Life Science – Grade 4
Standard 1

Standard: 1. Classify plants and animals according to the physical characteristics that they share
Essential Guiding Question: How do we group organisms?
Focus Questions: What is an organism? What are vertebrates and invertebrates? How do organisms behave differently according to their kingdom, class, and species?

Learning Expectations and Course Specific Goals	**Instructional Strategies**	**Assessment Techniques**	**Materials, Supplies and Resources**	**Pacing Guide**
Students will think more deeply about differences between groups and what those differences mean to the lives of the organisms in those groups. Students will understand what an organism is.	Students will review sorting and classification Guided Inquiry and Discussion Read Text Project Life Field Lesson Brainstorm and Chart Characteristics of Vertebrate Groups Observe and Classify Plant and Animal Materials (Project Life)	Assessments text p 2, 15, 16 Chapter Assessment 9-10 or 11-12	Project Life Materials Text: A36-A53, A8-A14	September - October

Life Science – Grade 4
Standard 2

Standard: 2. Identify the structures in plants (leaves, roots, flowers, stem, bark, wood) that are responsible for food production, support, water transport, reproduction, growth, and protection
Essential Guiding Question: How do structures differ in different types of plants?
Focus Questions: What are the different ways that plants can reproduce? How do life cycles differ in different groups of plants?

Learning Expectations and Course Specific Goals	**Instructional Strategies**	**Assessment Techniques**	**Materials, Supplies and Resources**	**Pacing Guide**
Students will acquire deeper and more specific knowledge about plant structures by considering the differences between plants that die in one season and plants that don't Students will recognize the difference between evergreen and deciduous trees Students will learn the parts of a flower and of a seed	Review Plant Concepts Learn Parts of Flowers Write Non-Fictional Paragraphs Germinate Seeds Dissect Flower Examine Project Life Plant Materials Observe Plant/Pollinator Interaction and Seed Dispersal Method Study Maple Trees Go Maple Sugaring Identify Maple Tree Structures and Functions	Journal Writing Teacher Observations (flower pot projects with labels) Assessment pp 4, 5, 5 Chapter Assessment 10 or 11-12 Create Detailed Drawing of a Plant Identify and Label Major Structures (i.e., leaves, flowers, stems, roots, seeds) Describe the function of each structure	Project Life Plants Flower Pots Seeds	September-October

Life Science – Grade 4
Standard 3 & 4

Standard: 3. Recognize that plants and animals go through predictable life cycles that include birth, growth, development, reproduction, and death **4.** Describe the major stages that characterize the life cycle of the frog and butterfly as they go through metamorphosis
Essential Guiding Question: What changes do plants and animals go through between the time they're born and the time they die?
Focus Questions: What is metamorphosis? What animals go through metamorphosis? What are the stages of metamorphosis in butterflies and in frogs? What kind of changes do other insects go through? How is this different from direct development?

Learning Expectations and Course Specific Goals	**Instructional Strategies**	**Assessment Techniques**	**Materials, Supplies and Resources**	**Pacing Guide**
Students will understand that organisms go through stages Students will recognize that some organisms completely change form during their lifetime, while other organisms change only in minor ways Students will understand that butterflies and frogs are common organisms used to study metamorphosis, but that they are not the only organisms that undergo metamorphosis	Guided Inquiry and Discussion Posters Hatch butterflies Examine Life Cycle of Gypsy Moth (Project Life) Diagram Life Cycle	Assessment p6. Chapter Assessments 9-10 or 11-12 Project Life Assessment p.16 Design and Construct a Habitat for a small animal T/E 1.1, 1.2, 2.1	Text A26-31, p.A47 Project Life	September-October

Life Science – Grade 4
Standard 5

Standard: 5. Differentiate between observed characteristics of plants and animals that are fully inherited (e.g., color of flower, shape of leaves, color of eyes, number of appendages) and characteristics that are affected by the climate or environment (e.g., browning of leaves due to too much sun, language spoken)
Essential Guiding Question: Why do plants and animals look and behave certain ways? How did they get to be that way?
Focus Questions: How can I tell the difference between a characteristic that all the members of a species have and a characteristic that occurred because of an unexpected change in that organism's life? What are abiotic factors? How do they affect organisms?

Learning Expectations and Course Specific Goals	**Instructional Strategies**	**Assessment Techniques**	**Materials, Supplies and Resources**	**Pacing Guide**
Students will be introduced to information regarding inherited vs. environmental characteristics Students will realize that all environmental factors, whether they are temporary or permanent affect the organisms that live in that environment	Students Share Pictures (of self and family members) Noting Similarities and Inherited Traits Discussion Construct Frequency Tables of the Number of Students with Inherited Physical Traits	Assessment p.41, 17	Text pA8-A14, A54-A58, A118-A121	September-October

Life Science – Grade 4
Standard 6

Standard: 6. Give examples of how inherited characteristics may change over time as adaptations to changes in the environment that enable organisms to survive, e.g., shape of beak or feet, placement of eyes on head, length of neck, shape of teeth color
Essential Guiding Question: How did different species come to be different over time?
Focus Questions: How do an organism's characteristics help it survive? How do an animal's characteristics help it to get food? Help it avoid being eaten? What characteristics help plants survive in different environments?

Learning Expectations and Course Specific Goals	**Instructional Strategies**	**Assessment Techniques**	**Materials, Supplies and Resources**	**Pacing Guide**
Students will begin to understand about the effect of abiotic factors on organisms over time	Review the Concept of Adaptation Examine Project Life Plant and Animal Materials to Identify Adaptations Infer Long-Term Effect of Particular Adaptations Adaptation Tag Game Illustrate Imaginary Animal and Describe its Adaptations Compare and Contrast the Physical Characteristics of Plants or Animals from Widely Different Environments (e.g., desert vs. tropical plants, aquatic vs. terrestrial animals) Explore how each Adapted to its Environment	Lesson Assessments p.39	Project Life Text A980A101	September-October

Life Science – Grade 4
Standard 7

Standard: 7. Give examples of how changes in the environment (drought, cold) have caused some plants and animals to die or move to new locations (migration)
Essential Guiding Question: What causes certain groups of animals to move back and forth between environments?
Focus Questions: What animal migrations do we experience here in the Cape Cod environment? How do animals know when it is time to change locations? What happens to the pattern of migrations when the climate changes?

Learning Expectations and Course Specific Goals	**Instructional Strategies**	**Assessment Techniques**	**Materials, Supplies and Resources**	**Pacing Guide**
Students will understand that some species adapt to seasonal changes by moving to a different climate and move back again Students will understand that when an environment changes, organisms will adapt, move, or die	Guided Inquiry and Discussion Read text Observe Adaptation of Woodland Plants and Animals Simulate how Changing a Habitat Affects Migration Students will be Introduced to Journey North in Lab	Assessment p41, 42	Project Life Text pA114-A121	September-October

Life Science – Grade 4
Standard 9

Standard: 9. Recognize plant behaviors, such as the way seedlings' stems grow toward light and their roots grow downward in response to gravity. Recognize that many plants and animals can survive harsh environments because of seasonal behaviors, e.g., in winter, some trees shed leaves, some animals hibernate, and other animals migrate
Essential Guiding Question: How do plants and animals respond to non-living favors in the environment?
Focus Questions: How does light and gravity affect plants? What adaptations to plants and animals have to survive heat or cold?

Learning Expectations and Course Specific Goals	**Instructional Strategies**	**Assessment Techniques**	**Materials, Supplies and Resources**	**Pacing Guide**
Students will recognize that gravity affects plant growth and that plants grow toward light. Students understand that in order to survive winter plants and animals may need to slow down their life processes or move.	Guided Inquiry and Discussion Create Plant Maze Observe Plant Growth Observe Trees Shedding Leaves	Assessment p28	Text pA27, pA74-76	September-October

Life Science – Grade 4
Standard 11

Standard: 11. Describe how energy derived from the sun is used by plants to produce sugars (photosynthesis) and is transferred within a food chain from producers (plants) to consumers to decomposers
Essential Guiding Question: Where does the energy on this planet come from and how does it move through the food chain?
Focus Questions: Where does the food chain start? What is a producer? What is a consumer? What is a decomposer? What happens when a food chain gets out of balance?

Learning Expectations and Course Specific Goals	**Instructional Strategies**	**Assessment Techniques**	**Materials, Supplies and Resources**	**Pacing Guide**
Students will understand that life on this planet cannot exist without energy from the sun Students will explain that there is a tiny fraction of organisms which derive energy from chemicals in the food chain as we know it is based on photosynthesis Students will demonstrate that animals cannot survive without plants Students will explain that plants provide oxygen and food in the form of sugars Students will demonstrate that dead organisms need to be broken down in order that the molecules built with energy from the sun, water, and carbon dioxide can be returned to the cycle	Guided Inquiry and Discussion Illustrate and Describe Food Chain of Woodland Organisms	Project Life Assessment Text Assessments p28, p29	Project Life Text pA74-A85	September-October

Earth Science – Grade 4
Standard 4

Standard: **4.** Explain and give examples of the ways in which soil is formed (the weathering of rock by water and wind and from the decomposition of plant and animal remains)
Essential Guiding Question: What is soil?
Focus Questions: What different parts make up soil? Why is soil important? How is soil formed?

Learning Expectations and Course Specific Goals	**Instructional Strategies**	**Assessment Techniques**	**Materials, Supplies and Resources**	**Pacing Guide**
Students will understand that soil is from out of particles of weathered rock and also by molecules left from decomposed bodies of plants and animals Students will learn that what is in soil affects what can grow from it	Experimentation with Soil Discussion Textbook	Journal Entry ORQ Teacher Observation	Soil Samples Tweezers	November – mid-January

Earth Science – Grade 4
Standard 6

Standard: **6.** Explain how air temperature, moisture, wind speed and direction, and precipitation make up the weather in a particular place and time
Essential Guiding Question: What is weather?
Focus Questions: What is temperature? What is moisture? What is precipitation?

Learning Expectations and Course Specific Goals	**Instructional Strategies**	**Assessment Techniques**	**Materials, Supplies and Resources**	**Pacing Guide**
Students will review learning from prior grade about the aspects of weather Students will learn ways such as barometers and anemometers that measure different aspects of weather Students will learn to think of weather as a combination of factors	Access Prior Knowledge Guided Discussion Experiment Create and Experiment with Weather Instruments. Quick Write Activity Experiment with Sand and Water Read & Discuss C8-C10 re: Uneven Heating Make and Use Weather Instruments	Lesson 1 and 2 Assessments p.109-110 Product-Based Assessments ORQ/ME Assessments	"Reading Street" Unit 3 Week 4, Background – Building CD2, Track 4	November – mid–January

Earth Science – Grade 4
Standard 9

Standard: **9.** Differentiate between weather and climate
Essential Guiding Question: What is the difference between weather and climate?
Focus Questions: What is weather? What is climate?

Learning Expectations and Course Specific Goals	**Instructional Strategies**	**Assessment Techniques**	**Materials, Supplies and Resources**	**Pacing Guide**
Students will understand that while weather is the overall affect of air temperature, humidity, wind speed, wind direction, and precipitation on any given day, climate is the pattern of weather established over many years Unusual weather events can have an impact on organisms in environments and make changes in abiotic parts of the environment Changes in climate may alter the way an entire food chain functions	Introduce & Explore Guided Practice Independent Practice Test Assess Prior Knowledge through Quick Write Read and Discuss Texts Partners/Groups Create Concept Maps Climate Zone Flip Books	Concept Map	Harcourt – Horizons Social Studies Text p.44-48 "Reading Street" Unit 5, Week 4 Selections Background – Building CD #3, track 4	November – mid-January

Earth Science – Grade 4
Standard 10

Standard: **10.** Describe how water on earth cycles in different forms and in different locations, including underground and in the atmosphere (review)
Essential Guiding Question: What is the water cycle?
Focus Questions: What are the locations on this planet where we can find water? Is it only in bodies of water like lakes or oceans? What are the parts of its cycle?

Learning Expectations and Course Specific Goals	**Instructional Strategies**	**Assessment Techniques**	**Materials, Supplies and Resources**	**Pacing Guide**
Review Prior Knowledge Review solid, liquid, gas change in physical state due to heat	Read and Discuss C22-C29 Diagram Water Cycle Videos Read and Discuss Text Pages Illustrate and describe water cycle Make *Cloud in a Jar*	Product-Based Assessment ORQ Assessment	"Reading Street" Unit 3, Week 4	November – mid-January

Earth Science – Grade 4
Standard 12

Standard: **12.** Give examples of how the surface of the earth changes due to slow processes such as erosion and weathering, and rapid processes such as landslides, volcanic eruptions, and earthquakes
Essential Guiding Question: How does the surface of the earth change?
Focus Questions: What is erosion? What is weathering? What causes them? What causes landslides? What are tectonic plates?

Learning Expectations and Course Specific Goals	**Instructional Strategies**	**Assessment Techniques**	**Materials, Supplies and Resources**	**Pacing Guide**
Students will understand that the surface of the earth changes Students will be able to explain weathering and erosion Students will understand the causes of volcanoes and earthquakes	Introduce and Explore Guided Practice Field Study Text Introduce Lesson with Demonstration of Erosion Read and Discuss Text Field Study (of school grounds to look for evidence of rocks cracking) Explore activity C36, Making Model of Movement of Molten Rock Read C36-41 Model of Volcano and Earthquake (optional)	Unit Test	"Reading Street" unit 1, week 4 S.1	November – mid-January

Earth Science – Grade 4
Standard 13

Standard: **13.** Recognize that the earth is part of a system called the "solar system" that includes the sun (a star), planets, and many moons. The earth is the third planet from the sun in our solar system (preview)
Essential Guiding Question: What is a solar system?
Focus Questions: What is a sun? What is a planet? What is an orbit?

Learning Expectations and Course Specific Goals	**Instructional Strategies**	**Assessment Techniques**	**Materials, Supplies and Resources**	**Pacing Guide**
Preview Basic Concepts of a Central Sun and Orbiting Planets	Activate and Access Prior Knowledge Guided Practice Independent Practice Text Graphic Organizers (what you know about earth and other planets) Read C108-113 Make Posters (planets in order of orbits and facts within planet shape)	Posters Lesson Assessment p.147	"Reading Street" p.738 "Reading Street" Unit 6, Week 5 Background – Building CD3, track 10	November – mid-January

Earth Science – Grade 4
Standard 14

Standard: **14.** Recognize that the earth revolves around (orbits) the sun in a year's time and that the earth rotates on its axis once approximately every 24 hours. Make connections between the rotation of the earth and day/night, and the apparent movement of the sun, moon, and stars across the sky (preview)
Essential Guiding Question: What is the difference between rotation and revolution?
Focus Questions: What is rotation? What is a revolution? What does orbiting mean?

Learning Expectations and Course Specific Goals	**Instructional Strategies**	**Assessment Techniques**	**Materials, Supplies and Resources**	**Pacing Guide**
Preview Knowledge of Solar System	Introduce and Explore Guided Practice Independent Practice Text Explore Seasons Demonstrate Movement of Earth around Sun Predict Temperatures	Lesson Assessment p.145	Instructional Resources p.101 "Reading Street" Unit 3, Week 1 Background – Building CD2, track 1 Activities – read C98-101 Address Misconceptions p.C100 Text and Leveled Readers Foam ball, pencil, flashlight	November – mid-January

Physical Science – Grade 4
Standard 1

Standard: 1. Sort objects by observable properties such as size, shape, color, weight, and texture
Essential Guiding Question: What are the ways that objects are sorted and classified?
Focus Questions: What are properties? What is the difference between properties of materials and properties of objects?

Learning Expectations and Course Specific Goals	Instructional Strategies	Assessment Techniques	Materials, Supplies and Resources	Pacing Guide
Students will be able to sort objects by shape, color, weight, and texture Students will consider what the affects of changes in shape, color, weight, and texture will be on an object	Sort Collections Compare and Contrast Objects by Properties	Teacher Observation Journal Entries	Text pp.B22-B29	March – mid-May

Physical Science Grade 4
Standard 2

Standard: 2. Identify objects and materials as solid, liquid, or gas. Recognize that solids have a definite shape and that liquids and gases take the shape of their container
Essential Guiding Question: What are the three stages of matter that are encountered everywhere?
Focus Questions: How does matter change from one state to another? How do the states differ? What are the properties of each state?

Learning Expectations and Course Specific Goals	Instructional Strategies	Assessment Techniques	Materials, Supplies and Resources	Pacing Guide
Students will understand that matter can change state and explain why Students will understand that gas is matter	Guided Inquiry and Discussion Read Text Discuss Examples of Solid, Liquid, and Gas Construct Chart Contrasting Properties Use Containers and Graduated Cylinders for Demonstration Use Balloons for Demonstration Make colloid (Dr. Seuss' Oobleck) and determine its physical state	Lesson Assignments p.55, 111 Teacher Observation Journal Entries	Text p. B9, B22-B25 Containers Cylinders Balloons	March – mid-May

Physical Science – Grade 4
Standard 4

Standard: 4. Identify the basic forms of energy (light, sound, heat, electrical, and magnetic). Recognize that energy is the ability to cause motion or create change
Essential Guiding Question: What is energy?
Focus Questions: What is the difference between energy and matter? What are forms of energy?

Learning Expectations and Course Specific Goals	Instructional Strategies	Assessment Techniques	Materials, Supplies and Resources	Pacing Guide
Preview deeper concepts such as the Law of Conservation of Energy Students will understand that energy is the ability to make something happen – sound, light, heat, motion	Guided Inquiry and Discussion Read Text Demonstrate Potential and Kinetic Energy with Small Pendulum Small Groups will Create Posters with Illustrations Displaying Examples of Energy	Assessment p.70. Activity Rubric p.T9	Transparency #6. Text p.B42-45, B64-71, B64-67 B68-71 Pendulum Poster Board	March – mid-May

Physical Science – Grade 4
Standard 6

Standard: 6. Recognize that electricity in circuits requires a complete loop through which an electrical current can pass, and that electricity can produce light, heat, and sound
Essential Guiding Question: What are the characteristics of electricity?
Focus Questions: Can electricity travel in a straight line? What work can electricity do? What generates electricity?

Learning Expectations and Course Specific Goals	Instructional Strategies	Assessment Techniques	Materials, Supplies and Resources	Pacing Guide
Students will understand that electricity requires a complete loop Students will understand that electricity is a form of energy that can transform into other kinds of energy Other kinds of energy can transform into electricity	Guided Inquiry and Discussion Read text Create series circuits Diagram circuits	Assessment p.81 Diagrams	Text p B66-B67 Batteries Bulbs Wires Bulb Holders	March – mid-May

Physical Science – Grade 4
Standard 7

Standard: 7. Identify and classify objects and materials that conduct electricity and objects and materials that are insulators of electricity
Essential Guiding Question: How do insulators and conductors affect the flow of electricity?
Focus Questions: What is an insulator? What is a conductor? Which materials will conduct and which will insulate? How does knowing about insulators and conductors allow us to use electricity safely?

Learning Expectations and Course Specific Goals	Instructional Strategies	Assessment Techniques	Materials, Supplies and Resources	Pacing Guide
Students will be able to predict which materials will conduct electricity and which will not Students will understand the safe use of electric means knowing about conductors and insulators	Guided Inquiry and Discussion Read text Test Certain Materials for Conduction	Assessment p.82	Text p.B68-B71	March – mid-May

Physical Science – Grade 4
Standard 9

Standard: 9. Recognize that magnets have poles that repel and attract each other
Essential Guiding Question: What is a magnetic pole?
Focus Questions: What is a magnet? What is a pole? What happens when like poles or unlike poles are put together?

Learning Expectations and Course Specific Goals	Instructional Strategies	Assessment Techniques	Materials, Supplies and Resources	Pacing Guide
Student will understand that magnets will have poles Students will demonstrate that like poles repel and opposite poles attract	Review Third Grade Concepts Guided Inquiry and Discussion Read text Experiment with Magnets Discuss Observations of Attraction and Repulsion Use Iron Filings to Experiment	Assessment p.83 Teacher observation. Journals	Text p. B74-B77 Foss Kit Investigation One Iron Filings Magnets	March – mid-May

Physical Science Grade 4
Standard 10

Standard: 10. Identify and classify objects and materials that a magnet will attract and objects and materials that a magnet will not attract
Essential Guiding Question: Which everyday objects will be attracted to a magnet and which will not?
Focus Questions: What general groups of objects are attracted or not attracted to magnets? Does distance matter? Are some magnets stronger than other magnets?

Learning Expectations and Course Specific Goals	Instructional Strategies	Assessment Techniques	Materials, Supplies and Resources	Pacing Guide
Students will be able to predict which common objects will be attracted to magnets and make generalizations	Guided Inquiry and Discussion Read text Predict and Experiment to Discover Materials that magnets attract Create Graphic Organizer	Assessment p.83	Text p B74-B77	March – mid-May

Physical Science – Grade 4
Standard 11

Standard: 11. Recognize that sound is produced by vibrating objects and requires a medium through which to travel. Relate the rate of vibration to the pitch of the sound
Essential Guiding Question: What are the characteristics of sound?
Focus Questions: What is sound? Can sound travel through space? Why or why not? What types of objects make high sounds? What types make low sounds? What is pitch? How is it different from volume?

Learning Expectations and Course Specific Goals	Instructional Strategies	Assessment Techniques	Materials, Supplies and Resources	Pacing Guide
Students will understand that sound is caused by vibrations of objects Students will understand that sound is a wave that needs to travel through matter	Guided Inquiry and Discussion Read Text Model Motion of Sound Waves with a "Slinky" Use tin can and string to make "phones"	Assessment p. 95 Teacher Observation Journal Entry	Text p B106-B113. B89C	March – mid-May

Physical Science – Grade 4
Standard 12

Standard: 12. Recognize that light travels in a straight line until it strikes an object or travels from one medium to another, and that light can be reflected, refracted, and absorbed
Essential Guiding Question: How is light related to what we see?
Focus Questions: What is light? How does light travel? What happens when it hits something? Can light be bent?

Learning Expectations and Course Specific Goals	Instructional Strategies	Assessment Techniques	Materials, Supplies and Resources	Pacing Guide
Students will understand that there is a relationship between sight and light Students will experience reflection, refraction, and absorption.	Guided Inquiry and Discussion Read Text Explore how Light Travels through Clear, Translucent, and Opaque Materials using Flashlights Demonstrate how Light	Assessment p.94	Text p. B92-B105. Lab manual p. 45-46 & p. T12 Clear, translucent, and opaque materials Flashlights Water	March – mid - May

	Bends			