

Anoka-Hennepin Secondary Curriculum Unit Plan

Department:	Science	Course:	IB Biology 11 SL (H)	Unit Title:	Ecology and Evolution	Grade Level(s):	11
Assessed Trimester:		Pacing:		Date Created:		Last Revision Date:	9/2/2014

Course Understandings: *Students will understand that:*

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DESIRED RESULTS (Stage 1) - WHAT WE WANT STUDENT TO KNOW AND BE ABLE TO DO?

Established Goals	
Transfer	
Students will be able to independently use their learning to: (product, high order reasoning)	
Meaning	
Unit Understanding(s): Students will understand that: - How environmental factors and interactions between organisms can affect the number and diversity of species in an ecosystem. - That the Greenhouse effect is both good and bad - Models can be applied to estimate the change in populations - That evolutionary theory explains the similarities, diversity and biological history of living things.	Essential Question(s): Students will keep considering:
Acquisition	
Knowledge - Students will: - About the biotic and abiotic interrelationships within ecosystems - The relationships between abiotic and biotic components of an ecosystem in terms of the cycling of water, carbon, oxygen and nitrogen. - That living things require constant energy input and that energy passed through food webs is lost as heat - How to describe trophic levels and a food chain/web for a given ecosystem. - The carbon cycle - The difference between short-wave radiation and longwave radiation - The precautionary principle of the Greenhouse Effect - The factor that influence size of and carrying capacity for populations including humans - That species change over time and the term evolutions is used to describe this process - How genetic variation between populations is due to different selective pressures acting on each population, which can lead to a new species - How scientific evidence, including the follies record, homologous structures, embryological development or biochemical similarities, help to classify organisms in order to show probable evolutionary relationships and common ancestry.	Skills - Students will: - Define species, habitat, population, community, ecosystem and ecology - Distinguish between autotrophy and heterotroph - Distinguish between consumers, detritivores and saprotrophs - Describe what is meant by a food chain, giving 3 examples, each with at least 3 linkages - Describe what is meant by a food web - Define trophic level - Deduce the trophic level of organisms in a food chain and a food web - Construct a food web containing up to 10 organisms, using appropriate information - State that light is the initial energy source for almost all communities - Explain the energy flow in a food chain - State that energy transformations are never 100% efficient - Explain reason for the shape of pyramids of energy - Explain that energy enters and leaves ecosystems but nutrients must be recycled - Draw and label a diagram of the carbon cycles to show the processes involved - Analyse the changes in concentration of atmospheric carbon dioxide using historical records

• How adaptations of species and coevolution with other species are related to success in an ecosystem. • Criteria used to define species Reasoning - Students will: •	• Explain the relationship between rises in concentrations of atmospheric carbon dioxide, methane and oxides of nitrogen and the enhanced greenhouse effect • Outline the precautionary principle and evaluate as a justification for strong action in response to the threats posed by the enhanced greenhouse effect • Outline the consequences of a global temperature rise on arctic ecosystems • Outline how population size is affected by natality, immigration, mortality and emigration • Draw and label a graph showing a sigmoid population growth curve • Explain the reasons for the exponential growth phase, ;the plateau phase and the transitional phase between these two phases • List three factors that set limits to population increase • Define evolution • Outline the evidence for evolution provided by the fossil record, selective breeding of domesticated animals and homologous structures • State that populations tend to produced more offspring than the environment can support • Explain that the consequence of the potential overproduction of offspring is a struggle for survival • State that the members of a species show variation • Explain how sexual reproduction promotes variation in a species • Explain how natural selection leads to evolution • Explain 2 examples of evolution in response to environmental change; one must be antibiotic resistance in bacteria • Outline the binomial system of nomenclature • Least seven levels in the hierarchy of taxa, using an example from 2 different kingdoms for each level • Distinguish between the following phyla of plants, using simple external recognition features • Distinguish between the following phyla of animals, using simple external recognition features: porifera, cnidaria, platyhelminthes, annelida, mollusca and arthropoda • Apply and design a key for a group of up to 8 organisms

Common Misunderstandings •	Essential new vocabulary • Species • Habitat • Population • Community • Ecosystem • Ecology • Autotroph • Heterotroph • consumers • Detritivores • Saprotrophs • Trophic level • Evolution • Natural selection • Binomial nomenclature • Bryophyta • Filicinophyta • Coniferophyta • Angiospermophyta
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