



'An ambitious curriculum that meets the needs of all'

Medium Term Planning - Topic: Interdependence and Variation

Curriculum Intent	In addition to working further on objectives from KS2, pupils will be taught, following National Curriculum guidelines, the following this topic:
Skills/National Curriculum Links	<p>Interactions and interdependencies</p> <ul style="list-style-type: none">the interdependence of organisms in an ecosystem, including food webs and insect pollinated cropshow organisms affect, and are affected by, their environment, including the accumulation of toxic materials. <p>Genetics and evolution</p> <ul style="list-style-type: none">differences between speciesthe variation between individuals within a species being continuous or discontinuous, to include measurement and graphical representation of variation
Spiritual, moral, social, and cultural development	<p>SMSC: Enable students to develop their self-knowledge of their own world.</p> <p>PSHE/British Values: These processes have allowed scientists to intervene through selective breeding to produce livestock with favoured characteristics. Scientists have now discovered how to take genes from one species and introduce them in to the genome of another by a process called genetic engineering.</p> <p>Skills Builder: Listening (Receiving, retaining and processing info), Speaking (The oral transmission of info and ideas), Problem solving (Find a solution to a situation or challenge), Creativity (imagination and generation of new ideas), Staying positive (The ability to use tactics and strategies to overcome setbacks), aiming high (Set clear and tangible goals), Leadership and teamwork</p>
Numeracy	Graphs for continuous and discontinuous data, accumulation nterdep
Literacy	<p>Vocabulary Tier 2: transfer, surroundings, decrease, increase, accumulate, particular, gather, co-exist, fertile, successful, seasons,</p> <p>Vocabulary Tier 3: Food chain, producer, consumer, prey, predator, food web, decomposer, carnivore, herbivore, interdependence, population, bioaccumulation, insecticide, concentrated, ecosystem, community, habitat, environment, niche, competition, variation, species, inherited variation, environmental variation, discontinuous variation, continuous variation, adaptation,</p> <p>Reading: Following a written method and read risk assessments. Students may be directed to the textbook; this could be in lesson or at home on Kerboodle.</p> <p>Writing: Describing and explaining scientific phenomenon, free response writing for describing precautions taken, use of word mat to promote sentence formation.</p> <p>Oracy: inclusion of BEST resources which are research evidence on common misunderstandings in science, effective diagnostic questioning and formative assessment, constructivist approaches to building understanding, and effective sequencing of key concepts that promote metacognitive talk and dialogue.</p>
Becoming future ready	<p>Careers/Employability:</p> <ul style="list-style-type: none">- Vet- Farmer- Environmental Scientist
Adaptation	Throughout this topic, quality first teaching will provide differentiation:

<p>QFT/SEND Provision</p>	<p>By product: Linear assessments and differentiated practical work.</p> <p>By resource: Lessons are differentiated per class and students, worksheets are coloured blue if support and assessments are linear.</p> <p>By Intervention: by providing different levels of supervision and support</p> <p>By Progressive Questioning: exploring pupils' understanding through interactive dialogue.</p> <p>By Grouping: according to prior attainment, gender, social preference, preferred learning style.</p> <p>By Task: Pupils should be involved in the identification of targets which are meaningful to them and in the selection of an appropriate task from the given range.</p> <p>By Offering Optional Activities: In class or as homework, to extend learning.</p> <p>This QFT/SEND provision will be explicit within the lesson-by-lesson schemes of work.</p>
<p>Implementation Curriculum Delivery</p>	<p>To be able to:</p>
<p>Learning Outcomes (Core Knowledge)</p>	<p><i>Know</i></p> <ul style="list-style-type: none"> - State what is meant by the term variation. - State that variation is caused by the environment or inheritance. - Record observations of variations between different species of gull. <p><i>Apply</i></p> <ul style="list-style-type: none"> - Describe how variation in species occurs. - Explain whether characteristics are inherited, environmental, or both. - Record and categorise observations of variations between different species of gull. <p><i>Extend</i></p> <ul style="list-style-type: none"> - Explain how variation gives rise to different species. - Critique a claim that a particular characteristic is inherited or environmental. - Record and categorise observations of variations between different species of gull to suggest species boundaries.
	<p><i>Know</i></p> <ul style="list-style-type: none"> - State that there are two types of variation. - State the two types of graphs that can be drawn when representing the two types of variation. - Record results in a table and plot a graph on axes provided. <p><i>Apply</i></p> <ul style="list-style-type: none"> - Describe the difference between continuous and discontinuous variation. - Use knowledge of continuous and discontinuous variation to explain whether characteristics are inherited, environmental, or both. - Plot bar charts or line graphs to show discontinuous or continuous variation data. - Record results in a table and plot a histogram. <p><i>Extend</i></p> <ul style="list-style-type: none"> - Explain the causes of continuous and discontinuous variation. - Record results in a table, and identify and plot an appropriate graph to show variation within a species.
	<p><i>Know</i></p> <ul style="list-style-type: none"> - Name an environmental change. - Give a possible reason for adaptation or extinction. <p><i>Apply</i></p> <ul style="list-style-type: none"> - Explain how organisms are adapted to their environments. - Explain how variation helps a particular species in a changing environment. - Describe how organisms are adapted to their environments. <p><i>Extend</i></p> <ul style="list-style-type: none"> - Explain how organisms are adapted to seasonal changes. - Explain how competition or long-term environmental change can lead to evolutionary adaptation or extinction and the role variation plays in a species success. - Predict implications of a change in the environment on a population.
	<p><i>Know</i></p> <ul style="list-style-type: none"> - State the definition of a food chain. - State the definition of a food web. <p><i>Apply</i></p> <ul style="list-style-type: none"> - Describe what food chains show. - Describe what food webs show. - Combine food chains to form a food web. <p><i>Extend</i></p> <ul style="list-style-type: none"> - Explain the link between food chains and energy. - Explain why a food web gives a more accurate representation of feeding relationships than a food chain.
	<p><i>Know</i></p> <ul style="list-style-type: none"> - State that one population of organisms can affect another. - State that toxic material can get into food chains.



- Present population data as a graph, and describe simple patterns shown.

Apply

- Describe the interdependence of organisms.
- Explain effects of toxic materials on a species' population.
- Present population data as a graph to describe trends and draw conclusions.
- Explain issues with human food supplies in terms of insect pollinators.

Extend

- Explain the interdependence of organisms.
- Explain how toxic materials can accumulate in human food sources.
- Present population data as a graph, explaining trends and drawing detailed conclusions from data provided.

Know

- State that different organisms can co-exist.
- State the definition of the term niche.
- Record data from sampling an ecosystem.

Apply

- Describe how different organisms co-exist within an ecosystem.
- Identify niches within an ecosystem.
- Use quadrats to take measurements in an ecosystem, describing trends observed.

Extend

- Explain why different organisms are needed in an ecosystem.
- Explain why different organisms within the same ecosystem have different niches.
- Use quadrats and transects to take unbiased measurements in an ecosystem, describing trends observed in data.

Current learning to be developed in the future within:

Before: In KS2 you learnt the idea that characteristics are passed from parents to their offspring, for instance by considering different breeds of dogs, and what happens when, for example, labradors are crossed with poodles. They should also appreciate that variation in offspring over time can make animals more or less able to survive in particular environments

Future: At GCSE you will understand how the number of chromosomes are halved during meiosis and then combined with new genes from the sexual partner to produce unique offspring. Gene mutations occur continuously and on rare occasions can affect the functioning of the animal or plant.

Assessment

Refer to assessment maps for formative and summative assessment opportunities.

Impact

Attainment and Progress – Refer to assessment results / data review documentation.