Carry out your own experiment to investigate how copper sulphate effects germination of cress seeds.

9	<p>Organisation (The heart, lungs, blood vessels and blood).</p> <p>Find out about the structure and function of lungs, heart, blood vessels and blood.</p> <p>What skills will you develop?</p> <p>Develop your scientific writing skills by using your new knowledge and vocabulary to explain how the lungs are adapted for their function.</p> <p>AQA Biology specification (8461) 4.2.1, 4.2.2.1 to 4.2.2.4</p>	<p>Health and disease</p> <p>Learn about lifestyle factors associated with non-communicable diseases and understand the human and financial cost of these diseases.</p> <p>What skills will you develop?</p> <p>◆ Learn in detail about what causes coronary heart disease and find out about the latest advances in modern medicine to reduce risk and treat this disease.</p> <p>AQA Biology specification (8461) 4.2.2.4 to 4.2.2.6</p>	<p>Communicable diseases & fighting infections</p> <p>Find out about the fascinating world of pathogens and how they spread from person to person and cause disease.</p> <p>AQA Biology specification (8461) 4.3.1.1 to 4.3.1.5</p> <p>What skills will you develop?</p> <p>◆ Discover the ingenious ways your body defends itself from being infected by pathogens and how vaccinations work</p> <p>AQA Biology specification (8461) 4.3.1.6 to 4.3.1.9</p>	<p>Medicine and drug development</p> <p>Discover how new drugs are being developed to fight disease.</p> <p>What skills will you develop?</p> <p>◆◆ Develop your own analysis skills by carrying out an investigation to find out how different antibacterial agents effect the growth of bacteria.</p> <p>AQA Biology specification (8461) 4.1.1.6 and 4.3.1.8 to 4.3.1.9</p>	<p>Cells and microscopy</p> <p>Compare the structure of eukaryotes (plant and animal cells) to prokaryotes.</p> <p>What skills will you develop?</p> <p>◆ Develop your practical skills by staining, viewing and drawing cells down a microscope.</p> <p>◆ During this topic you will develop your mathematical skills so that you can calculate magnification and use estimations to judge the relative size or area of sub-cellular structures.</p> <p>AQA Biology specification (8461) 4.1.1.1 to 4.1.1.5</p>	<p>Food groups and food tests</p> <p>Find out what carbohydrates, proteins and fats (lipids) are made up of and in what part of the digestive system are they broken down and how.</p> <p>What skills will you develop?</p> <p>◆◆ Develop your practical skills by using qualitative reagents to test for these different food groups in the laboratory.</p> <p>AQA Biology specification (8461) 4.2.2.1</p>
10	<p><u>Triple only and combined courses</u></p> <p>Cells, microscopy & division Learn about powerful microscopes that are available for scientists to use and think about how this has helped biologist understand more about the structure of a cell. Find out about stem cells and how they differentiate and specialise to carry out particular functions in plants and animals.</p> <p>Discover how both eukaryotic and prokaryotic cells divide by mitosis producing two identical cells allowing organisms to grow and repair damaged tissue.</p> <p>Discover that cancer is a result of changes in cells that lead to uncontrolled cell division. Find out about different types of tumours and what the lifestyle risk factors are for different types of cancers.</p> <p>◆ During this topic you will develop your mathematical skills so that you can demonstrate an understanding of the scale and size of cells and be able to make order of magnitude calculations, including the use of standard form.</p> <p>Learn how to grow bacteria and that bacteria multiply by binary fission. Develop your mathematical skills by calculating the number of bacteria in a population after a certain time if you know the mean division time.</p> <p>AQA Biology specification (8461) 4.1.1 & 4.1.2 (plus Cancer 4.2.2.7) 4.1.1.6 (triple only)</p>	<p><u>Triple only and combined courses</u></p> <p>Transport in cells Find out how substances move across the cell membrane by diffusion, osmosis or active transport.</p> <p>◆◆ Develop your practical and analysis skills by investigating the effect of a range of concentrations of salt or sugar solutions on the mass of plant tissue.</p> <p>Bioenergetics part 1</p> <p>Recap how animals and plants use oxygen to oxidise food in a process called aerobic respiration. Then explore further how anaerobic respiration transfers energy without the need for oxygen and consider how exercise effects the human body</p> <p>AQA Biology specification (8461) 4.4</p>	<p><u>Triple only & Combined:</u></p> <p>Organisation (The human digestive system) Learn how different organs work together to digest food (recap from KS3). Learn how enzymes work, where they are produced and how they are involved in metabolism.</p> <p>◆◆ Carry out an investigation to find out the effect of pH on the rate of reaction of amylase enzyme.</p> <p>AQA Biology specification (8461) 4.1.3 & 4.2.2.1</p> <p>Bioenergetics part 2</p> <p>Revise year 8 work on how plants harness the Sun's energy in photosynthesis in order to make food.</p> <p>◆◆ Continue to develop your analytical and practical skills by investigating the effect of light intensity on the rate of photosynthesis.</p> <p>◆◆ Analyse dendrometer data from the BIFoR FACE project to determine the effect of increased carbon dioxide concentration on tree growth.</p> <p>AQA Biology specification (8461) 4.4</p>	<p><u>Triple only & Combined:</u></p> <p>Organisation (Plant tissues, organs and organ systems) You will start of by recapping work from year 8 so that you are confident at explaining how the structures of plant tissues are related to their functions as well as explaining the effect of changing temperature, humidity, air movement and light intensity on the rate of transpiration.</p> <p>◆◆ During this topic you will develop your analytical skills by processing data from investigations involving stomata and transpiration rates to find arithmetic means, understand the principles of sampling and calculate surface areas and volumes.</p> <p>Antibodies and plant disease Discover how monoclonal antibodies are made and how they could be used for diagnosis, research and to treat disease.</p> <p>Find out what causes plant disease including ion deficiencies and pathogens. Learn how plant diseases can be detected and what defence responses plants have to disease. Compare this to what you learnt about human defence against disease in year 9.</p> <p>AQA Biology specification (8461) 4.2.3 & 4.4.1 & 4.4.2 4.3.3.1 (triple only)</p>	<p><u>Triple only & Combined:</u></p> <p>Ecology : Adaptation interdependence and competition Discover how organisms are adapted to live in different environments and how they compete with each other for resources in order to survive and reproduce.</p> <p>AQA Biology specification (8461) 4.7.1</p> <p>Ecology: Organisation of an ecosystem. Use food chains to represent feeding relationships within a community and interpret graphs showing predator-prey cycles. Learn about the differences between trophic levels in an environment and how biomass is lost between trophic levels as represented by a pyramid of biomass.</p> <p>◆◆ Use quadrats to determine the population of a certain plant species in a habitat.</p> <p>Explain how and why carbon and water cycles are important to living organisms. Learn how different factors affect the rate of decay.</p> <p>◆◆ Complete a practical investigation on the rate of decay of fresh milk.</p> <p>AQA Biology specification (8461) 4.7.2. 4.7.2.3, 4.7.4.1 (Triple only)</p>	<p><u>Triple only & combined</u></p> <p>Ecology: Biodiversity and the effect of human interaction on ecosystems. Recap from year 8 what biodiversity is and discover how the rapid growth of the human population has had a negative effect on the environment. ◆ Learn how people are reducing the impact of humans on ecosystem and biodiversity.</p> <p>AQA Biology specification (8461) 4.7.3</p> <p>Ecology: Food production</p> <p>◆ Discover the biological factors that are affecting food security and how farming can be made more efficient. And new biotechnology can be used to reach the demands of a growing human population.</p> <p>AQA Biology specification (8461) 4.7.5</p>

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12	<p>Module 2 Cells and microscopy. OCR Biology A specification (H420) 2.1.1</p> <p>Teacher 1 (5hrs/fortnight)</p> <p>Module 2 Biological molecules, nucleotides and nucleic acids OCR Biology A specification (H420) 2.1.2 & 2.1.3</p> <p>Teacher 2 (5hrs/fortnight)</p>	<p>Module 2 Biological membranes, cell division and cellular organisation. OCR Biology A specification (H420) 2.1.5 & 2.1.6</p> <p>Module 2 Enzymes OCR Biology A specification (H420) 2.1.4</p>	<p>Module 4 Communicable disease, disease prevention and the immune system. OCR Biology A specification (H420) 4.1.1</p> <p>Module 3 Exchange surfaces & transport in animals OCR Biology A specification (H420) 3.1.1 & 3.1.2</p>	<p>Module 4 Classification & Evolution OCR Biology A specification (H420) 4.2.2</p> <p>Module 3 Transport in plants OCR Biology A specification (H420) 3.1.3</p>	<p>Pulling it together.... Synoptic review of Y12 and revision for year 1 PPE</p>	<p>Module 4 Biodiversity & Module 6 Ecosystems OCR Biology A specification (H420) 4.2.1 & 6.3.1</p> <p>Module 6 Populations OCR Biology A specification (H420) 6.3.2</p>
13	<p>Module 5 Homeostasis: Hormonal and neuronal control OCR Biology A specification (H420) 5.1.1, 5.1.3 & 5.1.4</p> <p>(Teacher1 5hrs/fortnight)</p> <p>Module 6 Cellular control and patterns of inheritance OCR Biology A specification (H420) 5.1.1, 5.1.3 & 5.1.4</p> <p>(Teacher 2 5hrs/fortnight)</p>	<p>Module 5 Excretion as an example of homeostatic control & Animal responses OCR Biology A specification (H420) 5.1.2 & 5.1.5</p> <p>Module 6 Evolution & Manipulating genomes, OCR Biology A specification (H420) 5.1.1, 5.1.3 & 5.1.4</p>	<p>Module 5 Plant responses & photosynthesis OCR Biology A specification (H420) 5.1.5 & 5.2.1</p> <p>Module 6 Cloning and biotechnology OCR Biology A specification (H420) 5.1.1, 5.1.3 & 5.1.4</p>	<p>Module 5 Respiration & revision OCR Biology A specification (H420) 5.2.2</p> <p>Complete course & revision OCR Biology A specification (H420) 5.1.1, 5.1.3 & 5.1.4</p>		