

Anoka-Hennepin Secondary Curriculum Unit Plan

Department:	Science	Course:	Science 7 (Life Science)	Unit 7 Title:	Ecology	Grade Level(s):	7th Grade
Assessed Trimester:	Trimester 3	Pacing:	25-30 Days	Date Created:		Last Revision Date:	6.24.14

Course Understandings: *Students will understand that:*

- Living things strive for balance with each other and their environment.
- Evidence gathered from the past is used to explain the origination of an event, phenomenon, species, system, and to help predict the future.
- Living organisms are linked in a complex, balanced web of life, which can be changed by human activity.

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

Established Goals

- **Standard:** Current and emerging technologies have enabled humans to develop and use models to understand and communicate how natural and designed systems work and interact.
Benchmark:
7.1.3.4.1: Use maps, satellite images and other data sets to describe patterns and make predictions about natural systems in a life science context. For example: Use online data sets to compare wildlife populations or water quality in regions of Minnesota.
- **Standard:** Natural systems include a variety of organisms that interact with one another in several ways
Benchmark:
7.4.2.1.1: Identify a variety of populations and communities in an ecosystem and describe the relationships among the populations and communities in a stable ecosystem
7.4.2.1.2: Compare and contrast predator/prey, parasite/host and producer/consumer/decomposer relationships
7.4.2.1.3: Explain how the number of populations an ecosystem can support depends on the biotic resources available as well as abiotic factors such as amount of light and water, temperature range and soil composition.
- **Standard:** Interdependence among Living Systems
The flow of energy and the recycling of matter are essential to a stable ecosystem.
Benchmark:
7.4.2.2.1: Recognize that producers use the energy from sunlight to make sugars from carbon dioxide and water through a process called photosynthesis. This food can be used immediately, stored for later use, or used by other organisms.
7.4.2.2.2: Describe the roles and relationships among producers, consumers and decomposers in changing energy from one form to another in a food web within an ecosystem.
7.4.2.2.3: Explain that the total amount of matter in an ecosystem remains the same as it is transferred between organisms and their physical environment, even though its form and location change. *For example:* construct a food web to trace the flow of matter in an ecosystem.
- **Standard:** Human Interactions with Living Systems
Human activity can change living organisms and ecosystems
Benchmark:
7.4.4.1.2: Describe ways that human activities can change the populations and communities in an ecosystem
- **Standard:** Science Literacy
Reading Benchmark:
Key ideas and details
6.13.1.1: Cite specific textual evidence to support analysis of science and technical texts.
6.13.2.2: Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions
6.13.3.3: Follow precisely a multistep procedure when carrying out experiments, designing solutions, taking measurements, or performing technical tasks.
Craft and structure

<p>6.13.4.4: Determine the meaning of symbols, equations, graphical representations, tabular representations, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to <i>grades 6–8 texts and topics</i>.</p> <p>6.13.5.5: Analyze the structure an author uses to organize a text, including how the major sections contribute to the whole and to an understanding of the topic.</p> <p><i>Integration of knowledge and ideas</i></p> <p>6.13.9.9: Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.</p> <p><i>Range of reading and level of text complexity</i></p> <p>6.13.10.10: By the end of grade 8, read and comprehend science/technical texts in the grades 6–8 text complexity band independently and proficiently.</p> <p>Writing Benchmark:</p> <p><i>Text types and purposes</i></p> <p>6.14.1.1: Write arguments focused on <i>discipline-specific content</i>.</p> <p>a. Introduce claim(s) about a topic or issue, acknowledge and distinguish the claim(s) from alternate or opposing claims, and organize the reasons and evidence logically.</p> <p>b. Support claim(s) with logical reasoning and relevant, accurate data and credible evidence that demonstrate an understanding of the topic or text, using credible sources.</p> <p>c. Use words, phrases, and clauses to create cohesion and clarify the relationships among claim(s), counterclaims, reasons, and evidence.</p> <p>d. Establish and maintain a formal style.</p> <p>Provide a concluding statement or section that follows from and supports the argument presented.</p> <p><i>Research to build and present knowledge</i></p> <p>6.14.9.9: Draw evidence from literary or informational texts to support analysis, reflection, and research.</p> <p><i>Range of writing</i></p> <p>6.14.10.10: Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.</p>	
Transfer	
<p>Students will be able to independently use their learning to: (product, high order reasoning)</p> <ul style="list-style-type: none">• All life is interconnected and what people do affects other species. 7.4.2.2.3• The original source of energy within an ecosystem is the sun. 7.4.2.2.2• Show how energy is transferred between levels of a food web. 7.4.2.2.2• To understand the language of science allows us to communicate effectively and efficiently. <p>Students will be able to independently use their learning to understand the interactions between living things and describe how these interactions impact the world around us.</p>	
Meaning	
<p>Unit Understanding(s):</p> <p>Students will understand that:</p> <ul style="list-style-type: none">• There are interactions of abiotic and biotic factors in ecosystems. 7.4.2.1.3• The amount of usable energy available to organisms decreases as it passes through a food chain and/or food web. 7.4.2.2.2• Predator/Prey, parasite/host and producer/consumer/decomposer relationships describe interactions within an ecosystem. 7.4.2.1.2• There are potentially irreversible effects of human activity on ecosystems. 7.4.4.1.2	<p>Essential Question(s):</p> <p>Students will keep considering:</p> <ul style="list-style-type: none">• There are interactions of abiotic and biotic factors in ecosystems. 7.4.2.1.3• The amount of usable energy available to organisms decreases as it passes through a food chain and/or food web. 7.4.2.2.2• Predator/Prey, parasite/host and producer/consumer/decomposer relationships describe interactions within an ecosystem. 7.4.2.1.2• There are potentially irreversible effects of human activity on ecosystems. 7.4.4.1.2
Acquisition	
<p>Knowledge - Students will:</p> <ul style="list-style-type: none">• Examine features of maps, satellite images, and other data sets. 7.1.3.4.1• List and define the 4 levels of organization in the environment. (<i>organism, population, community, ecosystem</i>) 7.4.2.1.1• Describe the roles of producers, consumers, and decomposers within an ecosystem. 7.4.2.2.2• Define and give examples of biotic (<i>living</i>) and abiotic (<i>nonliving</i>) factors within an ecosystem. 7.4.2.1.3• Recognize that producers are organisms that carry out photosynthesis. 7.4.2.2.1	<p>Reasoning - Students will:</p> <ul style="list-style-type: none">• Interpret data sets to describe and make predictions about patterns in natural systems in life science. 7.1.3.4.1• Interpret food chains and food webs.• Compare and contrast the roles of producers, consumers, and decomposers within an ecosystem. 7.4.2.1.2• Compare and contrast predator/prey relationships. 7.4.2.1.2• Compare and contrast parasite/host relationships. 7.4.2.1.2

<ul style="list-style-type: none">● Know that photosynthesis requires energy from the sun, water and carbon dioxide to produce sugar and oxygen. 7.4.2.2.1● Know that the sugars produced by photosynthesis can be used immediately, stored for later use, or used by other organisms. 7.4.2.2.1● Understand equations for photosynthesis and cellular respiration. 7.4.2.2.1● Identify food chains and food webs. 7.4.2.2.2● Understand how energy flows between levels in a food pyramid. 7.4.2.2.2● Give examples of human activities that could potentially cause irreversible effects on an ecosystem. (chemicals in the environment, bacterial resistance, pollution, deforestation, over-hunting and urban sprawl) 7.4.4.1.2	<ul style="list-style-type: none">● Compare and contrast the three types of symbiosis (mutualism, parasitism, commensalism). 7.4.2.1.1, 7.4.2.1.2● Explain how a change in the amount of resources available, biotic & abiotic factors, and disease can affect the number and types of organisms within an ecosystem. 7.4.2.1.3● Describe how energy stays the same in an ecosystem even if it changes location or form. 7.4.2.2.3● Describe how human activity may potentially cause irreversible effects on ecosystems. 7.4.4.1.2 <p>Skills - Students will:</p> <ul style="list-style-type: none">● Construct a food web as a group using a set number of organisms. (this specifically set by the teacher) 7.4.2.2.2

<p>Common Misunderstandings</p> <ul style="list-style-type: none">● Plants feed by absorbing food through their roots.● Sunlight is “consumed” in photosynthesis.● Digestion is the process that releases usable energy from food.● Respiration is synonymous with breathing.● Energy accumulates in an ecosystem so that a top predator has all the energy from the organisms below it.● Ecosystems are not a functioning whole, but simply a collection of organisms.● If a population in a food web is disturbed, there will be little or no effect on populations below it in the food web. (e.g. if a predator is removed, no effect on prey)● Dead organisms simply rot away. (Students do not realize that the matter from the dead organism is converted into other materials in the environment.)	<p>Essential new vocabulary</p> <ul style="list-style-type: none">● Predator● Prey● Parasite● Host● Symbiosis● Mutualism● Parasitism● Commensalism● Abiotic● Biotic● Producer● Consumer● Decomposer● Food Chains● Food Webs● Energy Pyramid● Tertiary Consumer● Secondary Consumer● Primary Consumers● Photosynthesis● Cellular Respiration● Habitat● Niche
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