

Meden School Curriculum Planning							
Subject	Biology	Year Group	10	Sequence No.	1	Topic	B7 – Ecology

Retrieval	Core Knowledge	Student Thinking
What do teachers need retrieve from students before they start teaching new content ?	What specific ambitious knowledge do teachers need teach students in this sequence of learning?	What real life examples can be applied to this sequence of learning to development of our students thinking, encouraging them to see the inequalities around them and 'do something about them!'
<p>Year 8 Ecosystems, feeding relationships and adaptations L1: Understanding that food chains begin with a producer, which is a green plant or alga and they produce their own food through photosynthesis which provides biomass for the rest of the food chain which is passed on when one organism eats another. Explaining the organisation of a food chain, producer → primary consumer → secondary consumer → tertiary consumer. Defining the term predator, prey, herbivore, carnivore and omnivore.</p> <p>Year 8 Ecosystems, feeding relationships and adaptations L2: Interpreting numerous food chains that are connected within a food web. Defining the terms ecosystem, interdependence and stable community.</p> <p>Year 8 Ecosystems, feeding relationships and adaptations L3: Interpreting predator prey cycle graphs and understanding that</p>	<p>L1: Communities & Competition.</p> <p>Students should be able to describe:</p> <ul style="list-style-type: none"> • Different levels of organisation in an ecosystem from individual organisms to the whole ecosystem • The importance of interdependence and competition in a community. <p>Students should be able to, when provided with appropriate information:</p> <ul style="list-style-type: none"> • Suggest the factors for which organisms are competing in a given habitat • Suggest how organisms are adapted to the conditions in which they live. <p>An ecosystem is the interaction of a community of living organisms (biotic) with the non-living (abiotic) parts of their environment. To survive and reproduce, organisms require a supply of materials from their surroundings and from the other living organisms there. Plants in a community or habitat often compete with each other for light and space, and for water and mineral ions from the soil. Animals often compete with each other for food, mates and territory. Within a community each species depends on other species for food, shelter, pollination, seed dispersal etc. If one species is removed it can affect the whole community. This is called interdependence. A stable community is one where all the species and environmental factors are in balance so that population sizes remain fairly constant. Students should be able to extract and interpret information from charts, graphs and tables relating to the interaction of organisms within a community.</p> <p>L2: Abiotic & Biotic Factors.</p>	

<p>one affects the other and the cycles continuously rise and fall.</p> <p>Year 8 Ecosystems, feeding relationships and adaptations L4: Understanding how pyramids of numbers can be used to represent food chains.</p> <p>Year 8 Ecosystems, feeding relationships and adaptations L5: Investigating further into how biomass is passed along a food chain and as it moves up a food chain there is less biomass and energy. Explaining the different amounts of biomass in different organisms and how pyramids of biomass can be drawn to represent this.</p> <p>Year 8 Ecosystems, feeding relationships and adaptations L6: Researching how humans use different chemicals in industry such as herbicides, fungicides and pesticides and then investigating how these chemicals can accumulate within a food chain resulting in negative impacts on ecosystems and biodiversity.</p> <p>Year 8 Ecosystems, feeding relationships and adaptations L7: Explaining where biomass originates from, how it passes on and how it is lost. Also calculating efficiency of biomass transfer.</p> <p>Year 8 Ecosystems, feeding relationships and adaptations L8: Defining the term biodiversity and researching the human</p>	<p>Students should be able to explain how a change in an abiotic factor would affect a given community given appropriate data or context.</p> <p>Abiotic (non-living) factors which can affect a community are:</p> <ul style="list-style-type: none"> • light intensity • temperature • moisture levels • soil pH and mineral content • wind intensity and direction • carbon dioxide levels for plants oxygen levels for aquatic animals. <p>Students should be able to extract and interpret information from charts, graphs and tables relating to the effect of abiotic factors on organisms within a community.</p> <p>Students should be able to explain how a change in a biotic factor might affect a given community given appropriate data or context.</p> <p>Biotic (living) factors which can affect a community are:</p> <ul style="list-style-type: none"> • availability of food • new predators arriving • new pathogens • one species outcompeting another, so the numbers are no longer sufficient to breed. <p>Students should be able to extract and interpret information from charts, graphs and tables relating to the effect of biotic factors on organisms within a community.</p> <p>L3: Adaptations.</p> <p>Students should be able to explain how organisms are adapted to live in their natural environment, given appropriate information.</p> <p>Organisms have features (adaptations) that enable them to survive in the conditions in which they normally live. These adaptations may be structural, behavioural or functional.</p>	<p>L3: Understanding how animals are adapted, so should animals be kept in zoos considering they are specialised for certain environments?</p>
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<p>impact upon it and what the consequences of this are.</p> <p>Year 8 Ecosystems, feeding relationships and adaptations L9: Understanding why deforestation is occurring and the impact of this upon biodiversity and global warming and also discovering peat bogs and the issues surrounding their disappearance.</p> <p>Year 8 Ecosystems, feeding relationships and adaptations L10: Discovering how biodiversity is being maintained through breeding programmes, field margins and hedgerows, reducing waste and recycling and protecting and regenerating habitats. Discussing why some countries and governments cannot commit to maintaining biodiversity due to food security, cost of the programmes, development of society and the affect on the local economies.</p> <p>Year 8 Ecosystems, feeding relationships and adaptations L11: Researching adaptations in animals and plants to help them survive and be successful in their environments.</p> <p>Year 8 Ecosystems, feeding relationships and adaptations L12: Discovering what animals compete for and why.</p>	<p>Some organisms live in environments that are very extreme, such as at high temperature, pressure, or salt concentration. These organisms are called extremophiles. Bacteria living in deep sea vents are extremophiles.</p> <p>L4: Levels of Organisation.</p> <p>Students should understand that photosynthetic organisms are the producers of biomass for life on Earth. Feeding relationships within a community can be represented by food chains. All food chains begin with a producer which synthesises molecules. This is usually a green plant or alga which makes glucose by photosynthesis. Producers are eaten by primary consumers, which in turn may be eaten by secondary consumers and then tertiary consumers. Consumers that kill and eat other animals are predators, and those eaten are prey. In a stable community the numbers of predators and prey rise and fall in cycles. Students should be able to interpret graphs used to model these cycles.</p> <p>L5: Transects and Quadrats.</p> <p>A range of experimental methods using transects and quadrats are used by ecologists to determine the distribution and abundance of species in an ecosystem.</p> <p>Required practical activity 7: Measure the population size of a common species in a habitat. Use sampling techniques to investigate the effect of a factor on the distribution of this species.</p> <p>L6/L7: Water Cycle & the Carbon Cycle.</p> <p>Students should:</p> <ul style="list-style-type: none"> recall that many different materials cycle through the abiotic and biotic components of an ecosystem explain the importance of the carbon and water cycles to living organisms. <p>All materials in the living world are recycled to provide the building blocks for future organisms.</p> <p>The carbon cycle returns carbon from organisms to the atmosphere as carbon dioxide to be used by plants in photosynthesis.</p> <p>The water cycle provides fresh water for plants and animals on land before draining into the seas. Water is continuously evaporated and precipitated.</p> <p>Students are not expected to study the nitrogen cycle.</p> <p>Students should be able to explain the role of microorganisms in cycling materials through an</p>	<p>L4: Should hunting of animals for sport be legal in the UK?</p> <p>L5: Discovering how ecologists carry out their work and gaining a further understanding of a career within ecology.</p>
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<p>Year 8 Ecosystems, feeding relationships and adaptations L13: Discovering what plants compete for and why.</p>	<p>ecosystem by returning carbon to the atmosphere as carbon dioxide and mineral ions to the soil.</p> <p>L8: GPA. Revision lesson recapping new learning and providing a chance for exam question practice.</p> <p>L9: Biodiversity & Waste Management. Biodiversity is the variety of all the different species of organisms on earth, or within an ecosystem. A great biodiversity ensures the stability of ecosystems by reducing the dependence of one species on another for food, shelter and the maintenance of the physical environment.</p> <p>The future of the human species on Earth relies on us maintaining a good level of biodiversity. Many human activities are reducing biodiversity and only recently have measures been taken to try to stop this reduction.</p> <p>Rapid growth in the human population and an increase in the standard of living mean that increasingly more resources are used and more waste is produced. Unless waste and chemical materials are properly handled, more pollution will be caused.</p> <p>Pollution can occur:</p> <ul style="list-style-type: none"> • in water, from sewage, fertiliser or toxic chemicals • in air, from smoke and acidic gases • on land, from landfill and from toxic chemicals. <p>Pollution kills plants and animals which can reduce biodiversity</p> <p>L10/11: Global Warming & the Consequences. Students should be able to describe some of the biological consequences of global warming. Levels of carbon dioxide and methane in the atmosphere are increasing, and contribute to 'global warming'.</p> <p>L12: Deforestation & Land Use. Large-scale deforestation in tropical areas has occurred to:</p> <ul style="list-style-type: none"> • provide land for cattle and rice fields • grow crops for biofuels <p>Humans reduce the amount of land available for other animals and plants by building, quarrying,</p>	<p>L8: Does biodiversity affect our lives? Should every country in the world put in measures to reduce the loss of biodiversity?</p> <p>L9/10: Is global warming an issue for everyone? L11: How does the destruction of the Amazon rainforest affect the development of new drugs? What are the impacts on countries if they stop deforestation?</p>
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	<p>farming and dumping waste.</p> <p>L13: Peat bogs.</p> <p>The destruction of peat bogs, and other areas of peat to produce garden compost, reduces the area of this habitat and thus the variety of different plant, animal and microorganism species that live there (biodiversity).</p> <p>The decay or burning of the peat releases carbon dioxide into the atmosphere.</p> <p>L14: Maintaining Biodiversity.</p> <p>Students should be able to describe both positive and negative human interactions in an ecosystem and explain their impact on biodiversity. Scientists and concerned citizens have put in place programmes to reduce the negative effects of humans on ecosystems and biodiversity.</p> <p>These include:</p> <ul style="list-style-type: none"> • breeding programmes for endangered species • protection and regeneration of rare habitats • reintroduction of field margins and hedgerows in agricultural areas where farmers grow only one type of crop • reduction of deforestation and carbon dioxide emissions by some governments • recycling resources rather than dumping waste in landfill. 	<p>L13: Should zoos be used to maintain animal populations?</p> <p>Should the Government pay Farmers for introducing field margins?</p> <p>Should we dictate to other countries whether they should or should not cut down rainforests?</p> <p>Should recycling be made mandatory in UK law?</p>
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