

**Correlations of Nancy Larson[®] Science K-5
to
A Framework for K-12 Science Education
and
Next Generation Science Standards (NGSS)**

September 2017



The following pages show the correlations of Nancy Larson *Science K–5* to *A Framework for K–12 Science Education* and Next Generation Science Standards (NGSS). The correlations will show how Nancy Larson Science meets and exceeds the requirements in NGSS. The document will show the core and component ideas with the Nancy Larson Science lessons that match. Using the recommendations from *A Framework for K-12 Science Education*, we have broken the correlations into “By end of Grade 2” and “By end of Grade 5” to show the strength of coverage of the component ideas.

In addition, we have included a reverse correlation showing each Nancy Larson Science lesson and which core and component ideas are covered in each lesson. This provides teachers with information necessary for their lesson plans and peace-of-mind knowing that all the requirements are covered.

**Correlations of Nancy Larson® Science K–5
to A Framework for K–12 Science Education
and Next Generation Science Standards (NGSS)**

Physical Sciences

Core Idea PS1: Matter and Its Interactions	5
Core Idea PS2: Motion and Stability: Forces and Interactions	8
Core Idea PS3: Energy	12
Core Idea PS4: Waves and Their Applications in Technologies for Information Transfer	16

Life Sciences

Core Idea LS1: From Molecules to Organisms: Structures and Processes	19
Core Idea LS2: Ecosystems: Interactions, Energy, and Dynamics	26
Core Idea LS3: Heredity: Inheritance and Variation of Traits	29
Core Idea LS4: Biological Evolution: Unity and Diversity	31

Earth and Space Sciences

Core Idea ESS1: Earth's Place in the Universe	33
Core Idea ESS2: Earth's Systems	35
Core Idea ESS3: Earth and Human Activity	39

Engineering, Technology, and Applications of Science

Core Idea ETS1: Engineering Design	42
Core Idea ETS2: Links Among Engineering, Technology, Science, and Society	45

Reverse Correlations

Nancy Larson <i>Science K</i>	50
Nancy Larson <i>Science 1</i>	51
Nancy Larson <i>Science 2</i>	52
Nancy Larson <i>Science 3</i>	53
Nancy Larson <i>Science 4</i>	54
Nancy Larson <i>Science 5</i>	55

A Framework for K–12 Science Education

Dimension 3: Disciplinary Core Ideas—Physical Sciences

Core Idea PS1: Matter and Its Interactions

How can one explain the structure, properties, and interactions of matter?

Component Idea PS1.A: Structure and Properties of Matter

How do particles combine to form the variety of matter one observes?

Framework Progression

By the end of Grade 2: *Different kinds of matter exist (e.g., wood, metal, water), and many of them can be either solid or liquid, depending on temperature. Matter can be described and classified by its observable properties (e.g., visual, aural, textural), by its uses, and by whether it occurs naturally or is manufactured. Different properties are suited to different purposes. A great variety of objects can be built up from a small set of pieces (e.g., blocks, construction sets). Objects or samples of a substance can be weighed and their size can be described and measured. (Boundary: Volume is introduced only for liquid measure.)* (NGSS Grade 2)

By the end of Grade 5: *Matter of any type can be subdivided into particles that are too small to see, but even then the matter still exists and can be detected by other means (e.g., by weighing or by its effects on other objects). For example, a model showing that gases are made from matter particles that are too small to see and are moving freely around in space can explain many observations, including the inflation and shape of a balloon; the effects of air on larger particles or objects (e.g., leaves in wind, dust suspended in air); and the appearance of visible scale water droplets in condensation, fog, and, by extension, also in clouds or the contrails of a jet. The amount (weight) of matter is conserved when it changes form, even in transitions in which it seems to vanish (e.g., sugar in solution, evaporation in a closed container). Measurements of a variety of properties (e.g., hardness, reflectivity) can be used to identify particular materials. (Boundary: At this grade level, mass and weight are not distinguished, and no attempt is made to define the unseen particles or explain the atomic-scale mechanism of evaporation and condensation.)* (NGSS Grade 5)

Nancy Larson Science K–5 Lessons

Science K

- Lesson 25 Exploring foam blocks
- Lesson 26 Identifying characteristics of foam blocks
- Lesson 27 Describing and comparing foam blocks
- Lesson 28 Identifying objects as soft or hard; Identifying objects as smooth or rough
- Lesson 29 Identifying characteristics of objects made of metal, wood, plastic, rubber, or fabric
- Lesson 30 Using a hand lens to observe objects
- Lesson 31 Examining and describing seashells
- Lesson 32 Using a balance to compare the masses of objects
- Lesson 33 Identifying objects that are buoyant
- Lesson 34 Identifying an object from its characteristics
- Lesson 35 Making and separating mixtures
- Lesson 36 Making and separating a mixture of sand and pebbles; Observing sand
- Lesson 37 Observing and describing liquids; Conducting an experiment
- Lesson 38 Observing and describing the effect of low temperatures on liquids
- Lesson 39 Observing and describing mixtures of liquids

Science 1

- Lesson 33 Identifying and describing where bodies of water are found
- Lesson 34 Observing how water changes state; Predicting and comparing the ability of containers to collect rainwater

Science 2

- Lesson 2 Classifying matter as living or non-living
- Lesson 3 Identifying human-made and natural objects
- Lesson 4 Sorting objects by the material from which they are made
- Lesson 5 Observing and naming solids, liquids, and gases; Describing the characteristics of solids
- Lesson 6 Describing the color, luster, and texture of solids
- Lesson 7 Describing the hardness, flexibility, and buoyancy of solids
- Lesson 8 Measuring the mass of a solid
- Lesson 11 Identifying and describing the properties of liquids
- Lesson 12 Identifying and describing the properties of gases
- Lesson 13 Observing how matter changes state
- Lesson 14 Describing the transparency of matter
- Lesson 20 Classifying rocks by size
- Lesson 21 Observing and describing the physical properties of a rock
- Lesson 22 Describing the physical properties of minerals
- Lesson 23 Comparing the hardness of minerals
- Lesson 24 Observing the crystal structure of the mineral halite
- Lesson 25 Identifying the minerals in granite

Component Idea PS1.A: **Structure and Properties of Matter** (*continued*)**Nancy Larson Science K–5 Lessons****Science 3**

- Lesson 21 Identifying the building blocks of the universe: elements; Locating information on the Periodic Table of the Elements
- Lesson 24 Identifying the seven most common elements in the universe; Identifying the characteristics of a compound; Identifying the elements that combine to make a compound
- Lesson 25 Identifying the characteristics of atoms and molecules; Identifying the number of atoms of each element in a compound
- Lesson 30 Describing the characteristics of matter; Measuring the mass of solids
- Lesson 31 Measuring the volume of solids and liquids
- Lesson 32 Describing physical properties of matter; Describing the characteristics of solids, liquids, and gases
- Lesson 33 Describing and demonstrating the movement of molecules in solids, liquids, and gases

Science 5

- Lesson 21 Identifying elements that make up matter; Identifying and interpreting information on the Periodic Table of the Elements
- Lesson 22 Classifying elements as metals, non-metals, or metalloids; Describing properties of elements
- Lesson 23 Describing the structure of an atom
- Lesson 24 Identifying valence electrons; Using diagrams to represent atoms of elements
- Lesson 25 Describing compounds; Identifying organic and inorganic compounds; Identifying elements in a chemical formula
- Lesson 26 Identifying what happens during chemical bonding; Describing metallic bonding
- Lesson 27 Describing ionic bonding
- Lesson 28 Describing covalent bonding
- Lesson 29 Identifying the structural formula of a molecule
- Lesson 32 Classifying matter as a pure substance or a mixture; Identifying mixtures as homogeneous or heterogeneous
- Lesson 33 Classifying mixtures as solutions, colloids, or suspensions
- Lesson 34 Identifying characteristics of solids, liquids, gases, and plasmas
- Lesson 35 Identifying phase changes when heat is added
- Lesson 36 Identifying phase changes when heat is removed
- Lesson 37 Observing and describing cohesion, surface tension, and adhesion
- Lesson 38 Observing and identifying physical changes
- Lesson 39 Identifying physical properties of matter
- Lesson 40 Comparing the viscosity of liquids
- Lesson 45 Measuring the mass of solids and liquids
- Lesson 46 Measuring the volume of liquids and solids
- Lesson 47 Measuring the volume of rectangular solids
- Lesson 48 Describing density; Comparing the density of metals
- Lesson 49 Comparing the density of solids and liquids

Component Idea PS1.B: Chemical Reactions

How do substances combine or change (react) to make new substances? How does one characterize and explain these reactions and make predictions about them?

Framework Progression

By the end of Grade 2: *Heating or cooling a substance may cause changes that can be observed. Sometimes these changes are reversible (e.g., melting and freezing) and sometimes they are not (e.g., baking a cake, burning fuel).*
(NGSS Grade 2)

By the end of Grade 5: *When two or more different substances are mixed, a new substance with different properties may be formed; such occurrences depend on the substances and the temperature. No matter what reaction or change in properties occurs, the total weight of the substances does not change. (Boundary: Mass and weight are not distinguished at this grade level.)*
(NGSS Grade 5)

Nancy Larson Science K–5 Lessons**Science K**

- Lesson 37 Observing and describing liquids; Conducting an experiment
- Lesson 38 Observing and describing the effect of low temperatures on liquids
- Lesson 39 Observing and describing mixtures of liquids

Science 1

- Lesson 33 Identifying and describing where bodies of water are found
- Lesson 34 Observing how water changes state

Science 2

- Lesson 13 Observing how matter changes state

Science 3

- Lesson 26 Observing how heat creates a chemical change
- Lesson 29 Observing and comparing physical and chemical changes

Science 5

- Lesson 26 Identifying what happens during chemical bonding; Describing metallic bonding
- Lesson 28 Describing covalent bonding
- Lesson 32 Classifying matter as a pure substance or a mixture; Identifying mixtures as homogeneous or heterogeneous
- Lesson 33 Classifying mixtures as solutions, colloids, or suspensions
- Lesson 35 Identifying phase changes when heat is added
- Lesson 36 Identifying phase changes when heat is removed
- Lesson 50 Observing and identifying characteristics of chemical changes; Identifying endothermic and exothermic chemical reactions
- Lesson 51 Observing and describing chemical reactions: combustion, synthesis, and decomposition
- Lesson 52 Describing chemical reactions: neutralization; Identifying acids and bases

Component Idea PS1.C: Nuclear Processes

What forces hold nuclei together and mediate nuclear processes?

Framework Progression

By the end of Grade 2: *(Intentionally left blank.)*
(NGSS: None)

By the end of Grade 5: *(Intentionally left blank.)*
(NGSS: None)

Nancy Larson Science K–5 Lessons**Science 5**

- Lesson 71 Describing the four fundamental forces in nature

Core Idea PS2: Motion and Stability: Forces and Interactions

How can one explain and predict interactions between objects within systems of objects?

Component Idea PS2.A: Forces and Motion

How can one predict an object's continued motion, changes in motion, or stability?

Framework Progression

By the end of Grade 2: *Objects pull or push each other when they collide or are connected. Pushes and pulls can have different strengths and directions. Pushing or pulling on an object can change the speed or direction of its motion and can start or stop it. An object sliding on a surface or sitting on a slope experiences a pull due to friction on the object due to the surface that opposes the object's motion.*
(NGSS Grade K)

By the end of Grade 5: *Each force acts on one particular object and has both a 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.) The patterns of an object's motion in various situations can be observed and measured; when 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.)*
(NGSS Grade 3)

Nancy Larson Science K–5 Lessons

Science K

- Lesson 40 Identifying how objects can be moved by pushing or pulling
- Lesson 41 Identifying how the amount of force used affects the movement of an object
- Lesson 42 Identifying how round objects and objects with wheels require less force to move
- Lesson 43 Exploring how the Earth's gravity pulls objects toward Earth
- Lesson 44 Identifying objects that can be pulled by a magnet
- Lesson 45 Identifying wind as a force that pushes objects

Science 2

- Lesson 28 Demonstrating how the mass of an object affects the amount of force needed to move the object; Demonstrating how the strength and the direction of a force affects the movement of the object
- Lesson 29 Identifying gravity as a force
- Lesson 30 Observing and describing the effect of friction on the movement of objects
- Lesson 31 Describing and demonstrating how a lubricant affects friction between two objects
- Lesson 35 Observing how rollers and wheels make work easier
- Lesson 37 Investigating the effects of friction on movement down an inclined plane
- Lesson 39 Investigating what happens when objects of different masses travel down an inclined plane

Science 4

- Lesson 62 Describing kinetic energy; Comparing the kinetic energy of objects
- Lesson 63 Describing potential energy; Describing gravitational potential energy
- Lesson 64 Observing the conversion of energy

Science 5

- Lesson 70 Describing force; Demonstrating how forces affect matter
- Lesson 71 Describing the four fundamental forces in nature
- Lesson 72 Identifying weight as a force; Measuring weight
- Lesson 73 Describing magnetism and magnetic fields
- Lesson 74 Describing the effect a magnet has on other substances; Describing an electromagnet
- Lesson 75 Describing the Earth's magnetism; Using a compass
- Lesson 76 Describing contact forces involving solids
- Lesson 78 Describing contact forces involving fluids
- Lesson 79 Describing Newton's laws of motion
- Lesson 82 Describing and measuring work; Observing how sleds and rollers reduce the effort needed to do work
- Lesson 83 Describing machines; Identifying simple machines; Identifying, describing, and comparing inclined planes

Component Idea PS2.A: Forces and Motion *(continued)***Nancy Larson Science K–5 Lessons****Science 5** *(continued)*

- Lesson 84 Identifying and describing a wedge, screw, and wheel and axle
- Lesson 85 Identifying and describing first-class levers
- Lesson 86 Identifying and describing second-class levers
- Lesson 87 Identifying and describing third-class levers
- Lesson 88 Describing a pulley; Using a fixed pulley, a movable pulley, and a pulley system to lift a load
- Lesson 89 Measuring and comparing the amounts of effort needed to raise a load by using a fixed pulley, a movable pulley, and a pulley system
- Lesson 90 Calculating the amount of effort needed to raise a load and the distance the rope is pulled when a pulley or pulley system is used
- Lesson 91 Observing and describing gears

Component Idea PS2.B: Types of Interactions*What underlying forces explain the variety of interactions observed?***Framework Progression**

By the end of Grade 2: *When objects touch or collide, they push on one another and can change motion or shape.*
(NGSS Grade K)

By the end of Grade 5: *Objects in contact exert forces on each other (friction, elastic pushes and pulls). Electric, magnetic, and gravitational forces between a pair of objects do not require that the objects be in contact—for example, magnets push or pull at a distance. 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. The gravitational force of Earth acting on an object near Earth’s surface pulls that object toward the planet’s center.*
(NGSS Grades 3 and 5)

Nancy Larson Science K–5 Lessons**Science K**

- Lesson 41 Identifying how the amount of force used affects the movement of an object
- Lesson 42 Identifying that round objects and objects with wheels require less force to move
- Lesson 43 Exploring how the Earth’s gravity pulls objects toward Earth
- Lesson 44 Identifying objects that can be pulled by a magnet
- Lesson 45 Identifying wind as a force that pushes objects

Science 2

- Lesson 15 Identifying matter attracted to magnets
- Lesson 16 Exploring magnetic attraction; Identifying different types of magnets
- Lesson 17 Identifying and naming the magnetic poles of magnets; Demonstrating that like poles repel and unlike poles attract
- Lesson 28 Demonstrating how the mass of an object affects the amount of force needed to move the object; Demonstrating how the strength and the direction of a force affects the movement of the object
- Lesson 29 Identifying gravity as a force

Science 3

- Lesson 4 Describing and showing the Earth’s movement around the Sun
- Lesson 6 Describing and showing the Moon’s movement around Earth
- Lesson 55 Describing how tectonic plates move
- Lesson 56 Identifying tectonic plates and their movements

Science 4

- Lesson 62 Describing kinetic energy; Comparing the kinetic energy of objects
- Lesson 63 Describing potential energy; Describing gravitational potential energy
- Lesson 64 Observing the conversion of energy
- Lesson 80 Describing static and current electricity

Component Idea PS2.B: Types of Interactions *(continued)***Nancy Larson Science K–5 Lessons****Science 4** *(continued)*

Lesson 89 Making an electromagnet

Science 5

Lesson 6 Identifying the stages in the life cycles of stars

Lesson 10 Identifying characteristics of our solar system; Identifying characteristics of our Sun

Lesson 70 Describing force; Demonstrating how forces affect matter

Lesson 71 Describing the four fundamental forces in nature

Lesson 72 Identifying weight as a force; Measuring weight

Lesson 73 Describing magnetism and magnetic fields

Lesson 74 Describing the effect a magnet has on other substances; Describing an electromagnet

Lesson 75 Describing the Earth’s magnetism; Using a compass

Lesson 76 Describing contact forces involving solids

Lesson 77 Measuring force by using a spring scale; Conducting a friction experiment

Lesson 78 Describing contact forces involving fluids

Lesson 79 Describing Newton’s laws of motion

Lesson 82 Describing and measuring work; Observing how sleds and rollers reduce the effort needed to do work

Lesson 83 Describing machines; Identifying simple machines; Identifying, describing, and comparing inclined planes

Lesson 84 Identifying and describing a wedge, screw, and wheel and axle

Lesson 85 Identifying and describing first-class levers

Lesson 86 Identifying and describing second-class levers

Lesson 87 Identifying and describing third-class levers

Lesson 88 Describing a pulley; Using a fixed pulley, a movable pulley, and a pulley system to lift a load

Lesson 89 Measuring and comparing the amounts of effort needed to raise a load by using a fixed pulley, a movable pulley, and a pulley system

Lesson 90 Calculating the amount of effort needed to raise a load and the distance the rope is pulled when a pulley or pulley system is used

Lesson 91 Observing and describing gears

Component Idea PS2.C: Stability and Instability in Physical Systems*Why are some physical systems more stable than others?***Framework Progression**

By the end of Grade 2: *Whether an object stays still or moves often depends on the effects of multiple pushes and pulls on it (e.g., multiple players trying to pull an object in different directions). It is useful to investigate what pushes and pulls keep something in place (e.g., a ball on a slope, a ladder leaning on a wall) as well as what makes something change or move.*

(NGSS: None)

By the end of Grade 5: *A system can change as it moves in one direction (e.g., a ball rolling down a hill), shifts back and forth (e.g., a swinging pendulum), or goes through cyclical patterns*

Nancy Larson Science K–5 Lessons**Science K**

Lesson 41 Identifying how the amount of force used affects the movement of an object

Lesson 42 Identifying that round objects and objects with wheels require less force to move

Lesson 43 Exploring how the Earth’s gravity pulls objects toward Earth

Lesson 45 Identifying wind as a force that pushes objects

Science 1

Lesson 22 Identifying the seasons of the year

Lesson 32 Observing how the rotation of Earth causes day and night

Component Idea PS2.C: Stability and Instability in Physical Systems *(continued)*

(e.g., day and night). Examining how the forces on and within the system change as it moves can help to explain the system's patterns of change. A system can appear to be unchanging when processes within the system are occurring at opposite but equal rates (e.g., water behind a dam is at a constant height because water is flowing in at the same rate that water is flowing out). Changes can happen very quickly or very slowly and are sometimes hard to see (e.g., plant growth). Conditions and properties of the objects within a system affect how fast or slowly a process occurs (e.g., heat conduction rates).
(NGSS: None)

Science 2

- Lesson 16 Exploring magnetic attraction
- Lesson 17 Identifying and naming the magnetic poles of magnets; Demonstrating that like poles repel and unlike poles attract
- Lesson 28 Demonstrating how the mass of an object affects the amount of force needed to move the object; Demonstrating how the strength and the direction of a force affects the movement of the object
- Lesson 29 Identifying gravity as a force
- Lesson 30 Observing and describing the effect of friction on the movement of objects
- Lesson 32 Describing and demonstrating work
- Lesson 36 Observing the function of wheels and axles
- Lesson 37 Observing how large wheels make it easier to move over an object
- Lesson 38 Investigating how the steepness of an inclined plane affects the distance a toy car travels
- Lesson 39 Investigating what happens when objects of different masses travel down an inclined plane

Science 3

- Lesson 3 Showing the Earth's movement on its axis; Identifying the cause of day and night on Earth
- Lesson 44 Describing the water cycle
- Lesson 55 Exploring the theory of plate tectonics; Describing how tectonic plates move
- Lesson 56 Identifying tectonic plates and their movements
- Lesson 59 Identifying how igneous, sedimentary, and metamorphic rocks are formed
- Lesson 61 Identifying the effects of weathering and erosion

Science 4

- Lesson 64 Observing the conversion of energy
- Lesson 72 Describing how the Earth's rotation causes shadows; Describing the refraction of light waves
- Lesson 73 Describing heat; Observing and describing the transfer of heat by radiation and conduction; Identifying good conductors and insulators of heat
- Lesson 74 Observing and describing the transfer of heat by convection

Science 5

- Lesson 3 Describing constellations and asterisms; Locating the asterisms the Big Dipper and the Little Dipper on a sky map
- Lesson 4 Identifying factors that determine which stars and constellations we see; Locating constellations on sky maps
- Lesson 7 Describing the life cycles of stars
- Lesson 14 Describing the two motions of Earth; Identifying the cause of day and night on Earth; Identifying why the Sun, Moon, and stars appear to move across the sky
- Lesson 15 Identifying the causes of the Earth's seasons
- Lesson 16 Comparing the number of hours of daylight at different times of the year; Constructing a graph to show changing hours of daylight
- Lesson 17 Identifying the phases of the Earth's Moon
- Lesson 18 Identifying how solar and lunar eclipses occur
- Lesson 56 Describing the layers of the geosphere; Describing how the movement of tectonic plates causes changes to the geosphere
- Lesson 57 Describing and observing processes that change the geosphere: weathering, erosion, and deposition

Component Idea PS2.C: **Stability and Instability in Physical Systems** *(continued)*

Nancy Larson Science K–5 Lessons

Science 5 *(continued)*

- Lesson 58 Describing how erosion and deposition change the geosphere; Describing and observing fossils
- Lesson 59 Classifying rocks; Describing the rock cycle; Identifying rocks and minerals
- Lesson 63 Describing the water cycle; Identifying and describing natural disasters
- Lesson 73 Describing magnetism and magnetic fields
- Lesson 74 Describing the effect a magnet has on other substances; Describing an electromagnet
- Lesson 75 Describing the Earth’s magnetism; Using a compass
- Lesson 79 Describing Newton’s laws of motion
- Lesson 82 Describing and measuring work; Observing how sleds and rollers reduce the effort needed to do work
- Lesson 83 Describing machines; Identifying simple machines; Identifying, describing, and comparing inclined planes
- Lesson 84 Identifying and describing a wedge, screw, and wheel and axle
- Lesson 85 Identifying and describing first-class levers
- Lesson 86 Identifying and describing second-class levers
- Lesson 87 Identifying and describing third-class levers
- Lesson 88 Describing a pulley; Using a fixed pulley, a movable pulley, and a pulley system to lift a load
- Lesson 89 Measuring and comparing the amounts of effort needed to raise a load by using a fixed pulley, a movable pulley, and a pulley system
- Lesson 90 Calculating the amount of effort needed to raise a load and the distance the rope is pulled when a pulley or pulley system is used
- Lesson 91 Observing and describing gears

Core Idea PS3: **Energy**

How is energy transferred and conserved?

Component Idea PS3.A: **Definitions of Energy**

What is energy?

Framework Progression

By the end of Grade 2:
(Intentionally left blank.)
(NGSS: None)

By the end of Grade 5: *The faster a given object is moving, the more energy it possesses. Energy can be moved from place to place by moving objects, or through sound, light, or electric currents. (Boundary: At this grade level, no attempt is made to give a precise or complete definition of energy.)*
(NGSS Grade 4)

Nancy Larson Science K–5 Lessons

Science 4

- Lesson 61 Describing energy
- Lesson 62 Describing kinetic energy; Comparing the kinetic energy of objects
- Lesson 63 Describing potential energy; Describing gravitational potential energy
- Lesson 64 Observing the conversion of energy
- Lesson 65 Identifying characteristics of sound
- Lesson 66 Describing how musical instruments produce sounds
- Lesson 69 Describing radiant energy
- Lesson 70 Describing visible light; Observing how light waves are reflected
- Lesson 73 Describing heat; Observing and describing the transfer of heat reflected by radiation and conduction; Identifying good conductors and insulators of heat
- Lesson 79 Identifying sources of electricity; Describing how electricity is used

Component Idea PS3.A: Definitions of Energy *(continued)***Nancy Larson Science K–5 Lessons****Science 4** *(continued)*

- Lesson 80 Describing static and current electricity; Identifying and describing open and closed circuits
- Lesson 83 Making a closed circuit; Tracing the path of an electric current through a closed circuit
- Lesson 87 Identifying characteristics of a series circuit; Making a series current
- Lesson 88 Identifying characteristics of a parallel circuit; Making a parallel circuit
- Lesson 89 Making an electromagnet

Science 5

- Lesson 35 Identifying phase changes when heat is added
- Lesson 36 Identifying phase changes when heat is removed
- Lesson 79 Describing Newton's laws of motion

Component Idea PS3.B: Conservation of Energy and Energy Transfer

What is meant by conservation of energy? How is energy transferred between objects or systems?

Framework Progression

By the end of Grade 2: *Sunlight warms Earth's surface.*
(NGSS Grade K)

By the end of Grade 5: *Energy is present whenever there are moving objects, sound, light, or heat. When objects collide, energy can be transferred from one object to another, thereby changing their motion. In such collisions, some energy is typically also transferred to the surrounding air; as a result, the air gets heated and sound is produced. Light also transfers energy from place to place. For example, energy radiated from the sun is transferred to the earth by light. When this light is absorbed, it warms Earth's land, air, and water and facilitates plant growth. Energy can also be transferred from place to place by electric currents, which can then be used locally to produce motion, sound, heat, or light. The currents may have been produced to begin with by transforming the energy of motion into electrical energy (e.g., moving water driving a spinning turbine which generates electric currents).*
(NGSS Grade 4)

Nancy Larson Science K–5 Lessons**Science 1**

- Lesson 30 Investigating what the Sun gives us

Science 2

- Lesson 61 Identifying sources of light; Identifying how light travels
- Lesson 63 Identifying what determines the colors of objects

Science 3

- Lesson 2 Describing characteristics of the Sun
- Lesson 70 Describing how plants make their own food by photosynthesis

Science 4

- Lesson 61 Describing energy
- Lesson 62 Describing kinetic energy; Comparing the kinetic energy of objects
- Lesson 63 Describing potential energy; Describing gravitational potential energy
- Lesson 64 Observing the conversion of energy
- Lesson 65 Identifying characteristics of sound
- Lesson 66 Describing how musical instruments produce sounds
- Lesson 69 Describing radiant energy
- Lesson 70 Describing visible light; Observing how light waves are reflected
- Lesson 73 Describing heat; Observing and describing the transfer of heat by radiation and conduction; Identifying good conductors and insulators of heat
- Lesson 74 Observing and describing the transfer of heat by convection
- Lesson 75 Identifying renewable and non-renewable energy resources
- Lesson 80 Describing static and current electricity; Identifying and describing open and closed circuits
- Lesson 81 Observing and describing a dry cell battery and electrical wire; Identifying conductors and insulators of electric current
- Lesson 82 Examining an incandescent light bulb

Component Idea PS3.B: Conservation of Energy and Energy Transfer *(continued)***Nancy Larson Science K–5 Lessons****Science 4** *(continued)*

- Lesson 83 Making a closed circuit; Tracing the path of an electric current through a closed circuit
- Lesson 84 Making a closed circuit to observe how the number of batteries affects the brightness of a light bulb

Science 5

- Lesson 6 Identifying the stages in the life cycles of stars
- Lesson 15 Identifying the causes of the Earth's seasons
- Lesson 63 Describing the water cycle; Identifying and describing natural disasters
- Lesson 67 Describing the effects of forests on the Earth's systems; Identifying ways to protect forests
- Lesson 79 Describing Newton's laws of motion

Component Idea PS3.C: Relationship Between Energy and Forces*How are forces related to energy***Framework Progression**

By the end of Grade 2: *A bigger push or pull makes things go faster. Faster speeds during a collision can cause a bigger change in shape of the colliding objects.*
(NGSS Grade K)

By the end of Grade 5: *When objects collide, the contact forces transfer energy so as to change the objects' motions. Magnets can exert forces on other magnets or on magnetizable materials, thereby causing energy transfer between them (e.g., leading to changes in motion) even when the objects are not touching.*
(NGSS Grade 4)

Nancy Larson Science K–5 Lessons**Science K**

- Lesson 41 Identifying how the amount of force used affects the movement of an object
- Lesson 42 Identifying that round objects and objects with wheels require less force to move

Science 2

- Lesson 15 Identifying matter attracted to magnets
- Lesson 16 Exploring magnetic attraction; Identifying different types of magnets
- Lesson 17 Demonstrating that like poles repel and unlike poles attract
- Lesson 28 Demonstrating how the mass of an objects affects the amount of force needed to move the object; Demonstrating how the strength and the direction of a force affects the movement of the object

Science 3

- Lesson 33 Describing and demonstrating the movement of molecules in solids, liquids, and gases

Science 4

- Lesson 62 Describing kinetic energy; Comparing the kinetic energy of objects
- Lesson 63 Describing potential energy; Describing gravitational potential energy
- Lesson 64 Observing the conversion of energy
- Lesson 65 Identifying characteristics of sound
- Lesson 66 Describing how musical instruments produce sounds

Science 5

- Lesson 50 Observing and identifying characteristics of chemical changes; Identifying endothermic and exothermic chemical reactions

Component Idea PS3.C: Relationship Between Energy and Forces *(continued)*

Nancy Larson Science K–5 Lessons

Science 5 *(continued)*

- Lesson 51 Observing and describing chemical reactions: combustion, synthesis, and decomposition
- Lesson 70 Describing force; Demonstrating how forces affect matter
- Lesson 73 Describing magnetism and magnetic fields
- Lesson 74 Describing the effect a magnet has on other substances; Describing an electromagnet
- Lesson 75 Describing the Earth’s magnetism; Using a compass
- Lesson 76 Describing contact forces involving solids
- Lesson 77 Measuring force by using a spring scale; Conducting a friction experiment
- Lesson 78 Describing contact forces involving fluids
- Lesson 79 Describing Newton’s laws of motion

Component Idea PS3.D: Energy in Chemical Processes and Everyday Life

How do food and fuel provide energy? If energy is conserved, why do people say it is produced or used?

Framework Progression

By the end of Grade 2: *When two objects rub against each other, this interaction is called friction. Friction between two surfaces can warm both of them (e.g. rubbing hands together). There are ways to reduce the friction between two objects.* (NGSS: None)

By the end of Grade 5: *The expression “produce energy” typically refers to the conversion of stored energy into a desired form for practical use—for example, the stored energy of water behind a dam is released so that it flows downhill and drives a turbine generator to produce electricity. Food and fuel also release energy when they are digested or burned. When machines or animals “use” energy (e.g., to move around), most often the energy is transferred to heat the surrounding environment. The energy released by burning fuel or digesting food was once energy from the sun that was captured by plants in the chemical process that forms plant matter (from air and water). (Boundary: The fact that plants capture energy from sunlight is introduced at this grade level, but details of photosynthesis are not.) It is important to be able to concentrate energy so that it is available for use where and when it is needed. For example, batteries are physically transportable energy storage devices, whereas electricity generated by power plants is transferred from place to place through distribution systems.* (NGSS Grades 4 and 5)

Nancy Larson Science K–5 Lessons

Science 2

- Lesson 30 Observing and describing the effect of friction on the movement of objects
- Lesson 31 Describing and demonstrating how a lubricant affects friction between two objects
- Lesson 35 Observing how rollers and wheels make work easier
- Lesson 37 Observing how large wheels make it easier to move over an obstacle; Investigating the effects of friction on movement down an inclined plane

Science 4

- Lesson 13 Describing how plants make their own food through the process of photosynthesis
- Lesson 41 Describing how animals obtain energy
- Lesson 46 Identifying producers and consumers in a food chain
- Lesson 47 Describing food webs; Identifying food chains in a food web
- Lesson 61 Describing energy
- Lesson 63 Describing potential energy; Describing gravitational potential energy
- Lesson 75 Identifying renewable and non-renewable energy resources
- Lesson 79 Identifying sources of electricity; Describing how electricity is used
- Lesson 80 Describing static and current electricity
- Lesson 81 Observing and describing a dry cell battery and electrical wire

Science 5

- Lesson 67 Describing the effects of forests on the Earth’s systems; Identifying ways to protect forests

Core Idea PS4: Waves and Their Applications in Technologies for Information Transfer

How are waves used to transfer energy and information?

Component Idea PS4.A: Wave Properties

What are the characteristic properties and behaviors of waves?

Framework Progression

By the end of Grade 2: *Waves, which are regular patterns of motion, can be made in water by disturbing the surface. When waves move across the surface of deep water, the water goes up and down in place; it does not move in the direction of the wave—observe, for example, a bobbing cork or seabird—except when the water meets the beach. Sound can make matter vibrate, and vibrating matter can make sound.* (NGSS Grade 1)

By the end of Grade 5: *Waves of the same type can differ in amplitude (height of the wave) and wavelength (spacing between wave peaks). Waves can add or cancel one another as they cross, depending on their relative phase (i.e., relative position of peaks and troughs of the waves), but they emerge unaffected by each other. (Boundary: The discussion at this grade level is qualitative only; it can be based on the fact that two different sounds can pass a location in different directions without getting mixed up.) Earthquakes cause seismic waves, which are waves of motion in Earth’s crust.* (NGSS Grade 4)

Nancy Larson Science K–5 Lessons

Science 2

- Lesson 54 Identifying what causes sound
- Lesson 55 Identifying what causes loud and soft sounds
- Lesson 56 Describing the loudness of sounds
- Lesson 57 Identifying how the environment affects the sounds we hear
- Lesson 59 Describing the pitch of sound

Science 3

- Lesson 57 Identifying the causes and effects of earthquakes

Science 4

- Lesson 65 Identifying characteristics of sound
- Lesson 66 Describing how musical instruments produce sounds; Comparing the pitch of sounds

Component Idea PS4.B: Electromagnetic Radiation

What is light? How can one explain the varied effects that involve light? What other forms of electromagnetic radiation are there?

Framework Progression

By the end of Grade 2: *Objects can be seen only when light is available to illuminate them. Very hot objects give off light (e.g., a fire, the sun). 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 (i.e., on the other side from the light source), where the light cannot reach. Mirrors and prisms 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.)* (NGSS Grade 1)

Nancy Larson Science K–5 Lessons

Science 1

- Lesson 30 Investigating what the Sun gives us
- Lesson 31 Observing how shadows are formed when sunlight is blocked

Science 2

- Lesson 14 Describing the transparency of matter
- Lesson 61 Identifying sources of light; Identifying how light travels
- Lesson 62 Identifying the colors in the light spectrum
- Lesson 63 Identifying what determines the colors of objects

Science 3

- Lesson 2 Describing characteristics of the Sun

Science 4

- Lesson 69 Describing radiant energy
- Lesson 70 Describing visible light; Observing how light waves are reflected

Component Idea PS4.B: Electromagnetic Radiation *(continued)*

By the end of Grade 5: *A great deal of light travels through space to Earth from the sun and from distant stars. Objects can be seen when light reflected from its surface enters the eyes. The color people see depends on the color of the available light sources as well as the properties of the surface. (Boundary: This phenomenon is observed, but no attempt is made to discuss what confers the color reflection and absorption properties on a surface. The stress is on understanding that light traveling from the object to the eye determines what is seen.) Because lenses bend light beams, they can be used, singly or in combination, to provide magnified images of objects too small or too far away to be seen with the naked eye.* (NGSS Grade 4)

Nancy Larson Science K–5 Lessons**Science 4** *(continued)*

- Lesson 71 Identifying opaque, translucent, and transparent matter; Observing shadows
Lesson 72 Describing how the Earth’s rotation causes shadows; Describing the refraction of light waves

Science 5

- Lesson 2 Constructing a Galilean refracting telescope
Lesson 6 Identifying the stages in the life cycles of stars
Lesson 10 Identifying characteristics of our solar system; Identifying characteristics of our Sun
Lesson 17 Identifying the phases of the Earth’s Moon
Lesson 18 Identifying how solar and lunar eclipses occur
Lesson 39 Identifying physical properties of matter

Component Idea PS4.C: Information Technologies and Instrumentation

How are instruments that transmit and detect waves used to extend human senses?

Framework Progression

By the end of Grade 2: *People use their senses to learn about the world around them. Their eyes detect light, their ears detect sound, and they can feel vibrations by touch. People also use a variety of devices to communicate (send and receive information) over long distances.* (NGSS Grade 1)

By the end of Grade 5: *Lenses can be used to make eyeglasses, telescopes, or microscopes in order to extend what can be seen. The design of such instruments is based on understanding how the path of light bends at the surface of the lens. Digitized information (e.g., the pixels of a picture) can be stored for future recovery or transmitted over long distances without significant degradation. High tech devices, such as computers or cell phones, can receive and decode information—convert it from digitized form to voice—and vice versa.* (NGSS Grade 4)

Nancy Larson Science K–5 Lessons**Science K**

- Lesson 5 Exploring the senses of sight, hearing and smell; Identifying the parts of the body used to see, hear, and smell
Lesson 6 Exploring the sense of taste
Lesson 7 Identifying parts of the body used to touch; Identifying the five senses
Lesson 8 Identifying how senses are used
Lesson 9 Describing how the five senses are used each day
Lesson 10 Describing how the five senses are used each day

Science 2

- Lesson 58 Describing how human beings hear sound

Science 3

- Lesson 1 Describing what scientists do; Identifying objects in our solar system

Science 4

- Lesson 2 Using a microscope to observe a specimen
Lesson 3 Identifying parts of a microscope
Lesson 69 Describing radiant energy

Science 5

- Lesson 1 Identifying tools astronomers use to explore the universe
Lesson 2 Constructing a Galilean refracting telescope

A Framework for K–12 Science Education

Dimension 3: Disciplinary Core Ideas—Life Sciences

Core Idea LS1: From Molecules to Organisms: Structures and Processes

How do organisms live, grow, respond to their environment, and reproduce?

Component Idea LS1.A: Structure and Function

How do the structures of organisms enable life's functions?

Framework Progression

By the end of Grade 2: *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, grow, and produce more plants.*
(NGSS Grade 1)

By the end of Grade 5: *Plants and animals have both internal and external structures that serve various functions in growth, survival, behavior, and reproduction. (Boundary: Stress at this grade level is on understanding the macroscale systems and their function, not microscopic processes.)*
(NGSS Grade 4)

Nancy Larson Science K–5 Lessons

Science K

- Lesson 2 Identifying parts of the human body: head, neck, torso, arm, leg, foot, hand, finger, and toe
- Lesson 3 Identifying parts of the human body: shoulder, elbow, wrist, knee, ankle, heel, and shin
- Lesson 4 Identifying parts of the human body: forehead, cheek, chin, waist, hip, abdomen, chest, and buttocks
- Lesson 5 Exploring the senses of sight, hearing, and smell; Identifying parts of the body used to see, hear, and smell
- Lesson 6 Exploring the sense of taste; Identifying foods as salty, sweet, sour, or bitter
- Lesson 7 Identifying parts of the body used to touch; Identifying the five senses
- Lesson 8 Identifying how senses are used
- Lesson 9 Describing how the five senses are used each day
- Lesson 10 Describing how the five senses are used each day
- Lesson 11 Identifying exercise as a way to keep our bodies healthy
- Lesson 16 Identifying hand washing as a way to help keep our bodies healthy
- Lesson 17 Identifying oral hygiene as a way to keep our bodies healthy; Identifying the steps to promote oral hygiene
- Lesson 18 Identifying animals that are common pets
- Lesson 19 Identifying characteristics of dogs; Describing how to care for dogs
- Lesson 20 Identifying characteristics of cats; Describing how to care for cats
- Lesson 21 Identifying characteristics of birds; Describing how birds move
- Lesson 22 Identifying characteristics of fish; Describing how fish move
- Lesson 23 Identifying gerbils, guinea pigs, rabbits, and horses; Classifying and graphing photographs of pets
- Lesson 24 Identifying how animals move; Identifying animal body coverings
- Lesson 46 Observing a flowering plant; Identifying the parts of a plant
- Lesson 47 Observing and comparing seeds
- Lesson 51 Describing plants around us
- Lesson 52 Observing and recording the growth of plants from seeds
- Lesson 53 Identifying parts of plants we eat
- Lesson 54 Observing and recording the growth of plants
- Lesson 55 Describing living things

Science 1

- Lesson 13 Identifying what plants need to live; Identifying parts of plants
- Lesson 14 Identifying that plants are living organisms; Identifying and labeling the parts of a plant
- Lesson 15 Identifying trees in our habitat; Identifying the parts of trees
- Lesson 16 Observing and comparing leaves
- Lesson 17 Identifying and labeling the parts of a tree

Component Idea LS1.A: **Structure and Function** (*continued*)**Nancy Larson Science K–5 Lessons****Grade 1** (*continued*)

- Lesson 18 Identifying the characteristics of shrubs; Labeling the parts of a shrub
- Lesson 20 Identifying broad leaves and needles
- Lesson 21 Identifying deciduous and evergreen trees and shrubs; Identifying how deciduous trees change during the year
- Lesson 22 Identifying the seasons of the year; Identifying how an apple tree changes during the year
- Lesson 23 Describing how deciduous trees change during the year; Identifying how deciduous trees produce fruit
- Lesson 24 Observing and describing the seeds of broad-leaved trees
- Lesson 25 Observing and describing the cones and the seeds of conifers
- Lesson 26 Identifying the life stages of trees
- Lesson 27 Identifying the age of trees
- Lesson 42 Identifying how animals use camouflage
- Lesson 44 Identifying how animals adapt to seasonal changes
- Lesson 45 Identifying mammals and their characteristics
- Lesson 47 Identifying parts of the human body
- Lesson 48 Identifying the function of parts of the human body
- Lesson 49 Identifying the function of the skeletal system; Identifying bones in the skeletal system
- Lesson 50 Identifying the joints and their functions
- Lesson 51 Identifying the function of muscles
- Lesson 52 Identifying the function of skin
- Lesson 53 Identifying the function and parts of the digestive system
- Lesson 54 Identifying the function and parts of the respiratory system
- Lesson 55 Identifying the function and parts of the circulatory system
- Lesson 56 Identifying the function of the brain
- Lesson 57 Identifying ways to keep our bodies healthy
- Lesson 59 Identifying the number of legs on insects; Identifying and observing butterflies in the second stage of life
- Lesson 60 Identifying characteristics of butterflies and moths
- Lesson 61 Identifying the life cycles of butterflies and moths
- Lesson 62 Identifying and observing ladybird beetles in the second stage of life
- Lesson 63 Identifying the characteristics of ladybird beetles
- Lesson 64 Identifying the life cycles of ladybird beetles
- Lesson 65 Describing the characteristics and life cycles of grasshoppers
- Lesson 66 Identifying and describing the parts of insects' bodies
- Lesson 67 Describing the characteristics of spiders
- Lesson 69 Comparing, sorting, and graphing insects and spiders

Science 2

- Lesson 66 Identifying prior knowledge of birds
- Lesson 67 Identifying the characteristics of birds
- Lesson 68 Identifying how birds move
- Lesson 69 Identifying the characteristics of birds' bodies
- Lesson 70 Identifying the characteristics of birds' legs and feet
- Lesson 71 Identifying sounds birds make
- Lesson 72 Identifying what birds eat by the shape of their bills
- Lesson 73 Observing birds; Using a bird identification guide to identify birds
- Lesson 74 Describing the function and design of birds' nests; Describing the characteristics of birds' eggs
- Lesson 75 Describing the characteristics of chicks
- Lesson 76 Describing the characteristics of owls
- Lesson 77 Observing what an owl eats by examining an owl pellet
- Lesson 78 Using reference tools and resources to locate and report information about a bird

Component Idea LS1.A: **Structure and Function** (*continued*)**Nancy Larson Science K–5 Lessons****Science 3**

- Lesson 67 Identifying what seeds need to germinate
- Lesson 68 Classifying plants; Describing the function of parts of plants
- Lesson 69 Dissecting a bean seed; Observing the embryo of a bean seed
- Lesson 70 Describing how plants make their own food by photosynthesis
- Lesson 71 Observing the germination of grass seed
- Lesson 75 Identifying amphibians and their habitats; Identifying the characteristics of amphibians
- Lesson 77 Identifying the characteristics of reptiles
- Lesson 78 Comparing amphibians and reptiles

Science 4

- Lesson 1 Identifying biology as the study of life; Identifying characteristics of organisms; Identifying a cell as the smallest unit of an organism
- Lesson 3 Identifying the nucleus of a cheek cell
- Lesson 4 Describing the functions of structures in animal cells
- Lesson 5 Describing the functions of structures in plant cells
- Lesson 6 Describing fungus cells; Comparing and contrasting animal, plant, and fungus cells
- Lesson 7 Identifying characteristics of eukaryotic cells
- Lesson 8 Identifying characteristics of prokaryotic cells
- Lesson 12 Describing the function of vascular tissues
- Lesson 13 Describing how plants make their own food through the process of photosynthesis
- Lesson 14 Describing ways plants reproduce
- Lesson 18 Describing gymnosperms; Describing leaves of gymnosperms
- Lesson 20 Describing the life cycle of gymnosperms
- Lesson 21 Describing angiosperms; Describing the structure and function of flowers
- Lesson 22 Describing seed development in angiosperms
- Lesson 23 Describing the life cycle of angiosperms
- Lesson 24 Describing leaves of angiosperms
- Lesson 28 Identifying vertebrates and invertebrates
- Lesson 29 Identifying characteristics of vertebrates
- Lesson 30 Classifying vertebrates
- Lesson 31 Identifying characteristics of classes of vertebrates
- Lesson 35 Identifying animals that are invertebrates; Identifying and describing annelids, cnidarians, and echinoderms
- Lesson 36 Identifying and describing mollusks
- Lesson 37 Identifying characteristics of arthropods; Identifying characteristics of insects
- Lesson 38 Describing the metamorphosis of insects; Observing the larva of an insect
- Lesson 39 Identifying characteristics of arachnids and other arthropods
- Lesson 40 Classifying animals according to what they eat
- Lesson 41 Describing how animals obtain energy
- Lesson 48 Describing symbiotic relationships between organisms
- Lesson 51 Identifying inherited physical characteristics of plants and animals
- Lesson 52 Identifying inherited behaviors of plants; Conducting two experiments to observe plant behavior
- Lesson 53 Identifying inherited and learned behaviors of animals
- Lesson 54 Identifying physical adaptations of animals
- Lesson 55 Describing physical and behavioral adaptations of plants
- Lesson 56 Describing physical and behavioral adaptations of predators and prey
- Lesson 57 Identifying how an adaptation benefits an organism

Component Idea LS1.A: Structure and Function *(continued)***Nancy Larson Science K–5 Lessons****Science 5**

- Lesson 65 Describing terrestrial biomes
- Lesson 66 Describing freshwater and marine regions of the aquatic biome
- Lesson 67 Describing the effects of forests on the Earth’s systems; Identifying ways to protect forests

Component Idea LS1.B: Growth and Development of Organisms*How do organisms grow and develop?***Framework Progression**

By the end of Grade 2: *Plants and animals have predictable characteristics at different stages of development. Plants and animals grow and change. 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.*
(NGSS Grade 1)

By the end of Grade 5: *Reproduction is essential to the continued existence of every kind of organism. Plants and animals have unique and diverse life cycles that include being born (sprouting in plants), growing, developing into adults, reproducing and eventually dying.*
(NGSS Grade 3)

Nancy Larson Science K–5 Lessons**Science K**

- Lesson 24 Describing how animals resemble their parents
- Lesson 47 Observing and comparing seeds
- Lesson 52 Observing and recording the growth of plants from seeds
- Lesson 54 Observing and recording the growth of plants

Science 1

- Lesson 2 Ordering photographs of people from youngest to oldest; Identifying the characteristics of infants
- Lesson 3 Identifying the characteristics of toddlers
- Lesson 4 Identifying the characteristics of children
- Lesson 5 Identifying the characteristics of adolescents
- Lesson 6 Identifying the characteristics of adults
- Lesson 7 Classifying photographs according to the stages of life
- Lesson 8 Describing the stages of life
- Lesson 22 Identifying how an apple tree changes during the year
- Lesson 23 Describing how deciduous trees change during the year; Identifying how deciduous trees produce fruit
- Lesson 24 Observing and describing the seeds of broad-leaved trees
- Lesson 25 Observing and describing the cones and the seeds of conifers
- Lesson 26 Identifying the life stages of trees
- Lesson 27 Identifying the age of trees
- Lesson 45 Identifying mammals and their characteristics
- Lesson 49 Identifying the function of the skeletal system; Identifying bones in the skeletal system
- Lesson 59 Identifying and observing butterflies in the second stage of life
- Lesson 61 Identifying the life cycles of butterflies and moths
- Lesson 62 Identifying and observing ladybird beetles in the second stage of life
- Lesson 64 Identifying the life cycles of ladybird beetles
- Lesson 65 Describing the characteristics and life cycles of grasshoppers
- Lesson 68 Describing the life cycles of spiders

Science 2

- Lesson 67 Identifying the characteristics of birds
- Lesson 74 Describing the characteristics of birds’ eggs
- Lesson 75 Describing the characteristics of chicks

Science 3

- Lesson 67 Identifying what seeds need to germinate
- Lesson 69 Dissecting a bean seed; Observing the embryo of a bean seed
- Lesson 71 Observing the germination of grass seed; Analyzing data and writing conclusions for a one-variable experiment

Component Idea LS1.B: Growth and Development of Organisms *(continued)*

Nancy Larson Science K–5 Lessons

Science 3 *(continued)*

- Lesson 76 Describing the life cycles of amphibians
- Lesson 78 Describing the life cycles of reptiles; Comparing amphibians and reptiles

Science 4

- Lesson 14 Describing ways plants reproduce
- Lesson 15 Conducting a one-variable experiment; Identifying the steps in the scientific method
- Lesson 20 Describing the life cycle of gymnosperms
- Lesson 21 Describing angiosperms; Describing the structure and function of flowers
- Lesson 22 Describing seed development in angiosperms
- Lesson 23 Describing the life cycle of angiosperms
- Lesson 31 Identifying characteristics of classes of vertebrates
- Lesson 32 Describing the life cycles of vertebrates
- Lesson 38 Describing the metamorphosis of insects; Observing the larva of an insect

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

How do organisms obtain and use the matter and energy they need to live and grow?

Framework Progression

By the end of Grade 2: *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.* (NGSS Grade K)

By the end of Grade 5: *Animals and plants alike generally need to take in air and water, animals must take in food, and plants need light and minerals; anaerobic life, such as bacteria in the gut, functions without air. Food provides animals with the materials they need for body repair and growth and is digested to release the energy they need to maintain body warmth and for motion. Plants acquire their materials for growth chiefly from air and water and process matter they have formed to maintain their internal conditions (e.g., at night).* (NGSS Grade 5)

Nancy Larson Science K–5 Lessons

Science K

- Lesson 12 Identifying healthy snacks
- Lesson 13 Identifying nutritious foods: fruits, grains, and milk
- Lesson 14 Identifying nutritious foods: vegetables, meats, and beans
- Lesson 15 Identifying foods that keep our bodies healthy
- Lesson 19 Identifying characteristics of dogs; Describing how to care for dogs
- Lesson 20 Identifying characteristics of cats; Describing how to care for cats
- Lesson 24 Identifying what animals need to live
- Lesson 46 Identifying what plants need to live
- Lesson 48 Planting seeds
- Lesson 49 Making a scientific drawing
- Lesson 55 Describing living things
- Lesson 56 Identifying living and non-living things outside the school
- Lesson 57 Identifying living and non-living things in the classroom

Science 1

- Lesson 13 Identifying what plants need to live
- Lesson 14 Identifying that plants are living organisms
- Lesson 35 Identifying and describing how human beings use water
- Lesson 43 Identifying what animals need to live; Classifying animals as herbivores, carnivores, or omnivores
- Lesson 45 Identifying mammals and their characteristics
- Lesson 53 Identifying the function and parts of the digestive system
- Lesson 57 Identifying ways to keep our bodies healthy
- Lesson 63 Identifying the characteristics of ladybird beetles

Component Idea LS1.C: Organization for Matter and Energy Flow in Organisms *(continued)*

Nancy Larson Science K–5 Lessons

Science 2

- Lesson 72 Identifying what birds eat by the shape of their bills
- Lesson 76 Describing the characteristics of owls
- Lesson 77 Observing what an owl eats by examining an owl pellet
- Lesson 78 Using reference tools and resources to locate and report information about a bird

Science 3

- Lesson 67 Identifying what seeds need to germinate
- Lesson 68 Describing the function of parts of plants
- Lesson 69 Observing the embryo of a bean seed
- Lesson 70 Describing how plants make their own food by photosynthesis
- Lesson 71 Observing the germination of grass seed
- Lesson 74 Describing the dependence of animals on plants
- Lesson 75 Identifying amphibians and their habitats; Identifying the characteristics of amphibians
- Lesson 77 Identifying the characteristics of reptiles

Science 4

- Lesson 12 Describing the function of vascular tissues; Identifying vascular and nonvascular plants
- Lesson 13 Describing how plants make their own food through the process of photosynthesis
- Lesson 31 Identifying characteristics of classes of vertebrates
- Lesson 40 Classifying animals according to what they eat
- Lesson 41 Describing how animals obtain energy
- Lesson 45 Describing producers, consumers, and decomposers in an ecosystem
- Lesson 46 Identifying producers and consumers in a food chain
- Lesson 47 Describing food webs; Identifying food chains in a food web

Science 5

- Lesson 67 Describing the effects of forests on the Earth’s systems; Identifying ways to protect forests

Component Idea LS1.D: Information Processing

How do organisms detect, process, and use information about the environment?

Framework Progression

By the end of Grade 2: *Animals have body parts that capture and convey different kinds of information needed for growth and survival—for example, eyes for light, ears for sounds, and skin for temperature or touch. Animals respond to these inputs with behaviors that help them survive (e.g., find food, run from a predator). Plants also respond to some external inputs (e.g., turn leaves toward the sun.*
(NGSS Grade 1)

By the end of Grade 5: *Different sense receptors are specialized for particular kinds of information, which may then be processed and integrated*

Nancy Larson Science K–5 Lessons

Science K

- Lesson 5 Exploring the senses of sight, hearing, and smell; Identifying the parts of the body used to see, hear, and smell
- Lesson 6 Exploring the sense of taste; Identifying foods as salty, sweet, sour, or bitter
- Lesson 7 Identifying parts of the body used to touch; Identifying the five senses
- Lesson 8 Identifying how senses are used
- Lesson 9 Describing how the five senses are used each day
- Lesson 10 Describing how the five senses are used each day

Science 1

- Lesson 21 Identifying deciduous and evergreen trees and shrubs
- Lesson 22 Identifying how an apple tree changes during the year

Component Idea LS1.D: Information Processing *(continued)*

by an animal's brain, with some information stored as memories. Animals are able to use their perceptions and memories to guide their actions. Some responses to information are instinctive—that is, animals' brains are organized so that they do not have to think about how to respond to certain stimuli.

(NGSS Grade 4)

Nancy Larson Science K–5 Lessons**Science 1** *(continued)*

- Lesson 23 Describing how deciduous trees change during the year
- Lesson 41 Identifying animals that live in water habitats: pond, ocean, and ice
- Lesson 42 Identifying how animals use camouflage
- Lesson 44 Identifying how animals adapt to seasonal changes
- Lesson 48 Identifying the function of parts of the human body
- Lesson 50 Identifying the joints and their functions
- Lesson 51 Identifying the function of muscles
- Lesson 52 Identifying the function of skin
- Lesson 53 Identifying the function and parts of the digestive system
- Lesson 54 Identifying the function and parts of the respiratory system
- Lesson 55 Identifying the function and parts of the circulatory system
- Lesson 56 Identifying the function of the brain
- Lesson 65 Describing the characteristics and life cycles of grasshoppers
- Lesson 67 Describing the characteristics of spiders

Science 2

- Lesson 1 Describing what scientists do
- Lesson 71 Identifying sounds birds make
- Lesson 76 Describing the characteristics of owls

Science 3

- Lesson 75 Identifying the characteristics of amphibians
- Lesson 77 Identifying the characteristics of reptiles

Science 4

- Lesson 29 Identifying characteristics of vertebrates
- Lesson 48 Describing symbiotic relationships between organisms
- Lesson 51 Identifying inherited physical characteristics of plants and animals
- Lesson 52 Identifying inherited behaviors of plants; Conducting two experiments to observe plant behavior
- Lesson 53 Identifying inherited and learned behaviors of animals
- Lesson 54 Identifying physical adaptations of animals
- Lesson 56 Describing physical and behavioral adaptations of predators and prey
- Lesson 57 Identifying how an adaptation benefits an organism

Science 5

- Lesson 66 Describing freshwater and marine regions of the aquatic biome

Core Idea LS2: Ecosystems: Interactions, Energy, and Dynamics

How and why do organisms interact with their environment, and what are the effects of these interactions?

Component Idea LS2.A: Interdependent Relationships in Ecosystems

How do organisms interact with the living and nonliving environments to obtain matter and energy?

Framework Progression

By the end of Grade 2: *Animals depend on their surroundings to get what they need, including food, water, shelter, and a favorable temperature. Animals depend on plants or other animals for food. They use their senses to find food and water and they use their body parts to gather, catch, eat, and chew the food. Plants depend on air, water, minerals (in the soil), and light to grow. Animals can move around, but plants cannot, and they often depend on animals for pollination or to move their seeds around. Different plants survive better in different settings because they have varied needs for water, minerals, and sunlight.* (NGSS Grade 2)

By the end of Grade 5: *The food of almost any kind of animal can be traced back to plants. Organisms are related in food webs in which some animals eat plants for food and other animals eat the animals that eat plants. Either way, they are “consumers.” Some organisms, such as fungi and bacteria, break down dead organisms (both plants or plant parts and animals) and therefore operate as “decomposers.” Decomposition eventually restores (recycles) some materials back to the soil for plants to use. Organisms can survive only in environments in which their particular needs are met. A healthy ecosystem is one in which multiple species of different types are each able to meet their needs in a relatively stable web of life. Newly introduced species can damage the balance of an ecosystem.* (NGSS Grade 5)

Nancy Larson Science K–5 Lessons

Science K

- Lesson 5 Exploring the senses of sight, hearing, and smell; Identifying parts of the body used to see, hear, and smell
- Lesson 6 Exploring the sense of taste; Identifying foods as salty, sweet, sour, or bitter
- Lesson 7 Identifying parts of the body used to touch; Identifying the five senses
- Lesson 8 Identifying how senses are used
- Lesson 9 Describing how the five senses are used each day
- Lesson 10 Describing how the five sense are used each day
- Lesson 19 Identifying characteristics of dogs; Describing how to care for dogs
- Lesson 20 Identifying characteristics of cats; Describing how to care for cats
- Lesson 24 Identifying how animals move
- Lesson 46 Observing a flowering plant
- Lesson 48 Planting seeds
- Lesson 49 Making a scientific drawing
- Lesson 55 Describing living things

Science 1

- Lesson 9 Identifying our homes as part of our habitat
- Lesson 11 Identifying animals and plants in our habitat
- Lesson 13 Identifying what plants need to live
- Lesson 14 Identifying that plants are living organisms
- Lesson 30 Investigating what the Sun gives us
- Lesson 35 Identifying and describing how human beings use water
- Lesson 37 Observing and describing soil
- Lesson 43 Identifying what animals need to live; Classifying animals as herbivores, carnivores, or omnivores
- Lesson 44 Identifying how animals adapt to seasonal changes
- Lesson 45 Identifying mammals and their characteristics

Science 2

- Lesson 70 Identifying the characteristics of birds’ legs and feet
- Lesson 72 Identifying what birds eat by the shape of their bills
- Lesson 74 Describing the function and design of birds’ nests
- Lesson 75 Describing the characteristics of chicks
- Lesson 76 Describing the characteristics of owls
- Lesson 77 Observing what an owl eats by examining an owl pellet

Science 3

- Lesson 74 Describing the dependence of animals on plants
- Lesson 75 Identifying the characteristics of amphibians
- Lesson 77 Identifying the characteristics of reptiles

Science 4

- Lesson 40 Classifying animals according to what they eat

Component Idea LS2.A: Interdependent Relationships in Ecosystems *(continued)*

Nancy Larson Science K–5 Lessons

Science 4 *(continued)*

- Lesson 41 Describing how animals obtain energy
- Lesson 44 Identifying characteristics of ecosystems
- Lesson 45 Describing producers, consumers, and decomposers in an ecosystem
- Lesson 46 Identifying producers and consumers in a food chain
- Lesson 47 Describing food webs; Identifying food chains in a food web
- Lesson 48 Describing symbiotic relationships between organisms
- Lesson 54 Identifying physical adaptations of animals
- Lesson 55 Describing physical and behavioral adaptations of plants
- Lesson 56 Describing physical and behavioral adaptations of predators and prey
- Lesson 57 Identifying how an adaptation benefits an organism

Science 5

- Lesson 67 Describing the effects of forests on the Earth’s systems; Identifying ways to protect forests

Component Idea LS2.B: Cycles of Matter and Energy Transfer in Ecosystems

How do matter and energy move through an ecosystem?

Framework Progression

By the end of Grade 2: *Organisms obtain the materials they need to grow and survive from the environment. Many of these materials come from organisms and are used again by other organisms.* (NGSS: None)

By the end of Grade 5: *Matter cycles between the air and soil and among plants, animals, and microbes as these organisms live and die. Organisms obtain gases, water, and minerals from the environment and release waste matter (gas, liquid, or solid) back into the environment.* (NGSS Grade 5)

Nancy Larson Science K–5 Lessons

Science K

- Lesson 53 Identifying parts of plants we eat
- Lesson 55 Describing living things

Science 1

- Lesson 13 Identifying what plants need to live; Identifying parts of plants
- Lesson 35 Identifying and describing how human beings use water
- Lesson 37 Observing and describing soil
- Lesson 43 Identifying what animals need to live; Classifying animals as herbivores, carnivores, or omnivores
- Lesson 44 Identifying how animals adapt to seasonal changes
- Lesson 63 Identifying the characteristics of ladybird beetles
- Lesson 65 Describing the characteristics and life cycles of grasshoppers
- Lesson 67 Describing the characteristics of spiders

Science 2

- Lesson 74 Describing the function and design of birds’ nests; Describing the characteristics of birds’ eggs
- Lesson 76 Describing the characteristics of owls
- Lesson 77 Observing what an owl eats by examining an owl pellet

Science 3

- Lesson 70 Describing how plants make their own food by photosynthesis

Science 4

- Lesson 13 Describing how plants make their own food through the process of photosynthesis
- Lesson 41 Describing how animals obtain energy
- Lesson 45 Describing producers, consumers, and decomposers in an ecosystem

Component Idea LS2.B: **Cycles of Matter and Energy Transfer in Ecosystems** *(continued)*

Nancy Larson Science K–5 Lessons

Science 4 *(continued)*

- Lesson 46 Identifying producers and consumers in a food chain
- Lesson 47 Describing food webs; Identifying food chains in a food web
- Lesson 48 Describing symbiotic relationships between organisms

Science 5

- Lesson 67 Describing the effects of forests on the Earth’s systems; Identifying ways to protect forests

Component Idea LS2.C: **Ecosystem Dynamics, Functioning, and Resilience**

What happens to ecosystems when the environment changes?

Framework Progression

By the end of Grade 2: *The places where plants and animals live often change, sometimes slowly and sometimes rapidly. When animals and plants get too hot or too cold, they may die. If they cannot find enough food, water, or air, they may die.*

(NGSS: None)

By the end of Grade 5: *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.*

(NGSS Grade 3)

Nancy Larson Science K–5 Lessons

Science 1

- Lesson 44 Identifying how animals adapt to seasonal changes

Science 4

- Lesson 53 Identifying inherited and learned behaviors of animals
- Lesson 54 Identifying physical adaptations of animals
- Lesson 55 Describing physical and behavioral adaptations of plants
- Lesson 56 Describing physical and behavioral adaptations of predators and prey
- Lesson 58 Identifying extinct and endangered animals
- Lesson 59 Recording and analyzing data from experiments

Science 5

- Lesson 67 Describing the effects of forests on the Earth’s systems; Identifying ways to protect forests

Component Idea LS2.D: **Social Interactions and Group Behavior**

How do organisms interact in groups so as to benefit individuals?

Framework Progression

By the end of Grade 2: *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.*

(NGSS: None)

By the end of Grade 5: *Groups can be collections of equal individuals, hierarchies with dominate members, small families, groups of single or mixed gender, or groups composed of individuals similar in age. Some groups are stable over long periods of time; others are fluid, with members moving in and out. Some groups assign specialized tasks to each member; in others, all members perform the same or a similar range of functions.*

(NGSS: Grade 3)

Nancy Larson Science K–5 Lessons

Science 4

- Lesson 44 Identifying characteristics of ecosystems
- Lesson 53 Identifying inherited and learned behaviors of animals
- Lesson 56 Describing physical and behavioral adaptations of predators and prey

Core Idea LS3: Heredity: Inheritance and Variation of Traits

How are characteristics of one generation passed to the next? How can individuals of the same species and even siblings have different characteristics?

Component Idea LS3.A: Inheritance of Traits

How are the characteristics of one generation related to the previous generation?

Framework Progression

By the end of Grade 2: *Organisms have characteristics that can be similar or different. Young animals are very much, but not exactly, like their parents and also resemble other animals of the same kind. Plants also are very much, but not exactly, like their parents and resemble other plants of the same kind.*
(NGSS Grade 1)

By the end of Grade 5: *Many characteristics of organisms are inherited from their parents. Other characteristics result from individuals' interactions with the environment, which can range from diet to learning. Many characteristics involve both inheritance and environment.*
(NGSS Grade 3)

Nancy Larson Science K–5 Lessons

Science K

- Lesson 24 Describing how animals resemble their parents
- Lesson 47 Observing and comparing seeds

Science 1

- Lesson 14 Identifying that plants are living organisms
- Lesson 23 Describing how deciduous trees change during the year
- Lesson 24 Observing and describing the seeds of broad-leaved trees
- Lesson 25 Observing and describing the cones and the seeds of conifers
- Lesson 26 Identifying the life stages of trees
- Lesson 61 Identifying the life cycles of butterflies and moths
- Lesson 64 Identifying the life cycles of ladybird beetles
- Lesson 65 Describing the characteristics and life cycles of grasshoppers
- Lesson 68 Describing the life cycles of spiders

Science 2

- Lesson 67 Identifying the characteristics of birds

Science 3

- Lesson 76 Describing the life cycles of amphibians
- Lesson 78 Describing the life cycles of reptiles

Science 4

- Lesson 51 Identifying inherited physical characteristics of plants and animals
- Lesson 52 Identifying inherited behaviors of plants; Conducting two experiments to observe plant behavior
- Lesson 53 Identifying inherited and learned behaviors of animals
- Lesson 54 Identifying physical adaptations of animals
- Lesson 55 Describing physical and behavioral adaptations of plants
- Lesson 56 Describing physical and behavioral adaptations of predators and prey
- Lesson 57 Identifying how an adaptation benefits an organism

Component Idea LS3.B: Variation of Traits

Why do individuals of the same species vary in how they look, function, and behave?

Framework Progression

By the end of Grade 2: *Individuals of the same kind of plant or animal are recognizable as similar but can also vary in many ways.*

(NGSS Grade 1)

By the end of Grade 5: *Offspring acquire a mix of traits from their biological parents. Different organisms vary in how they look and function because they have different inherited information. In each kind of organism there is variation in the traits themselves, and different kinds of organisms may have different versions of the trait. The environment also affects the traits that an organism develops—differences in where they grow or in the food they consume may cause organisms that are related to end up looking or behaving differently.*

(NGSS Grade 3)

Nancy Larson Science K–5 Lessons

Science K

- Lesson 19 Identifying characteristics of dog
- Lesson 20 Identifying characteristics of cats
- Lesson 21 Identifying characteristics of birds
- Lesson 24 Identifying animal body coverings; Describing how animals resemble their parents
- Lesson 50 Observing plants around us

Science 1

- Lesson 16 Observing and comparing leaves
- Lesson 24 Observing and describing the seeds of broad-leaved trees
- Lesson 25 Observing and describing the cones and the seeds of conifers
- Lesson 52 Identifying the function of skin; Examining and comparing fingerprints
- Lesson 60 Identifying characteristics of butterflies and moths

Science 2

- Lesson 76 Describing the characteristics of owls

Science 3

- Lesson 76 Describing the life cycles of amphibians
- Lesson 78 Describing the life cycles of reptiles

Science 4

- Lesson 19 Using a resource book to locate information about gymnosperms
- Lesson 51 Identifying inherited physical characteristics of plants and animals
- Lesson 53 Identifying inherited and learned behaviors of animals
- Lesson 54 Identifying physical adaptations of animals
- Lesson 55 Describing physical and behavioral adaptations of plants
- Lesson 56 Describing physical and behavioral adaptations of predators and prey
- Lesson 57 Identifying how an adaptation benefits an organism

Core Idea LS4: Biological Evolution: Unity and Diversity

How can there be so many similarities among organisms yet so many different kinds of plants, animals, and microorganisms? How does biodiversity affect humans?

Component Idea LS4.A: Evidence of Common Ancestry and Diversity

What evidence shows that different species are related?

Framework Progression

By the end of Grade 2: *Some kinds of plants and animals that once lived on Earth (e.g., dinosaurs) are no longer found anywhere, although others now living (e.g., lizards) resemble them in some ways.*

(NGSS: None)

By the end of Grade 5: *Fossils provide evidence about the types of organisms (both visible and microscopic) that lived long ago and also about the nature of their environments. Fossils can be compared with one another and to living organisms according to their similarities and differences.*

(NGSS Grade 3)

Nancy Larson Science K–5 Lessons

Science 3

Lesson 77 Identifying the characteristics of reptiles

Science 5

Lesson 58 Describing how erosion and deposition change the geosphere; Describing and observing fossils

Component Idea LS4.B: Natural Selection

How does genetic variation among organisms affect survival and reproduction?

Framework Progression

By the end of Grade 2: *(Intentionally left blank.)*

(NGSS: None)

By the end of Grade 5: *Sometimes the differences in characteristics between individuals of the same species provide advantages in surviving, finding mates, and reproducing.*

(NGSS Grade 3)

Nancy Larson Science K–5 Lessons

Science 1

Lesson 44 Identifying how animals adapt to seasonal changes

Component Idea LS4.C: Adaptation*How does the environment influence populations of organisms over multiple generations?***Framework Progression**

By the end of Grade 2: *Living things can survive only where their needs are met. If some places are too hot or too cold or have too little water or food, plants and animals may not be able to live there.*

(NGSS: None)

By the end of Grade 5: *Changes in an organism’s habitat are sometimes beneficial to it and sometimes harmful. For any particular environment, some kinds of organisms survive well, some survive less well, and some cannot survive at all.*

(NGSS Grade 3)

Nancy Larson Science K–5 Lessons**Science 1**

Lesson 44 Identifying how animals adapt to seasonal changes

Science 4

Lesson 58 Identifying extinct and endangered animals

Science 5

Lesson 65 Describing terrestrial biomes

Lesson 66 Describing freshwater and marine regions of the aquatic biome

Component Idea LS4.D: Biodiversity and Humans*What is biodiversity, how do humans affect it, and how does it affect humans?***Framework Progression**

By the end of Grade 2: *There are many different kinds of living things in any area, and they exist in different places on land and in water.*

(NGSS Grade 2)

By the end of Grade 5: *Scientists have identified and classified many plants and animals. Populations of organisms live in a variety of habitats, and change in those habitats affects the organisms living there. Humans, like all other organisms, obtain living and nonliving resources from their environments.*

(NGSS Grade 3)

Nancy Larson Science K–5 Lessons**Science 1**

Lesson 11 Identifying animals and plants in our habitat

Lesson 15 Identifying trees in our habitat

Lesson 21 Identifying deciduous and evergreen trees and shrubs

Lesson 39 Sorting animals by land and water habitats

Lesson 40 Identifying animals that live in land habitats: forest, desert, and grassland

Lesson 41 Identifying animals that live in water habitats: pond, ocean, and ice

Lesson 42 Identifying how animals use camouflage

Lesson 61 Identifying the life cycles of butterflies and moths

Lesson 64 Identifying the life cycles of ladybird beetles

Science 2

Lesson 67 Identifying the characteristics of birds

Lesson 75 Describing the characteristics of chicks

Science 4

Lesson 9 Classifying organisms into domains; Identifying kingdoms of eukaryotes

Lesson 44 Identifying characteristics of ecosystems

Lesson 45 Describing producers, consumers, and decomposers in an ecosystem

Lesson 46 Identifying producers and consumers in a food chain

Lesson 47 Describing food webs; Identifying food chains in a food web

Lesson 48 Describing symbiotic relationships between organisms

Science 5

Lesson 65 Describing terrestrial biomes

Lesson 66 Describing freshwater and marine regions of the aquatic biome

A Framework for K–12 Science Education

Dimension 3: Disciplinary Core Ideas—Earth and Space Sciences

Core Idea ESS1: Earth’s Place in the Universe

What is the universe, and what is Earth’s place in it?

Component Idea ESS1.A: The Universe and Its Stars

What is the universe, and what goes on in stars?

Framework Progression

By the end of Grade 2: *Patterns of the motion of the sun, moon, and stars in the sky can be observed, described, and predicted. At night one can see the light coming from many stars with the naked eye, but telescopes make it possible to see many more and to observe them and the moon and planets in greater detail.*
(NGSS Grade 1)

By the end of Grade 5: *The sun is a star that appears larger and brighter than other stars because it is closer. Stars range greatly in their size and distance from Earth.*
(NGSS Grade 5)

Nancy Larson Science K–5 Lessons

Science 3

- Lesson 1 Identifying objects in our solar system
- Lesson 2 Describing characteristics of the Sun

Science 5

- Lesson 1 Identifying tools astronomers use to explore the universe
- Lesson 3 Describing constellations and asterisms; Locating the asterisms the Big Dipper and the Little Dipper on a sky map
- Lesson 4 Identifying factors that determine which stars and constellations we see; Locating constellations on sky maps
- Lesson 5 Describing and classifying galaxies; Describing the Milky Way Galaxy
- Lesson 6 Identifying the stages in the life cycles of stars
- Lesson 7 Describing the life cycles of stars
- Lesson 10 Identifying characteristics of our solar system; Identifying characteristics of our Sun

Component Idea ESS1.B: Earth and the Solar System

What are the predictable patterns caused by Earth’s movement in the solar system?

Framework Progression

By the end of Grade 2: *Seasonal patterns of sunrise and sunset can be observed, described, and predicted.*
(NGSS Grade 1)

By the end of Grade 5: *The orbits of Earth around the sun and of the moon around Earth, together with the rotation of Earth about an axis between its North and South poles, cause observable patterns. These include day and night; daily and seasonal changes in the length and direction of shadows; phases of the moon; and different positions of the sun, moon, and stars at different times of the day, month, and year. Some objects in the solar system can be seen with the naked eye. Planets in the night sky change positions and are not always visible from Earth as they orbit the sun. Stars appear in patterns called constellations, which can be used for navigation and appear to move together across the sky because of Earth’s rotation.*
(NGSS Grade 5)

Nancy Larson Science K–5 Lessons

Science 1

- Lesson 30 Investigating what the Sun gives us
- Lesson 31 Observing how shadows are formed when sunlight is blocked
- Lesson 32 Observing how the rotation of Earth causes day and night

Science 3

- Lesson 1 Identifying objects in our solar system
- Lesson 3 Showing the Earth’s movement on its axis; Identifying the cause of day and night on Earth
- Lesson 4 Describing and showing the Earth’s movement around the Sun
- Lesson 5 Identifying the causes of the Earth’s seasons
- Lesson 6 Describing and showing the Moon’s movement around Earth; Describing the characteristics of the Moon
- Lesson 8 Identifying and describing a new and a full Moon
- Lesson 9 Identifying the phases of the Moon
- Lesson 12 Identifying and describing the planets in our solar system; Comparing the number of moons of each planet; Comparing the amount of time it takes each planet to rotate once
- Lesson 13 Describing the inner and outer planets; Describing asteroids and the asteroid belt
- Lesson 14 Describing the relative distances of the planets from the Sun
- Lesson 15 Identifying characteristics of terrestrial planets and gas giants; Comparing terrestrial planets and gas giants

Component Idea ESS1.B: Earth and the Solar System *(continued)***Nancy Larson Science K–5 Lessons****Science 3** *(continued)*

- Lesson 16 Comparing the amount of time it takes each planet to orbit the Sun
- Lesson 17 Identifying characteristics of comets
- Lesson 18 Identifying the characteristics of meteoroids, meteors, and meteorites

Science 5

- Lesson 3 Describing constellations and asterisms; Locating the asterisms the Big Dipper and the Little Dipper on a sky map
- Lesson 4 Identifying factors that determine which stars and constellations we see; Locating constellations on sky maps
- Lesson 10 Identifying characteristics of our solar system; Identifying characteristics of our Sun
- Lesson 11 Describing the planets in our solar system
- Lesson 12 Comparing and contrasting the planets
- Lesson 13 Identifying characteristics of asteroids, meteoroids, dwarf planets, and comets
- Lesson 14 Describing the two motions of Earth; Identifying the cause of day and night on Earth; Identifying why the Sun, Moon, and stars appear to move across the sky
- Lesson 15 Identifying the causes of the Earth's seasons
- Lesson 16 Comparing the number of hours of daylight at different times of the year; Constructing a graph to show changing hours of daylight
- Lesson 17 Identifying the phases of the Earth's Moon
- Lesson 18 Identifying how solar and lunar eclipses occur

Component Idea ESS1.C: The History of Planet Earth*How do people reconstruct and date events in Earth's planetary history?***Framework Progression**

By the end of Grade 2: *Some events on Earth occur in cycles, like day and night, and others have a beginning and an end, like a volcanic eruption. Some events like an earthquake, happen very quickly; others, such as the formation of the Grand Canyon, occur very slowly over a time period much longer than one can observe.* (NGSS Grade 2)

By the end of Grade 5: *Earth has changed over time. Understanding how landforms develop, are weathered (broken down into smaller pieces), and erode (get transported elsewhere) can help infer the history of the current landscape. Local, regional, and global patterns of rock formations reveal changes over time due to Earth forces, such as earthquakes. The presence and location of certain fossil types indicate the order in which rock layers were formed. Patterns of tree rings and ice cores from glaciers can help reconstruct Earth's recent climate history.* (NGSS Grade 4)

Nancy Larson Science K–5 Lessons**Science 1**

- Lesson 32 Observing how the rotation of Earth causes day and night

Science 3

- Lesson 53 Identifying the characteristics of the Earth's surface
- Lesson 54 Identifying and describing the layers of Earth
- Lesson 55 Exploring the theory of plate tectonics; Describing how tectonic plates move
- Lesson 56 Identifying tectonic plates and their movements
- Lesson 57 Identifying the causes and effects of earthquakes
- Lesson 58 Identifying the causes and effects of volcanoes
- Lesson 59 Identifying how igneous, sedimentary, and metamorphic rocks are formed
- Lesson 60 Describing and identifying igneous, sedimentary, and metamorphic rocks
- Lesson 61 Identifying the effects of weathering and erosion
- Lesson 62 Describing and identifying clay, silt, and sand
- Lesson 64 Identifying and describing characteristics of soil; Identifying the layers of soil on the Earth's surface

Component Idea ESS1.C: The History of Planet Earth *(continued)***Nancy Larson Science K–5 Lessons****Science 5**

- Lesson 56 Describing the layers of the geosphere; Describing how the movement of tectonic plates causes changes to the geosphere
- Lesson 57 Describing and observing processes that change the geosphere: weathering, erosion, and deposition
- Lesson 58 Describing how erosion and deposition change the geosphere; Describing and observing fossils
- Lesson 59 Classifying rocks; Describing the rock cycle; Identifying rocks and minerals

Core Idea ESS2: Earth’s Systems*How and why is the Earth constantly changing?***Component Idea ESS2.A: Earth Materials and Systems***How do Earth’s major systems interact?***Framework Progression**

By the end of Grade 2: *Wind and water can change the shape of the land. The resulting landforms, together with the materials on the land, provide homes for living things.* (NGSS Grade 2)

By the end of Grade 5: *Earth’s major systems are the geosphere (solid and molten rock, soil, and sediments), the hydrosphere (water and ice), the atmosphere (air), and the biosphere (living things, including humans). These systems interact in multiple ways to affect Earth’s surface materials and processes. The ocean supports a variety of ecosystems and organisms, shapes landforms, and influences climate. Winds and clouds in the atmosphere interact with the landforms to determine patterns of weather. Rainfall helps shape the land and affects the types of living things found in a region. Water, ice, wind, living organisms, and gravity break rocks, soils, and sediments into smaller particles and move them around. Human activities affect Earth’s systems and their interactions at its surface.* (NGSS Grades 4 and 5)

Nancy Larson Science K–5 Lessons**Science 1**

- Lesson 33 Identifying and describing where bodies of water are found
- Lesson 37 Observing and describing soil

Science 3

- Lesson 42 Identifying the composition of the planets’ atmospheres
- Lesson 43 Identifying the layers of the Earth’s atmosphere and the characteristics of each layer
- Lesson 44 Describing the water cycle
- Lesson 45 Identifying and describing types of clouds
- Lesson 46 Identifying wind direction; Estimating wind speed
- Lesson 47 Collecting and recording weather data
- Lesson 48 Describing the characteristics of tornadoes
- Lesson 49 Describing the characteristics of hurricanes and typhoons
- Lesson 59 Identifying how igneous, sedimentary, and metamorphic rocks are formed
- Lesson 61 Identifying the effects of weathering and erosion
- Lesson 62 Describing and identifying clay, silt, and sand
- Lesson 63 Observing and demonstrating how water moves through sand and silt
- Lesson 64 Identifying and describing characteristics of soil; Identifying the layers of soil on the Earth’s surface

Science 5

- Lesson 55 Identifying Earth’s four major systems; Describing how human activities cause changes to the environment and affect Earth’s systems
- Lesson 56 Describing the layers of the geosphere; Describing how the movement of tectonic plates causes changes to the geosphere
- Lesson 57 Describing and observing processes that change the geosphere: weathering, erosion, and deposition
- Lesson 58 Describing how erosion and deposition change the geosphere; Describing and observing fossils
- Lesson 59 Classifying rocks; Describing the rock cycle; Identifying rocks and minerals

Component Idea ESS2.A: Earth Materials and Systems *(continued)***Nancy Larson Science K–5 Lessons****Science 5** *(continued)*

- Lesson 60 Describing the layers of the atmosphere; Describing the effects of greenhouse gases and ozone
- Lesson 61 Describing weather conditions; Describing characteristics of air masses
- Lesson 62 Describing the hydrosphere; Identifying sources of saline and fresh water
- Lesson 63 Describing the water cycle; Identifying and describing natural disasters
- Lesson 64 Describing climate; Identifying and describing climatic regions
- Lesson 65 Describing terrestrial biomes
- Lesson 66 Describing freshwater and marine regions of the aquatic biome
- Lesson 67 Describing the effects of forests on the Earth’s systems; Identifying ways to protect forests

Component Idea ESS2.B: Plate Tectonics and Large-Scale System Interactions*Why do the continents move, and what causes earthquakes and volcanoes?***Framework Progression**

By the end of Grade 2: *Rocks, soils, and sand are present in most areas where plants and animals live. There may also be rivers, streams, lakes, and ponds. Maps show where things are located. One can map the shapes and kinds of land and water in any area.*
(NGSS Grade 2)

By the end of Grade 5: *The locations of mountain ranges, deep ocean trenches, ocean floor structures, earthquakes, and volcanoes occur in patterns. Most earthquakes and volcanoes occur in bands that are often along the boundaries between continents and oceans. Major mountain chains form inside continents or near their edges. Maps can help locate the different land and water features where people live and in other areas of Earth.*
(NGSS Grade 4)

Nancy Larson Science K–5 Lessons**Science 1**

- Lesson 33 Identifying and describing where bodies of water are found
- Lesson 37 Observing and describing soil

Science 3

- Lesson 53 Identifying the characteristics of the Earth’s surface
- Lesson 54 Identifying and describing the layers of Earth
- Lesson 55 Exploring the theory of plate tectonics; Describing how tectonic plates move
- Lesson 56 Identifying tectonic plates and their movements
- Lesson 57 Identifying the causes and effects of earthquakes
- Lesson 58 Identifying the causes and effects of volcanoes
- Lesson 59 Identifying how igneous, sedimentary, and metamorphic rocks are formed
- Lesson 60 Describing and identifying igneous, sedimentary, and metamorphic rocks

Science 5

- Lesson 56 Describing the layers of the geosphere; Describing how the movement of tectonic plates causes changes to the geosphere

Component Idea ESS2.C: The Roles of Water in Earth’s Surface Processes*How do the properties and movements of water shape Earth’s surface and affect its systems?***Framework Progression**

By the end of Grade 2: *Water is found in oceans, rivers, lakes, and ponds. Water exists as solid ice and in liquid form. It carries soil and rocks from one place to another and determines the variety of life forms that can live in a particular location.*
(NGSS Grade 2)

Nancy Larson Science K–5 Lessons**Science 1**

- Lesson 33 Identifying and describing where bodies of water are found
- Lesson 34 Observing how water changes state
- Lesson 41 Identifying animals that live in water habitats: pond, ocean, and ice

Component Idea ESS2.C: The Roles of Water in Earth’s Surface Processes *(continued)*

By the end of Grade 5: *Water is found almost everywhere on Earth: as vapor; as fog or clouds in the atmosphere; as rain or snow falling from clouds; as ice, snow, and running water on land and in the ocean; and as groundwater beneath the surface. The downhill movement of water as it flows to the ocean shapes the appearance of the land. Nearly all of Earth’s available water is in the oceans. Most fresh water is in glaciers or underground; only a tiny fraction is in streams, lakes, wetlands, and the atmosphere.* (NGSS Grade 5)

Nancy Larson Science K–5 Lessons**Science 3**

- Lesson 35 Observing and measuring the changes in temperatures of hot water and ice water over time
- Lesson 37 Observing and describing a physical change: melting and freezing
- Lesson 38 Observing and describing a physical change: vaporization; Conducting an evaporation experiment
- Lesson 39 Observing and describing a physical change: condensation
- Lesson 44 Describing the water cycle
- Lesson 45 Identifying and describing types of clouds
- Lesson 47 Collecting and recording weather data
- Lesson 61 Identifying the effects of weathering and erosion
- Lesson 62 Describing and identifying clay, silt, and sand

Science 5

- Lesson 57 Describing and observing processes that change the geosphere: weathering, erosion, and deposition
- Lesson 58 Describing how erosion and deposition change the geosphere; Describing and observing fossils
- Lesson 62 Describing the hydrosphere; Identifying sources of saline and fresh water
- Lesson 63 Describing the water cycle; Identifying and describing natural disasters
- Lesson 66 Describing freshwater and marine regions of the aquatic biome

Component Idea ESS2.D: Weather and Climate*What regulates weather and climate?***Framework Progression**

By the end of Grade 2: *Weather is the combination of sunlight, wind, snow or rain, and temperature in a particular region at a particular time. People measure these conditions to describe and record the weather and to notice patterns over time.* (NGSS Grade K)

By the end of Grade 5: *Weather is the minute-by-minute to day-by-day variation of the atmosphere’s condition on a local scale. Scientists record the patterns of the weather across different times and areas so that they can make predictions about what kind of weather might happen next. Climate describes the ranges of an area’s typical weather conditions and the extent to which those conditions vary over years to centuries.* (NGSS Grade 3)

Nancy Larson Science K–5 Lessons**Science K**

- Lesson 1 Identifying the day as sunny, cloudy, rainy, or snowy
- Lesson 58 Identifying a season of the year: summer; Identifying the day as hot
- Lesson 59 Identifying a season of the year: fall; Identifying the day as warm
- Lesson 60 Identifying a season of the year: winter; Identifying the day as cold
- Lesson 61 Identifying a season of the year: spring; Identifying the day as cool

Science 1

- Lesson 44 Identifying how animals adapt to seasonal changes

Science 3

- Lesson 42 Identifying what meteorologists do
- Lesson 43 Identifying the layers of the Earth’s atmosphere and the characteristics of each layer
- Lesson 45 Identifying and describing types of clouds
- Lesson 46 Identifying wind direction; Estimating wind speed
- Lesson 47 Collecting and recording weather data
- Lesson 48 Describing the characteristics of tornadoes
- Lesson 49 Describing the characteristics of hurricanes and typhoons

Component Idea ESS2.D: **Weather and Climate** *(continued)***Nancy Larson Science K–5 Lessons****Science 5**

- Lesson 61 Describing weather conditions; Describing characteristics of air masses
Lesson 64 Describing climate; Identifying and describing climatic regions

Component Idea ESS2.E: **Biogeology***How do living organisms alter Earth’s processes and structures?***Framework Progression**

By the end of Grade 2: *Plants and animals (including humans) depend on the land, water, and air to live and grow. They in turn can change their environment (e.g., the shape of land, the flow of water).*
(NGSS Grade K)

By the end of Grade 5: *Living things affect the physical characteristics of their regions (e.g., plants’ roots hold soil in place, beaver shelters and human-built dams alter the flow of water, plants’ respiration affects the air). Many types of rocks and minerals are formed from the remains of organisms or are altered by their activities.*
(NGSS Grade 4)

Nancy Larson Science K–5 Lessons**Science K**

- Lesson 46 Identifying what plants need to live
Lesson 48 Planting seeds
Lesson 55 Describing living things
Lesson 56 Identifying living and non-living things outside the school
Lesson 57 Identifying living and non-living things in the classroom

Science 1

- Lesson 13 Identifying what plants need to live
Lesson 14 Identifying that plants are living organisms
Lesson 28 Identifying how trees are used
Lesson 35 Identifying and describing how human beings use water
Lesson 36 Identifying ways to conserve natural resources: water
Lesson 37 Observing and describing soil
Lesson 54 Identifying the function and parts of the respiratory system

Science 2

- Lesson 2 Classifying matter as living or non-living

Science 3

- Lesson 50 Identifying sources of water and air pollution; Identifying ways to avoid polluting the environment
Lesson 59 Identifying how igneous, sedimentary, and metamorphic rocks are formed
Lesson 60 Describing and identifying igneous, sedimentary, and metamorphic rocks
Lesson 64 Identifying and describing characteristics of soil; Identifying the layers of soil on the Earth’s surface
Lesson 67 Identifying what seeds need to germinate
Lesson 68 Describing the function of parts of plants
Lesson 70 Describing how plants make their own food by photosynthesis

Science 4

- Lesson 13 Describing how plants make their own food through the process of photosynthesis
Lesson 41 Describing how animals obtain energy
Lesson 75 Identifying renewable and non-renewable energy resources

Science 5

- Lesson 55 Identifying Earth’s four major systems; Describing how human activities cause changes to the environment and affect Earth’s systems

Component Idea ESS2.E: Biogeology *(continued)***Nancy Larson Science K–5 Lessons****Science 5** *(continued)*

- Lesson 58 Describing how erosion and deposition change the geosphere; Describing and observing fossils
- Lesson 60 Describing the layers of the atmosphere; Describing the effects of greenhouse gases and ozone
- Lesson 62 Describing the hydrosphere; Identifying sources of saline and fresh water
- Lesson 67 Describing the effects of forests on the Earth’s systems; Identifying ways to protect forests

Core Idea ESS3: Earth and Human Activity*How do Earth’s surface processes and human activities affect each other?***Component Idea ESS3.A: Natural Resources***How do humans depend on Earth’s resources?***Framework Progression**

By the end of Grade 2: *Living things need water, air, and resources from the land, and they try to live in places that have the things they need. Humans use natural resources for everything they do: for example, they use soil and water to grow food, wood to burn to provide heat or to build shelters, and materials such as iron or copper extracted from Earth to make cooking pans.* (NGSS Grade K)

By the end of Grade 5: *All materials, energy, and fuels that humans use are derived from natural sources, and their use affects the environment in multiple ways. Some resources are renewable over time, and others are not.* (NGSS Grade 4)

Nancy Larson Science K–5 Lessons**Science K**

- Lesson 46 Identifying what plants need to live
- Lesson 55 Describing living things
- Lesson 56 Identifying living and non-living things outside the school
- Lesson 57 Identifying living and non-living things in the classroom

Science 1

- Lesson 10 Identifying places in our habitat
- Lesson 13 Identifying what plants need to live
- Lesson 14 Identifying that plants are living organisms
- Lesson 28 Identifying how trees are used
- Lesson 35 Identifying and describing how human beings use water
- Lesson 36 Identifying ways to conserve natural resources: water
- Lesson 37 Observing and describing soil
- Lesson 39 Sorting animals by land and water habitats
- Lesson 40 Identifying animals that live in land habitats: forest, desert, and grassland
- Lesson 41 Identifying animals that live in water habitats: pond, ocean, and ice
- Lesson 43 Identifying what animals need to live; Classifying animals as herbivores, carnivores, or omnivores

Science 2

- Lesson 24 Observing the crystal structure of the mineral halite
- Lesson 25 Identifying the minerals in granite

Science 3

- Lesson 21 Identifying the building blocks of the universe: elements; Locating information on the Periodic Table of the Elements
- Lesson 22 Classifying elements on the Periodic Table of the Elements as solids, liquids, or gases; Identifying elements our bodies require to be healthy
- Lesson 23 Identifying mineral nutrients in packaged foods and drinks
- Lesson 24 Identifying the seven most common elements in the universe; Identifying the characteristics of a compound; Identifying the elements that combine to make a compound

Component Idea ESS3.A: **Natural Resources** *(continued)*

Nancy Larson Science K–5 Lessons

Science 4

- Lesson 41 Describing how animals obtain energy
- Lesson 58 Identifying extinct and endangered animals
- Lesson 61 Describing energy
- Lesson 75 Identifying renewable and non-renewable energy resources
- Lesson 79 Identifying sources of electricity

Science 5

- Lesson 55 Identifying Earth’s four major systems; Describing how human activities cause changes to the environment and affect Earth’s systems
- Lesson 62 Describing the hydrosphere; Identifying sources of saline and fresh water
- Lesson 67 Describing the effects of forests on the Earth’s systems; Identifying ways to protect forests

Component Idea ESS3B: **Natural Hazards**

How do natural hazards affect individuals and societies?

Framework Progression

By the end of Grade 2: *Some kinds of severe weather are more likely than others in a given region. Weather scientists forecast severe weather so that communities can prepare for and respond to these events.*
(NGSS Grade K)

By the end of Grade 5: *A variety of hazards result from natural processes; (e.g., earthquakes, tsunamis, volcanic eruptions, severe weather, floods, coastal erosion). Humans cannot eliminate natural hazards but can take steps to reduce their impacts.*
(NGSS Grades 3 and 4)

Nancy Larson Science K–5 Lessons

Science 3

- Lesson 48 Describing the characteristics of tornadoes
- Lesson 49 Describing the characteristics of hurricanes and typhoons
- Lesson 50 Identifying sources of water and air pollution; Identifying ways to avoid polluting the environment
- Lesson 56 Identifying tectonic plates and their movements
- Lesson 57 Identifying the causes and effects of earthquakes
- Lesson 58 Identifying the causes and effects of volcanoes

Science 5

- Lesson 56 Describing the layers of the geosphere; Describing how the movement of tectonic plates causes changes to the geosphere
- Lesson 63 Describing the water cycle; Identifying and describing natural disasters

Component Idea ESS3.C: Human Impacts on Earth’s Systems*How do humans change the planet?***Framework Progression**

By the end of Grade 2: *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—for example, by reducing trash through reuse and recycling.*
(NGSS Grade K)

By the end of Grade 5: *Human activities in agriculture, industry, and everyday life have had major effects on the land, vegetation, streams, oceans, air, and even outer space. But individuals and communities are doing things to help protect Earth’s resources and environments. For example, they are treating sewage, reducing the amounts of materials they use, and regulating sources of pollution such as emissions from factories and power plants or the runoff from agricultural activities.*
(NGSS Grade 5)

Nancy Larson Science K–5 Lessons**Science 1**

Lesson 36 Identifying ways to conserve natural resources: water

Science 2

Lesson 53 Identifying ways to conserve paper and plastic

Science 3

Lesson 50 Identifying sources of water and air pollution; Identifying ways to avoid polluting the environment

Science 4

Lesson 76 Describing ways to help the environment by recycling, reducing and reusing

Science 5

Lesson 55 Identifying Earth’s four major systems; Describing how human activities cause changes to the environment and affect Earth’s systems
Lesson 60 Describing the layers of the atmosphere; Describing the effects of greenhouse gases and ozone
Lesson 67 Describing the effects of forests on the Earth’s systems; Identifying ways to protect forests

Component Idea ESS3.D: Global Climate Change*How do people model and predict the effects of human activities on Earth’s climate?***Framework Progression**

By the end of Grade 2: *(Intentionally left blank.)*
(NGSS: None)

By the end of Grade 5: *If Earth’s global mean temperature continues to rise, the lives of humans and other organisms will be affected in many different ways.*
(NGSS: None)

Nancy Larson Science K–5 Lessons**Science 5**

Lesson 60 Describing the layers of the atmosphere; Describing the effects of greenhouse gases and ozone
Lesson 64 Describing climate; Identifying and describing climatic regions

A Framework for K–12 Science Education

Dimension 3: Disciplinary Core Ideas—Engineering, Technology, and Applications of Science

Core Idea ETS1: Engineering Design

How do engineers solve problems?

Component Idea ETS1.A: Defining and Delimiting an Engineering Problem

What is a design for? What are the criteria and constraints of a successful solution?

Framework Progression

By the end of Grade 2: *A situation that people want to change or create can be approached as a problem to be solved through engineering. Such problems may have many acceptable solutions. Asking questions, making observations, and gathering information are helpful in thinking about problems. Before beginning to design a solution, it is important to clearly understand the problem.*

(NGSS Grades K–2)

By the end of Grade 5: *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.*

(NGSS Grades 3–5)

Nancy Larson Science K–5 Lessons

Science K

- Lesson 1 Identifying what scientists do
- Lesson 25 Exploring foam blocks
- Lesson 35 Making and separating mixtures
- Lesson 36 Making and separating a mixture of sand and pebbles
- Lesson 40 Identifying how objects can be moved by pushing or pulling
- Lesson 42 Identifying that round objects and objects with wheels require less force to move

Science 1

- Lesson 1 Describing what scientists do
- Lesson 34 Observing how water changes state; Predicting and comparing the ability of containers to collect rainwater

Science 2

- Lesson 1 Describing what scientists do
- Lesson 28 Demonstrating how the mass of an object affects the amount of force needed to move the object; Demonstrating how the strength and the direction of a force affects the movement of the object
- Lesson 30 Observing and describing the effect of friction on the movement of objects
- Lesson 31 Describing and demonstrating how a lubricant affects friction between two objects
- Lesson 35 Observing how rollers and wheels make work easier
- Lesson 36 Observing the function of wheels and axles
- Lesson 37 Observing how large wheels make it easier to move over an obstacle; Investigating the effects of friction on movement down an inclined plane
- Lesson 38 Investigating how the steepness of an inclined plane affects the distance a toy car travels
- Lesson 39 Investigating what happens when objects of different masses travel down an inclined plane
- Lesson 42 Identifying how inclined planes make work easier
- Lesson 43 Describing the characteristics of wedges
- Lesson 44 Describing the characteristics of screws; Comparing nails and screws
- Lesson 45 Identifying the function of screws
- Lesson 46 Demonstrating how first-class levers function; Identifying the parts of levers
- Lesson 47 Identifying the fulcrum, load, and effort of levers; Identifying how second- and third-class levers function
- Lesson 48 Describing the characteristics of wheels and axles
- Lesson 49 Demonstrating how pulleys function

Component Idea ETS1.A: Defining and Delimiting an Engineering Problem *(continued)*

Nancy Larson Science K–5 Lessons

Science 2 *(continued)*

- Lesson 50 Identifying and describing machines people use
- Lesson 60 Making an instrument that produces various pitches

Science 3

- Lesson 1 Describing what scientists do

Science 5

- Lesson 40 Comparing the viscosity of liquids
- Lesson 41 Conducting a viscosity experiment
- Lesson 82 Describing and measuring work; Observing how sleds and rollers reduce the effort needed to do work
- Lesson 83 Describing machines; Identifying simple machines; Identifying, describing, and comparing inclined planes
- Lesson 84 Identifying and describing a wedge, screw, and wheel and axle
- Lesson 85 Identifying and describing first-class levers
- Lesson 86 Identifying and describing second-class levers
- Lesson 87 Identifying and describing third-class levers
- Lesson 88 Describing a pulley; Using a fixed pulley, a movable pulley, and a pulley system to lift a load
- Lesson 89 Measuring and comparing the amounts of effort needed to raise a load by using a fixed pulley, a movable pulley, and a pulley system
- Lesson 90 Calculating the amount of effort needed to raise a load and the distance the rope is pulled when a pulley or pulley system is used
- Lesson 91 Observing and describing gears
- Lesson 92 Describing the functions of tools; Researching the history and development of a tool
- Lesson 93 Identifying engineering occupations; Describing the role of engineers

Component Idea ETS1.B: Developing Possible Solutions

What is the process for developing potential design solutions?

Framework Progression

By the end of Grade 2: *Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in communicating ideas for a problem's solutions to other people. To design something complicated, one may need to break the problem into parts and attend to each part separately but most then bring the parts together to test the overall plan.* (NGSS Grades K and 2)

By the end of Grade 5: *Research on a problem should be carried out—for example, through Internet searches, market research, or field observations—before beginning to design a solution. An often productive way to generate ideas is for people to work together to brainstorm, test, and refine possible solutions. Testing a solution involves investigating how well it*

Nancy Larson Science K–5 Lessons

Science K

- Lesson 25 Exploring foam blocks

Science 2

- Lesson 38 Investigating how the steepness of an inclined plane affects the distance a toy car travels
- Lesson 42 Identifying how inclined planes make work easier
- Lesson 43 Describing the characteristics of wedges
- Lesson 44 Describing the characteristics of screws; Comparing nails and screws
- Lesson 45 Identifying the function of screws
- Lesson 46 Demonstrating how first-class levers function; Identifying the parts of levers
- Lesson 47 Identifying the fulcrum, load, and effort of levers; Identifying how second- and third-class levers function
- Lesson 48 Describing the characteristics of wheels and axles
- Lesson 49 Demonstrating how pulleys function
- Lesson 60 Making an instrument that produces various pitches

Component Idea ETS1.B: Developing Possible Solutions *(continued)*

of likely conditions. Tests are often designed to identify failure points or difficulties, which suggest the elements of the design that need to be improved. 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. There are many types of models, ranging from simple physical models to computer models. They can be used to investigate how a design might work, communicate the design to others, and compare different designs.
(NGSS Grades 3–5)

Nancy Larson Science K–5 Lessons**Science 4**

- Lesson 83 Making a closed circuit; Tracing the path of an electric current through a closed circuit
- Lesson 84 Making a closed circuit to observe how the number of batteries affects the brightness of a light bulb
- Lesson 85 Testing materials to determine if they are conductors of insulators of electric current
- Lesson 86 Using a switch to open and close a circuit; Reading a circuit diagram
- Lesson 87 Identifying characteristics of a series circuit; Making a series circuit
- Lesson 88 Identifying characteristics of a parallel circuit; Making a parallel circuit
- Lesson 89 Making an electromagnet

Science 5

- Lesson 40 Comparing the viscosity of liquids
- Lesson 41 Conducting a viscosity experiment
- Lesson 82 Describing and measuring work; Observing how sleds and rollers reduce the effort needed to do work
- Lesson 83 Describing machines; Identifying simple machines; Identifying, describing, and comparing inclined planes
- Lesson 85 Identifying and describing first-class levers
- Lesson 86 Identifying and describing second-class levers
- Lesson 88 Describing a pulley; Using a fixed pulley, a movable pulley, and a pulley system to lift a load
- Lesson 89 Measuring and comparing the amounts of effort needed to raise a load by using a fixed pulley, a movable pulley, and a pulley system
- Lesson 90 Calculating the amount of effort needed to raise a load and the distance the rope is pulled when a pulley or pulley system is used

Component Idea ETS1.C: Optimizing the Design Solution

How can the various proposed design solutions be compared and improved?

Framework Progression

By the end of Grade 2: *Because there is always more than one possible solution to a problem, it is useful to compare designs, test them, and discuss their strengths and weaknesses.*
(NGSS Grade 2)

By the end of Grade 5: *Different solutions need to be tested in order to determine which of them best solves the problem, given the criteria and the constraints.*
(NGSS Grades 3–5)

Nancy Larson Science K–5 Lessons**Science K**

- Lesson 25 Exploring foam blocks
- Lesson 35 Making and separating mixtures
- Lesson 40 Identifying how objects can be moved by pushing or pulling

Science 1

- Lesson 34 Predicting and comparing the ability of containers to collect rainwater

Science 2

- Lesson 60 Making an instrument that produces various pitches

Science 4

- Lesson 83 Making a closed circuit; Tracing the path of an electric current through a closed circuit

Component Idea ETS1.C: Optimizing the Design Solution *(continued)***Nancy Larson Science K–5 Lessons****Science 4** *(continued)*

- Lesson 84 Making a closed circuit to observe how the number of batteries affects the brightness of a light bulb
- Lesson 85 Testing materials to determine if they are conductors or insulators of electric current

Science 5

- Lesson 41 Conducting a viscosity experiment
- Lesson 77 Measuring force by using a spring scale; Conducting a friction experiment
- Lesson 82 Describing and measuring work; Observing how sleds and rollers reduce the effort needed to do work
- Lesson 83 Describing machines; Identifying simple machines; Identifying, describing, and comparing inclined planes
- Lesson 89 Measuring and comparing the amounts of effort needed to raise a load by using a fixed pulley, a movable pulley, and a pulley system
- Lesson 90 Calculating the amount of effort needed to raise a load and the distance the rope is pulled when a pulley or pulley system is used

Core Idea ETS2: Links Among Engineering, Technology, Science, and Society*How are engineering, technology, science, and society interconnected?***Component Idea ETS2.A: Interdependence of Science, Engineering, and Technology***What are the relationships among science, engineering, and technology?***Framework Progression**

By the end of Grade 2: *People encounter questions about the natural world every day. There are many types of tools produced by engineering that can be used in science to help answer these questions through observation or measurement. Observations and measurements are also used in engineering to help test and refine design ideas.*

(NGSS: None)

By the end of Grade 5: *Tools and instruments (e.g., rulers, balances, thermometers, graduated cylinders, telescopes, microscopes) are used in scientific exploration to gather data and help answer questions about the natural world. Engineering design can develop and improve such technologies. Scientific discoveries about the natural world can often lead to new and improved technologies, which are developed through the engineering design process. Knowledge of relevant scientific concepts and research findings is important in engineering.*

(NGSS: None)

Nancy Larson Science K–5 Lessons**Science K**

- Lesson 32 Using a balance to compare the masses of objects
- Lesson 35 Making and separating mixtures
- Lesson 36 Making and separating a mixture of sand and pebbles; Observing sand
- Lesson 37 Observing and describing liquids; Conducting an experiment

Science 1

- Lesson 27 Identifying the age of trees
- Lesson 34 Observing how water changes state; Predicting and comparing the ability of containers to collect rainwater
- Lesson 52 Examining and comparing fingerprints

Science 2

- Lesson 8 Measuring the mass of a solid
- Lesson 15 Identifying matter attracted to magnets
- Lesson 16 Exploring magnetic attraction; Identifying different types of magnets
- Lesson 17 Identifying and naming the magnetic poles of magnets; Demonstrating that like poles repel and unlike poles attract
- Lesson 38 Investigating how the steepness of an inclined plane affects the distance a toy car travels

Component Idea ETS2.A: **Interdependence of Science, Engineering, and Technology** (*continued*)**Nancy Larson Science K–5 Lessons****Science 2** (*continued*)

Lesson 39 Investigating what happens when objects of different masses travel down an inclined plane

Science 3

- Lesson 1 Describing what scientists do; Identifying objects in our solar system
- Lesson 7 Identifying the role of astronauts in outer space exploration
- Lesson 30 Describing the characteristics of matter; Measuring the mass of solids
- Lesson 31 Measuring the volume of solids and liquids
- Lesson 34 Measuring temperature using a thermometer
- Lesson 35 Observing and measuring the changes in temperatures of hot water and ice water over time
- Lesson 36 Making a line graph to record data; Drawing conclusions from data shown on a line graph
- Lesson 46 Identifying wind direction; Estimating wind speed
- Lesson 47 Collecting and recording weather data

Science 4

- Lesson 2 Using a microscope to observe a specimen
- Lesson 3 Identifying parts of a microscope; Using a microscope to observe a cheek cell; Identifying the nucleus of a cheek cell
- Lesson 5 Describing the functions of structures in plant cells
- Lesson 7 Identifying characteristics of eukaryotic cells; Identifying organisms with eukaryotic cells; Using a microscope to observe protists
- Lesson 12 Describing the function of vascular tissues; Identifying vascular and nonvascular plants

Science 5

- Lesson 1 Identifying tools astronomers use to explore the universe
- Lesson 2 Constructing a Galilean refracting telescope
- Lesson 44 Measuring temperature
- Lesson 45 Measuring the mass of solids and liquids
- Lesson 46 Measuring the volume of liquids and solids
- Lesson 48 Describing density; Comparing the density of metals
- Lesson 52 Describing chemical reactions: neutralization; Identifying acids and bases
- Lesson 61 Describing weather conditions; Describing characteristics of air masses
- Lesson 72 Identifying weight as a force; Measuring weight
- Lesson 74 Describing the effect a magnet has on other substances; Describing an electromagnet
- Lesson 75 Describing the Earth's magnetism; Using a compass
- Lesson 77 Measuring force by using a spring scale; Conducting a friction experiment
- Lesson 82 Describing and measuring work; Observing how sleds and rollers reduce the effort needed to do work
- Lesson 83 Describing machines; Identifying simple machines; Identifying, describing, and comparing inclined planes
- Lesson 92 Describing the functions of tools; Researching the history and development of a tool
- Lesson 93 Identifying engineering occupations; Describing the role of engineers

Component Idea ETS2.B: Influence of Engineering, Technology, and Science on Society and the Natural World

How do science, engineering, and the technologies that result from them affect the ways in which people live? How do they affect the natural world?

Framework Progression

By the end of Grade 2: *People depend on various technologies in their lives; human life would be very different without technology. Every human-made product is designed by applying some knowledge of the natural world and is built by using materials derived from the natural world, even when the materials are not themselves natural—for example, spoons made from refined metals. Thus, developing and using technology has impacts on the natural world.*

(NGSS: None)

By the end of Grade 5: *Over time, people's needs and wants change, as do their demands for new and improved technologies. Engineers improve existing technologies or develop new ones to increase their benefits (e.g., better artificial limbs), to decrease known risks (e.g., seatbelts in cars), and to meet societal demands (e.g., cell phones). When new technologies become available, they can bring about changes in the way people live and interact with one another.*

(NGSS: None)

Nancy Larson Science K–5 Lessons

Science K

Lesson 42 Identifying that round objects and objects with wheels require less force to move

Science 1

Lesson 28 Identifying how trees are used

Science 2

Lesson 25 Identifying the minerals in granite

Lesson 35 Observing how rollers and wheels make work easier

Lesson 42 Identifying how inclined planes make work easier

Lesson 43 Describing the characteristics of wedges

Lesson 44 Describing the characteristics of screws; Comparing nails and screws

Lesson 45 Identifying the function of screws

Lesson 46 Demonstrating how first-class levers function

Lesson 47 Identifying the fulcrum, load, and effort of levers; Identifying how second- and third-class levers function

Lesson 50 Identifying and describing machines people use

Science 3

Lesson 23 Identifying mineral nutrients in packaged foods and drinks

Lesson 46 Identifying wind direction; Estimating wind speed

Lesson 47 Collecting and recording weather data

Lesson 48 Describing the characteristics of tornadoes

Lesson 49 Describing the characteristics of hurricanes and typhoons

Lesson 50 Identifying sources of water and air pollution; Identifying ways to avoid polluting the environment

Science 4

Lesson 2 Using a microscope to observe a specimen

Lesson 61 Describing energy

Lesson 81 Observing and describing a dry cell battery and electrical wire; Identifying conductors and insulators of electric current

Lesson 82 Examining an incandescent light bulb

Lesson 89 Making an electromagnet

Science 5

Lesson 1 Identifying tools astronomers use to explore the universe

Lesson 2 Constructing a Galilean refracting telescope

Lesson 73 Describing magnetism and magnetic fields

Lesson 83 Describing machines; Identifying simple machines; Identifying, describing, and comparing inclined planes

Lesson 84 Identifying and describing a wedge, screw, and wheel and axle

Lesson 85 Identifying and describing first-class levers

Lesson 86 Identifying and describing second-class levers

Lesson 87 Identifying and describing third-class levers

Lesson 88 Describing a pulley; Using a fixed pulley, a movable pulley, and a pulley system to lift a load

Lesson 89 Measuring and comparing the amounts of effort needed to raise a load by using a fixed pulley, a movable pulley, and a pulley system

Component Idea ETS2.B: Influence of Engineering, Technology, and Science on Society and the Natural World *(continued)*

Nancy Larson Science K–5 Lessons

Science 5 *(continued)*

- Lesson 92 Describing the functions of tools; Researching the history and development of a tool
- Lesson 93 Identifying engineering occupations; Describing the role of engineers

Nancy Larson *Science K*

Reverse Correlations to Framework Component Ideas

<i>Science K</i> Lessons	Framework Component Ideas	<i>Science K</i> Lessons	Framework Component Ideas
1.	ESS2D, ETS1A	51.	LS1A
2.	LS1A	52.	LS1A, LS1B
3.	LS1A	53.	LS1A, LS1B
4.	LS1A	54.	LS1A, LS1B
5.	PS4C, LS1A, LS1D, LS2A	55.	ESS2E, ESS3A, LS1A, LS1C, LS2A, LS2B
6.	PS4C, LS1A, LS1D, LS2A	56.	ESS2E, ESS3A
7.	PS4C, LS1A, LS1D, LS2A	57.	ESS2E, ESS3A, LS1C
8.	PS4C, LS1A, LS1D, LS2A	58.	ESS2D
9.	PS4C, LS1A, LS1D, LS2A	59.	ESS2D
10.	PS4C, LS1A, LS1D, LS2A	60.	ESS2D
11.	LS1A	61.	ESS2D
12.	LS1C		
13.	LS1C		
14.	LS1C		
15.	LS1C		
16.	LS1A		
17.	LS1A		
18.	LS1A		
19.	LS1A, LS1C, LS2A, LS3B		
20.	LS1A, LS1C, LS2A, LS3B		
21.	LS1A, LS3B		
22.	LS1A		
23.	LS1A		
24.	LS1A, LS1B, LS1C, LS2A, LS3A, LS3B		
25.	PS1A, ETS1A, ETS1B, ETS1C		
26.	PS1A		
27.	PS1A		
28.	PS1A		
29.	PS1A		
30.	PS1A		
31.	PS1A		
32.	PS1A, ETS2A		
33.	PS1A		
34.	PS1A		
35.	PS1A, ETS1A, ETS1C, ETS2A		
36.	PS1A, ETS1A, ETS2A		
37.	PS1A, PS1B, ETS2A		
38.	PS1A, PS1B		
39.	PS1A, PS1B		
40.	PS2A, ETS1A, ETS1C		
41.	PS2A, PS2B, PS2C, PS3C		
42.	PS2A, PS2B, PS2C, PS3C, ETS1A, ETS2B		
43.	PS2A, PS2B, PS2C		
44.	PS2A, PS2B		
45.	PS2A, PS2B, PS2C		
46.	ESS2E, LS1A, LS1C, LS2A, ESS3A		
47.	LS1A, LS1C, LS3A		
48.	ESS2E, LS1C, LS2A		
49.	LS1C, LS2A		
50.	LS3B		

LS = Life Sciences PS = Physical Sciences ESS = Earth and Space Sciences
 ETS = Engineering, Technology, and Applications of Science

Nancy Larson Science 1

Reverse Correlations to Framework Component Ideas

Science 1 Lessons	Framework Component Ideas	Science 1 Lessons	Framework Component Ideas
1.	ETS1A	51.	LS1A, LS1D
2.	LS1B	52.	LS1A, LS1D, LS3B, ETS2A
3.	LS1B	53.	LS1A, LS1C, LS1D
4.	LS1B	54.	ESS2E, LS1A, LS1D
5.	LS1B	55.	LS1A, LS1D
6.	LS1B	56.	LS1A, LS1D
7.	LS1B	57.	LS1A, LS1C
8.	LS1B	58.	Assessment
9.	LS2A	59.	LS1A, LS1B
10.	ESS3A	60.	LS1A, LS3B
11.	LS2A, LS4D	61.	LS1A, LS1B, LS3A, LS4D
12.	Assessment	62.	LS1A, LS1B
13.	ESS2E, ESS3A, LS1A, LS1C, LS2A, LS2B	63.	LS1A, LS1C, LS2B
14.	ESS2E, ESS3A, LS1A, LS1C, LS2A, LS3A	64.	LS1A, LS1B, LS3A, LS4D
15.	LS1A, LS4D	65.	LS1A, LS1B, LS1D, LS2B, LS3A
16.	LS1A, LS3B	66.	LS1A
17.	LS1A	67.	LS1A, LS1D, LS2B
18.	LS1A	68.	LS1B, LS3A
19.	Assessment	69.	LS1A
20.	LS1A	70.	Review
21.	LS1A, LS1D, LS4D	71.	Assessment
22.	PS2C, LS1A, LS1B, LS1D		
23.	LS1A, LS1B, LS1D, LS3A		
24.	LS1A, LS1B, LS3A, LS3B		
25.	LS1A, LS1B, LS3A, LS3B		
26.	LS1A, LS1B, LS3A		
27.	ESS1C, LS1A, LS1B, ETS2A		
28.	ESS2E, ESS3A, ETS2B		
29.	Assessment		
30.	PS3B, PS4B, ESS1B, LS2A		
31.	PS4B, ESS1B		
32.	PS2C, ESS1B, ESS1C		
33.	PS1A, PS1B, ESS2A, ESS2B, ESS2C		
34.	PS1A, PS1B, ESS2C, ETS1A, ETS1C, ETS2A		
35.	ESS2E, ESS3A, LS1C, LS2A, LS2B		
36.	ESS2E, ESS3A, ESS3C		
37.	ESS2A, ESS2B, ESS2E, ESS3A, LS2A, LS2B		
38.	Assessment		
39.	ESS3A, LS4D		
40.	ESS3A, LS4D		
41.	ESS2C, ESS3A, LS1D, LS4D		
42.	LS1A, LS1D, LS4D		
43.	ESS3A, LS1C, LS2A, LS2B		
44.	ESS2D, LS1A, LS1D, LS2A, LS2B, LS2C, LS4B, LS4C		
45.	LS1A, LS1B, LS1C, LS2A		
46.	Assessment		
47.	LS1A		
48.	LS1A, LS1D		
49.	LS1A, LS1B		
50.	LS1A, LS1D		

LS = Life Sciences PS = Physical Sciences ESS = Earth and Space Sciences
 ETS = Engineering, Technology, and Applications of Science

Nancy Larson *Science 2*

Reverse Correlations to Framework Component Ideas

<i>Science 2</i> Lessons	Framework Component Ideas	<i>Science 2</i> Lessons	Framework Component Ideas
1.	LS1D, ETS1A	51.	Review
2.	PS1A, ESS2E	52.	Assessment
3.	PS1A	53.	ESS3C
4.	PS1A	54.	PS4A
5.	PS1A	55.	PS4A
6.	PS1A	56.	PS4A
7.	PS1A	57.	PS4A
8.	PS1A, ETS2A	58.	PS4C
9.	Review	59.	PS4A
10.	Assessment	60.	ETS1A, ETS1B, ETS1C
11.	PS1A	61.	PS3B, PS4B
12.	PS1A	62.	PS4B
13.	PS1A, PS1B	63.	PS3B, PS4B
14.	PS1A, PS4B	64.	Review
15.	PS2B, PS3C, ETS2A	65.	Assessment
16.	PS2B, PS2C, PS3C, ETS2A	66.	LS1A
17.	PS2B, PS2C, PS3C, ETS2A	67.	LS1A, LS1B, LS3A, LS4D
18.	Review	68.	LS1A
19.	Assessment	69.	LS1A
20.	PS1A	70.	LS1A, LS2A
21.	PS1A	71.	LS1A, LS1D
22.	PS1A	72.	LS1A, LS1C, LS2A
23.	PS1A	73.	LS1A
24.	PS1A, ESS3A	74.	LS1A, LS1B, LS2A, LS2B
25.	PS1A, ESS3A, ETS2B	75.	LS1A, LS1B, LS2A, LS4D
26.	Review	76.	LS1A, LS1C, LS1D, LS2A, LS2B, LS3B
27.	Assessment	77.	LS1A, LS1C, LS2A, LS2B
28.	PS2A, PS2B, PS2C, PS3C, ETS1A	78.	LS1A, LS1C
29.	PS2A, PS2B, PS2C	79.	Review
30.	PS2A, PS2C, PS3D, ETS1A	80.	Assessment
31.	PS2A, PS3D, ETS1A		
32.	PS2C		
33.	Review		
34.	Assessment		
35.	PS2A, PS3D, ETS1A, ETS2B		
36.	PS2C, ETS1A		
37.	PS2A, PS2C, PS3D, ETS1A		
38.	PS2C, ETS1A, ETS1B, ETS2A		
39.	PS2A, PS2C, ETS1A, ETS2A		
40.	Review		
41.	Assessment		
42.	ETS1A, ETS1B, ETS2B		
43.	ETS1A, ETS1B, ETS2B		
44.	ETS1A, ETS1B, ETS2B		
45.	ETS1A, ETS1B, ETS2B		
46.	ETS1A, ETS1B, ETS2B		
47.	ETS1A, ETS1B, ETS2B		
48.	ETS1A, ETS1B		
49.	ETS1A, ETS1B		
50.	ETS1A, ETS2B		

LS = Life Sciences PS = Physical Sciences ESS = Earth and Space Sciences
ETS = Engineering, Technology, and Applications of Science

Nancy Larson Science 3

Reverse Correlations to Framework Component Ideas

Science 3 Lessons	Framework Component Ideas	Science 3 Lessons	Framework Component Ideas
1.	PS4C, ESS1A, ESS1B, ETS1A, ETS2A	51.	Review
2.	PS3B, PS4B, ESS1A	52.	Assessment
3.	PS2C, ESS1B	53.	ESS1C, ESS2B
4.	PS2B, ESS1B	54.	ESS1C, ESS2B
5.	ESS1B	55.	PS2B, PS2C, ESS1C, ESS2B, ESS3B
6.	PS2B, ESS1B	56.	PS2B, PS2C, ESS1C, ESS2B, ESS3B
7.	ETS2A	57.	PS4A, ESS1C, ESS2B, ESS3B
8.	ESS1B	58.	ESS1C, ESS2B, ESS3B
9.	ESS1B	59.	PS2C, ESS1C, ESS2A, ESS2B, ESS2E
10.	Review	60.	ESS1C, ESS2B, ESS2E
11.	Assessment	61.	PS2C, ESS1C, ESS2A, ESS2C
12.	ESS1B	62.	ESS1C, ESS2A, ESS2C
13.	ESS1B	63.	ESS2A
14.	ESS1B	64.	ESS1C, ESS2A, ESS2E
15.	ESS1B	65.	Review
16.	ESS1B	66.	Assessment
17.	ESS1B	67.	ESS2E, LS1A, LS1B, LS1C
18.	ESS1B	68.	ESS2E, LS1A, LS1C
19.	Review	69.	LS1A, LS1B, LS1C
20.	Assessment	70.	PS3B, ESS2E, LS1A, LS1C, LS2B
21.	PS1A, ESS3A	71.	LS1A, LS1B, LS1C, ETS1A
22.	ESS3A	72.	Review
23.	ESS3A, ETS2B	73.	Assessment
24.	PS1A, ESS3A	74.	ESS3A, LS1C, LS2A
25.	PS1A	75.	LS1A, LS1C, LS1D, LS2A
26.	PS1B	76.	LS1B, LS3A, LS3B
27.	Review	77.	LS1A, LS1C, LS1D, LS2A, LS4A
28.	Assessment	78.	LS1A, LS1B, LS3A, LS3B
29.	PS1B	79.	Review
30.	PS1A, ETS2A	80.	Assessment
31.	PS1A, ETS2A		
32.	PS1A		
33.	PS1A, PS3C		
34.	ETS2A		
35.	ESS2C, ETS2A		
36.	ETS2A		
37.	ESS2C		
38.	ESS2C		
39.	ESS2C		
40.	Review		
41.	Assessment		
42.	ESS2A, ESS2D		
43.	ESS2A, ESS2D		
44.	PS2C, ESS2A, ESS2C		
45.	ESS2A, ESS2C, ESS2D		
46.	ESS2A, ESS2D, ETS2A, ETS2B		
47.	ESS2A, ESS2C, ESS2D, ETS2A, ETS2B		
48.	ESS2A, ESS2D, ESS3B, ETS2B		
49.	ESS2A, ESS2D, ESS3B, ETS2B		
50.	ESS2E, ESS3C, ETS2B		

LS = Life Sciences PS = Physical Sciences ESS = Earth and Space Sciences
ETS = Engineering, Technology, and Applications of Science

Nancy Larson Science 4

Reverse Correlations to Framework Component Ideas

Science 4 Lessons	Framework Component Ideas	Science 4 Lessons	Framework Component Ideas
1.	LS1A	51.	LS1A, LS1D, LS3A, LS3B
2.	PS4C, ETS2A, ETS2B	52.	ETS1A, LS1A, LS1D, LS3A
3.	PS4C, ETS2A, LS1A	53.	LS1A, LS1D, LS2C, LS2D, LS3A, LS3B
4.	LS1A	54.	LS1A, LS1D, LS2A, LS2C, LS3A, LS3B
5.	ETS2A, LS1A	55.	LS1A, LS2A, LS2C, LS3A, LS3B
6.	LS1A	56.	LS1A, LS1D, LS2A, LS2C, LS2D, LS3A, LS3B
7.	ETS2A, LS1A	57.	LS1A, LS1D, LS2A, LS3A, LS3B
8.	LS1A	58.	ESS3A, LS2C, LS4C
9.	LS4D	59.	Review, ETS1A, LS2C
10.	Review	60.	Assessment
11.	Assessment	61.	PS3A, PS3B, PS3D, ESS3A, ETS2B
12.	LS1A, LS1C, ETS2A	62.	PS2A, PS2B, PS3A, PS3B, PS3C
13.	PS3D, ESS2E, LS1A, LS1C, LS2B	63.	PS2A, PS2B, PS3A, PS3B, PS3C, PS3D
14.	LS1A, LS1B	64.	PS2A, PS2B, PS2C, PS3A, PS3B, PS3C
15.	LS1B	65.	PS3A, PS3B, PS3C, PS4A
16.	Review	66.	PS3A, PS3B, PS3C, PS4A, ETS1A
17.	Assessment	67.	Review
18.	LS1A	68.	Assessment
19.	LS3B	69.	PS3A, PS3B, PS4B, PS4C
20.	LS1A, LS1B	70.	PS3A, PS3B, PS4B
21.	LS1A, LS1B	71.	PS4B
22.	LS1A, LS1B	72.	PS2C, PS4B
23.	LS1A, LS1B	73.	PS2C, PS3A, PS3B
24.	LS1A	74.	PS2C, PS3B
25.	ETS1A	75.	PS3B, PS3D, ESS2E, ESS3A
26.	Review	76.	ESS3C
27.	Assessment	77.	Review
28.	LS1A	78.	Assessment
29.	LS1A, LS1D	79.	PS3A, PS3D, ESS3A
30.	LS1A	80.	PS2B, PS3A, PS3B, PS3D
31.	LS1A, LS1B, LS1C	81.	PS3B, PS3D, ETS2B
32.	LS1B	82.	PS3B, ETS2B
33.	Review	83.	PS3A, PS3B, ETS1B, ETS1C
34.	Assessment	84.	PS3B, ETS1B, ETS1C
35.	LS1A	85.	ETS1B, ETS1C
36.	LS1A	86.	ETS1B
37.	LS1A	87.	PS3A, ETS1B
38.	LS1A, LS1B	88.	PS3A, ETS1B
39.	LS1A	89.	PS2B, PS3A, ETS1B, ETS2B
40.	LS1A, LS1C, LS2A	90.	Review
41.	PS3D, ESS2E, ESS3A, LS1A, LS1C, LS2A, LS2B	91.	Assessment
42.	Review		
43.	Assessment		
44.	LS2A, LS2D, LS4D		
45.	LS1C, LS2A, LS2B, LS4D		
46.	PS3D, LS1C, LS2A, LS2B, LS4D		
47.	PS3D, LS1C, LS2A, LS2B, LS4D		
48.	LS1A, LS1C, LS2A, LS2B, LS4D		
49.	Review		
50.	Assessment		

LS = Life Sciences PS = Physical Sciences ESS = Earth and Space Sciences
ETS = Engineering, Technology, and Applications of Science

Nancy Larson Science 5

Reverse Correlations to Framework Component Ideas

Science 5 Lessons	Framework Component Ideas	Science 5 Lessons	Framework Component Ideas
1.	PS4C, ESS1A, ETS2A, ETS2B	51.	PS1B, PS3C
2.	PS4B, PS4C, ETS2A, ETS2B	52.	PS1B, ETS2A
3.	PS2C, ESS1A, ESS1B	53.	Review
4.	PS2C, ESS1A, ESS1B	54.	Assessment
5.	ESS1A	55.	ESS2A, ESS2E, ESS3A, ESS3C
6.	PS2B, PS3B, PS4B, ESS1A	56.	PS2C, ESS1C, ESS2A, ESS2B, ESS3B,
7.	PS2C, ESS1A	57.	PS2C, ESS1C, ESS2A, ESS2C
8.	Review	58.	PS2C, LS4A, ESS1C, ESS2A, ESS2C, ESS2E
9.	Assessment	59.	PS2C, ESS1C
10.	PS2B, PS4B, ESS1A, ESS1B	60.	ESS2A, ESS2E, ESS3C, ESS3D
11.	ESS1B	61.	ESS2A, ESS2D, ETS2A
12.	ESS1B	62.	ESS2A, ESS2C, ESS2E, ESS3A
13.	ESS1B	63.	PS2C, PS3B, ESS2A, ESS2C, ESS3B
14.	PS2C, ESS1B	64.	ESS2A, ESS2D, ESS3D
15.	PS2C, PS3B, ESS1B	65.	LS1A, LS4C, LS4D, ESS2A
16.	PS2C, ESS1B	66.	LS1A, LS1D, LS4C, LS4D, ESS2A, ESS2C
17.	PS2C, PS4B, ESS1B	67.	PS3B, PS3D, LS1A, LS1C, LS2A, LS2B, LS2C, ESS2A, ESS2E, ESS3A, ESS3C
18.	PS2C, PS4B, ESS1B	68.	Review
19.	Review	69.	Assessment
20.	Assessment	70.	PS2A, PS2B, PS3C
21.	PS1A	71.	PS1C, PS2A, PS2B
22.	PS1A	72.	PS2A, PS2B, ETS2A
23.	PS1A	73.	PS2A, PS2B, PS2C, PS3C, ETS2B
24.	PS1A	74.	PS2A, PS2B, PS2C, PS3C, ETS2A
25.	PS1A	75.	PS2A, PS2B, PS2C, PS3C, ETS2A
26.	PS1A, PS1B	76.	PS2A, PS2B, PS3C
27.	PS1A	77.	PS2B, PS3C, ETS1C, ETS2A
28.	PS1A, PS1B	78.	PS2A, PS2B, PS3C
29.	PS1A	79.	PS2A, PS2B, PS2C, PS3A, PS3B, PS3C
30.	Review	80.	Review
31.	Assessment	81.	Assessment
32.	PS1A, PS1B	82.	PS2A, PS2B, PS2C, ETS1A, ETS1B, ETS1C, ETS2A
33.	PS1A, PS1B	83.	PS2A, PS2B, PS2C, ETS1A, ETS1B, ETS1C, ETS2A, ETS2B
34.	PS1A	84.	PS2A, PS2B, PS2C, ETS1A, ETS2B
35.	PS1A, PS1B, PS3A	85.	PS2A, PS2B, PS2C, ETS1A, ETS1B, ETS2B
36.	PS1A, PS1B, PS3A	86.	PS2A, PS2B, PS2C, ETS1A, ETS1B, ETS2B
37.	PS1A	87.	PS2A, PS2B, PS2C, ETS1A, ETS2B
38.	PS1A	88.	PS2A, PS2B, PS2C, ETS1A, ETS1B, ETS2B
39.	PS1A, PS4B	89.	PS2A, PS2B, PS2C, ETS1A, ETS1B, ETS1C, ETS2B
40.	PS1A, ETS1A, ETS1B	90.	PS2A, PS2B, PS2C, ETS1A, ETS1B, ETS1C
41.	ETS1A, ETS1B, ETS1C	91.	PS2A, PS2B, PS2C, ETS1A
42.	Review	92.	ETS1A, ETS2A, ETS2B
43.	Assessment	93.	ETS1A, ETS2A, ETS2B
44.	ETS2A	94.	Review
45.	PS1A, ETS2A	95.	Assessment
46.	PS1A, ETS2A		
47.	PS1A		
48.	PS1A, ETS2A		
49.	PS1A		
50.	PS1B, PS3C		

LS = Life Sciences PS = Physical Sciences ESS = Earth and Space Sciences
ETS = Engineering, Technology, and Applications of Science

