



PLANNED COURSE OF STUDY

Course Title	Life Science
Grade Level	7
Content Area / Dept.	Science
Length of Course	Every other day for one full school year
Author	Rich Colonna

Course Description:

In seventh grade, students learn and use the habits and techniques of scientists, including setting up experiments and making observations.

Course Rationale:

Throughout this course of study, students are learning and experiencing the practice of scientists and exploring the living world, both macroscopic and microscopic. They are setting up investigations, recording and describing their observations, and drawing conclusions. Also, they are connecting their active investigations with scientific and nonfiction text. Students will express their observations and conclusions through writing, formative, summative and performance-based assessments.



Curriculum Map

Month	Typical # of Weeks	Topics Covered this Month
September	4 weeks	Diversity of Life
October	4 weeks	Diversity of Life
November	3 weeks	Diversity of Life
December	3 weeks	Cells and Heredity
January	4 weeks	Cells and Heredity
February	4 weeks	Cells and Heredity
March	4 weeks	Ecology and the Environment
April	4 weeks	Ecology and the Environment/Anchor Activity
May	4 weeks	Ecology and the Environment/Anchor Activity
June	2 weeks	Ecology and the Environment



Unit Title	The Diversity of Life
Unit Description	The classification and characteristics of living organisms.
Essential Questions & Enduring Understandings	<p>C1: How are living things alike and yet different?</p> <p>C2: How are living things other than plants and animals important to Earth?</p> <p>C3: How do you know a plant when you see it?</p> <p>C4: How do you know an animal when you see it?</p> <p>C5: How do animals move?</p> <p>C6: How do animals get and use energy?</p> <p>C7: How does an animal's behavior help it survive and reproduce?</p>

Core Standards	Assessment Anchors
PE-MS-LS1-1	S8.A.1
PE-MS-LS1-4	S8.A.2
PE-MS-LS1-5	S8.A.3
PE-MS-LS1-8	S8.B.1
DCI-MS-LS1.A.1	S8.B.2
DCI-MS-LS2.A.1	

Key Unit Vocabulary	<p>Chapter 1</p> <p><i>organism, cell, unicellular, multicellular, metabolism, stimulus, response, development, asexual reproduction, sexual reproduction, spontaneous generation, controlled experiment, autotroph, heterotroph, homeostasis classification, taxonomy, binomial nomenclature, genus, species prokaryote, nucleus, eukaryote, evolution, branching, tree diagram, shared derived characteristic, convergent</i></p> <p>Chapter 2</p> <p><i>virus, host, parasite, vaccine, bacteria, cytoplasm, ribosome, flagellum, cellular respiration, binary fission, conjugation, endospore, pasteurization, decomposer, protist, protozoan, pseudopod, contractile vacuole, cilia, algae, pigment, spore, fungus, hyphae, fruiting body, budding, lichen</i></p> <p>Chapter 3</p> <p><i>chlorophyll, photosynthesis, tissue, chloroplast, vacuole, cuticle, vascular tissue, nonvascular plant, phloem, xylem, frond, pollen, seed, gymnosperm, angiosperm, cotyledon, monocot, dicot root cap, cambium, stoma, transpiration, embryo, germination, flower, pollination, septal, petal, stamen, pistil, ovary, sporophyte, gametophyte, annual, biennial, perennial,</i></p>
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fertilization, zygote, cone, ovule, fruit, tropism, hormone, auxin, photoperiodism, critical night length, short-day plant, long-day plant, day-neutral plant, dormancy

Chapter 4

adaptation, vertebrate, invertebrate, tissue, organ, radial symmetry, bilateral symmetry, cnidarian, mollusk, arthropod, exoskeleton, echinoderm, endoskeleton, chordate, notochord, vertebra, ectotherm, endotherm, fish, cartilage, amphibian, reptile, bird, mammal, mammary gland, monotreme, marsupial, placental mammal, placenta

Chapter 5

molting, cartilage, joint, muscle, nervous system, stimulus, response, neuron, impulse, sensory neuron, interneuron, motor neuron, brain, waste vascular system, swim bladder

Chapter 6

carnivore, herbivore, omnivore, filter feeder, radula digestion, digestive system, anus, crop, gizzard, intestine, esophagus, stomach, cellular respiration, diffusion, respiratory system, gill, lung, circulatory system, heart, open circulatory system, closed circulatory system, capillary, atrium, ventricle, excretory system, kidney, urine

Chapter 7

larva, polyp, medusa, external fertilization, internal fertilization, gestation period, amniotic egg, placenta, metamorphosis, pupa, incomplete metamorphosis, nymph, tadpole, behavior, instinct, learning, imprinting, conditioning, trial and error learning, insight learning, pheromone, aggression, territory, courtship behavior, society, circadian rhythm, hibernation, migration



Learning Objectives – <i>The student will...</i>	Assessment Opportunities
Chapter 1.1	
<ul style="list-style-type: none"> ▪ List the characteristics all living things share, what they need to survive, and where they come from. 	labs, formative/summative quizzes and tests Lessons and Chapters
Chapter 1.2	
<ul style="list-style-type: none"> ▪ Explain the organization levels of classification and the use of taxonomic keys. ▪ Explain how biologists classify organisms and how they assign scientific names. 	
Chapter 1.3	
<ul style="list-style-type: none"> ▪ Explain how organisms are classified into domains and kingdoms. 	
Chapter 1.4	
<ul style="list-style-type: none"> ▪ Explain the relationship between evolution and classification. 	
Chapter 2.1	
<ul style="list-style-type: none"> ▪ Describe the characteristics of viruses, how they multiply, and the positive and negative ways they affect living things. 	
Chapter 2.2	
<ul style="list-style-type: none"> ▪ Name and describe structures, shapes, and sizes of bacterial cells. ▪ Explain how bacteria obtain food and energy and reproduce. ▪ Describe the roles that bacteria play in the natural world. 	
Chapter 2.3	
<ul style="list-style-type: none"> ▪ Describe and give examples of animal, plant and fungi-like protists. 	
Chapter 2.4	
<ul style="list-style-type: none"> ▪ Describe the characteristics of fungi, how they reproduce, and 	



the roles they play in the natural world.	
Chapter 3.1	
<ul style="list-style-type: none">Identify the characteristics that all plants share.List the things they need to live successfully on land.	
Chapter 3.2	
<ul style="list-style-type: none">Name the major characteristics of nonvascular, seedless vascular, and seed plants.	
Chapter 3.3	
<ul style="list-style-type: none">Describe the functions of roots, stems, leaves, and flowers.Explain how seeds become new plants.	
Chapter 3.4	
<ul style="list-style-type: none">Identify the stages of a plant's life cycle.Describe how plants reproduce.	
Chapter 3.5	
<ul style="list-style-type: none">Identify three stimuli that produce plant responses.Explain how plants respond to seasonal changes	
Chapter 3.6	
<ul style="list-style-type: none">Explain how plants are important in everyday life.	
Chapter 4.1	
<ul style="list-style-type: none">Identify four functions that enable animals to meet their needs.Explain how animals are classified.	
Chapter 4.2	
<ul style="list-style-type: none">Describe levels of organization in animal bodies.Infer animal body structures based on symmetry.	



Chapter 4.3	
<ul style="list-style-type: none">Identify the characteristics of invertebrates.Describe the major groups of them.	
Chapter 4.4	
<ul style="list-style-type: none">Identify the characteristics of invertebrates.Compare how vertebrates differ in the way they control body temperature.	
Chapter 4.5	
<ul style="list-style-type: none">Identify the major groups of vertebrates.	
Chapter 5.1	
<ul style="list-style-type: none">Describe the framework for support and protection and the role of muscles in animal bodies.	
Chapter 5.2	
<ul style="list-style-type: none">Explain the functions of the nervous system.Compare how the nervous systems of animals differ.	
Chapter 5.3	
<ul style="list-style-type: none">Explain how muscles, the skeleton, and the nervous system interact to allow animal movement.Compare adaptations in organisms that help them move in specific environments.	
Chapter 6.1	
<ul style="list-style-type: none">Identify the different ways animals obtain food.Compare the ways animals digest food.	
Chapter 6.2	
<ul style="list-style-type: none">Explain how animals exchange oxygen and carbon dioxide with the environment.Compare the different respiratory	



systems of animals.	
Chapter 6.3	
<ul style="list-style-type: none">Describe the two types of circulatory systems.Explain how closed circulatory systems differ among vertebrates.Compare how different animals get rid of wastes.	
Chapter 7.1	
<ul style="list-style-type: none">Compare asexual and sexual reproduction in invertebrates and vertebrates.Explain how internal fertilization and external fertilization differ.	
Chapter 7.2	
<ul style="list-style-type: none">Compare and contrast embryonic development.Describe life cycles, and care for young vertebrates and invertebrates.	
Chapter 7.3	
<ul style="list-style-type: none">Explain the causes of animal behavior.Describe instinct and the four kinds of learned behavior.	
Chapter 7.4	
<ul style="list-style-type: none">List the three ways animals communicate.Give examples of competitive and cooperative behavior.Describe cyclic behavior.	



Sequence of Teaching and Learning		
Number of Lessons / Blocks	Lesson Topic	Lesson Activities
1	1.1	Begin by reading <i>My Planet Diary</i> as a class. Students share ideas about how Kismet is similar to yet different from humans. Students will cite characteristics that indicate whether a wind-up toy is living or nonliving and discuss the evidence that the toy is alive. Complete the After the Inquiry Warm-Up worksheet to discuss which characteristic of the toy is most likely to make others believe it is living. Have volunteers share their answers to question 4.
1	1.2	Begin by reading <i>My Planet Diary</i> as a class. Have students share ideas about reasons scientists classify animals. Then have students do the Inquiry Warm-Up activity. Students will organize objects from a desk drawer. Discuss what sorts of objects were found in the desk drawer. The After the Inquiry Warm-Up worksheet sets up a discussion about the main purpose of grouping the items, regardless of your method of classification. Have volunteers share their answers to question 4 about why grouping these items by color or shape is less useful than grouping them by function.
1	1.3	Begin by reading <i>My Planet Diary</i> as a class. Have students share ideas about why there are so many different species of bees. Then have students do the Inquiry Warm-Up activity. Students will investigate how scientists organize living things into kingdoms. Discuss the shared characteristics students used to place two organisms in the same kingdom. The After the Inquiry Warm-Up worksheet sets up a discussion about the criteria involved in a specific classification of an organism. Have volunteers share their answers to question 4 about whether or not all observations needed to classify organisms can be made in a minute or two with the unaided eye.
1	1.4	Begin by reading <i>My Planet Diary</i> as a class. Have students share ideas about what they know about a platypus. Then have students do the Inquiry Warm-Up activity. Students will investigate the connection between skeletal structures and evolutionary relationships. Discuss the similarities between the three skeletal structures. The After the Inquiry Warm-Up worksheet sets up a discussion about which animals are more



		closely related based on their skeletons. Have volunteers share their answers to question 4 about how a plant's X-ray would compare to the X-rays of these skeletal systems.
1	2.1	Begin by reading My Planet Diary as a class. Have students discuss rabies and its physical symptoms. Then have students do the Inquiry Warm-Up activity. Students will visualize the relationship between interlocking parts in anticipation of reading about a virus's protein coat and its host cell. The After the Inquiry Warm-Up worksheet sets up a discussion about the concept of lock and key and how it could be incorporated into mechanisms in living things. Have volunteers share their answers to question 4 telling how a cell can protect itself from invading organisms.
1	2.2	Begin by reading My Planet Diary as a class. Have students discuss foods that are made with bacteria that keep our bodies healthy. Then have students do the Inquiry Warm-Up activity. Students will model the rapid multiplication of bacterial cells. The After the Inquiry Warm-Up worksheet sets up a discussion about how quickly bacteria can reproduce. Have volunteers share their answers to question 4 whether they think there are more people or more bacteria on Earth.
1.5	2.3	Begin by reading My Planet Diary as a class. Have students discuss the method by which malaria is spread. Then have students do the Inquiry Warm-Up activity. Students will draw organisms they observe in a drop of pond water under a microscope. The After the Inquiry Warm-Up worksheet sets up a discussion about microscopic organisms in a drop of pond water. Have volunteers share their answers to question 4 telling why it was necessary to wash their hands at the end of the lab.
1	2.4	Begin by reading My Planet Diary as a class. Have students discuss how leafcutter ants and the fungus benefit from their relationship. Then have students do the Inquiry Warm-Up activity. Students will examine the structure of a mushroom. The After the Inquiry Warm-Up worksheet sets up a discussion about the structure of a mushroom. Have volunteers share their answers to question 4 explaining why they think the gills were given their name.



1	3.1	Begin by reading My Planet Diary as a class. Have students discuss a plant project they would like to do at school. Then have students do the Inquiry Warm-Up activity. Students will observe leaves from plants growing in two different environments and infer the growing place of each plant based on leaf thickness. The After the Inquiry Warm-Up worksheet sets up a discussion about how leaf thickness, texture, and size may be used to make an inference about a plant's environment. Have volunteers share their answers to question 4, suggesting a question to ask to determine if a leaf is from a plant native to a desert environment.
1	3.2	Begin by reading My Planet Diary as a class. Have students discuss using moss instead of grass for lawns. Then have students do the Inquiry Warm-Up activity. Students will predict whether peat moss or sand absorbs more water and then test their prediction. The After the Inquiry Warm-Up worksheet sets up a discussion about whether peat moss or sand can better absorb water. Have volunteers share their answers to question 4 about what would happen to moss if it were transplanted to a desert area.
1	3.3	Begin by reading My Planet Diary as a class. Have students discuss why the aroid plant has such big leaves. Then have students do the Inquiry Warm-Up activity. Students will observe common food items and identify them as roots, stems, or leaves. The After the Inquiry Warm-Up worksheet sets up a discussion about roots, stems, and leaves. Have volunteers share their answers to question 4, explaining which part of the plant is least likely to have a lot of sugars and starches.
1	3.4	Begin by reading My Planet Diary as a class. Have students discuss what can be learned from a 5,000-year-old tree. Then have students do the Inquiry Warm-Up activity. Students will model how pollen grains attach to the stigma in flowering plants. The After the Inquiry Warm-Up worksheet sets up a discussion about the how in vascular plants a sticky substance made by the ovule helps pollen grains attach to the stigma. Have volunteers share their answers to question 4, explaining



		whether or not they think a sticky stigma is an adaptation that helps a plant to reproduce.
1.5	3.5	Begin by reading My Planet Diary as a class. Have students discuss the challenges to overcome when trying to get plants to succeed in a new area. Then have students do the Inquiry Warm-Up activity. Students will determine the responses to touch in various plants and infer an advantage to the plant. The After the Inquiry Warm-Up worksheet sets up a discussion about how two different types of plants respond to being touched. Have volunteers share their answers to question 4, comparing how quickly the Venus flytrap moved in response to the touch of the pencil with how quickly a houseplant on a window sill moves in response to sunlight.
1	3.6	Begin by reading My Planet Diary as a class. Have students identify plants that are important in their everyday lives. Then have students do the Inquiry Warm-Up activity. Students will simulate the distribution of food among the world's population, make observations about how they and others feel, and predict the impact of an increase in global population on the world's food supply. The After the Inquiry Warm-Up worksheet sets up a discussion about the impact of an increase in global population on the world's food supply. Have volunteers share their answers to question 4 regarding the amount of food received by a poor country compared to the amount of food received by a wealthy country.
1	4.1	Begin by reading My Planet Diary as a class. Have students share ideas about how they think scientists discover new things. Then have students do the Inquiry Warm-Up activity. Students will determine if organisms are animals based on their observations. Discuss the characteristics students observed about the organisms. The After the Inquiry Warm-Up worksheet sets up a discussion about what one question people could ask to determine if an organism is an animal. Have volunteers share their answers to question 4 about a trait that they thought was characteristic to all animals but is not.



1	4.2	Begin by reading My Planet Diary as a class. Have students share ideas about why scientists study animals. Then have students do the Inquiry Warm-Up activity. Students will investigate symmetry and identify animals with each type of body plan symmetry. Discuss the two types of symmetry students discovered while folding paper. The After the Inquiry Warm-Up worksheet sets up a discussion about the symmetry of a human compared to the symmetry of a jellyfish and a horse. Have volunteers share their answers to question 4 about what question a person could ask if they wanted to classify organisms according to body plan symmetry.
1	4.3	Begin by reading My Planet Diary as a class. Have students share ideas about how animals defend themselves. Then have students do the Inquiry Warm-Up activity. Students will compare natural and synthetic sponges. Discuss the function of pores in a sponge. The After the Inquiry Warm-Up worksheet sets up a discussion about what a sponge gets from the water. Have volunteers share their answers to question 4 about why sponges are adapted to take in large amounts of water.
1	4.4	Begin by reading My Planet Diary as a class. Have students share ideas about adaptations other animals have that help them survive in their environments. Then have students do the Inquiry Warm-Up activity. Students will investigate how an umbrella is like a skeleton. Discuss how the ribs of an umbrella compare to the exoskeleton of an arthropod. The After the Inquiry Warm-Up worksheet sets up a discussion about the characteristics of umbrella ribs and human ribs. Have volunteers share their answers to question 4 about the functions of the human rib cage.
1	4.5	Begin by reading My Planet Diary as a class. Have students share ideas about different ways humans use their bodies to communicate. Then have students do the Inquiry Warm-Up activity. Students will explore vertebrates. Discuss the ways vertebrates can be classified. The After the Inquiry Warm-Up worksheet sets up a discussion about how user friendly and all-encompassing each group's classification system was. Have volunteers share their answers to question 4 about why it is difficult to set up a classification system.



1	5.1	Begin by reading My Planet Diary as a class. Have students share ideas about how various types of felines capture prey or escape predators. Then have students do the Inquiry Warm-Up activity. Students will investigate some of the necessary characteristics of an exoskeleton. Discuss how your movement would be affected if your leg were covered in cardboard. The After the Inquiry Warm-Up worksheet sets up a discussion about the differences between an endoskeleton and an exoskeleton. Have volunteers share their answers to question 4 about the parts of the endoskeleton that do protect soft tissues and organs.
1.5	5.2	Begin by reading My Planet Diary as a class. Have students share ideas about whom the discovery of nAG could benefit in the future. Then have students do the Inquiry Warm-Up activity. Students will model how a signal is transmitted through the nervous system. Discuss the form the message took as it moved from the key to the light bulb. The After the Inquiry Warm-Up worksheet sets up a discussion about what would happen if a person's spinal cord was injured. Have volunteers share their answers to question 4 about where in the body stimulus messages and response messages come from.
1.5	5.3	Begin by reading My Planet Diary as a class. Have students share ideas about how their perspective would change if they could fly. Then have students do the Inquiry Warm-Up activity. Students will observe the movements of a hydra. Discuss what students observed about the hydra before and after they touched it with a toothpick. The After the Inquiry Warm-Up worksheet sets up a discussion about stimuli and responses. Have volunteers share their answers to question 4 about what would happen if a tiny water animal touched a hydra.
1.5	6.1	Begin by reading My Planet Diary as a class. Have students discuss how owls obtain food and what kinds of foods they eat. Then have students do the Inquiry Warm-Up activity. Students will use a sock and an orange to model a snake feeding. The After the Inquiry Warm-Up worksheet sets up a discussion about a feeding adaptation that some snake species have but lizards do not have. Have volunteers share



		their answers to question 4, telling which animal will take longer to digest a meal, a snake or a lizard.
1	6.2	Begin by reading My Planet Diary as a class. Have students discuss how most fish get the oxygen they need. Then have students do the Inquiry Warm-Up activity. Students will observe fish and how their gills work. The After the Inquiry Warm-Up worksheet sets up a discussion about the natural behavior of a fish, particularly how it uses its gills. Have volunteers share their answers to question 4, explaining their hypothesis and the experiments designed to test them.
1	6.3	Begin by reading My Planet Diary as a class. Have students discuss the heart's role in circulation. Then have students do the Inquiry Warm-Up activity. Students will model the one-loop circulatory system found in fishes and the exchange of gases in a fish's body. The After the Inquiry Warm-Up worksheet sets up a discussion about the exchange of gases in a fish's body. Have volunteers share their answers to question 4, telling from where the fish's gills get oxygen.
1	7.1	Begin by reading My Planet Diary as a class. Have students share ideas about things they have learned from their own experiments and others' experiments. Then have students do the Inquiry Warm-Up activity. Students will investigate two methods of reproduction. Discuss the difference in the amount of beans put down by Team A and B. The After the Inquiry Warm-Up worksheet sets up a discussion about the number of beans Team B would produce if the experiment went on for five minutes. Have volunteers share their answers to question 4.
1	7.2	Begin by reading My Planet Diary as a class. Have students share ideas about why it is important for some animals to find a mate. Then have students do the Inquiry Warm-Up activity. Students will observe an egg and discuss its various parts. The After the Inquiry Warm-Up worksheet sets up a discussion about the functions of the parts of a chicken egg. Have volunteers share their answers to question 4 about how a chicken egg and a human embryo are alike and different.
1	7.3	Begin by reading My Planet Diary as a class. Have students share ideas about training pets. Then have students do the Inquiry Warm-Up activity. Students will observe behaviors of



		<p>small vertebrates. Discuss the way an animal's nervous system functions. The After the Inquiry Warm-Up worksheet sets up a discussion about what things could impact the animal's natural behavior. Have volunteers share their answers to question 4 about how students think the animal's behavior might be different if you observed it in the wild.</p>
1	7.4	<p>Begin by reading My Planet Diary as a class. Have students share ideas about sign language as a means of communication. Then have students do the Inquiry Warm-Up activity. Students will communicate without words. Discuss the ways people communicate a wide range of emotions. The After the Inquiry Warm-Up worksheet sets up a discussion about which senses are used and not used to communicate. Have volunteers share their answers to question 4 about other animals that use different senses than humans do to communicate.</p>



Unit Title	Ecology and the Environment
Unit Description	Living things interact with each other and their environment. There are outcomes and consequences from these interactions.
Essential Questions & Enduring Understandings	C1: How do living things affect one another? C2: How do energy and matter move through ecosystems? C3: How do people use Earth's resources? C4: What can people do to use resources wisely? C5: What are some of Earth's energy resources?

Core Standards	Assessment Anchors
DCI-MS-LS2.A.4	S8.A.1
DCI-MS-ESS1.A.1	S8.A.2
DCI-MS-ESS2.C.1	S8.A.3
DCI-MS-ESS3.C.1	S8.B.1
DCI-MS-ESS3.C.2	S8.B.2
DCI-MS-ETS1.B.1	
DCI-MS-ETS1.B.2	
DCI-MS-ETS1.B.3	
DCI-MS-ETS1.B.4	
DCI-MS-LS1.A.1	
DCI-MS-LS1.D.1	
DCI-MS-LS2.A.1	
DCI-MS-LS2.A.2	
DCI-MS-LS2.A.3	
DCI-MS-LS2.A.4	
DCI-MS-LS2.B.1	
DCI-MS-LS2.C.1	
DCI-MS-LS2.C.2	
DCI-MS-LS4.B.2	
DCI-MS-LS4.C.1	
DCI-MS-LS4.D.1	
PE-MS-ESS1-1	
PE-MS-ESS2-2	
PE-MS-ESS3-4	
PE-MS-ETS1-2	
PE-MS-ETS1-3	
PE-MS-ETS1-4	
PE-MS-LS1-1	
PE-MS-LS1-4	
PE-MS-LS1-5	



PE-MS-LS1-8 PE-MS-LS2-1 PE-MS-LS2-2 PE-MS-LS2-3 PE-MS-LS2-4 PE-MS-LS2-5 PE-MS-LS4-4 PE-MS-LS4-6 PE-MS-PS1-6 PE-MS-PS3-3	
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Key Unit Vocabulary	<p>Chapter 1: <i>organism habitat, biotic, factor, abiotic factor, species, population, community, ecosystem, ecology, birth rate, death rate, immigration emigration, population density, limiting factor, carrying capacity, natural selection, adaptation, niche, competition, predation, predator, prey, symbiosis, mutualism, commensalism, parasitism, parasite, host, succession, primary succession, pioneer species, secondary succession</i></p> <p>Chapter 2: <i>producer, consumer, herbivore, carnivore, omnivore, scavenger, decomposer, food chain, food web, energy pyramid, evaporation, condensation, precipitation, nitrogen fixation, biome, climate, desert, rain forest, emergent layer, canopy, understory, grassland, savanna, deciduous tree, boreal forest, coniferous tree, tundra, permafrost, estuary, intertidal zone, neritic zone, biogeography, continental drift, dispersal, exotic species</i></p> <p>Chapter 3 <i>natural resource pollution point source, nonpoint source, environmental science, renewable resource, nonrenewable resource, sustainable use, ecological footprint, conservation, exponential growth clear-cutting, selective cutting, sustainable yield, fishery, aquaculture, biodiversity, keystone species, gene, extinction, endangered species, threatened species, habitat destruction, habitat fragmentation, poaching, captive breeding</i></p> <p>Chapter 4: <i>litter, topsoil, subsoil, bedrock, erosion, nutrient depletion, fertilizer, desertification, drought, land reclamation, municipal solid waste, incineration, pollutant, leachate, sanitary landfill, recycling, biodegradable, hazardous waste, emissions, photochemical smog, ozone, temperature inversion, acid rain,</i></p>
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	<p><i>radon, ozone layer, chlorofluorocarbon, groundwater, pesticide, sewage, sediment, nodule, upwelling</i></p> <p>Chapter 5: <i>fuel, fossil fuel, hydrocarbon, petroleum, refinery, petrochemical, solar energy, hydroelectric power, biomass fuel, gasohol, geothermal energy, nuclear fission, reactor vessel, fuel rod, control rod, efficiency, insulation, energy conservation</i></p>
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Learning Objectives – <i>The student will...</i>	Assessment Opportunities
Chapter 1.1	
<ul style="list-style-type: none"> ▪ Identify the needs that must be met by an organism's surroundings. ▪ Identify biotic and abiotic parts of a habitat. ▪ Describe the levels of organization within an ecosystem. 	labs, formative/summative quizzes and tests apply to all Lessons and Chapters
Chapter 1.2	
<ul style="list-style-type: none"> ▪ Describe how populations change in size. ▪ Identify the factors that limit population growth. 	
Chapter 1.3	
<ul style="list-style-type: none"> ▪ Explain how adaptations help an organism survive. ▪ Describe competition and predation. ▪ Identify the three types of symbiosis. 	
Chapter 1.4	
<ul style="list-style-type: none"> ▪ Explain the difference between primary and secondary succession. 	
Chapter 2.1	
<ul style="list-style-type: none"> ▪ Name and describe energy roles that organisms play in an ecosystem. ▪ Explain how energy moves through an ecosystem. 	



Chapter 2.2	
<ul style="list-style-type: none">▪ Name and describe processes involved in the water cycle.▪ Explain how the carbon and oxygen cycles are related.▪ Define and describe the nitrogen cycle.	
Chapter 2.3	
<ul style="list-style-type: none">▪ Name the six major biomes found on Earth.	
Chapter 2.4	
<ul style="list-style-type: none">▪ Name and describe the two major types of aquatic ecosystems.	
Chapter 2.5	
<ul style="list-style-type: none">▪ Identify what factors affect species dispersal.	
Chapter 3.1	
<ul style="list-style-type: none">▪ Identify the general categories of environmental issues.▪ Describe how decision makers balance opposing needs and concerns.	
Chapter 3.2	
<ul style="list-style-type: none">▪ Explain what natural resources are and distinguish between renewable and nonrenewable resources.▪ Explain why natural resources are important.	
Chapter 3.3	
<ul style="list-style-type: none">▪ Explain how the human population has grown over time.▪ Identify factors that affect the rate of human population growth.	
Chapter 3.4	
<ul style="list-style-type: none">▪ Describe how forests can be managed as renewable resources.▪ Describe how fisheries can be managed for a sustainable yield.	



Chapter 3.5	
<ul style="list-style-type: none">▪ Explain the value of biodiversity.▪ Identify the factors that affect biodiversity.▪ Identify ways that human activity threatens and protects biodiversity.	
Chapter 4.1	
<ul style="list-style-type: none">▪ Explain how people use land.▪ Describe why soil management is important.	
Chapter 4.2	
<ul style="list-style-type: none">▪ Name three methods of solid waste disposal.▪ Identify ways people can help control the solid waste problem.▪ Explain how hazardous wastes can be safely disposed of.	
Chapter 4.3	
<ul style="list-style-type: none">▪ Identify the causes of indoor and outdoor air pollution.▪ Explain the importance of the ozone layer and how it has been damaged.▪ Explain the key to reducing air pollution.	
Chapter 4.4	
<ul style="list-style-type: none">▪ Explain why fresh water is a limited resource.▪ Identify the major sources of water pollution.▪ Describe how water pollution can be reduced.	
Chapter 4.5	
<ul style="list-style-type: none">▪ Identify the ocean's living and nonliving resources.▪ Identify sources of ocean pollution.	



Chapter 5.1	
<ul style="list-style-type: none"> ▪ Name the three major fossil fuels. ▪ Explain why fossil fuels are considered nonrenewable resources. 	
Chapter 5.2	
<ul style="list-style-type: none"> ▪ Identify and describe the various renewable sources of energy. ▪ Explain how a nuclear power plant produces electricity. 	
Chapter 5.3	
<ul style="list-style-type: none"> ▪ Explain how human energy use has changed over time. ▪ Name ways to ensure that there will be enough energy for the future. 	

Sequence of Teaching and Learning		
Number of Lessons / Blocks	Lesson Topic	Lesson Activities
1	1.1	Begin by reading My Planet Diary as a class. Have students share ideas about the mouse lemur population and identify what they know about habitats. Then do the Inquiry Warm-Up activity. Students will identify living and nonliving things in magazine pictures. Discuss the connections different students chose and how they decided to test the living thing's dependence. The After the Inquiry Warm-Up worksheet sets up a discussion about how living things also depend on other living things. Have volunteers share their answers to number 4 about the effect of different seasons.
1	1.2	Begin by reading My Planet Diary as a class. Have students share ideas and thoughts about this method of prairie dog population control. Then have students do the Inquiry Warm-Up activity. Students will use the process of estimation. Discuss the methods of estimation that different students chose and the accuracy of those methods. The After the Inquiry Warm-Up worksheet sets up a discussion about estimation of a population. Have volunteers share their answers to number 4 about the estimation of a tree



		population.
1	1.3	Begin by reading My Planet Diary as a class. Have students share ideas about predators such as trap-jaw ants. Then have students do the Inquiry Warm-Up activity. Students will learn how coloring can help camouflage an animal. The After the Inquiry Warm-Up worksheet sets up a discussion about successful and unsuccessful camouflaging. Have volunteers share their answers to number 4 about how the results of the lab might differ with real butterflies.
1.5	1.4	Begin by reading My Planet Diary as a class. Have students share ideas any experience they may have had or knowledge of prescribed fires. Then have students do the Inquiry Warm-Up activity. Students will investigate the order in which organisms move into a community. The After the Inquiry Warm-Up worksheet sets up a discussion about kinds of plants and animals living in the area. Have volunteers share their answers to number 4 about abiotic factors that will determine which species will survive.
1	2.1	Begin by reading My Planet Diary as a class. Have students share ideas about wild animals that live in their region and what they eat. Then have students do the Inquiry Warm-Up activity. Students will classify their own food and food sources. Discuss the categories different students chose and how they classified their food sources. The After the Inquiry Warm-Up worksheet sets up a discussion about common food sources. Have volunteers share their answers to number 4 about which foods come from multiple sources.
1	2.2	Begin by reading My Planet Diary as a class. Have students share their opinions about using animals to save human lives. Then have students do the Inquiry Warm-Up activity. Students will investigate their part in the water cycle. Discuss the formation of evaporation of water vapor and students' part in the process. The After the Inquiry Warm-Up worksheet sets up a discussion about students' part in a water cycle. Have volunteers share their answers to number 4 about other cycles students may be a part of.
1.5	2.3	Begin by reading My Planet Diary as a class. Have students share ideas about animals that live in their region whose



		habits change according to seasonal changes. Then have students do the Inquiry Warm-Up activity. Students will investigate the amount of rain that falls in four different regions. The After the Inquiry Warm-Up worksheet sets up a discussion about the amount of rain falling in different regions and its effect on organisms. Have volunteers share their graphs to number 4, a bar graph that includes the annual precipitation for their state.
1.5	2.4	Begin by reading My Planet Diary as a class. Have students share ideas about real-world connections, such as Alvin, to aquatic ecosystems. Then have students do the Inquiry Warm-Up activity. Students will investigate how an organism's structure helps it survive in its habitat. The After the Inquiry Warm-Up worksheet sets up a comparison of students' structures and those of a fish. Have volunteers share and compare their answers to number 4 to identify the many structures of a fish.
1.5	2.5	Begin by reading My Planet Diary as a class. Have students share ideas about animals that live in Australia and how they are unique. Then have students do the Inquiry Warm-Up activity. Students will investigate how seeds are transported. Discuss the different ways of dispersal of seed types. The After the Inquiry Warm-Up worksheet sets up a discussion about seed dispersal. Have volunteers share their answers to number 4 about disadvantages to seed dispersal.
1	3.1	Begin by reading My Planet Diary as a class. Have students share their ideas and feelings about nature. Discuss agreements and disagreements. Then have students do the Inquiry Warm-Up activity. Students will discuss pressing environmental issues and decision-making about these issues. Have students do the After the Inquiry Warm-Up worksheet. Have volunteers share their answers to number 4 about whether personal interest plays an important role in making decisions about the environment.
1	3.2	Begin by reading My Planet Diary as a class. Have students share ideas about protecting natural resources. Then have students do the Inquiry Warm-Up activity. Students will investigate some of the natural resources they use in the



		course of a day. Discuss how important each resource is. The After the Inquiry Warm-Up worksheet continues to investigate natural resource use. Have volunteers share their answers to 4 about steps that can be taken to use less electricity daily.
1	3.3	Begin by reading My Planet Diary as a class. Have students share ideas about the exponential nature of human population growth. Then have students do the Inquiry Warm-Up activity. Students will use tables of population growth to answer questions. Discuss the After the Inquiry Warm-Up worksheet and the mathematics required to solve number 4 about whether unchecked population growth is beneficial or harmful to a species.
1.5	3.4	Begin by reading My Planet Diary as a class. Have students share ideas about the destruction of forests. Then have students do the Inquiry Warm-Up activity. Students will investigate the decline of the Western Atlantic Bluefin Tuna and make a graph. Discuss the line graphs. The After the Inquiry Warm-Up worksheet uses prior knowledge and graphs to help students understand changes in a tuna population. Have volunteers share their answers to number 4 and discuss their conclusions based on graphs.
1.5	3.5	Begin by reading My Planet Diary as a class. Have students share ideas about how they could protect and encourage wildlife. Then have students do the Inquiry Warm-Up activity. Students will investigate the biodiversity of different ecosystems. Discuss the differences in relation to the ecosystems temperatures. The After the Inquiry Warm-Up worksheet compares diversities in different ecosystems and asks students to make inferences. Have volunteers share their answers to number 4. If there are two different points of view, ask students to defend each point of view.
1	4.1	Begin by reading My Planet Diary as a class. Have students share ideas about reasons to conserve land and soil. Then have students do the Inquiry Warm-Up activity. Students will learn how mining affects the land and what can be done to minimize its impact on the land. The After the Inquiry Warm-



		Up worksheet sets up a discussion about varying effects on the land of different methods of mining. Have volunteers share their answers to number 4 about the results of mining methods.
1	4.2	Begin by reading My Planet Diary as a class. Have students share ideas about what kinds of trash they produce and how to produce less. Have students do the Inquiry Warm-Up activity. They will classify trash to determine common types. The After the Inquiry Warm-Up worksheet sets up a discussion about common materials in household trash and recycling possibilities. Have volunteers share their answers to number 4 about how recycling cuts down on household trash.
1	4.3	Begin by reading My Planet Diary as a class. Have students share ideas about how they can raise awareness about reducing air pollution. Then have students do the Inquiry Warm-Up activity. Discuss how quickly and how far the scent spread. The After the Inquiry Warm-Up worksheet asks students to predict what happens if variables of the activity were changed. Have volunteers share their answers to number 4 about designing a new experiment to test other scents.
1.5	4.4	Begin by reading My Planet Diary as a class. Have students identify waterways in your area that are not safe for recreation or fishing. Then have students do the Inquiry Warm-Up activity. Students will investigate how pollutants in water affect the passage of light through the water. Have students do the After the Inquiry Warm-Up worksheet. Ask volunteers to share their observations to number 4 about the clarity of the mixture.
1	4.5	Begin by reading My Planet Diary as a class. Have students share ideas about how to restore healthy fish populations. Then do the Inquiry Warm-Up activity. Students will classify a variety of household products as derived from ocean resources or not. The After the Inquiry Warm-Up worksheet sets up a discussion about the potential effects of ocean pollution on the availability or price of foods and products that include ingredients from the ocean. Have volunteers share their answers to number 4 about how pollution in the ocean may affect availability and the price of ocean-sourced products.



1	5.1	Begin by reading My Planet Diary as a class. Have students share ideas about how an energy crisis could impact their lives. Then have students do the Inquiry Warm-Up activity. Students will investigate and identify organic remains in a chunk of coal. The After the Inquiry Warm-Up worksheet sets up a discussion about the characteristics of coal which are developed during the formation process. Have volunteers share their answers to number 4 about how the layers of coal were formed.
1.5	5.2	Begin by reading My Planet Diary as a class. Have students share ideas about fossil fuels as sources of energy and identify alternative sources of energy. Then have students do the Inquiry Warm-Up activity. Students will use water to capture energy from sunlight and monitor temperature changes. The After the Inquiry Warm-Up worksheet sets up a discussion about why certain areas are better than others for capturing solar energy. Have volunteers share their answers to number 4 about the temperature changes that occur when the water is exposed to sunlight for longer lengths of time.
1	5.3	Begin by reading My Planet Diary as a class. Have students share what they know about various forms of insulation. Then have students do the Inquiry Warm-Up activity. Students will compare the efficiency of incandescent and fluorescent light bulbs. Discuss the characteristics of each type of light bulb. The After the Inquiry Warm-Up worksheet sets up a discussion about the benefits of using fluorescent light bulbs. Have volunteers share their answers to number 4 about the brightness of fluorescent and incandescent light bulbs.