

Science Standards - Life Science

Science Standards - Life Science			Wolves	Minnesota Raptors	Wild About Wildlife - Littles	Cold Blooded Creatures	Student Research		Outreach - Wolves	Outreach - Raptors	Outreach - Wildlife	Outreach - Unlovable Animals
	Kindergarten											
	Strand 1 - Exploring phenomena or engineering problems											
1.2 Planning and carrying out investigations	1.2.1 Students will be able to design and conduct investigations in the classroom, laboratory, and/or field to test students' ideas and questions, and will organize and collect data to provide evidence to support claims the students make about phenomena.	OL.1.2.1.2 Make observations of plants and animals to compare the diversity of life in different habitats. (P: 3, CC: 1, CI: LS4) Emphasis is on the diversity of living things in a variety of different habitats and patterns across those habitats.	X	X	X	X	X		X	X	X	X
	Strand 2 - Looking at data and empirical evidence to understand phenomena or solve problems											
2.1 Analyzing and interpreting data	2.1.1 Students will be able to represent observations and data in order to recognize patterns in the data, the meaning of those patterns, and possible relationships between variables.	OL.2.1.1.3 Record and use observations to describe patterns of what plants and animals (including humans) need to survive.** (P: 4, CC: 1, CI: LS1) Examples of patterns may include that animals need to take in food, but plants do not; different animals need different kinds of food; plants require light; and that all living things need water.	X	X	X	X	X		X	X	X	X
	Strand 3 - Developing possible explanations of phenomena or designing solutions to engineering problems											
3.1 Developing and using models	3.1.1 Students will be able to develop, revise, and use models to represent the students' understanding of phenomena or systems as they develop questions, predictions and/or explanations, and communicate ideas to others.	OL.3.1.1.1 Develop a simple model to represent the relationship between the needs of different plants and animals (including humans) and the places they live. (P: 2, CC: 4, CI: LS2) Examples of relationships may include that deer eat buds and leaves, therefore, they usually live in forested areas; and grasses need sunlight, so they often grow in meadows. Examples of models may include food chains, collages, and/or sorting activities.	X	X	X	X	X		X	X	X	X

3.2 Constructing explanations and designing solutions	3.2.2 Students will be able to use their understanding of scientific principles and the engineering design process to design solutions that meet established criteria and constraints.*	2L.3.2.2.1 Engineer a device that mimics the structures and functions of plants or animals in seed dispersal.* (P: 6, CC: 6, CI: LS2, ETS1) Emphasis is on how specific structures have particular functions. Examples of seed dispersal by animals may include feeding and subsequent elimination of seeds, or attachment of seeds/pollen to animal structures. Examples of seed dispersal by plants may include various wind-catching designs (as in dandelions or maple trees) or colors and smells that attract pollinators.	X	X	X	X	X		X	X	X	X
Strand 4 - Communicating reasons, arguments and ideas to others												
4.1 Engaging in Arguing from evidence	4.1.1 Students will be able to engage in argument from evidence for the explanations the students construct, defend and revise their interpretations when presented with new evidence, critically evaluate the scientific arguments of others, and present counter arguments.	2L.4.1.1.1 Construct an argument with evidence that evaluates how in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all. (P: 7, CC: 2, CI: LS4, ETS2) Emphasis is on the interdependence of parts of a system (organisms and their habitat). Examples of habitats should include those found in Minnesota, such as a wetland, prairie, or garden. Examples of evidence may include needs and characteristics of the organisms and habitats involved.	X	X	X	X	X	X	X	X	X	X
Third Grade												
Strand 3 - Developing possible explanations of phenomena or designing solutions to engineering												
3.1 Developing and using models	3.1.1 Students will be able to develop, revise, and use models to represent the students' understanding of phenomena or systems as they develop questions, predictions and/or explanations, and communicate ideas to others.	3L.3.1.1.2 Develop multiple models to describe how organisms have unique and diverse life cycles but all have birth, growth, reproduction, and death in common. (P: 2, CC: 4, CI: LS1) Emphasis is on the pattern of changes organisms go through during their life. Examples of models may include diagrams, drawings, physical models, or computer programs.	X	X	X	X	X	X	X	X	X	X

3.2 Constructing explanations and designing solutions	3.2.1 Students will be able to apply scientific principles and empirical evidence (primary or secondary) to explain the causes of phenomena or identify weaknesses in explanations developed by the students or others.	3L.3.2.1.1 Construct an explanation using evidence from various sources for how the variations in characteristics among individuals of the same species may provide advantages in surviving, finding mates, and reproducing. (P: 6, CC: 2, CI: LS4) Examples of cause and effect relationships may include how individual plants of the same species with different length thorns may be more or less likely to be eaten by predators; or animals that have better camouflage coloration than others of their species may be more likely to survive and therefore more likely to leave offspring.	X	X	X	X	X		X	X	X	X
Strand 4 - Communicating reasons, arguments and ideas to others												
4.1 Engaging in Arguing from evidence	4.1.1 Students will be able to engage in argument from evidence for the explanations the students construct, defend and revise their interpretations when presented with new evidence, critically evaluate the scientific arguments of others, and present counter arguments.	3L.4.1.1.1 Construct an argument about strategies animals use to survive. (P: 7, CC: 2, CI: LS2) Emphasis is on group behavior and how being part of a group helps animals obtain food, defend themselves, and cope with changes. Examples of animals should include wolves or other animals that live in Minnesota.	X	X	X	X	X		X	X	X	X
4.2 Obtaining, evaluating and communicating information	4.2.1 Students will be able to read and interpret multiple sources to obtain information, evaluate the merit and validity of claims and design solutions, and communicate information, ideas, and evidence in a variety of formats.	3L.4.2.1.1 Obtain information from various types of media to support an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.** (P: 8, CC: 4, CI: LS1) Examples of structures may include thorns, stems, roots, colored petals, heart, stomach, lungs, brain, and skin. Examples of media may include electronic sources.	X	X	X	X	X		X	X	X	X
Fourth Grade												
Strand 4 - Communicating reasons, arguments and ideas to other												
4.1 Engaging in Arguing from evidence	4.1.1 Students will be able to engage in argument from evidence for the explanations the students construct, defend and revise their interpretations when presented with new evidence, critically evaluate the scientific arguments of others, and present counter arguments.	4L.4.1.1.1 Construct or support an argument that traits can be influenced by different environments. (P: 7, CC: 2, CI: LS3) Emphasis of the practice is on using evidence, data and/or a model to support an argument. Examples of the environment affecting a trait may include the stunted growth of a typically tall plant grown with insufficient water or an animal's weight being influenced by the availability of food.	X	X	X	X	X		X	X	X	X

2.1 Analyzing and interpreting data	2.1.1 Students will be able to represent observations and data in order to recognize patterns in the data, the meaning of those patterns, and possible relationships between variables.	7L.2.1.1.1 Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.** (P: 4, CC: 2, CI: LS2) Emphasis is on cause and effect relationships between resources and growth of individual organisms and the number or organisms in ecosystems during periods of abundant and scarce resources. Examples may include populations of MN deer, moose, wolf, scavengers or aquatic populations in Lake Superior or algal blooms in lakes and ponds. Examples of evidence may include the use of flow charts to organize and sequence the algorithm, and to show relationships.	X	X	X	X	X		X	X	X	X
2.1 Analyzing and interpreting data	2.1.1 Students will be able to represent observations and data in order to recognize patterns in the data, the meaning of those patterns, and possible relationships between variables.	7L.2.1.1.2 Analyze and interpret data for patterns in the fossil record that document the existence, diversity, extinction, and change of life forms throughout the history of life on Earth. (P: 4, CC: 1, CI: LS4) Emphasis is on finding patterns of changes in the level of complexity of anatomical structures in organisms and the chronological order of fossil appearance in the rock layers.	X	X	X	X	X		X	X	X	X
	Strand 3 - Developing possible explanations of phenomena or designing solutions to engineering problems											
3.1 Developing and using models	3.1.1 Students will be able to develop, revise, and use models to represent their understanding of phenomena or systems as they develop questions, predictions and/or explanations and communicate ideas to others.	7L.3.1.1.3 Develop and use a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem. (P: 2, CC: 5, CI: LS2) Emphasis is on describing the conservation of matter and flow of energy into and out of various ecosystems.	X	X	X	X	X		X	X	X	X
	Ninth - Twelfth Grade											
	Strand 2 - Looking at data and empirical evidence to understand phenomena or solve problems											
2.1 Analyzing and interpreting data	2.1.1 Students will be able to represent observations and data in order to recognize patterns in the data, the meaning of those patterns, and possible relationships between variables.	9L.2.1.1.1 Apply concepts of probability to explain and predict the variation and distribution of expressed traits in a population. (P: 4, CC: 3, CI: LS3) <i>Examples of traits in human groups may include lactose intolerance, or high-altitude adaptation.</i>	X	X	X	X	X		X	X	X	X

