

**Gilford School District**  
**Grade 7 - Science**

Earth System Science and Living Things		
Proficiencies	Content	Skills
What characteristics define "living things"?	Basic needs of living things	Students can identify the 5 characteristics of life.
How do the earth's four systems affect each other (atmosphere, biosphere, geosphere, hydrosphere)?	Features of life	Students can identify the needs of living things.
In what ways do living things rely on all our earth systems?	The four earth spheres	Students can identify how the needs of living things are met.
Birds of Prey		
Proficiencies	Content	Skills
How do birds of prey rely on their environments to obtain what they need to survive?	Eagles, Hawks, Falcons, Osprey, Vultures, Secretary Birds.	Students will be able to identify 15 different birds in the raptor groups studied.
How does studying birds of prey increase my understanding of the life cycle of living organisms?	Migration	Students will be able to interpret graphs showing how populations of predator and prey are interrelated.
Why do animals migrate?	predator/prey relationships	Students will be able to identify 3 hazards migratory birds face during migration. Students will be able to identify 3 factors that influence the movement of raptors in their environment. Students will be able to observe migrating birds of prey in the field and report their data.
Classification		
Proficiencies	Content	Skills
How are living things placed into the 6 kingdoms?	The seven levels of classification.	Students will be able to name the seven levels of classification of living things.
How do you use a dichotomous key?	Using a dichotomous key	Students will use a dichotomous key to identify different leaf samples.
How do you use a dichotomous key?	The 6 Kingdoms of life.	Students will create their own dichotomous keys to identify alien creatures.
Why is classification important?	Species diversity	Given a description of an organism, students will be able to classify the living thing into one of the 6 kingdoms.
What characteristics do scientists look at when they are grouping living things into categories?		

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Owls of New Hampshire		
Proficiencies	Content	Skills
Why are owls an important part of ecosystems in New Hampshire?	The owls of New Hampshire	Students will be able to identify the species of owls that are most often found living in New Hampshire. They will be able to identify them based on sound and appearance.
What is the niche of an owl? What vital job do they perform in an environment?	Physical characteristics of owls	Students will be able to explain how owls use their tremendous senses of sight and hearing to survive in their environment.
If we observe an animal's environment what can we learn about the animal?	Food webs and the ecological pyramid	Students will construct a food web that accurately shows the predator/prey relationships of owls and other creatures in their ecosystems.
	Skeletal systems	Students will demonstrate an understanding of the flow of energy in an ecosystem starting with the sun and returning back to the soil via decomposers.
	Lab procedures	Students will sort, identify, and categorize bones of various rodents in owl pellets. Students will identify several types of rodents using a dichotomous key and skeletal remains from owl pellets.
Bacteria and Fungi		
Proficiencies	Content	Skills
How do bacteria affect humans in both positive and negative ways?	where in our world do we find organisms like fungi and bacteria	Students will be able to list at least 5 positive and 5 negative affects of bacteria on humans
Why are bacteria and fungi essential to the recycling of materials in our environment?	how are bacteria and fungi classified	Students will be able to identify where bacteria and fungi fit in the energy cycle/food webs
Where do these living things come from and what are their basic characteristics?	decomposers and the energy cycle	Students will be able to demonstrate through a lab experience where simple fungi such as bread mold come from and how they reproduce
How do organisms such as bacteria and fungi reproduce?	forms of asexual reproduction	Students will be able to explain the difference between sexual and asexual reproduction
	affects of fungi and bacteria on humans and other living things in the environment	

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Cell Structure		
Proficiencies	Content	Skills
<p>What is the structure and function of cells? How are plant and animal cells similar and different?</p>	<p>Plant and animal cell structure Basic functions of cells</p>	<p>Students will be able to identify the basic structures of a cell. Students will be able to explain the basic functions of the following cell parts: cell membrane, nucleus, mitochondria, ribosomes, and cytoplasm</p> <p>Students will be able to identify 3 differences between plant and animal cells</p>
Microbiology/Protozoa		
Proficiencies	Content	Skills
<p>What characteristics are shared by all protozoa? How are plant-like protists essential to life on earth? In what ways must protists adapt to and change with their environment? What can microscopes help us learn about the world around us?</p>	<p>Overview of the Kingdom Protista physical characteristics, locomotion, and feeding habits of microorganisms. specimen collection wet mount slide preparation use of the microscope Organism adaptation Food webs and the CO<sub>2</sub>/O<sub>2</sub> cycle in aquatic environments</p>	<p>Students will be able to the following:</p> <ol style="list-style-type: none"> <li>1. Prepare a wet mount slide.</li> <li>2. Focus a microscope.</li> <li>3. Identify 10 microorganisms based on physical characteristics and locomotion</li> </ol> <p>Students will be able to recognize that life on earth depends on microscopic plants and animals for food and oxygen Students will be able to differentiate between plant-like and animal-like protists Students will be able to explain how protozoa must adapt to changes in their environments in order to survive</p>

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Composition and Properties of Matter/Biochemistry		
Proficiencies	Content	Skills
How does the composition of matter vary?	atoms and molecules creating compounds periodic table of elements	Students will be able to explain how atoms of various elements combine to form different substances Students will be able to identify the basic differences between an atom and a molecule Students will be able to list the 5 different states of matter and accurately describe how matter changes from one state to another
What factors cause matter to change states?		Students will be able to identify 5 elements that are essential to living things
What elements are commonly found in living things?	chemical reactions basic biochemistry changing states of matter	
Life and the Environment		
Proficiencies	Content	Skills
How do biotic and abiotic factors interact in the environment?	Biotic and abiotic factors	Students will be able to define and give examples of biotic and abiotic factors
How are living things organized within an ecosystem?	Levels of biological organization	Students will be able to show the progression of how living things are grouped from a single organism to being a part of the entire biosphere (populations, communities, ecosystems)
Why is the cycling of materials through the environment so important?	Interactions among living organisms	Students will be able to explain how both biotic and abiotic factors limit or encourage the growth of a particular species of animal
What is the law of conservation of energy?	Habitats and niches	Students will differentiate between a food chain, food web, and ecological pyramid.
How are the conservation of energy and the conservation of mass related?	Energy flow through ecosystems The water cycle The nitrogen cycle Law of conservation of mass	Students will be able to draw and label a diagram representing the water cycle on earth. Students will be able to give at least 3 examples of how nitrogen moves through the environment and is recycled Students will be able to explain the Law of Conservation of Energy and give an example of it in the environment

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Winter Awareness		
Proficiencies	Content	Skills
<p>How do changes in the environment affect the human body?</p> <p>How do the systems of the human body work together to protect us against extreme cold?</p> <p>Why do environmental conditions change the survival rate organisms or entire species?</p> <p>How is heat transferred to the environment when the warm, human body is exposed to cold weather?</p>	<p>Frostbite, Hypothermia, Metabolism, Heat Transfer (conduction, convection, respiration, radiation), Adaptation</p>	<p>Students will be able to describe the signs of both frostbite and hypothermia in a human being.</p> <p>Students will be able to list 5 ways to treat a person suffering from either frostbite or hypothermia.</p> <p>Students will be able to write an explanation of how cold weather affects the human body and how the body is equipped to maintain "homeostasis".</p> <p>Students will create examples of conduction, convection, radiation, and respiration in a lab setting and will be able to explain their findings to their classmates.</p>
Biodiversity		
Proficiencies	Content	Skills
<p>What is biodiversity and how do scientists measure it in an ecosystem?</p> <p>What are biodiversity "hot spots"?</p> <p>Why is species loss such a concern to environmentalists?</p> <p>How has biodiversity on the earth changed over time?</p>	<p>define biodiversity</p> <p>species loss/extinction</p> <p>biodiversity across our planet</p> <p>human impact</p>	<p>Students will be able to define the term biodiversity and identify 3 ways scientists look at biodiversity in ecosystems</p> <p>Students will be able to use a map to locate several biodiversity hot spots on our planet</p> <p>Students will be able to describe 3 concerns that scientists have related to the earth's current levels of biodiversity</p> <p>Students will be able to define the term extinction and compare current rates with historical rates on the earth</p>
Global climate change		
Proficiencies	Content	Skills
<p>What are the major causes of global climate change?</p> <p>How are we changing our uses of natural resources? (compare/contrast)</p> <p>What effects is global climate change having on the earth?</p>	<p>Vocabulary about climate change</p> <p>Causes, effects, and proposed solutions to climate change</p> <p>Renewable vs nonrenewable resources</p> <p>Types of energy</p>	<p>Students will be able to define what global climate change is and list at least 5 contributing factors.</p> <p>Students will be able to identify various cause and effect relationships of human impact on the earth's climate.</p> <p>Students will be able to explain the difference between a renewable and nonrenewable energy source and list several examples of each.</p>

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Invertebrates		
Proficiencies	Content	Skills
How do the structure of simple organisms (invertebrates) compare to more complex ones (such as humans)?	Conservation of energy in an ecosystem	Students will be able to explain how energy is conserved in an environment as it is passed from organism to organism
Why are simple organisms essential to the survival of all ecosystems?	Relationship of the structure of an organism to how it functions.	Students will practice the skill of observation and taking notes while observing a live specimen
How does reproduction vary in different species?	Animal behavior and response to environmental stimuli	Students will be able to accurately identify the various anatomical structures of a simple earthworm such as an earthworm.
	Process of reproduction	Students will compare and contrast the reproductive process of a simple organism with one that is more complex (asexual/sexual reproduction)
Genetics		
Proficiencies	Content	Skills
How are the traits of an organism influenced by genetics and the environment?	Chromosomes	Students will demonstrate an understanding of the difference between dominant and recessive genes and explain how they are recognized in humans.
What determines the characteristics of an organism before it is born?	Dominant and recessive genes	Students will create a drawing of basic human conception (the combining of cells and chromosomes) to show how genetic material is passed on to offspring.
How can an organisms' traits determine whether or not it will survive in a given environment?	Inherited traits	Students will determine through observation and analysis which traits may be assets for a given organism and which might be a threat to survival.
	Population dynamics	Given a set of two genes (4 alleles) the students will be able to create a basic punnett square to determine the likelihood of a certain trait being passed on from parents.
The Human Body		
Proficiencies	Content	Skills
How is the human body structured?	Types of body cells, tissues and systems	Students will be able to identify the different types of cells, tissue and systems that make up the human body and state the basic job of each.
How do parts of the human body function together?	Parts of the blood and their various functions	Students will be able to identify the 4 basic components that make up our blood and tell two jobs that each of these parts does for the body.
How do humans develop before birth?	Sensory organs of the body	Students will be able to compare and contrast the sexual versus asexual reproduction in organisms.
		Students will be able to describe the basic changes that happen during each trimester of prenatal development.

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	Human prenatal development Disease affects and prevention	
Plants as producers		
<b>Proficiencies</b>	<b>Content</b>	<b>Skills</b>
What is the difference between asexual and sexual reproduction in living things? How do the process of photosynthesis and respiration work in a continual, vital cycle? How is photosynthesis the basis of all foodwebs on our earth?	The content for this unit will be new next year and is still being developed	still being developed