



Big Question: What is the Health of St. David's Ecosystem?

AoLE: Science & Technology	Subject: Science - Biology	Year: 8
----------------------------	----------------------------	---------

Big Question / Aim / Objective / Concept	Vision (Proposed outcome) / Purpose of curriculum	Prior knowledge / Learners previous knowledge
<p>What is the health of St. David's High School's ecosystem?</p> <p>Students study the concepts of microbes, immunity and monitoring ecosystems.</p>	<p>This Big question covers:</p> <ul style="list-style-type: none"> - microbes, population growth, uses of microbes, disease transmission, disease prevention, natural defences, vaccines and medicines. - habitats, classification, adaptation and feeding relationships from Year 7. Population changes, fieldwork techniques and the interdependence of organisms within a community are also introduced. 	<ul style="list-style-type: none"> • recognise that organisms carry out seven 'life processes' • know what aerobic and anaerobic respiration is • understand that microbes are organisms that are too small to see with the naked eye • appreciate that microbes can be useful (e.g. bread making) • know that microbes can be harmful (e.g. making food go off) • recall that cells can be adapted to their functions. • that animals and plants are adapted to their habitats • that food chains and food webs can be used to represent feeding relationships • that animals can be endangered • the main taxonomic groups of animals • what a fossil is.

What does progression look like in this Big Question?

Progression Indicator	Description of learning (What matters statements)	Student evidence of progression (Blooms) / Knowledge
Excelling	<p>I can explain how variation of organisms within a changing environment leads to natural selection which drives evolution.</p> <p>I can explain how biological processes and control mechanisms enable organisms to function, develop, reproduce and survive.</p> <p>I can evaluate the factors which affect the development and health of organisms.</p> <p>I can explain how prevention and treatment can support natural defence systems and enhance the health of organisms.</p>	<p>Recognise that some theories are driven by commercial need.</p> <p>Explain how scientists have used evidence to put together new theories about disease transmission and develop new drugs.</p> <p>Explain how trends are more easily spotted using tables, charts and graphs.</p> <p>Identify and explain the typical phases in a population growth curve.</p> <p>Explain how immunisation improves the body's own immune response.</p> <p>Recall that antibiotics may be effective against a wide range of bacteria or only a specific species.</p> <p>Describe what protocists are and how they are classified.</p> <p>Recall some of the theories and the supporting evidence to explain dinosaur and plant extinction 65 million years ago.</p> <p>Describe how computers are used to model scientific ideas.</p> <p>Plan how to collect data in cases when it is difficult to control some variables.</p> <p>Draw and interpret pyramids of numbers.</p> <p>Explain the advantages and disadvantages of biological control.</p> <p>Describe how some environmental conditions are linked.</p> <p>Draw and interpret pyramids of biomass and numbers..</p>



<p>Advancing</p>	<p>I can describe the interdependence of organisms in ecosystems and explain how this affects their chances of survival. I can explain how reproduction, mutations and the environment can lead to variation and adaptations within organisms which can affect their chances of survival. I can describe the levels of cellular organisation and how cells perform biological processes that ensure the development and survival of organisms. I can explain the threats to the development and health of organisms and describe how the effects of these are reduced by natural defences, preventions and treatments.</p>	<p>Recognise how a theory is used to make predictions that are then tested. Identify reasons why correct theories might not be accepted. Recall some evidence that has led to current ideas about disease. Spot trends and patterns in data from first-hand and secondary sources and draw conclusions from them. Draw conclusions from first-hand and secondary sources and link them to scientific facts. Describe the body's main methods of defence against disease causing microbes. Recall that antibiotics are only effective against bacteria and not viruses. Critically evaluate theories in terms of the evidence they explain. Critically analyse evidence to determine whether it is reliable. Relate the number and the distribution of organisms to the resources available.</p>
<p>Securing</p>	<p>I can describe how living things compete for specific resources and depend on each other for survival. I can describe the features of organisms and recognise how they allow them to live, grow and reproduce for survival in their environment. I can explain the role of different organs and systems that enable plants and animals to live and grow. I can identify the threats to the development and health of organisms and recognise some natural defences, preventions and treatments.</p>	<p>Recall that theories about disease have changed. Describe an old model of disease and explain how it does not match current evidence. Describe how our knowledge of disease transmission has increased with increasing knowledge about microbes. Describe how new scientific knowledge (e.g. about the causes of disease, hygiene) alters people's behaviour. Spot some trends and patterns in data from investigations. Explain how risks are controlled in practical work involving microbes. Use charts and graphs to identify trends. Recall that immunisation is a way of protecting us from infectious diseases. Recall that bacteria, some fungi and viruses are classified as micro-organisms. Describe how microbes are used in the production of some foods and drinks. Recall the names of some of the diseases caused by certain microbes and describe how they are spread. Recall that there are different theories about how organisms have become extinct. Recognise how a theory is used to make predictions that are then tested. Describe how human activity has caused some animals to become endangered or extinct. Compare different habitats. Select and use suitable sampling methods to collect data from a habitat. Identify some reasons for differences in communities, populations and distributions in different habitats. Classify some plants into their main taxonomic groups. Explain how adaptations aid survival.</p>
<p>Beginning</p>	<p>I can recognise patterns from my observations and investigations and can communicate my findings. I can use my knowledge and understanding to predict effects as part of my scientific exploration. I can recognise that what I do, and the things I use, can have an impact on my environment and on living things. I can explore relationships between living things, their habitats and their life cycles.</p>	<p>Appreciate that people are used to trial new medicines. Describe a range of jobs that people do to look after patients in a hospital. Point out some hazards when working with microbes. Recall some ways in which microbes can be spread. Recall the names of the seven life processes. Recall that animals and plants can be classified into groups. Recall some ways in which scientists tell each other about their findings. Select appropriate methods and apparatus to collect data about a habitat. Collect, store and present information using ICT. Describe how organisms are adapted to their environments. Draw and interpret food chains and food webs.</p>



Authentic learning experiences (Local / National / International)	Skills (Literacy / Numeracy / DCF) / Cross Curricular links
Health of St. David's High school community and ecosystem and the factors that cause disease.	Literacy: WF – Word familiarisation EC – Extended reading/ comprehension RR – Research and report EW – Extended writing, DS – Debates and speaking Numeracy: Analysis of data, application of formulae, constructing line graphs (SALUTE) M – Measuring C – Calculations T – Tables L – Line graphs B – Bar charts, N - Numbers DCF: IR – Internet research DL - Datalogging WP – Word processing SS – Spreadsheets PS – Presentation software MS – Media software

Assessment (How will we know that students have learnt what we taught them?)	
Formative assessment: Quick quiz questions Word sheets Quick checks Summary sheets I can progression ladders	Summative assessment: End of 'Biq Question' test x2 (mid topic and end of topic)

Evaluation (to be completed 2024)		
Strengths	Areas for Development	Pupil Voice