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**Knowledge Rich Curriculum Plan**

SCIENCE- Interdependence



| **Lesson/Learning Sequence** | **Intended Knowledge:**  *Students will know that…* | **Prior Knowledge:**  *In order to know this, students need to already know that…* | **Working Scientifically** | **Tiered Vocabulary and Reading Activity** | **Assessment** | **Support** |
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| ***01***  ***Food Chain*** | *Students will be able explain the order of organisms in a given food chain to be the producer is the bottom of the food chain as it uses sunlight to produce energy. The primary consumers are second in the food chain and are known as herbivores. The second consumers and tertiary are the next in the food chain, these are carnivores. Students will be able to distinguish between prey, an animal that is hunted and killed by another for food and a predator, an animal that naturally preys on others. Students will be able to explain that arrows in a food chain is the transfer of energy. Students will be able to recognise that words and pictures in a diagram are used to represent populations of organisms in a community* | *Students will already know the definition of predators, producers and prey and how to construct and interpret a food chain.* | *ANALYSE food chains* | ***Herbivore:***  *An organism that only eats plants*  ***Carnivore:***  *An organism that only eats meat.*  *Interdependent:*  *Organisms depending on each other for survival*  ***Trophic level:***  *The position of an organism in a food chain.*  ***Consumer:***  *An organism that is unable to make its own food and must eat.*  ***Producer:***  *An organism that is able to make its own food.* | *Retrieval questions*  *Simple exam questions*  *Homework quiz 1*  *End of topic test*  *Summative assessment 3*  *Q) Explain why the arrows on a food chain go from producer to consumer?*  *A) The arrows represent the flow of energy through the food chain.*  *Q) Why might it be difficult to place Venus fly trap in a food chain?*  *A) Because it is both a producer and a consumer.* | *Knowledge organiser (provided on Teams and in class)*  [*https://www.bbc.co.uk/bitesize/topics/zxhhvcw/articles/zjh4r2p*](https://www.bbc.co.uk/bitesize/topics/zxhhvcw/articles/zjh4r2p) |
| ***02***  ***Food webs*** | *Students will be able to recognise that food webs represent several interconnected food chains within a community of organisms. Students will be able to use food web diagrams to predict and explain effects that a change in the size of a population could have on other populations in the same community.* | *Students will know that food chains show energy transfer through a community. They will also know that a food chain shows a single line of energy transfer.* | *Analyse relationships and species interdependence* | ***Interdependence:***  *Organisms depending on each other for survival* | *Retrieval questions*  *Simple exam questions*  *Homework quiz 1*  *End of topic test*  *Summative assessment 3*  *Q) (For the British food web) predict what will happen to the other trophic levels if the mouse population decreases?*  *A) The insect population will increase.*  *Q) Explain the change in population on all the other levels if the mouse population decreases?*  *A) Because the insects now have less consumers.*  *(HAP – Use the Australian desert food web)* | *Knowledge organiser (provided on Teams and in class)*  [*https://www.bbc.co.uk/bitesize/topics/zxhhvcw/articles/zjh4r2p*](https://www.bbc.co.uk/bitesize/topics/zxhhvcw/articles/zjh4r2p) |
| ***03***  ***Interdependence with ecosystems*** | *Students will be able to describe the ways in which organisms are interdependent. If there is a decrease in the population of producers, there will be less food available for the primary consumer, therefore the population of primary consumers would decrease at a staggered rate. Students will be able to predict effects of a change in the size of a population. Students will be able to describe the ways in which organisms are interdependent. If there is a decrease in the population of producers, there will be less food available for the primary consumer, therefore the population of primary consumers would decrease at a staggered rate. Students will be able to predict effects of a change in the size of a population.* | *Students will know that bees and other insects are capable of pollinating plants. They will know the basic structure of flowering plants.* | *Solve- predict effects of changes to population sizes* | ***Community***  *A diverse group of organisms interacting in a common location*  ***Ecosystem***  *The natural environment, including all of the plants and animals that live there.* | *Retrieval questions*  *Simple exam questions*  *Homework quiz 1*  *End of topic test*  *Summative assessment 3.*  *Q) How might a draught impact on the predator prey cycle?*  *A) Will result in the herbivores having less food which will result in population decrease.*  *Q) How might a disease which affects lynx impact on the predator prey cycle?*  *A) The population of foxes will decrease resulting in the peak of the curve decreasing and the curve for hare would increase.* | *Knowledge organiser (provided on Teams and in class)*  [*https://www.bbc.co.uk/bitesize/guides/z2m39j6/revision/3*](https://www.bbc.co.uk/bitesize/guides/z2m39j6/revision/3) |
| ***04 Abiotic vs Biotic Factors*** | *Students will be able to identify abiotic factors to be non-living variables that determine that can influence where organisms live. Students will be able to identify biotic factors to be a living organism that shapes its environment. Students will be able to recognise that there are different environmental conditions in different ecosystems that affects what lives there to be temperature, light, water, nutrient levels.* | *Students will know that PH, rainfall and temperature are non-living*  *Students will know that food source, predators and disease are all living factors* | *Communicate- construct explanations as to why biotic and abiotic factors affect the distribution of populations* | ***Population:***  *A group of individuals of a species living in a particular area*  ***Biotic:***  *A living factor that affects other organisms*  ***Abiotic:***  *A non-living factor that affects other organisms* | *Retrieval questions*  *Simple exam questions*  *Homework quiz 1*  *End of topic test*  *Summative assessment 3.*  *Q) A new predator has been introduced to the habitat. How might the competition affect the distribution of population?*  *A) The population of the prey is fixed but the number of consumers has increased so the population of prey will decrease rapidly.*  *Q) How might a volcano eruption affect the distribution of populations?*  *A) The population of producers will decrease which will force consumers to move to find new producers.* | *Knowledge organiser (provided on Teams and in class)*  [*https://www.bbc.co.uk/bitesize/guides/z9pd6yc/revision/5*](https://www.bbc.co.uk/bitesize/guides/z9pd6yc/revision/5) |
| ***05 Environmental conditions*** | *Students will be able to describe the ways in which animals change the environment they live in by eating, seed dispersal, trampling, deforestation and climate change. Students will be able to describe how changes in environmental conditions may lead to population change in ecosystems, such as climate change, droughts and introduction of disease* | *Students will know that different animals live in different habitats.* | *Communicate- construct explanations as to why changes in environmental conditions can cause changes in ecosystems.* | ***Endozoochory:***  *The dispersal of seeds after they have been eaten by an organism.*  ***Competition:***  *The interaction of multiple organisms seeking the same, limited resource.* | *Retrieval questions*  *Simple exam questions*  *Homework quiz 1*  *End of topic test*  *Summative assessment 3*  *Q) How might trampling on sherdley park following ‘reminisce festival’ lead to population changes in the sherdley park ecosystem.*  *A) Producers will be destroyed resulting in consumers eating different vegetation (Plants) and consumers who rely on those plants will be forced to move.*  *Q) How might endozoochory explain why apples trees have started to appear in Sherdley park?*  *A) The birds have eaten the seeds and flew to a new location and defecated the seeds.* | *Knowledge organiser (provided on Teams and in class)*  [*https://www.bbc.co.uk/bitesize/guides/z9pn6yc/revision/3*](https://www.bbc.co.uk/bitesize/guides/z9pn6yc/revision/3) |
| ***06 Pathogens, bacteria, fungi and virus*** | *Students will know that pathogens are disease-causing microorganisms. Bacteria, fungi and viruses are all types of microorganisms. Students will know that pathogens cause some but not all diseases in both animals and plants. Diseases caused by pathogens are; rose black spot, malaria, HIV, tobacco mosaic, salmonella. Students will be able to state that not all microorganisms cause ill health. Bacteria produce toxins, bacteria and viruses damage cells which cause symptoms of ill health.* | *Disease can be caused by bacteria, virus and fungi.* | *Solve- Estimate risks of catching and transmitting disease dependent upon the pathogen* | ***Pathogens:***  *A disease-causing micro-organism*  ***Communicable:***  *Can be passed from person to person*  ***Toxins:***  *A substance poisonous to an organism* | *Retrieval questions*  *Simple exam questions*  *Homework quiz 1*  *End of topic test*  *Summative assessment 3.*  *Q) How might stale milk make us ill?*  *A) \*Refer to the stages on slide 6 (How does bacteria make us ill slide)\*.*  *Q) A gardener has found plant disease on rose bushes. How might they protect the other plants in the garden?*  *A) Treat by removing infected leaves and burning them and Spray with fungicide.* | *Knowledge organiser (provided on Teams and in class)*  [*https://www.bbc.co.uk/bitesize/guides/zxr7ng8/revision/1*](https://www.bbc.co.uk/bitesize/guides/zxr7ng8/revision/1) |