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

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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)

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

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 impacts of gas particles on surfaces (e.g., of a balloon) and on larger particles or objects (e.g., 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 substances. (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	Identifying and describing transparent, translucent, and opaque matter
Lesson 20	Classifying rocks by size
Lesson 21	Describing minerals
Lesson 22	Observing and describing 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 elements on the Periodic Table of the Elements; Identifying the chemical symbols and atomic numbers of elements
Lesson 22	Identifying elements our bodies need to be healthy; Classifying elements as solids, liquids, or gases
Lesson 23	Identifying mineral nutrients in packaged foods and drinks
Lesson 24	Identifying characteristics of compounds; Identifying the elements that combine to make compounds
Lesson 25	Describing atoms and molecules; Identifying the atoms in molecules of elements and compounds; Writing chemical formulas for models of molecules
Lesson 31	Identifying characteristics of matter; Measuring mass and volume
Lesson 32	Identifying characteristics of solids, liquids, gases, and plasma
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 atom 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 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 13 Observing how matter changes state

Science 3

Lesson 28 Identifying and describing physical and chemical changes; Observing physical changes
Lesson 29 Observing a chemical change
Lesson 30 Identifying and describing mixtures; Observing and making mixtures
Lesson 37 Observing and describing the physical changes of melting and freezing
Lesson 38 Observing and describing the physical change of vaporizing; Conducting an experiment to determine how surface area affects how quickly water evaporates
Lesson 39 Observing and describing the physical change of condensing

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 32 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. The effect of unbalanced forces on an object results in a change 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 Observing and describing the effect of force on the movement of objects
Lesson 29 Identifying gravity as a force; Observing and describing the effect of gravity on the movement of objects
Lesson 30 Identifying friction as a force; 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 reduce the amount of force needed to do work
Lesson 37 Conducting an experiment to determine how the steepness of a ramp affects the distance a toy car travels
Lesson 39 Engineering: Building a car with wheels

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

Component Idea PS2.A: **Forces and Motion** *(continued)*

Nancy Larson *Science K–5* Lessons

Science 5 *(continued)*

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.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 Observing and describing the effect of force on the movement of objects
Lesson 29 Identifying gravity as a force; Observing and describing the effect of gravity on the movement of objects

Science 3

Lesson 18 Describing meteoroids, meteors, and meteorites
Lesson 55 Describing how tectonic plates move; Identifying what may occur when 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
Lesson 89 Making an electromagnet

Component Idea PS2.B: **Types of Interactions** *(continued)*

Nancy Larson *Science K–5* Lessons

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 as well (e.g., a ball on a slope, a ladder leaning on a wall) as well as what makes something change or move.*

(NGSS: None)

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; Identifying how an apple tree changes during 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)*

Framework Progression

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 other cyclical patterns (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)

Nancy Larson *Science K–5* Lessons

Science 2

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	Observing and describing the effect of force on the movement of objects
Lesson 29	Identifying gravity as a force; Observing and describing the effect of gravity on the movement of objects
Lesson 30	Identifying fiction as a force; Observing and describing the effect of friction on the movement of objects
Lesson 32	Describing and demonstrating work
Lesson 36	Observing how wheels make it easier to move an object
Lesson 37	Conducting an experiment to determine how the steepness of a ramp affects the distance a toy car travels
Lesson 38	Investigating what happens when objects of different masses travel down a ramp
Lesson 39	Engineering: Building a car with wheels

Science 3

Lesson 3	Identifying how the Earth's rotation causes day and night
Lesson 5	Identifying what causes the Earth's seasons
Lesson 9	Identifying the phases of the Moon
Lesson 44	Describing the water cycle; Describing evaporation, condensation, and precipitation
Lesson 55	Describing how tectonic plates move; Identifying what may occur when tectonic plates move
Lesson 56	Identifying tectonic plates and their movements
Lesson 62	Identifying the causes and effects of weathering
Lesson 65	Identifying causes and effects of erosion
Lesson 67	Identifying how igneous, sedimentary, and metamorphic rocks are formed

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
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 cycle 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

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

Nancy Larson *Science K–5* Lessons

Science 5 *(continued)*

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
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)

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 Describing the characteristics of sound
Lesson 66 Describing how musical instruments produce sounds
Lesson 69 Describing radiant energy

Component Idea PS3.A: **Definitions of Energy** *(continued)*

Framework Progression

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 *(continued)*

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 79	Identifying sources of electricity; Describing how electricity is used
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 circuit
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 1	Identifying the early astronomers Copernicus and Galileo; Identifying the Sun as the center of our solar system; Identifying how a telescope is used by astronomers
Lesson 2	Identifying characteristics of the Sun

Science 4

Lesson 13	Describing how plants make their own food through the process of photosynthesis
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	Describing the 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

Component Idea PS3.B: **Conservation of Energy and Energy Transfer** *(continued)*

Nancy Larson *Science K–5* Lessons

Science 4 *(continued)*

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
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 Identifying and naming the magnetic poles of magnets; Demonstrating that like poles repel and unlike poles attract
Lesson 28 Observing and describing the effect of force on the movement of objects

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 Describing the characteristics of sound
Lesson 66 Describing how musical instruments produce sounds

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

Nancy Larson *Science K–5* Lessons

Science 5

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 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 about 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 Identifying friction as a force; 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 reduce the amount of force needed to do work
Lesson 37 Conducting an experiment to determine how the steepness of a ramp affects the distance a toy car travels

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; Describing 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 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. Some materials allow light to pass through them, others allow only some light through, and others block all the light.*

(NGSS Grade 1)

By the end of Grade 5: *Objects can be seen when light reflected from their surface enters our eyes. The color people see depends on the color of the available light sources as well as the properties of the surface.*

(NGSS Grade 4)

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 Identifying and describing transparent, translucent, and opaque 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 color

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

Nancy Larson *Science K–5* Lessons

Science 3

Lesson 2	Identifying characteristics of the Sun
Lesson 6	Describing how the Moon rotates and orbits; Identifying characteristics of the Moon's surface
Lesson 18	Describing meteoroids, meteors, and meteorites

Science 4

Lesson 69	Describing radiant energy
Lesson 70	Describing visible light; Observing how light waves are reflected
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
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	Identifying the early astronomers Copernicus and Galileo; Identifying the Sun as the center of our solar system; Identifying how a telescope is used by astronomers

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 severe 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 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
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

Component Idea LS1.A: **Structure and Function** *(continued)*

Nancy Larson *Science K–5* Lessons

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 parts of a tree
Lesson 16	Observing and comparing leaves
Lesson 17	Identifying and labeling the parts of a tree
Lesson 18	Identifying 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 seeds of broad-leaved trees
Lesson 25	Observing and describing cones and seeds of conifers
Lesson 26	Identifying the life stages of trees
Lesson 27	Identifying the age of a tree
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 function of joints
Lesson 51	Identifying the function of muscles
Lesson 52	Identifying the function of skin; Examining and comparing fingerprints
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 butterfly caterpillars
Lesson 60	Identifying characteristics of butterflies and moths
Lesson 61	Identifying the life stages of butterflies and moths
Lesson 62	Identifying characteristics of ladybird beetles
Lesson 63	Identifying the life stages of ladybird beetles
Lesson 64	Describing characteristics and the life stages of grasshoppers
Lesson 65	Identifying and describing the parts of insects' bodies
Lesson 66	Describing characteristics of spider
Lesson 68	Comparing, sorting, and graphing insects and spiders

Science 2

Lesson 66	Observing birds in their habitat
Lesson 67	Identifying characteristics of birds
Lesson 68	Identifying how birds move
Lesson 69	Identifying characteristics of birds' bodies

Component Idea LS1.A: **Structure and Function** *(continued)*

Nancy Larson *Science K–5* Lessons

Science 2 *(continued)*

Lesson 70	Identifying 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 characteristics of birds' eggs
Lesson 75	Describing how birds care for their chicks; Describing characteristics of chicks
Lesson 76	Describing 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 72	Identifying and describing amphibians; Describing the habitats of amphibians
Lesson 73	Identifying and describing reptiles; Describing the habitats 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

Component Idea LS1.A: **Structure and Function** *(continued)*

Nancy Larson *Science K–5* Lessons

Science 4 *(continued)*

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

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 plants, 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 characteristics of infants
Lesson 3 Identifying characteristics of toddlers
Lesson 4 Identifying characteristics of children
Lesson 5 Identifying characteristics of adolescents
Lesson 6 Identifying characteristics of adults
Lesson 7 Classifying photographs according to the stages of life
Lesson 8 Describing the stages of life
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 seeds of broad-leaved trees

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

Nancy Larson *Science K–5* Lessons

Science 1 *(continued)*

Lesson 25 Observing and describing cones and seeds of conifers
Lesson 26 Identifying the life stages of trees
Lesson 27 Identifying the age of a tree
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 the number of legs on insects; Identifying and observing butterfly caterpillars
Lesson 61 Identifying the life stages of butterflies and moths
Lesson 62 Identifying characteristics of ladybird beetles
Lesson 64 Describing characteristics and the life stages of grasshoppers
Lesson 67 Describing the life stages of spiders

Science 2

Lesson 67 Identifying characteristics of birds
Lesson 74 Describing the function and design of birds' nests; Describing characteristics of birds' eggs
Lesson 75 Describing how birds care for their chicks; Describing characteristics of chicks

Science 3

Lesson 75 Describing the life cycle of amphibians
Lesson 76 Describing the metamorphosis of a frog
Lesson 77 Describing the life cycle of reptiles
Lesson 78 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 insects

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)

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

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

Framework Progression

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 *(continued)*

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; Identifying parts of plants
Lesson 14 Identifying that plants are living organisms; Identifying and labeling the parts of a plant
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 62 Identifying characteristics of ladybird beetles

Science 2

Lesson 72 Identifying what birds eat by the shape of their bills
Lesson 76 Describing 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 72 Identifying and describing amphibians; Describing the habitats of amphibians
Lesson 73 Identifying and describing reptiles; Describing the habitats 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 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 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; 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 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 function of joints
Lesson 51 Identifying the function of muscles
Lesson 52 Identifying the function of skin; Examining and comparing fingerprints
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 64 Describing characteristics and the life stages of grasshoppers
Lesson 66 Describing characteristics of spiders

Science 2

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

Science 3

Lesson 72 Identifying and describing amphibians; Describing the habitats of amphibians
Lesson 73 Identifying and describing reptiles; Describing the habitats of reptiles
Lesson 74 Describing the body temperatures of amphibians and reptiles
Lesson 78 Comparing amphibians and 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

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

Nancy Larson *Science K–5* Lessons

Science 4 *(continued)*

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, and light to grow. Plants often depend on animals for pollination or to move their seeds around.*
(NGSS Grade 2)

By the end of Grade 5: *The food of almost any animal can be traced back to plants. Some organisms, such as fungi and bacteria, break down dead organisms and therefore operate as "decomposers." Decomposition eventually restores (recycles) some materials back to the soil for plants to use.*
(NGSS Grade 5)

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
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; Identifying parts of plants
Lesson 14 Identifying that plants are living organisms; Identifying and labeling the parts of a plant
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 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; Describing characteristics of birds' eggs

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

Nancy Larson *Science K–5* Lessons

Science 2 *(continued)*

Lesson 75 Describing how birds care for their chicks; Describing characteristics of chicks
Lesson 76 Describing characteristics of owls
Lesson 77 Observing what an owl eats by examining an owl pellet

Science 3

Lesson 66 Identifying and describing soil horizons
Lesson 72 Identifying and describing amphibians; Describing the habitats of amphibians
Lesson 73 Identifying and describing reptiles; Describing the habitats of reptiles

Science 4

Lesson 40 Classifying animals according to what they eat
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 62 Identifying characteristics of ladybird beetles
Lesson 64 Describing characteristics and the life stages of grasshoppers
Lesson 66 Describing characteristics of spiders

Science 2

Lesson 74 Describing the function and design of birds' nests; Describing characteristics of birds' egg

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

Nancy Larson *Science K–5* Lessons

Science 2 *(continued)*

Lesson 76 Describing characteristics of owls
Lesson 77 Observing what an owl eats by examining an owl pellet

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
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 3

Lesson 74 Describing the body temperatures of amphibians and reptiles

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 individual's 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; Identifying and labeling the parts of a plant
Lesson 23	Describing how deciduous trees change during the year; Identifying how deciduous trees produce fruit
Lesson 24	Observing and describing seeds of broad-leaved trees
Lesson 25	Observing and describing cones and seeds of conifers
Lesson 26	Identifying the life stages of trees
Lesson 61	Identifying the life stages of butterflies and moths
Lesson 63	Identifying the life stages of ladybird beetles
Lesson 64	Describing characteristics and the life stages of grasshoppers
Lesson 67	Describing the life stages of spiders

Science 2

Lesson 67	Identifying characteristics of birds

Science 3

Lesson 75	Describing the life cycle of amphibians
Lesson 76	Describing the metamorphosis of a frog
Lesson 78	Comparing amphibians and reptiles

Component Idea LS3.A: **Inheritance of Traits** *(continued)*

Nancy Larson *Science K–5* Lessons

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 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 dogs
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 seeds of broad-leaved trees
Lesson 25 Observing and describing cones and 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 characteristics of owls

Science 3

Lesson 75 Describing the life cycle of amphibians
Lesson 76 Describing the metamorphosis of a frog
Lesson 77 Describing the life cycle 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 69 Describing how fossils are formed

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

Science 5

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

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)

Nancy Larson *Science K–5* Lessons

Science 1

Lesson 44 Identifying how animals adapt to seasonal changes

Science 3

Lesson 72 Identifying and describing amphibians; Describing the habitats of amphibians

Lesson 73 Identifying and describing reptiles; Describing the habitats of reptiles

Component Idea LS4.C: **Adaptation** *(continued)*

Framework Progression

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 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. Change 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; Identifying parts of trees
Lesson 21 Identifying deciduous and evergreen trees and shrubs; Identifying how deciduous trees change during the year
Lesson 39 Identifying animals from photographs; 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 stages of butterflies and moths
Lesson 63 Identifying the life stages of ladybird beetles

Science 2

Lesson 67 Identifying characteristics of birds
Lesson 75 Describing how birds care for their chicks; Describing 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 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 others 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 the early astronomers Copernicus and Galileo; Identifying the Sun as the center of our solar system; Identifying how a telescope is used by astronomers
Lesson 2	Identifying 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 rotations.*
(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 the early astronomers Copernicus and Galileo; Identifying the Sun as the center of our solar system; Identifying how a telescope is used by astronomers
Lesson 3	Identifying how the Earth's rotation causes day and night
Lesson 4	Describing the Earth's orbit around the Sun
Lesson 5	Identifying what causes the Earth's seasons
Lesson 6	Describing how the Moon rotates and orbits; Identifying characteristics of the Moon's surface
Lesson 8	Identifying and comparing a full Moon and a new Moon
Lesson 9	Identifying the phases of the Moon
Lesson 12	Describing planets and moons; Identifying the eight planets in our solar system; Identifying the inner and outer planets
Lesson 13	Describing and comparing asteroids and dwarf planets
Lesson 14	Comparing the distances the planets are from the Sun
Lesson 15	Identifying and comparing the number of moons, rotational times, and orbital times of the planets

Component Idea ESS1.B: **Earth and the Solar System** *(continued)*

Nancy Larson *Science K–5* Lessons

Science 3 *(continued)*

Lesson 16 Identifying and comparing characteristics of inner and outer planets
Lesson 17 Identifying characteristics of comets
Lesson 18 Describing 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 features of the Earth's surface; Identifying the Earth's oceans and continents
Lesson 54 Identifying and describing the layers of Earth
Lesson 55 Describing how tectonic plates move; Identifying what may occur when tectonic plates move
Lesson 56 Identifying tectonic plates and their movements
Lesson 57 Identifying causes and effects of earthquakes
Lesson 58 Identifying causes and effects of volcanoes
Lesson 62 Identifying the causes and effects of weathering
Lesson 63 Classifying rocks by size; Examining and identifying clay, silt, and sand
Lesson 64 Conducting experiments to observe and compare how water interacts with sand, silt, and clay
Lesson 65 Identifying causes and effects of erosion
Lesson 66 Identifying and describing soil horizons
Lesson 67 Identifying how igneous, sedimentary, and metamorphic rocks are formed

Component Idea ESS1.C: **The History of Planet Earth** *(continued)*

Nancy Larson *Science K–5* Lessons

Science 3 *(continued)*

Lesson 68 Examining and identifying igneous, sedimentary, and metamorphic rocks

Lesson 69 Describing how fossils are formed

Science 5

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

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. 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 Grade 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 gases in the Earth's atmosphere; Identifying how the Earth's atmosphere helps human beings live and survive on Earth

Lesson 43 Identifying the layers of the Earth's atmosphere; Describing the layers of the atmosphere

Lesson 44 Describing the water cycle; Describing evaporation, condensation, and precipitation

Lesson 45 Describing and identifying five types of clouds

Lesson 46 Describing wind and wind direction; Describing and estimating wind speed

Lesson 47 Describing weather; Describing cloud cover; Identifying types of precipitation

Lesson 49 Describing characteristics of tornadoes; Identifying safety precautions during tornado warnings

Lesson 50 Describing characteristics of hurricanes

Lesson 53 Identifying features of the Earth's surface; Identifying the Earth's oceans and continents

Lesson 54 Identifying and describing the layers of Earth

Lesson 55 Describing how tectonic plates move; Identifying what may occur when tectonic plates move

Lesson 56 Identifying tectonic plates and their movements

Lesson 57 Identifying causes and effects of earthquakes

Lesson 58 Identifying causes and effects of volcanoes

Lesson 59 Identifying sources of water and air pollution; Identifying ways to avoid polluting the environment

Lesson 62 Identifying the causes and effects of weathering

Component Idea ESS2.A: **Earth Materials and Systems** *(continued)*

Nancy Larson *Science K–5* Lessons

Science 3 *(continued)*

Lesson 64 Conducting experiments to observe and compare how water interacts with sand, silt, and clay
Lesson 65 Identifying causes and effects of erosion
Lesson 66 Identifying and describing soil horizons
Lesson 67 Identifying how igneous, sedimentary, and metamorphic rocks are formed

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
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)

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 features of the Earth's surface; Identifying the Earth's oceans and continents
Lesson 54 Identifying and describing the layers of Earth
Lesson 55 Describing how tectonic plates move; Identifying what may occur when tectonic plates move
Lesson 56 Identifying tectonic plates and their movements
Lesson 57 Identifying causes and effects of earthquakes
Lesson 58 Identifying causes and effects of volcanoes

Component Idea ESS2.B: **Plate Tectonics and Large-Scale System Interactions** *(continued)*

Framework Progression

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. 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 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)

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 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

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

Science 3

Lesson 35 Measuring temperature by using a thermometer; Observing and measuring the changes in temperatures of hot water and ice water over time

Lesson 37 Observing and describing the physical changes of melting and freezing

Lesson 38 Observing and describing the physical change of vaporizing; Conducting an experiment to determine how surface area affects how quickly water evaporates

Lesson 39 Observing and describing the physical change of condensing

Lesson 44 Describing the water cycle; Describing evaporation, condensation, and precipitation

Lesson 45 Describing and identifying five types of clouds

Lesson 47 Describing weather; Describing cloud cover; Identifying types of precipitation

Lesson 48 Describing humidity, air pressure, and UV Index; Recording and analyzing weather data

Lesson 53 Identifying features of the Earth's surface; Identifying the Earth's oceans and continents

Lesson 64 Conducting experiments to observe and compare how water interacts with sand, silt, and clay

Lesson 65 Identifying causes and effects of erosion

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 43	Identifying the layers of the Earth's atmosphere; Describing the layers of the atmosphere
Lesson 45	Describing and identifying five types of clouds
Lesson 46	Describing wind and wind direction; Describing and estimating wind speed
Lesson 47	Describing weather; Describing cloud cover; Identifying types of precipitation
Lesson 48	Describing humidity, air pressure, and UV Index; Recording and analyzing weather data
Lesson 49	Describing characteristics of tornadoes; Identifying safety precautions during tornado warnings
Lesson 50	Describing characteristics of hurricanes

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; Identifying parts of plants
Lesson 14	Identifying that plants are living organisms; Identifying and labeling the parts of a plant
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

Component Idea ESS2.E: **Biogeology** *(continued)*

Nancy Larson *Science K–5* Lessons

Science 3

Lesson 59 Identifying sources of water and air pollution; Identifying ways to avoid polluting the environment
Lesson 66 Identifying and describing soil horizons
Lesson 67 Identifying how igneous, sedimentary, and metamorphic rocks are formed
Lesson 68 Examining and identifying igneous, sedimentary, and metamorphic rocks
Lesson 69 Describing how fossils are formed

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
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, 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; Identifying pars of plants
Lesson 14 Identifying that plants are living organisms; Identifying and labeling the parts of a plant
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 Identifying animals from photographs; Sorting animals by land and water habitats

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

Nancy Larson *Science K–5* Lessons

Science 1 *(continued)*

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 elements on the Periodic Table of the Elements; Identifying the chemical symbols and atomic numbers of elements
Lesson 22 Identifying elements our bodies need to be healthy; Classifying elements as solids, liquids, or gases
Lesson 23 Identifying mineral nutrients in packaged foods and drinks
Lesson 24 Identifying characteristics of compounds; Identifying the elements that combine to make compounds

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 ESS3.B: **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 49 Describing characteristics of tornadoes; Identifying safety precautions during tornado warnings
Lesson 50 Describing characteristics of hurricanes
Lesson 56 Identifying tectonic plates and their movements
Lesson 57 Identifying causes and effects of earthquakes
Lesson 58 Identifying 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 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 by reducing, reusing, and recycling

Science 3

Lesson 59 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	Observing and describing the effect of force on the movement of objects
Lesson 30	Identifying friction as a force; 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 reduce the amount of force needed to do work
Lesson 36	Observing how wheels make it easier to move an object
Lesson 37	Conducting an experiment to determine how the steepness of a ramp affects the distance a toy car travels
Lesson 38	Investigating what happens when objects of different masses travel down a ramp
Lesson 39	Investigating what happens when objects of different masses travel down a ramp
Lesson 42	Identifying the six simple machines; Identifying and describing inclined planes; Demonstrating how inclined planes function
Lesson 43	Identifying and describing wedges; Demonstrating how wedges function
Lesson 44	Identifying and describing screws; Demonstrating how screws function
Lesson 45	Engineering: Comparing nails and screws
Lesson 46	Identifying and describing levers; Identifying the fulcrum, load, and effort; Demonstrating how a first-class lever functions
Lesson 47	Identifying and describing second- and third-class levers; Identifying the fulcrum, load, and effort; Demonstrating how a third-class lever functions
Lesson 48	Identifying and describing wheels and axles; Demonstrating how wheels and axles function

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

Nancy Larson *Science K–5* Lessons

Science 2 *(continued)*

Lesson 49 Identifying and describing fixed and movable pulleys; Demonstrating how pulleys function
Lesson 50 Identifying and describing machines people use
Lesson 60 Making an instrument that produces various pitches

Science 4

Lesson 25 Using a dichotomous key to identify trees
Lesson 52 Identifying inherited behaviors of plants; Conducting two experiments to observe plant behavior
Lesson 59 Recording and analyzing data from experiments
Lesson 66 Describing how musical instruments produce sounds; Comparing the pitch of sounds

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 must then bring the parts together to test the overall plan.*
(NGSS Grades K and 2)

Nancy Larson *Science K–5* Lessons

Science K

Lesson 25 Exploring foam blocks

Science 2

Lesson 38 Investigating what happens when objects of different masses travel down a ramp
Lesson 42 Identifying the six simple machines; Identifying and describing inclined planes; Demonstrating how inclined planes function
Lesson 43 Identifying and describing wedges; Demonstrating how wedges function

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

Framework Progression

By the end of Grade 5: *Research on a problem should be carried—for example, through Internet searches, market research, or field observations—out 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 performs under a range 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 2 *(continued)*

Lesson 44 Identifying and describing screws; Demonstrating how screws function
Lesson 45 Engineering: Comparing nails and screws
Lesson 46 Identifying and describing levers; Identifying the fulcrum, load, and effort; Demonstrating how a first-class lever functions
Lesson 47 Identifying and describing second- and third-class levers; Identifying the fulcrum, load and effort; Demonstrating how a third-class lever functions
Lesson 48 Identifying and describing wheels and axles; Demonstrating how wheels and axles function
Lesson 49 Demonstrating how pulleys function
Lesson 60 Making an instrument that produces various sounds

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 Observing how water changes state; 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
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

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)

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 a tree

Component Idea ETS2.A: **Interdependence of Science, Engineering, and Technology** *(continued)*

Framework Progression

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 1 *(continued)*

Lesson 34	Observing how water changes state; Predicting and comparing the ability of containers to collect rainwater
Lesson 52	Identifying the function of skin; 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 what happens when objects of different masses travel down a ramp
Lesson 39	Engineering: Building a car with wheels
Lesson 46	Identifying and describing levers; Identifying the fulcrum, load, and effort; Demonstrating how a first-class lever functions
Lesson 47	Identifying and describing second- and third-class levers; Identifying the fulcrum, load and effort; Demonstrating how a third-class lever functions
Lesson 48	Identifying and describing wheels and axles; Demonstrating how wheels and axles function

Science 3

Lesson 1	Identifying the early astronomers Copernicus and Galileo; Identifying the Sun as the center of our solar system; Identifying how a telescope is used by astronomers
Lesson 7	Describing what the first astronauts to visit the Moon observed
Lesson 31	Identifying characteristics of matter; Measuring mass and volume
Lesson 34	Describing and measuring temperature; Identifying a thermometer as a tool used to measure Fahrenheit and Celsius temperatures
Lesson 35	Measuring temperature by using a thermometer; Observing and measuring the changes in temperatures of hot water and ice water over time
Lesson 36	Making a line graph to represent data; Analyzing data and making predictions from data on a graph
Lesson 38	Observing and describing the physical change of vaporizing; Conducting an experiment to determine how surface area affects how quickly water evaporates
Lesson 46	Describing wind and wind direction; Describing and estimating wind speed
Lesson 47	Describing weather; Describing cloud cover; Identifying types of precipitation
Lesson 48	Describing humidity, air pressure, and UV Index; Recording and analyzing weather data
Lesson 63	Classifying rocks by size; Examining and identifying clay, silt, and sand
Lesson 64	Conducting experiments to observe and compare how water interacts with sand, silt, and clay

Science 4

Lesson 2	Using a microscope to observe a specimen

Component Idea ETS2.A: **Interdependence of Science, Engineering, and Technology** *(continued)*

Nancy Larson *Science K–5* Lessons

Science 4 *(continued)*

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: combustion, synthesis, and decomposition
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. Thus, developing and using technology has impacts on the natural world.*

(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 reduce the amount of force needed to do work
Lesson 42	Identifying the six simple machines; Identifying and describing inclined planes; Demonstrating how inclined planes function

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

Framework Progression

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., 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 2 *(continued)*

Lesson 43 Identifying and describing wedges; Demonstrating how wedges function

Lesson 44 Identifying and describing screws; Demonstrating how screws function

Lesson 45 Engineering: Comparing nails and screws

Lesson 46 Identifying and describing levers; Identifying the fulcrum, load, and effort; Demonstrating how a first-class lever functions

Lesson 47 Identifying and describing second- and third-class levers; Identifying the fulcrum, load, and effort; Demonstrating how a third-class lever functions

Lesson 50 Identifying and describing machines people use

Science 3

Lesson 23 Identifying mineral nutrients in packaged foods and drinks

Lesson 46 Describing wind and wind direction; Describing and estimating wind speed

Lesson 48 Describing humidity, air pressure, and UV Index; Recording and analyzing weather data

Lesson 49 Describing characteristics of tornadoes; Identifying safety precautions during tornado warnings

Lesson 50 Describing characteristics of hurricanes

Lesson 57 Identifying causes and effects of earthquakes

Lesson 59 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 loads

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 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

Science K Lessons	Framework Component Ideas
1.	ESS2D, ETS1A
2.	LS1A
3.	LS1A
4.	LS1A
5.	PS4C, LS1A, LS1D, LS2A
6.	PS4C, LS1A, LS1D, LS2A
7.	PS4C, LS1A, LS1D, LS2A
8.	PS4C, LS1A, LS1D, LS2A
9.	PS4C, LS1A, LS1D, LS2A
10.	PS4C, LS1A, LS1D, LS2A
11.	LS1A
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

Science K Lessons	Framework Component Ideas
51.	LS1A
52.	LS1A, LS1B
53.	LS1A, LS1B
54.	LS1A, LS1B
55.	ESS2E, ESS3A, LS1A, LS1C, LS2A, LS2B
56.	ESS2E, ESS3A
57.	ESS2E, ESS3A, LS1C
58.	ESS2D
59.	ESS2D
60.	ESS2D
61.	ESS2D

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
1.	ETS1A
2.	LS1B
3.	LS1B
4.	LS1B
5.	LS1B
6.	LS1B
7.	LS1B
8.	LS1B
9.	LS2A
10.	ESS3A
11.	LS2A, LS4D
12.	Assessment
13.	ESS2E, ESS3A, LS1A, LS1C, LS2A, LS2B
14.	ESS2E, ESS3A, LS1A, LS1C, LS2A, LS3A
15.	LS1A, LS4D
16.	LS1A, LS3B
17.	LS1A
18.	LS1A
19.	Assessment
20.	LS1A
21.	LS1A, LS1D, LS4D
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
51.	LS1A, LS1D
52.	LS1A, LS1D, LS3B, ETS2A
53.	LS1A, LS1C, LS1D
54.	ESS2E, LS1A, LS1D
55.	LS1A, LS1D
56.	LS1A, LS1D
57.	LS1A, LS1C
58.	Assessment
59.	LS1A, LS1B
60.	LS1A, LS3B
61.	LS1A, LS1B, LS3A, LS4D
62.	LS1A, LS1C, LS2B
63.	LS1A, LS1B, LS3A, LS4D
64.	LS1A, LS1B, LS1D, LS2B, LS3A
65.	LS1A
66.	LS1A, LS1D, LS2B
67.	LS1B, LS3A
68.	LS1A
69.	Review
70.	Assessment

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Nancy Larson *Science 2*
Reverse Correlations to Framework Component Ideas

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

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Nancy Larson *Science 3*
Reverse Correlations to Framework Component Ideas

Science 3 Lessons	Framework Component Ideas
1.	PS3B, PS4C, ESS1A, ESS1B, ETS2A
2.	PS3B, PS4B, ESS1A
3.	PS2C, ESS1B
4.	ESS1B
5.	PS2C, ESS1B
6.	PS4B, ESS1B
7.	ETS2A
8.	ESS1B
9.	PS2C, ESS1B
10.	Review
11.	Assessment
12.	ESS1B
13.	ESS1B
14.	ESS1B
15.	ESS1B
16.	ESS1B
17.	ESS1B
18.	PS2B, PS4B, ESS1B
19.	Review
20.	Assessment
21.	PS1A, ESS3A
22.	PS1A, ESS3A
23.	PS1A, ESS3A, ETS2B
24.	PS1A, ESS3A
25.	PS1A
26.	Review
27.	Assessment
28.	PS1B
29.	PS1B
30.	PS1B
31.	PS1A, ETS2A
32.	PS1A
33.	PS1A, PS3C
34.	ETS2A
35.	ESS2C, ETS2A
36.	ETS2A
37.	PS1B, ESS2C
38.	PS1B, ESS2C, ETS2A
39.	PS1B, ESS2C
40.	Review
41.	Assessment
42.	ESS2A
43.	ESS2A, ESS2D
44.	PS2C, ESS2A, ESS2C
45.	ESS2A, ESS2C, ESS2D
46.	ESS2A, ESS2D, ETS2A, ETS2B
47.	ESS2A, ESS2C, ESS2D, ETS2A
48.	ESS2C, ESS2D, ESS3B, ETS2A, ETS2B
49.	ESS2A, ESS2D, ESS3B, ETS2B
50.	ESS2A, ESS2D, ESS3B, ETS2B

Science 3 Lessons	Framework Component Ideas
51.	Review
52.	Assessment
53.	ESS1C, ESS2A, ESS2B, ESS2C
54.	ESS1C, ESS2A, ESS2B
55.	PS2B, PS2C, ESS1C, ESS2A, ESS2B
56.	PS2B, PS2C, ESS1C, ESS2A, ESS2B, ESS3B
57.	PS4A, ESS1C, ESS2A, ESS2B, ESS3B, ETS2B
58.	ESS1C, ESS2A, ESS2B, ESS3B
59.	ESS1C, ESS2A, ESS2E, ESS3C, ETS2B
60.	Review
61.	Assessment
62.	PS2C, ESS1C, ESS2A
63.	ESS1C, ETS2A
64.	ESS1C, ESS2A, ESS2C, ETS2A
65.	PS2C, ESS1C, ESS2A, ESS2C
66.	LS2A, ESS1C, ESS2A, ESS2E
67.	PS2C, ESS1C, ESS2A, ESS2E
68.	ESS1C, ESS2E
69.	LS4A, ESS1C, ESS2E
70.	Review
71.	Assessment
72.	LS1A, LS1C, LS1D, LS2A, LS4C
73.	LS1A, LS1C, LS1D, LS2A, LS4C
74.	LS1D, LS2C
75.	LS1B, LS3A, LS3B
76.	LS1B, LS3A, LS3B
77.	LS1B, LS3B
78.	LS1A, LS1B, LS1D, LS3A
79.	Review
80.	Assessment

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Nancy Larson *Science 4*
Reverse Correlations to Framework Component Ideas

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

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Nancy Larson *Science 5*
Reverse Correlations to Framework Component Ideas

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

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