Ecology Unit

Essential

EcE.1 - Describe/Demonstrate energy and nutrient flow through an ecosystem.

Level 3 Description	Recognizes or recalls specific terminology such as: herbivores, detritivores, producers, consumers, food web, food chain. Uses a food web to describes how nutrients and energy flows through a system. Describes how carbon flows through ecosystems.
Level 4 Description	Recognizes or recalls specific terminology such as: primary consumers, secondary consumers, tertiary consumers, energy pyramid, trophic level. Creates a food web to describes how nutrients and energy flows through a system. Describes carbon, nitrogen, and phosphorus cycles including its reservoirs and process.

EcE.2 - Use mathematical representations to support explanations of factors that affect carrying capacity of ecosystems.

Level 3 Description	Recognizes or recalls specific terminology such as: biotic factors, abiotic factors, limiting factor, carrying capacity, density-dependent and independent factors Depict factors(both biotic and abiotic) that affect carrying capacity of ecosystems.
Level 4 Description	Use data to support explanations of factors that affect carrying capacity of ecosystems and predict population growth and carrying capacity changes when limiting factors change in an ecosystem. Analyze population dynamics (including human populations) and the factors that affect them (limiting factors, density-dependent and independent factors, carrying capacity).

EcE.3 - Describe the relationships between organisms in an environment.

Level 3 Description	Recognizes or recalls specific terminology such as:, ecology, habitat, symbiosis, mutualism, commensalism, parasitism, niche List levels of organization in order. (individual, population, community, ecosystem, biome, biosphere)
Level 4 Description	Recognizes or recalls specific terminology such as:, competitive exclusion, niche, Evaluate the role of a keystone species and the effects in an ecosystem.

Supporting

EcS.1 - Evaluate the factors that would result in a stable ecosystem and a changing ecosystem.

Level 3 Description	Describes types of organisms in stable ecosystems. Define biodiversity. Explain that high biodiversity leads to a stable sustainable environment. Define succession and the order of organisms found in primary and secondary succession. Describe how a change in one organism can affect the stability of a population of another. Use mathematical representations to support explanations based on evidence about factors affecting biodiversity and populations in ecosystems
Level 4 Description	Explain that high biodiversity leads to a sustainable environment and the problems that can occur as biodiversity lowers. Describe how a change in one organism affects the stability of populations of others in an ecosystem. Define succession, order organisms found in primary and secondary succession, and discuss factors that affect succession. Describe that complex interactions in ecosystems maintain consistent numbers and types of organisms and changing abiotic factors may result in new ecosystems. (succession) Use mathematical representations to support and revise explanations based on evidence about factors affecting biodiversity and populations in ecosystems

EcS.2 - Analyze ways humans impact ecosystems and design a solution for reducing these impacts.

Level 3 Description	Explain changes in ecosystems prompted by human impact. Design a solution for reducing the impacts of human activities on the environment and biodiversity. Describe how sustainable development could help with current resource issues (e.g., using renewable rather than nonrenewable resources, using recycled resources) Revise a simulation to test a solution to mitigate adverse impacts of human activity on biodiversity.
Level 4 Description	Analyze and explain changes in ecosystems prompted by human impact (e.g., habitat destruction, exotic species, global warming, pollution, overpopulation). Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity. Create a simulation to test a solution to mitigate adverse impacts of human activity on biodiversity.

EcS.3 - Evaluate an organism's behavior and how it will affect its ability to survive and reproduce.

Level 3 Description	Describe an organism's behavior in terms of its ability to help the organism survive and reproduce.
Level 4 Description	Use evidence to support a description of an organism's behavior in terms of its ability to help the organism survive and reproduce.