KESTEVEN AND SLEAFORD HIGH SCHOOL

Biology Scheme of Learning

Year 11 – Term 4/Unit B16 & B17

Intent – Rationale

.Students learn about the importance of communities and their stability. They consider the abiotic and biotic factors that affect communities and how to measure the distribution and abundance of organisms. They learn about factors that animals and plants compete for and the adaptations that make plants and animals successful in particular environments. Students then move on too look at feeding relationships, including predator and prey, how materials are cycled through an ecosystem. Triple students will learn about the factors that affect the rate of decomposition.

Sequencing – what prior learning does this topic build upon?	Sequencing – what subsequent learning does this topic feed into?
GCSE Biology Topic B5 Communicable diseases, B8 Photosynthesis and B15 Genetics and evolution.	• GCSE Biology Topic B18 Biodiversity and ecosystems. • A Level Unit 3 Organisms exchange substances with their environment, Unit 4 Genetic information, variation and relationships between organisms, Unit 5 Energy transfer in and between organisms, Unit 6 Organisms respond to changes, Unit 7 Genetics, populations, evolution and ecosystems, Unit 8 The control of gene expression.
What are the links with other subjects in the curriculum?	**What are the links to SMSC, British Values and Careers?**
• Base the content here on what you already know but there will be time in future to liaise further as part of our collaborative work	• GB4dg B16 L2 • GB4e B17 L1 • GB4dg B17 L4
What are the opportunities for developing literacy skills and developing learner confidence and enjoyment in reading?	**What are the opportunities for developing mathematical skills?**
FROM THE LIBRARY *Benefits of Bacteria-616* *Evolve or Die-500* *Fighting Infectious Disease-616.9*	• Calculate range, mean, median and mode • Calculate SA:V

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Intent – Concepts

What knowledge will students gain and what skills will they develop as a consequence of this topic?

Know

- Define the terms community, population, habitat, ecosystem, abiotic factor, biotic factor. Describe in detail how to measure the pH and water content of soil. Suggest and explain how animals and plants are adapted to compete for resources. Describe how animals are adapted to live in hot, dry and cold habitats. Describe how animals and plants are adapted to live in hot, dry and cold habitats. Identify producers, primary consumers, secondary consumers, tertiary consumers, predators and prey in a food web. State the conditions needed for decay. Describe what the carbon cycle is. Describe how oxygen, temperature, moisture and pH affect the rate of decay.

Apply

- Identify factors as biotic or abiotic. Calculate range, mean, median and mode in order to analyse results. Use the terms inter-specific and intra-specific competition and give examples of each. Appply knowledge of animal or plant adaptations to unfamiliar organisms. Plot data as a line graph and explain the pattern of predator and prey populations. Identify processes that allow materials to be recycled in a stable community. Identify processes in the carbon cycle from diagrams. Analyse the data, considering the limitations of the experiment.

Extend

- Explain why interdependence is important in maintaining a stable community. Explain how to use a quadrat and transect to estimate population size. Suggest and explain in detail how an organism in an extreme location might evolve to become better adapted to its habitat. Explain why plants need to reduce water loss by transpiration. Explain how the numbers of predators and prey in a community are related. Explain the role of microorganisms in decay. Explain the terms combustion, photosynthesis and respiration and their role in the carbon cycle. Explain how to Investigate the effect of temperature on the rate of decay of fresh milk by measuring pH change.

What subject specific language will be used and developed in this topic?

Word	Definition
abundance	a measure of how common or rare a particular type of organism is in a given environment
adaptations	special features that make an organism particularly well suited to the environment where it lives
community	group of interdependent living organisms in an ecosystem
competition	the process by which living organisms compete with each other for limited resources such as food, light, or reproductive partners
distribution	where particular types of organisms are found within an environment
extremophile	an organism that can survive and reproduce in extreme conditions
interdependence	the network of relationships between different organisms within a community, for example each species depends on other species for food, shelter, pollination, seed dispersal, etc.
mean	the arithmetical average of a series of numbers
median	the middle value in a list of numbers
mode	the number which occurs most often in a set of data

What opportunities are available for assessing the progress of students?

- B16 L2 Long answer question – Quadrats
- B16 L4 Long answer question – Animal adaptations.
- B16 L5 analysing data
- B16 test
- B17 L3 Long answer question – the carbon cycle
- B17 Summative test

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quadrat	a sample area used for measuring the abundance and distribution of organisms in the field
sample size	the size of a sample in an investigation
transect	a measured line or area along which ecological measurements are made

Word	Definition
Biomass	the amount of biological material in an organism
carbon cycle	the cycling of carbon through the living and non-living world
Decomposers	microorganisms that break down waste products and dead bodies
primary consumer	animals that eat producers
producers	organisms such as plants and algae that can make food from raw materials such as carbon dioxide and water
secondary consumer	animals that eat the primary consumers

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Intent – Concepts

Lesson title	Learning challenge	Higher level challenge	Suggested activities and resources
L1 Communities	Can I define the terms community, population, habitat, ecosystem, abiotic factor, biotic factor?	Can I explain why interdependence is important in maintaining a stable community?	
L2 Required Practical 9: Measuring abundance	Can I describe in detail how to measure the pH and water content of soil?	Can I explain how to use a quadrat and transect to estimate population size?	
L3 Competition and adaptation	Can I suggest and explain how animals and plants are adapted to compete for resources?	Can I suggest and explain in detail how an organism in an extreme location might evolve to become better adapted to its habitat?	
L4 Adaptation in animals	Can I describe how animals are adapted to live in hot, dry and cold habitats?	Can I explain and illustrate how surface area to volume ratio is linked to maintaining the correct body temperature?	
L5 Adaptation in plants	Can I describe how animals	Can I explain why plants need to reduce	

	plants are adapted to live in hot, dry and cold habitats?	water loss by transpiration?	
B16 Test	Summative assessment		
L1 Feeding Relationships	Can I identify producers, primary consumers, secondary consumers, tertiary consumers, predators and prey in a food web?	Can I explain how the numbers of predators and prey in a community are related?	
L2 Decay	Can I state the conditions needed for decay?	Can I explain the role of microorganisms in decay?	
L3 The carbon cycle	Can I describe what the carbon cycle is?	Can I explain the terms combustion, photosynthesis and respiration and their role in the carbon cycle?	
L4 Required practical 10 (Triple only) Investigate the effect of temperature on the rate of decay of fresh milk	Can I describe how oxygen, temperature, moisture and pH affect the rate of decay?	Can I explain how to Investigate the effect of temperature on the rate of decay of fresh milk by measuring pH change?	

by measuring pH change			
B17 test	Summative assessment		