

Simple Solutions

NextGen Science 3

Alignment with DCIs

Review standards K-2 are in red.

REVIEW STANDARDS LIFE SCIENCE

LS1.A: Structure and Function

- ✦ All organisms have external parts. Different animals use their body parts in different ways to see, hear, grasp objects, protect themselves, move from place to place, and seek, find, and take in food, water and air. Plants also have different parts (roots, stems, leaves, flowers, fruits) that help them survive and grow. (1-LS1-1)

– Lessons 8, 9, 11, 12

LS1.B: Growth and Development of Organisms

- ✦ Adult plants and animals can have young. In many kinds of animals, parents and the offspring themselves engage in behaviors that help the offspring to survive. (1-LS1-2)

– Lessons 17, 18

LS1.C: Organization for Matter and Energy Flow in Organisms

- ✦ All animals need food in order to live and grow. They obtain their food from plants or from other animals. Plants need water and light to live and grow. (K-LS1-1)

– Lessons 1, 2, 3, 4, 6, 14

LS1.D: Information Processing

- ✦ Animals have body parts that capture and convey different kinds of information needed for growth and survival. Animals respond to these inputs with behaviors that help them survive. Plants also respond to some external inputs. (1-LS1-1)

– Lesson 13

LS2.A: Interdependent Relationships in Ecosystems

- ✦ Plants depend on water and light to grow. (2-LS2-1)

– Lesson 6

- ✦ Plants depend on animals for pollination or to move their seeds around. (2-LS2-2)

– Lesson 16

LS4.D: Biodiversity and Humans

- ✦ There are many different kinds of living things in any area, and they exist in different places on land and in water. (2-LS4-1)

– Lesson 7

REVIEW STANDARDS EARTH AND SPACE SCIENCE

ESS1.A: The Universe and its Stars

- ✦ Patterns of the motion of the sun, moon, and stars in the sky can be observed, described, and predicted. (1-ESS1-1)
 - Lessons 57, 58

ESS1.B: Earth and the Solar System

- ✦ Seasonal patterns of sunrise and sunset can be observed, described, and predicted. (1-ESS1-2)
 - Lesson 59

ESS1.C: The History of Planet Earth

- ✦ Some events happen very quickly; others occur very slowly, over a time period much longer than one can observe. (2-ESS1-1)
 - Lessons 61, 62, 63

ESS2.A: Earth Materials and Systems

- ✦ Wind and water can change the shape of the land. (2-ESS2-1)
 - Lessons 62, 63

ESS2.B: Plate Tectonics and Large-Scale System Interactions

- ✦ Maps show where things are located. One can map the shapes and kinds of land and water in any area. (2-ESS2-2)
 - Lessons 64, 66

ESS2.C: The Roles of Water in Earth's Surface Processes

- ✦ Water is found in the ocean, rivers, lakes, and ponds. Water exists as solid ice and in liquid form. (2-ESS2-3)
 - Lesson 67

ESS2.E: Biogeology

- ✦ Plants and animals can change their environment. (K-ESS2-2)
 - Lesson 71

ESS3.A: Natural Resources

- ✦ Living things need water, air, and resources from the land, and they live in places that have the things they need. Humans use natural resources for everything they do. (K-ESS3-1)
 - Lesson 72

ESS3.C: Human Impacts on Earth Systems

- ✦ Things that people do to live comfortably can affect the world around them. But they can make choices that reduce their impacts on the land, water, air, and other living things. (K-ESS3-3)
 - Lessons 68, 69, 73, 74, 76

REVIEW STANDARDS PHYSICAL SCIENCE

PS1.A: Structure and Properties of Matter

- ✦ Different kinds of matter exist and many of them can be either solid or liquid, depending on temperature. Matter can be described and classified by its observable properties. (2-PS1-1)
 - Lesson 93
- ✦ Different properties are suited to different purposes. (2-PS1-2), (2-PS1-3)
 - Lesson 94
- ✦ A great variety of objects can be built up from a small set of pieces. (2-PS1-3)
 - Lesson 96

PS1.B: Chemical Reactions

- ✦ Heating or cooling a substance may cause changes that can be observed. Sometimes these changes are reversible, and sometimes they are not. (2-PS1-4)
 - Lesson 97

PS2.B: Types of Interactions

- ✦ When objects touch or collide, they push on one another and can change motion. (K-PS2-1)
 - Lesson 106

PS3.B: Conservation of Energy and Energy Transfer

- ✦ Sunlight warms Earth's surface. (K-PS3-1), (K-PS3-2)
 - Lesson 88

PS3.C: Relationship Between Energy and Forces

- ✦ A bigger push or pull makes things speed up or slow down more quickly. (secondary to K-PS2-1)
 - Lesson 98

PS4.A: Wave Properties

- ✦ Sound can make matter vibrate, and vibrating matter can make sound. (1-PS4-1)
 - Lesson 89

PS4.B: Electromagnetic Radiation

- ✦ Objects can be seen if light is available to illuminate them or if they give off their own light. (1-PS4-2)
 - Lesson 91
- ✦ Some materials allow light to pass through them, others allow only some light through and others block all the light and create a dark shadow on any surface beyond them, where the light cannot reach. Mirrors can be used to redirect a light beam. (Boundary: The idea that light travels from place to place is developed through experiences with light sources, mirrors, and shadows, but no attempt is made to discuss the speed of light.) (1-PS4-3)
 - Lesson 92

3-PS.2 MOTION AND STABILITY: FORCES AND INTERACTIONS

PS2.A: Forces and Motion

- ✦ Each force acts on one particular object and has both strength and a direction. An object at rest typically has multiple forces acting on it, but they add to give zero net force on the object. Forces that do not sum to zero can cause changes in the object's speed or direction of motion. (Boundary: Qualitative and conceptual, but not quantitative addition of forces are used at this level.) (3-PS2-1)
 - Lessons 99, 101, 102, 103
- ✦ The patterns of an object's motion in various situations can be observed and measured; when that past motion exhibits a regular pattern, future motion can be predicted from it. (Boundary: Technical terms, such as magnitude, velocity, momentum, and vector quantity, are not introduced at this level, but the concept that some quantities need both size and direction to be described is developed.) (3-PS2-2)
 - Lesson 104

PS2.B: Types of Interactions

- ✦ Objects in contact exert forces on each other. (3-PS2-1)
 - Lesson 107
- ✦ Electric, and magnetic forces between a pair of objects do not require that the objects be in contact. The sizes of the forces in each situation depend on the properties of the objects and their distances apart and, for forces between two magnets, on their orientation relative to each other. (3-PS2-3), (3-PS2-4)
 - Lesson 108

3-LS1 FROM MOLECULES TO ORGANISMS: STRUCTURES AND PROCESSES

LS1.B: Growth and Development of Organisms

- ✦ Reproduction is essential to the continued existence of every kind of organism. Plants and animals have unique and diverse life cycles. (3-LS1-1)
 - Lessons 19, 21, 22, 23, 24, 26

3-LS2 ECOSYSTEMS: INTERACTIONS, ENERGY, AND DYNAMICS

LS2.D: Social Interactions and Group Behavior

- ✦ Being part of a group helps animals obtain food, defend themselves, and cope with changes. Groups may serve different functions and vary dramatically in size. (Note: Moved from K–2). (3-LS2-1)
 - Lessons 39, 41, 42

3-LS3 HEREDITY: INHERITANCE AND VARIATION OF TRAITS

LS3.A: Inheritance of Traits

- ✦ Many characteristics of organisms are inherited from their parents. (3-LS3-1)
 - Lessons 27, 28

- ✦ Other characteristics result from individuals' interactions with the environment, which can range from diet to learning. Many characteristics involve both inheritance and environment. (3-LS3-2)
 - Lessons 31, 32

LS3.B: Variation of Traits

- ✦ Different organisms vary in how they look and function because they have different inherited information. (3-LS3-1)
 - Lesson 29
- ✦ The environment also affects the traits that an organism develops. (3-LS3-2)
 - Lesson 31

3-LS4 BIOLOGICAL EVOLUTION: UNITY AND DIVERSITY

LS2.C: Ecosystem Dynamics, Functioning, and Resilience

- ✦ When the environment changes in ways that affect a place's physical characteristics, temperature, or availability of resources, some organisms survive and reproduce, others move to new locations, yet others move into the transformed environment, and some die. (Secondary to 3-LS4-4)
 - Lessons 43, 44

LS4.A: Evidence of Common Ancestry and Diversity

- ✦ Some kinds of plants and animals that once lived on Earth are no longer found anywhere. (Note: moved from K-2) (3-LS4-1)
- ✦ Fossils provide evidence about the types of organisms that lived long ago and also about the nature of their environments. (3-LS4-1)
 - Lessons 54, 56

LS4.B: Natural Selection

- ✦ Sometimes the differences in characteristics between individuals of the same species provide advantages in surviving, finding mates, and reproducing. (3-LS4-2)
 - Lesson 33

LS4.C: Adaptation

- ✦ For any particular environment, some kinds of organisms survive well, some survive less well, and some cannot survive at all. (3-LS4-2)
 - Lessons 34, 36, 37, 38

LS4.D: Biodiversity and Humans

- ✦ Populations live in a variety of habitats, and change in those habitats affects the organisms living there. (3-LS4-4)
 - Lessons 46, 47

3-ESS2 EARTH'S SYSTEMS

ESS2.D: Weather and Climate

- ✦ Scientists record patterns of the weather across different times and areas so that they can make predictions about what kind of weather might happen next. (3-ESS2-1)
 - Lessons 77, 78, 79, 81
- ✦ Climate describes a range of an area's typical weather conditions and the extent to which those conditions vary over years. (3-ESS2-2)
 - Lessons 82, 83

3-ESS3 EARTH AND HUMAN ACTIVITY

ESS3.B: Natural Hazards

- ✦ A variety of natural hazards result from natural processes. Humans cannot eliminate natural hazards but can take steps to reduce their impacts. (3-ESS3-1) (Note: This Disciplinary Core Idea is also addressed by 4-ESS3-2.)
 - Lessons 84, 86, 87

3-ETS1 ENGINEERING DESIGN

ETS1.A: Defining and Delimiting Engineering Problems

- ✦ Possible solutions to a problem are limited by available materials and resources (constraints). The success of a designed solution is determined by considering the desired features of a solution (criteria). Different proposals for solutions can be compared on the basis of how well each one meets the specified criteria for success or how well each takes the constraints into account. (3-5-ETS1-1)
 - Lesson 49

ETS1.B: Developing Possible Solutions

- ✦ Research on a problem should be carried out before beginning to design a solution. Testing a solution involves investigating how well it performs under a range of likely conditions. (3-5-ETS1-2)
- ✦ At whatever stage, communicating with peers about proposed solutions is an important part of the design process, and shared ideas can lead to improved designs. (3-5-ETS1-2)
 - Lessons 47, 48, 49, 51

ETS1.C: Optimizing the Design Solution

- ✦ Different solutions need to be tested in order to determine which of them best solves the problem, given the criteria and the constraints. (3-5-ETS1-3)
 - Lessons 52, 53

Grade 3 Review Lessons:

5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70, 75, 80, 85, 90, 95, 100, 105