SRA Life, Earth, and Physical Science Laboratories
correlation to
Missouri Science Standards
Grade 6

SRA Life, Earth, and Physical Science Laboratories provide core science content in an alternate reading format. Each *SRA Science Lab* contains 180 Science Cards covering key science concepts and vocabulary. Each lab covers 90 different science topics presented at two different reading levels to meet varied student abilities. The *Teacher's Handbook* includes hands-on inquiry activities as well as vocabulary building exercises. The *Classroom Resource CD-ROM* includes Writing Strategies in Science along with tests and vocabulary games.

Strand 1: Properties and Principles of Matter and Energy
1. Changes in properties and states of matter provide evidence of the atomic theory or matter.
Concept A. Objects, and the materials they are made of, have properties that can be used to describe and classify them.
a. Recognize matter is anything that has mass and volume.
Physical Science Lab, Level A: Cards 1, 2, 3, 4, 5 **Physical Science Lab, Level B:** Cards 1, 2, 3, 4, 5

Strand 1: Properties and Principles of Matter and Energy
1. Changes in properties and states of matter provide evidence of the atomic theory or matter.
Concept A. Objects, and the materials they are made of, have properties that can be used to describe and classify them.
b. Describe and compare the volumes (the amount of space and object occupies) of objects or substances directly, using a graduated cylinder and/or indirectly, using displacement methods.
Physical Science Lab, Level A: Card 2 **Physical Science Lab, Level B:** Card 2

Strand 1: Properties and Principles of Matter and Energy
1. Changes in properties and states of matter provide evidence of the atomic theory or matter.
Concept A. Objects, and the materials they are made of, have properties that can be used to describe and classify them.
c. Describe and compare the masses (amounts of matter) of objects to the nearest gram using a balance.
This topic is not covered at this level.

Strand 1: Properties and Principles of Matter and Energy
1. Changes in properties and states of matter provide evidence of the atomic theory or matter.
Concept A. Objects, and the materials they are made of, have properties that can be used to describe and classify them.
d. Classify the types of matter is an object into pure substances or mixtures using their specific physical properties.
Physical Science Lab, Level A: Cards 3, 4, 10, 11, 12, 13 **Physical Science Lab, Level B:** Cards 3, 4, 10, 11, 12, 13

Strand 1: Properties and Principles of Matter and Energy
1. Changes in properties and states of matter provide evidence of the atomic theory or matter.
Concept B. Properties of mixtures depend upon the concentrations, properties, and interactions of particles.
a. Describe the properties of each component in a mixture/solution and their distinguishing properties (e.g., salt water, oil and vinegar, pond water, Kool-Aid).
Physical Science Lab, Level A: Cards 12, 13 **Physical Science Lab, Level B:** Cards 12, 13

Strand 1: Properties and Principles of Matter and Energy
1. Changes in properties and states of matter provide evidence of the atomic theory or matter.
Concept B. Properties of mixtures depend upon the concentrations, properties, and interactions of particles.
b. Describe appropriate ways to separate the components of different types of mixtures (sorting, evaporation, filtration, magnets, boiling, chromatography, screening).
Physical Science Lab, Level A: Cards 12, 13 **Physical Science Lab, Level B:** Cards 12, 13

Strand 1: Properties and Principles of Matter and Energy
1. Changes in properties and states of matter provide evidence of the atomic theory or matter.
Concept B. Properties of mixtures depend upon the concentrations, properties, and interactions of particles.
c. Predict how various solids (soluble/insoluble) behave (e.g., dissolve, settle, float) when mixed with water.
Physical Science Lab, Level A: Card 13 **Physical Science Lab, Level B:** Card 13

Strand 1: Properties and Principles of Matter and Energy
1. Changes in properties and states of matter provide evidence of the atomic theory or matter.
Concept C. Properties of matter can be explained in terms of moving particles too small to be seen without tremendous magnification.
a. Recognize evidence (e.g., diffusion of food coloring in water, light reflecting off of dust particles in the air, condensation of water vapor by increased pressure or decreased temperature) that supports the theory that matter is composed of small particles (atoms, molecules) that are inconstant, random motion.
Physical Science Lab, Level A: Cards 1, 3, 4, 5, 6, 7, 8, 42 **Physical Science Lab, Level B:** Cards 1, 3, 4, 5, 6, 7, 8, 42

Strand 1: Properties and Principles of Matter and Energy
1. Changes in properties and states of matter provide evidence of the atomic theory or matter.
Concept D. Physical changes in the state of matter that result from thermal changes can be explained by the Kinetic Theory of Matter.
a. Describe the relationship between the change in the volume of water and changes in temperature as it relates to the properties of water (i.e., water expands and becomes less dense when frozen).
Physical Science Lab, Level A: Cards 6, 8, 42 **Physical Science Lab, Level B:** Cards 6, 8, 42

Strand 1: Properties and Principles of Matter and Energy
1. Changes in properties and states of matter provide evidence of the atomic theory or matter.
Concept G. Properties of objects and states of matter can change chemically and/or physically.
a. Recognize and classify changes in matter as chemical and/or physical.
Physical Science Lab, Level A: Cards 5, 6, 7, 8, 9, 27, 28, 29, 30 **Physical Science Lab, Level B:** Cards 5, 6, 7, 8, 9, 27, 28, 29, 30 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 2, *Chemical Reaction Rates,* pages 81-83

Strand 1: Properties and Principles of Matter and Energy
1. Changes in properties and states of matter provide evidence of the atomic theory or matter.
Concept G. Properties of objects and states of matter can change chemically and/or physically.
b. Identify chemical changes (i.e., rusting, oxidation, burning, decomposition by acids, decaying, baking) in common objects (i.e., rocks such as limestone, minerals, wood, steel wool, plants) as a result of interactions with sources of energy or other matter that form new substances with different characteristic properties.
Earth Science Lab, Level A: Cards 6, 8 **Earth Science Lab, Level B:** Cards 6, 8 **Physical Science Lab, Level A:** Cards 9, 27, 28, 29, 30 **Physical Science Lab, Level B:** Cards 9, 27, 28, 29, 30 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 2, *Chemical Reaction Rates,* pages 81-83

Strand 1: Properties and Principles of Matter and Energy
1. Changes in properties and states of matter provide evidence of the atomic theory or matter.
Concept G. Properties of objects and states of matter can change chemically and/or physically.
c. Identify physical changes in common objects (e.g., rocks, minerals, wood, water, steel wool, plants) and descript the processes which caused he change (e.g., weathering, erosion, cutting, dissolving).
Earth Science Lab, Level A: Cards 6, 7, 8, 9, 22, 24, 25, 26, 27, 28, 47, 48, 49 **Earth Science Lab, Level B:** Cards 6, 7, 8, 9, 22, 24, 25, 26, 27, 28, 47, 48, 49 **Physical Science Lab, Level A:** Cards 6, 7, 8, 13 **Physical Science Lab, Level B:** Cards 6, 7, 8, 13

Strand 1: Properties and Principles of Matter and Energy
1. Changes in properties and states of matter provide evidence of the atomic theory or matter.
Concept I. Mass is conserved during any physical or chemical change.
a. Demonstrate and provide evidence that mass is conserved during a physical change.
Physical Science Lab, Level A: Cards 9, 27, 28, 29, 30 **Physical Science Lab, Level B:** Cards 9, 27, 28, 29, 30 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 2, *Chemical Reaction Rates,* pages 81-83

Strand 1: Properties and Principles of Matter and Energy
2. Energy has a source, can be transferred, and can be transformed into various forms but is conserved between and within systems.
Concept A. Forms of energy have a source, a means of transfer (work and heat), and a receiver.
a. Identify sources of visible light (e.g., the Sun and other stars, flint, bulb, flames, lightning).
Earth Science Lab, Level A: Cards 67, 75, 76 **Earth Science Lab, Level B:** Cards 67, 75, 76 **Physical Science Lab, Level A:** Cards 82, 83, 85 **Physical Science Lab, Level B:** Cards 82, 83, 85

Strand 1: Properties and Principles of Matter and Energy
2. Energy has a source, can be transferred, and can be transformed into various forms but is conserved between and within systems.
Concept A. Forms of energy have a source, a means of transfer (work and heat), and a receiver.
b. Describe evidence (i.e., cannot bend around walls) that visible light travels in a straight line using the appropriate tools (i.e., pinhole viewer, ray box, laser pointer).
Physical Science Lab, Level A: Cards 83, 86, 87, 89 **Physical Science Lab, Level B:** Cards 83, 86, 87, 89

Strand 1: Properties and Principles of Matter and Energy
2. Energy has a source, can be transferred, and can be transformed into various forms but is conserved between and within systems.
Concept A. Forms of energy have a source, a means of transfer (work and heat), and a receiver.
c. Compare the reflection of visible light by various surfaces (i.e., mirror, smooth and rough surfaces, shiny and dull surfaces, moon).
Physical Science Lab, Level A: Card 86 **Physical Science Lab, Level B:** Card 86

Strand 1: Properties and Principles of Matter and Energy
2. Energy has a source, can be transferred, and can be transformed into various forms but is conserved between and within systems.
Concept A. Forms of energy have a source, a means of transfer (work and heat), and a receiver.
d. Compare the refraction of visible light passing through transparent and translucent materials (e.g., prisms, water, a lens).
Physical Science Lab, Level A: Cards 87, 88 **Physical Science Lab, Level B:** Cards 87, 88

Strand 1: Properties and Principles of Matter and Energy
2. Energy has a source, can be transferred, and can be transformed into various forms but is conserved between and within systems.
Concept A. Forms of energy have a source, a means of transfer (work and heat), and a receiver.
e. Predict how different surface transparent, translucent, opaque) and lenses (convex, concave) affect the behavior of visible light rays and the resulting image of an object.
Physical Science Lab, Level A: Cards 87, 88 **Physical Science Lab, Level B:** Cards 87, 88

Strand 1: Properties and Principles of Matter and Energy
2. Energy has a source, can be transferred, and can be transformed into various forms but is conserved between and within systems.
Concept A. Forms of energy have a source, a means of transfer (work and heat), and a receiver.
f. Identify receivers of visible light energy (e.g., eye, photocell).
Physical Science Lab, Level A: Card 89 **Physical Science Lab, Level B:** Card 89

Strand 1: Properties and Principles of Matter and Energy
2. Energy has a source, can be transferred, and can be transformed into various forms but is conserved between and within systems.
Concept A. Forms of energy have a source, a means of transfer (work and heat), and a receiver.
g. Recognize that an object is "seen" only when the object emits or reflects light to the eye.
Physical Science Lab, Level A: Card 89 **Physical Science Lab, Level B:** Card 89

Strand 1: Properties and Principles of Matter and Energy
2. Energy has a source, can be transferred, and can be transformed into various forms but is conserved between and within systems.
Concept A. Forms of energy have a source, a means of transfer (work and heat), and a receiver.
h. Recognize differences in wavelength and energy levels within the range of visible light that can be seen by the human eye are perceived as differences in color.
Physical Science Lab, Level A: Cards 83, 85 **Physical Science Lab, Level B:** Cards 83, 85

Strand 1: Properties and Principles of Matter and Energy
2. Energy has a source, can be transferred, and can be transformed into various forms but is conserved between and within systems.
Concept A. Forms of energy have a source, a means of transfer (work and heat), and a receiver.
i. Describe how sound energy is transferred by wave-like disturbances that spread away from the source through a medium.
Physical Science Lab, Level A: Cards 77, 78, 79, 80, 81 **Physical Science Lab, Level B:** Cards 77, 78, 79, 80, 81 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 6, *Making Sound,* pages 97-99

Strand 1: Properties and Principles of Matter and Energy
2. Energy has a source, can be transferred, and can be transformed into various forms but is conserved between and within systems.
Concept A. Forms of energy have a source, a means of transfer (work and heat), and a receiver.
i. Predict how the properties of a medium (e.g., air, water, empty space, rock) affect the speed of different types of mechanical waves (i.e., earthquake, sound).
Earth Science Lab, Level A: Card 16 **Earth Science Lab, Level B:** Card 16 **Physical Science Lab, Level A:** Cards 77, 78, 79, 80 **Physical Science Lab, Level B:** Cards 77, 78, 79, 80 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 6, *Making Sound,* pages 97-99

Strand 1: Properties and Principles of Matter and Energy
2. Energy has a source, can be transferred, and can be transformed into various forms but is conserved between and within systems.
Concept C. Electromagnetic energy from the Sun (solar radiation) is a major source of energy on Earth.
a. Recognize energy from the Sun is transferred to Earth in a range of wavelengths and energy levels, including visible light, infrared radiation, and ultraviolet radiation.
Earth Science Lab, Level A: Cards 37, 67 **Earth Science Lab, Level B:** Cards 37, 67 **Physical Science Lab, Level A:** Cards 46, 81, 82 **Physical Science Lab, Level B:** Cards 46, 81, 82

Strand 1: Properties and Principles of Matter and Energy
2. Energy has a source, can be transferred, and can be transformed into various forms but is conserved between and within systems.
Concept C. Electromagnetic energy from the Sun (solar radiation) is a major source of energy on Earth.
b. Recognize the Sun is the source of almost all energy used to produce food for living organisms.
Life Science Lab, Level A: Cards 7, 9, 16, 17, 76 **Life Science Lab, Level B:** Cards 7, 9, 16, 17, 76

Strand 3: Characteristics and Interactions of Living Organisms
1. There is a fundamental unity underlying the diversity of all living organisms.
Concept A. Organisms have basic needs for survival.
a. Describe the common life processes necessary to the survival of organisms (i.e., growth, reproduction, life span, response to stimuli, energy use, exchange of gases, use of water, elimination of waste).
Life Science Lab, Level A: Cards 1, 9, 10, 25 **Life Science Lab, Level B:** Cards 1, 9, 10, 25

Strand 3: Characteristics and Interactions of Living Organisms
1. There is a fundamental unity underlying the diversity of all living organisms.
Concept C. Cells are fundamental units of structure and function of all living things.
a. Recognize all organisms are composed of cells, the fundamental units of life, which carry out all life processes.
Life Science Lab, Level A: Cards 1, 5, 6, 7, 8, 9, 10 **Life Science Lab, Level B:** Cards 1, 5, 6, 7, 8, 9, 10 **Life Science Lab Teacher's Handbook:** Hands-On Activity 1, *Examining Cells*, pages 77-79

Strand 3: Characteristics and Interactions of Living Organisms
1. There is a fundamental unity underlying the diversity of all living organisms.
Concept E. Biological classifications are based on how organisms are related.
a. Recognize most of the organisms on Earth are unicellular (e.g., bacteria, protists) and other organisms, including humans, are multicellular.
Life Science Lab, Level A: Cards 1, 5, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 25, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40 **Life Science Lab, Level B:** Cards 1, 5, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 25, 27, 28,2 9, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40 **Life Science Lab Teacher's Handbook:** Hands-On Activity 2, *Culturing Bacteria*, pages 81-83; Hands-On Activity 3, *Investigating Arthropods*, pages 85-87

Strand 3: Characteristics and Interactions of Living Organisms
1. There is a fundamental unity underlying the diversity of all living organisms.
Concept E. Biological classifications are based on how organisms are related.
b. Identify examples of unicellular (e.g., bacteria, some protists, fungi) and multicellular organisms (e.g., some fungi, plants, animals).
Life Science Lab, Level A: Cards 1, 5, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 25, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40 **Life Science Lab, Level B:** Cards 1, 5, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 25, 27, 28,2 9, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40 **Life Science Lab Teacher's Handbook:** Hands-On Activity 2, *Culturing Bacteria*, pages 81-83; Hands-On Activity 3, *Investigating Arthropods*, pages 85-87

Strand 3: Characteristics and Interactions of Living Organisms
2. Living organisms carry out life processes in order to survive.
Concept A. The cell contains a set of structures call organelles that interact to carry out life processes through physical and chemical means.
a. Compare and contrast the following plant and animal cell structures: cell membrane, nucleus, cell wall, chloroplasts, and cytoplasm.
Life Science Lab, Level A: Cards 6, 7, 8, 9 **Life Science Lab, Level B:** Cards 6, 7, 8, 9 **Life Science Lab Teacher's Handbook:** Hands-On Activity 1, *Examining Cells*, pages 77-79

Strand 3: Characteristics and Interactions of Living Organisms
2. Living organisms carry out life processes in order to survive.
Concept A. The cell contains a set of structures call organelles that interact to carry out life processes through physical and chemical means.
b. Recognize the chloroplast as the cell structure where food is produced in plants and some unicellular organisms (e.g., algae, some protists).
Life Science Lab, Level A: Cards 7, 8, 16, 17 **Life Science Lab, Level B:** Cards 7, 9, 16, 17

Strand 3: Characteristics and Interactions of Living Organisms
2. Living organisms carry out life processes in order to survive.
Concept B. Photosynthesis and cellular respiration are complementary processes necessary to the survival of most organisms on Earth.
a. Recognize plants use energy from the Sun to produce food and oxygen through the process of photosynthesis.
Life Science Lab, Level A: Cards 7, 9, 16, 17, 76 **Life Science Lab, Level B:** Cards 7, 9, 16, 17, 76

Strand 4: Changes in Ecosystems and Interactions of Organisms with their Environments
1. Organisms are interdependent with one another and with their environment.
Concept A. All populations living together within a community interact withy one another and with their environment in order to survive and maintain a balanced ecosystem.
a. Identify the biotic factors (populations of organisms) and abiotic factors (e.g., quantity of light and water, range of temperatures, soil composition) that make up an ecosystem.
Life Science Lab, Level A: Cards 70, 71, 72 **Life Science Lab, Level B:** Cards 70, 71, 72

Strand 4: Changes in Ecosystems and Interactions of Organisms with their Environments
1. Organisms are interdependent with one another and with their environment.
Concept B. Living organisms have the capacity to produce populations of infinite size, but environments and resources are finite.
a. Identify populations with a community that are in competition with one another for resources.
Life Science Lab, Level A: Cards 73, 75 **Life Science Lab, Level B:** Cards 73, 75

Strand 4: Changes in Ecosystems and Interactions of Organisms with their Environments
1. Organisms are interdependent with one another and with their environment.
Concept B. Living organisms have the capacity to produce populations of infinite size, but environments and resources are finite.
b. Recognize that factors that affect the number and types of organisms an ecosystem can support (e.g., food availability, abiotic factor such as quantity of light and water, temperature and temperature range, soil composition, disease, competition from other organisms, predation).
Life Science Lab, Level A: Cards 70, 71, 72, 73, 74, 75 **Life Science Lab, Level B:** Cards 70, 71, 72, 73, 74, 75

Strand 4: Changes in Ecosystems and Interactions of Organisms with their Environments
1. Organisms are interdependent with one another and with their environment.
Concept B. Living organisms have the capacity to produce populations of infinite size, but environments and resources are finite.
c. Predict the possible effects of changes in the number and types of organisms in an ecosystem on the populations of other organisms within that ecosystem.
Life Science Lab, Level A: Cards 71, 72, 86 **Life Science Lab, Level B:** Cards 71, 72, 86

Strand 4: Changes in Ecosystems and Interactions of Organisms with their Environments
1. Organisms are interdependent with one another and with their environment.
Concept D. The diversity of species within an ecosystem is affected by changes in the environment, which can be caused by other organisms or outside processes.
a. Describe beneficial and harmful activities of organisms, including humans (e.g., deforestation, overpopulation, water and air pollution, global warming, restoration of natural environments, river bank/coastal stabilization, recycling, channelization, reintroduction of species, depletion of resources) and explain how these activities affect organisms within an ecosystem.
Life Science Lab, Level A: Cards 84, 85, 86, 87, 88, 89, 90 **Life Science Lab, Level B:** Cards 84, 85, 86, 87, 88, 89, 90 **Life Science Lab Teacher's Handbook:** Hands-On Activity 7, *The Effects of Acid Rain,* pages 101-103 **Earth Science Lab, Level A:** Cards 29, 35, 37, 42, 59, 60, 61, 85, 86 **Earth Science Lab, Level B:** Cards 29, 35, 37, 42, 59, 60, 61, 85, 86 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 5, *What is in the Air?,* pages 89-91

Strand 4: Changes in Ecosystems and Interactions of Organisms with their Environments
1. Organisms are interdependent with one another and with their environment.
Concept D. The diversity f species within an ecosystem is affected by changes in the environment, which can be caused by other organisms or outside processes.
b. Predict the impact (beneficial or harmful) of a natural environmental change (e.g., forest fire, flood, volcanic eruptions, avalanche) on the organisms in an ecosystem.
Life Science Lab, Level A: Cards 84, 85, 86, 87, 88, 89, 90 **Life Science Lab, Level B:** Cards 84, 85, 86, 87, 88, 89, 90 **Life Science Lab Teacher's Handbook:** Hands-On Activity 7, *The Effects of Acid Rain,* pages 101-103 **Earth Science Lab, Level A:** Cards 15, 17, 29, 35, 37, 42, 52, 53, 54, 59, 60, 61, 85, 86 **Earth Science Lab, Level B:** Cards 15, 17, 29, 35, 37, 42, 52, 53, 54, 59, 60, 61, 85, 86 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 5, *What is in the Air?,* pages 89-91

Strand 4: Changes in Ecosystems and Interactions of Organisms with their Environments
1. Organisms are interdependent with one another and with their environment.
Concept D. The diversity f species within an ecosystem is affected by changes in the environment, which can be caused by other organisms or outside processes.
c. Describe possible solutions to potentially harmful environmental changes within an ecosystem.
Life Science Lab, Level A: Cards 87, 88, 89, 90 **Life Science Lab, Level B:** Cards 87, 88, 89, 90 **Life Science Lab Teacher's Handbook:** Hands-On Activity 7, *The Effects of Acid Rain,* pages 101-103 **Earth Science Lab, Level A:** Cards 37, 42, 59, 60, 61, 86 **Earth Science Lab, Level B:** Cards 37, 42, 59, 60, 61, 86 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 5, *What is in the Air?,* pages 89-91

Strand 4: Changes in Ecosystems and Interactions of Organisms with their Environments
2. Matter and energy flow through an ecosystem.
Concept A. As energy flows through the ecosystem, all organisms capture a portion of that energy and transform it to a form they can use.
a. Diagram and describe the transfer of energy in an aquatic food web and a land food web with reference to producers, consumers, decomposers, scavengers, and predator/prey relationships.
Life Science Lab, Level A: Cards 13, 73, 74, 76, 77 **Life Science Lab, Level B:** Cards 13, 73, 74, 76, 77 **Life Science Lab Teacher's Handbook:** Hands-On Activity 6, *How Much Does Energy Cost?,* pages 97-99

Strand 4: Changes in Ecosystems and Interactions of Organisms with their Environments
2. Matter and energy flow through an ecosystem.
Concept A. As energy flows through the ecosystem, all organisms capture a portion of that energy and transform it to a form they can use.
b. Classify populations of unicellular and multicellular organisms as producers, consumers, and decomposers by the role they serve in the ecosystem.
Life Science Lab, Level A: Cards 13, 76, 77 **Life Science Lab, Level B:** Cards 13, 76, 77 **Life Science Lab Teacher's Handbook:** Hands-On Activity 6, *How Much Does Energy Cost?,* pages 97-99

Strand 4: Changes in Ecosystems and Interactions of Organisms with their Environments
3. Genetic variation sorted by the natural selection process explains evidence of biological evolution.
Concept A. Evidence for the nature and rates of evolution can be found in anatomical and molecular characteristics of organisms and in the fossil record.
a. Identify fossils as evidence some types of organisms (e.g., dinosaurs, trilobites, mammoths, giant tree ferns) that once lived in the past, and have since become extinct, have similarities with and differences from organisms living today.
Life Science Lab, Level A: Card 67 **Life Science Lab, Level B:** Card 67 **Earth Science Lab, Level A:** Cards 33, 34 **Earth Science Lab, Level B:** Cards 33, 34

Strand 4: Changes in Ecosystems and Interactions of Organisms with their Environments
3. Genetic variation sorted by the natural selection process explains evidence of biological evolution.
Concept C. Natural selection is the process of sorting individual based on their ability to survive and reproduce within their ecosystem.
a. Relate examples of adaptations (specialized structures or behaviors) within a species to its ability to survive in a specific environment (e.g., hollow bones/flight, hollow hair/insulation, dense root structure/compact soil, seeds/food, protection for plant embryo vs. spores, fins/movement in water).
Life Science Lab, Level A: Cards 23, 24, 36, 41, 43, 65, 68, 73, 83 **Life Science Lab, Level B:** Cards 23, 24, 36, 41, 43, 65, 68, 73, 83

Strand 4: Changes in Ecosystems and Interactions of Organisms with their Environments
3. Genetic variation sorted by the natural selection process explains evidence of biological evolution.
Concept C. Natural selection is the process of sorting individual based on their ability to survive and reproduce within their ecosystem.
b. Predict how certain adaptations, such as behavior, body structure, or coloration, may offer a survival advantage to an organism in a particular environment.
Life Science Lab, Level A: Cards 23, 24, 41, 43, 65, 66, 68 **Life Science Lab, Level B:** Cards 23, 24, 41, 43, 65, 66, 68

Strand 5: Processes and Interactions of the Earth's Systems (Geosphere, Atmosphere, and Hydrosphere)
1. Earth's systems (geosphere, atmosphere, and hydrosphere) have common components and unique structures.
Concept A. The Earth's crust is composed of various materials, including soil, minerals, and rocks, with characteristic properties.
a. Describe the components of soil and other factors that influence soil texture, fertility, and resistance to erosion (e.g., plant roots and debris, bacteria, fungi, worms, rodents).
Life Science Lab, Level A: Card 13 **Life Science Lab, Level B:** Card 13 **Earth Science Lab, Level A:** Cards 23, 29 **Earth Science Lab, Level B:** Cards 23, 29

Strand 5: Processes and Interactions of the Earth's Systems (Geosphere, Atmosphere, and Hydrosphere)
1. Earth's systems (geosphere, atmosphere, and hydrosphere) have common components and unique structures.
Concept B. The hydrosphere is composed of water (a material with unique properties) and other materials.
a. Recognize the properties of water that make it an essential component of the Earth system (e.g., ability to act as a solvent, its ability to remain as a liquid at most Earth temperatures).
Earth Science Lab, Level A: Cards 47, 48, 49, 82, 83, 84, 87 **Earth Science Lab, Level B:** Cards 47, 48, 49, 82, 83, 84, 87

Strand 5: Processes and Interactions of the Earth's Systems (Geosphere, Atmosphere, and Hydrosphere)
2. Earth's systems (geosphere, atmosphere, and hydrosphere) interact with one another as they undergo change by common processes.
Concept A. The Earth's materials and surface features are changed through a variety of external processes.
a. Make inferences about the formation of sedimentary rocks from their physical properties (e.g., layering and the presence of fossils indicate sedimentation).
Earth Science Lab, Level A: Cards 7, 30, 32, 33, 34 **Earth Science Lab, Level B:** Cards 7,.30, 32, 33, 34

Strand 5: Processes and Interactions of the Earth's Systems (Geosphere, Atmosphere, and Hydrosphere)
2. Earth's systems (geosphere, atmosphere, and hydrosphere) interact with one another as they undergo change by common processes.
Concept A. The Earth's materials and surface features are changed through a variety of external processes.
b. Explain how the formation of sedimentary rocks depends on weathering and erosion.
Earth Science Lab, Level A: Cards 7, 9 **Earth Science Lab, Level B:** Cards 7, 9

Strand 5: Processes and Interactions of the Earth's Systems (Geosphere, Atmosphere, and Hydrosphere)
2. Earth's systems (geosphere, atmosphere, and hydrosphere) interact with one another as they undergo change by common processes.
Concept A. The Earth's materials and surface features are changed through a variety of external processes.
c. Describe how weathering agents and erosional processes (i.e., force of water as it freezes or flows, expansion/contraction due to temperature, force of wind, force of plant roots, action of gravity, chemical decomposition) slowly change surface changes that create and/or change landforms.
Earth Science Lab, Level A: Cards 24, 25, 26, 27, 28, 29 **Earth Science Lab, Level B:** Cards 24, 25, 26, 27, 28, 29

Strand 5: Processes and Interactions of the Earth's Systems (Geosphere, Atmosphere, and Hydrosphere)
2. Earth's systems (geosphere, atmosphere, and hydrosphere) interact with one another as they undergo change by common processes.
Concept A. The Earth's materials and surface features are changed through a variety of external processes.
d. Describe how the Earth's surface and surface materials can change abruptly through the activity of floods, rock/mudslides, or volcanoes.
Earth Science Lab, Level A: Cards 15, 17, 24, 25, 26, 27, 28, 88 **Earth Science Lab, Level B:** Cards 15, 17, 24, 25, 26, 27, 28, 88

Strand 5: Processes and Interactions of the Earth's Systems (Geosphere, Atmosphere, and Hydrosphere)
2. Earth's systems (geosphere, atmosphere, and hydrosphere) interact with one another as they undergo change by common processes.
Concept B. There are internal processes and sources of energy within the geosphere that cause changes in Earth's crustal plates.
a. Identify events (earthquakes, volcanic eruptions) and the landforms created by them on the Earth's surface that occur at different plate boundaries.
Earth Science Lab, Level A: Cards 11, 12, 13, 14, 15, 16, 17, 88 **Earth Science Lab, Level B:** Cards 11, 12, 13, 14, 15, 16, 17, 88 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 2, *Plate Boundaries in Action*, pages 77-79

Strand 5: Processes and Interactions of the Earth's Systems (Geosphere, Atmosphere, and Hydrosphere)
2. Earth's systems (geosphere, atmosphere, and hydrosphere) interact with one another as they undergo change by common processes.
Concept D. Changes in the Earth over time can be inferred through rock and fossil evidence.
a. Explain the types of fossils and the processes by which they are formed (i.e., replacement, mold and cast, preservation, trace).
Life Science Lab, Level A: Card 67 **Life Science Lab, Level B:** Card 67 **Life Science Lab Teacher's Handbook:** Hands-On Activity 5, *Making Fossils*, pages 93-95 **Earth Science Lab, Level A:** Cards 33, 34 **Earth Science Lab, Level B:** Cards 33, 34

Strand 5: Processes and Interactions of the Earth's Systems (Geosphere, Atmosphere, and Hydrosphere)
2. Earth's systems (geosphere, atmosphere, and hydrosphere) interact with one another as they undergo change by common processes.
Concept D. Changes in the Earth over time can be inferred through rock and fossil evidence.
b. Use fossil evidence to make inferences about changes on Earth and in its environment (i.e., superposition of rock layers, similarities between fossils in different geographical locations, fossils of seashells indicate that area was once underwater).
Life Science Lab, Level A: Card 67 **Life Science Lab, Level B:** Card 67 **Life Science Lab Teacher's Handbook:** Hands-On Activity 5, *Making Fossils*, pages 93-95 **Earth Science Lab, Level A:** Cards 30, 33, 34 **Earth Science Lab, Level B:** Cards 30, 33, 34

Strand 5: Processes and Interactions of the Earth's Systems (Geosphere, Atmosphere, and Hydrosphere)
3. Human activity is dependent upon and affects Earth's resources and systems.
Concept A. Earth's materials are limited natural resources affected by human activity.
a. Relate the comparative amounts of fresh water and salt water on the Earth to the availability of water as a resource for living organisms and human activity.
Earth Science Lab, Level A: Cards 82, 83, 84, 85, 86, 87, 89, 90 **Earth Science Lab, Level B:** Cards 82, 83, 84, 85, 86, 87, 89, 90 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 8, *Temperature, Salinity, and Water Density*, pages 101-103

Strand 5: Processes and Interactions of the Earth's Systems (Geosphere, Atmosphere, and Hydrosphere)
3. Human activity is dependent upon and affects Earth's resources and systems.
Concept A. Earth's materials are limited natural resources affected by human activity.
b. Describe the affect of human activities (e.g., landfills, use of fertilizers and herbicides, farming, septic systems) on the quality of water.
Life Science Lab, Level A: Card 90 **Life Science Lab, Level B:** Card 90 **Earth Science Lab, Level A:** Card 86 **Earth Science Lab, Level B:** Card 86

Strand 5: Processes and Interactions of the Earth's Systems (Geosphere, Atmosphere, and Hydrosphere)
3. Human activity is dependent upon and affects Earth's resources and systems.
Concept A. Earth's materials are limited natural resources affected by human activity.
c. Analyze the ways humans affect the erosion and deposition of soil and rock materials (e.g., clearing of land, planting vegetation, paving land, construction of new buildings, building or removal of dams).
Life Science Lab, Level A: Card 87, 88 **Life Science Lab, Level B:** Cards 87, 88 **Earth Science Lab, Level A:** Cards 25, 26, 27, 28, 29 **Earth Science Lab, Level B:** Cards 25, 26, 27, 28, 29

Strand 7: Scientific Inquiry
1. Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking.
Concept A. Scientific inquiry includes the ability of students to formulate a testable question and explanation, and to select appropriate investigative methods in order to obtain evidence relevant to the explanation.
a. Formulate testable questions and hypotheses.
Life Science Lab Teacher's Handbook: Hands-On Activity 1, *Examining Cells,* pages 77-79; Hands-On Activity 2, *Culturing Bacteria,* pages 81-83; Hands-On Activity 3, *Investigating Arthropods,* pages 85-87; Hands-On Activity 4, *Your Cardiovascular System,* pages 89-91; Hands-On Activity 5, *Making Fossils,* pages 93-95; Hands-On Activity 6, *How Much Does Energy Cost?,* pages 97-99; Hands-On Activity 7, *The Effects of Acid Rain,* pages 101-103 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 1, *Identifying Minerals with the Mohs Scale,* pages 73-75; Hands-On Activity 2, *Plate Boundaries in Action,* pages 77-79; Hands-On Activity 3, *Interpreting a Topographic Map,* pages 81-83; Hands-On Activity 4, *Using Sound Waves,* pages 85-87; Hands-On Activity 5, *What is in the Air?,* pages 89-91; Hands-On Activity 6, *Modeling a Tornado,* pages 93-95; Hands-On Activity 7, *Sizes in the Solar System,* pages 97-99; Hands-On Activity 8, *Temperature, Salinity, and Water Density,* pages 101-103 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 1, *Measuring pH of Acids and Bases,* pages 77-79; Hands-On Activity 2, *Chemical Reaction Rates,* pages 81-83; Hands-On Activity 3, *Energy Conversion,* pages 85-87; Hands-On Activity 4, *Reducing Friction,* pages 89-91; Hands-On Activity 5, *Making a Potato Battery,* pages 93-95; Hands-On Activity 6, *Making Sound,* pages 97-99 **Classroom Resource CD-ROM:** Writing Strategy 8, 15

Strand 7: Scientific Inquiry
1. Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking.
Concept A. Scientific inquiry includes the ability of students to formulate a testable question and explanation, and to select appropriate investigative methods in order to obtain evidence relevant to the explanation.
b. Recognize the importance of the independent variable, dependent variables, control of constants, and multiple trials to the design of a valid experiment.
Life Science Lab Teacher's Handbook: Hands-On Activity 7, *The Effects of Acid Rain,* pages 101-103 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 8, *Temperature, Salinity, and Water Density,* pages 101-103 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 2, *Chemical Reaction Rates,* pages 81-83 **Classroom Resource CD-ROM:** Writing Strategy 23

Strand 7: Scientific Inquiry
1. Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking.
Concept A. Scientific inquiry includes the ability of students to formulate a testable question and explanation, and to select appropriate investigative methods in order to obtain evidence relevant to the explanation.
c. Design and conduct a valid experiment.
Life Science Lab Teacher's Handbook: Hands-On Activity 1, *Examining Cells,* pages 77-79; Hands-On Activity 2, *Culturing Bacteria,* pages 81-83; Hands-On Activity 3, *Investigating Arthropods,* pages 85-87; Hands-On Activity 4, *Your Cardiovascular System,* pages 89-91; Hands-On Activity 5, *Making Fossils,* pages 93-95; Hands-On Activity 6, *How Much Does Energy Cost?,* pages 97-99; Hands-On Activity 7, *The Effects of Acid Rain,* pages 101-103 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 1, *Identifying Minerals with the Mohs Scale,* pages 73-75; Hands-On Activity 2, *Plate Boundaries in Action,* pages 77-79; Hands-On Activity 3, *Interpreting a Topographic Map,* pages 81-83; Hands-On Activity 4, *Using Sound Waves,* pages 85-87; Hands-On Activity 5, *What is in the Air?,* pages 89-91; Hands-On Activity 6, *Modeling a Tornado,* pages 93-95; Hands-On Activity 7, *Sizes in the Solar System,* pages 97-99; Hands-On Activity 8, *Temperature, Salinity, and Water Density,* pages 101-103 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 1, *Measuring pH of Acids and Bases,* pages 77-79; Hands-On Activity 2, *Chemical Reaction Rates,* pages 81-83; Hands-On Activity 3, *Energy Conversion,* pages 85-87; Hands-On Activity 4, *Reducing Friction,* pages 89-91; Hands-On Activity 5, *Making a Potato Battery,* pages 93-95; Hands-On Activity 6, *Making Sound,* pages 97-99 **Classroom Resource CD-ROM:** Writing Strategy 15

Strand 7: Scientific Inquiry
1. Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking.
Concept A. Scientific inquiry includes the ability of students to formulate a testable question and explanation, and to select appropriate investigative methods in order to obtain evidence relevant to the explanation.
d. Evaluate the design of an experiment and make suggestions for reasonable improvements or extensions of an experiment.
Life Science Lab Teacher's Handbook: Hands-On Activity 1, *Examining Cells,* pages 77-79; Hands-On Activity 2, *Culturing Bacteria,* pages 81-83; Hands-On Activity 3, *Investigating Arthropods,* pages 85-87; Hands-On Activity 4, *Your Cardiovascular System,* pages 89-91; Hands-On Activity 5, *Making Fossils,* pages 93-95; Hands-On Activity 6, *How Much Does Energy Cost?,* pages 97-99; Hands-On Activity 7, *The Effects of Acid Rain,* pages 101-103 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 1, *Identifying Minerals with the Mohs Scale,* pages 73-75; Hands-On Activity 2, *Plate Boundaries in Action,* pages 77-79; Hands-On Activity 3, *Interpreting a Topographic Map,* pages 81-83; Hands-On Activity 4, *Using Sound Waves,* pages 85-87; Hands-On Activity 5, *What is in the Air?,* pages 89-91; Hands-On Activity 6, *Modeling a Tornado,* pages 93-95; Hands-On Activity 7, *Sizes in the Solar System,* pages 97-99; Hands-On Activity 8, *Temperature, Salinity, and Water Density,* pages 101-103 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 1, *Measuring pH of Acids and Bases,* pages 77-79; Hands-On Activity 2, *Chemical Reaction Rates,* pages 81-83; Hands-On Activity 3, *Energy Conversion,* pages 85-87; Hands-On Activity 4, *Reducing Friction,* pages 89-91; Hands-On Activity 5, *Making a Potato Battery,* pages 93-95; Hands-On Activity 6, *Making Sound,* pages 97-99

Strand 7: Scientific Inquiry
1. Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking.
Concept A. Scientific inquiry includes the ability of students to formulate a testable question and explanation, and to select appropriate investigative methods in order to obtain evidence relevant to the explanation.
e. Recognize different kinds of questions suggest different kinds of scientific investigations (e.g., some involve observing and describing objects, organisms, or events; some involve collecting specimens; some involve experiments; some involve making observations in nature; some involve discovery of new objects and phenomena; some involve making models).
Life Science Lab Teacher's Handbook: Hands-On Activity 1, *Examining Cells,* pages 77-79; Hands-On Activity 2, *Culturing Bacteria,* pages 81-83; Hands-On Activity 3, *Investigating Arthropods,* pages 85-87; Hands-On Activity 4, *Your Cardiovascular System,* pages 89-91; Hands-On Activity 5, *Making Fossils,* pages 93-95; Hands-On Activity 6, *How Much Does Energy Cost?,* pages 97-99; Hands-On Activity 7, *The Effects of Acid Rain,* pages 101-103 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 1, *Identifying Minerals with the Mohs Scale,* pages 73-75; Hands-On Activity 2, *Plate Boundaries in Action,* pages 77-79; Hands-On Activity 3, *Interpreting a Topographic Map,* pages 81-83; Hands-On Activity 4, *Using Sound Waves,* pages 85-87; Hands-On Activity 5, *What is in the Air?,* pages 89-91; Hands-On Activity 6, *Modeling a Tornado,* pages 93-95; Hands-On Activity 7, *Sizes in the Solar System,* pages 97-99; Hands-On Activity 8, *Temperature, Salinity, and Water Density,* pages 101-103 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 1, *Measuring pH of Acids and Bases,* pages 77-79; Hands-On Activity 2, *Chemical Reaction Rates,* pages 81-83; Hands-On Activity 3, *Energy Conversion,* pages 85-87; Hands-On Activity 4, *Reducing Friction,* pages 89-91; Hands-On Activity 5, *Making a Potato Battery,* pages 93-95; Hands-On Activity 6, *Making Sound,* pages 97-99 **Classroom Resource CD-ROM:** Writing Strategy 15

Strand 7: Scientific Inquiry
1. Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking.
Concept B. Scientific inquiry relies upon gathering evidence from qualitative and quantitative observations.
a. Make qualitative observations using the five senses.
Life Science Lab Teacher's Handbook: Hands-On Activity 1, *Examining Cells,* pages 77-79; Hands-On Activity 2, *Culturing Bacteria,* pages 81-83; Hands-On Activity 3, *Investigating Arthropods,* pages 85-87; Hands-On Activity 4, *Your Cardiovascular System,* pages 89-91; Hands-On Activity 5, *Making Fossils,* pages 93-95; Hands-On Activity 6, *How Much Does Energy Cost?,* pages 97-99; Hands-On Activity 7, *The Effects of Acid Rain,* pages 101-103 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 1, *Identifying Minerals with the Mohs Scale,* pages 73-75; Hands-On Activity 2, *Plate Boundaries in Action,* pages 77-79; Hands-On Activity 3, *Interpreting a Topographic Map,* pages 81-83; Hands-On Activity 4, *Using Sound Waves,* pages 85-87; Hands-On Activity 5, *What is in the Air?,* pages 89-91; Hands-On Activity 6, *Modeling a Tornado,* pages 93-95; Hands-On Activity 7, *Sizes in the Solar System,* pages 97-99; Hands-On Activity 8, *Temperature, Salinity, and Water Density,* pages 101-103 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 1, *Measuring pH of Acids and Bases,* pages 77-79; Hands-On Activity 2, *Chemical Reaction Rates,* pages 81-83; Hands-On Activity 3, *Energy Conversion,* pages 85-87; Hands-On Activity 4, *Reducing Friction,* pages 89-91; Hands-On Activity 5, *Making a Potato Battery,* pages 93-95; Hands-On Activity 6, *Making Sound,* pages 97-99 **Classroom Resource CD-ROM:** Writing Strategy 11

Strand 7: Scientific Inquiry
1. Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking.
Concept B. Scientific inquiry relies upon gathering evidence from qualitative and quantitative observations.
b. Determine the appropriate tools and techniques to collect data.
Life Science Lab Teacher's Handbook: Hands-On Activity 1, *Examining Cells,* pages 77-79; Hands-On Activity 2, *Culturing Bacteria,* pages 81-83; Hands-On Activity 3, *Investigating Arthropods,* pages 85-87; Hands-On Activity 4, *Your Cardiovascular System,* pages 89-91; Hands-On Activity 5, *Making Fossils,* pages 93-95; Hands-On Activity 6, *How Much Does Energy Cost?,* pages 97-99; Hands-On Activity 7, *The Effects of Acid Rain,* pages 101-103 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 1, *Identifying Minerals with the Mohs Scale,* pages 73-75; Hands-On Activity 2, *Plate Boundaries in Action,* pages 77-79; Hands-On Activity 3, *Interpreting a Topographic Map,* pages 81-83; Hands-On Activity 4, *Using Sound Waves,* pages 85-87; Hands-On Activity 5, *What is in the Air?,* pages 89-91; Hands-On Activity 6, *Modeling a Tornado,* pages 93-95; Hands-On Activity 7, *Sizes in the Solar System,* pages 97-99; Hands-On Activity 8, *Temperature, Salinity, and Water Density,* pages 101-103 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 1, *Measuring pH of Acids and Bases,* pages 77-79; Hands-On Activity 2, *Chemical Reaction Rates,* pages 81-83; Hands-On Activity 3, *Energy Conversion,* pages 85-87; Hands-On Activity 4, *Reducing Friction,* pages 89-91; Hands-On Activity 5, *Making a Potato Battery,* pages 93-95; Hands-On Activity 6, *Making Sound,* pages 97-99

Strand 7: Scientific Inquiry
1. Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking.
Concept B. Scientific inquiry relies upon gathering evidence from qualitative and quantitative observations.
c. Use a variety of tools and equipment to gather data (e.g., microscopes, thermometers, computers, spring scales, balances, magnets, metric rulers, graduated cylinders, stopwatches).
Life Science Lab Teacher's Handbook: Hands-On Activity 4, *Your Cardiovascular System,* pages 89-91; Hands-On Activity 7, *The Effects of Acid Rain,* pages 101-103 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 1, *Identifying Minerals with the Mohs Scale,* pages 73-75; Hands-On Activity 3, *Interpreting a Topographic Map,* pages 81-83; Hands-On Activity 7, *Sizes in the Solar System,* pages 97-99; Hands-On Activity 8, *Temperature, Salinity, and Water Density,* pages 101-103 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 1, *Measuring pH of Acids and Bases,* pages 77-79; Hands-On Activity 2, *Chemical Reaction Rates,* pages 81-83; Hands-On Activity 3, *Energy Conversion,* pages 85-87; Hands-On Activity 4, *Reducing Friction,* pages 89-91; Hands-On Activity 6, *Making Sound,* pages 97-99

Strand 7: Scientific Inquiry
1. Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking.
Concept B. Scientific inquiry relies upon gathering evidence from qualitative and quantitative observations.
d. Measure length to the nearest millimeter, mass to the nearest gram, volume to the nearest milliliter, temperature to the nearest degree Celsius, force (weight) to the nearest Newton, time to the nearest second.
Life Science Lab Teacher's Handbook: Hands-On Activity 4, *Your Cardiovascular System,* pages 89-91; Hands-On Activity 7, *The Effects of Acid Rain,* pages 101-103 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 1, *Identifying Minerals with the Mohs Scale,* pages 73-75; Hands-On Activity 3, *Interpreting a Topographic Map,* pages 81-83; Hands-On Activity 7, *Sizes in the Solar System,* pages 97-99; Hands-On Activity 8, *Temperature, Salinity, and Water Density,* pages 101-103 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 1, *Measuring pH of Acids and Bases,* pages 77-79; Hands-On Activity 2, *Chemical Reaction Rates,* pages 81-83; Hands-On Activity 3, *Energy Conversion,* pages 85-87; Hands-On Activity 4, *Reducing Friction,* pages 89-91; Hands-On Activity 6, *Making Sound,* pages 97-99

Strand 7: Scientific Inquiry
1. Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking.
Concept B. Scientific inquiry relies upon gathering evidence from qualitative and quantitative observations.
e. Compare amounts/measurements.
Life Science Lab Teacher's Handbook: Hands-On Activity 4, *Your Cardiovascular System,* pages 89-91; Hands-On Activity 7, *The Effects of Acid Rain,* pages 101-103 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 1, *Identifying Minerals with the Mohs Scale,* pages 73-75; Hands-On Activity 3, *Interpreting a Topographic Map,* pages 81-83; Hands-On Activity 7, *Sizes in the Solar System,* pages 97-99; Hands-On Activity 8, *Temperature, Salinity, and Water Density,* pages 101-103 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 1, *Measuring pH of Acids and Bases,* pages 77-79; Hands-On Activity 2, *Chemical Reaction Rates,* pages 81-83; Hands-On Activity 3, *Energy Conversion,* pages 85-87; Hands-On Activity 4, *Reducing Friction,* pages 89-91; Hands-On Activity 6, *Making Sound,* pages 97-99

Strand 7: Scientific Inquiry
1. Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking.
Concept B. Scientific inquiry relies upon gathering evidence from qualitative and quantitative observations.
f. Judge whether measurements and computation of quantities are reasonable.
Life Science Lab Teacher's Handbook: Hands-On Activity 4, *Your Cardiovascular System,* pages 89-91; Hands-On Activity 7, *The Effects of Acid Rain,* pages 101-103 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 1, *Identifying Minerals with the Mohs Scale,* pages 73-75; Hands-On Activity 3, *Interpreting a Topographic Map,* pages 81-83; Hands-On Activity 7, *Sizes in the Solar System,* pages 97-99; Hands-On Activity 8, *Temperature, Salinity, and Water Density,* pages 101-103 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 1, *Measuring pH of Acids and Bases,* pages 77-79; Hands-On Activity 2, *Chemical Reaction Rates,* pages 81-83; Hands-On Activity 3, *Energy Conversion,* pages 85-87; Hands-On Activity 4, *Reducing Friction,* pages 89-91; Hands-On Activity 6, *Making Sound,* pages 97-99

Strand 7: Scientific Inquiry
1. Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking.
Concept C. Evidence is used to formulate explanations.
a. Use quantitative and qualitative data as support for reasonable explanations (conclusions).
Life Science Lab Teacher's Handbook: Hands-On Activity 3, *Investigating Arthropods,* pages 85-87; Hands-On Activity 4, *Your Cardiovascular System,* pages 89-91; Hands-On Activity 5, *Making Fossils,* pages 93-95; Hands-On Activity 6, *How Much Does Energy Cost?,* pages 97-99; Hands-On Activity 7, *The Effects of Acid Rain,* pages 101-103 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 1, *Identifying Minerals with the Mohs Scale,* pages 73-75; Hands-On Activity 3, *Interpreting a Topographic Map,* pages 81-83; Hands-On Activity 5, *What is in the Air?,* pages 89-91; Hands-On Activity 7, *Sizes in the Solar System,* pages 97-99; Hands-On Activity 8, *Temperature, Salinity, and Water Density,* pages 101-103 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 1, *Measuring pH of Acids and Bases,* pages 77-79; Hands-On Activity 2, *Chemical Reaction Rates,* pages 81-83; Hands-On Activity 3, *Energy Conversion,* pages 85-87; Hands-On Activity 4, *Reducing Friction,* pages 89-91; Hands-On Activity 6, *Making Sound,* pages 97-99 **Classroom Resource CD-ROM:** Writing Strategy 22, 24

Strand 7: Scientific Inquiry
1. Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking.
Concept C. Evidence is used to formulate explanations.
b. Use data as support for observed patterns and relationships, and to make predictions to be tested.
Life Science Lab Teacher's Handbook: Hands-On Activity 3, *Investigating Arthropods,* pages 85-87; Hands-On Activity 4, *Your Cardiovascular System,* pages 89-91; Hands-On Activity 5, *Making Fossils,* pages 93-95; Hands-On Activity 6, *How Much Does Energy Cost?,* pages 97-99; Hands-On Activity 7, *The Effects of Acid Rain,* pages 101-103 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 1, *Identifying Minerals with the Mohs Scale,* pages 73-75; Hands-On Activity 3, *Interpreting a Topographic Map,* pages 81-83; Hands-On Activity 5, *What is in the Air?,* pages 89-91; Hands-On Activity 7, *Sizes in the Solar System,* pages 97-99; Hands-On Activity 8, *Temperature, Salinity, and Water Density,* pages 101-103 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 1, *Measuring pH of Acids and Bases,* pages 77-79; Hands-On Activity 2, *Chemical Reaction Rates,* pages 81-83; Hands-On Activity 3, *Energy Conversion,* pages 85-87; Hands-On Activity 4, *Reducing Friction,* pages 89-91; Hands-On Activity 6, *Making Sound,* pages 97-99 **Classroom Resource CD-ROM:** Writing Strategy 22, 24

Strand 7: Scientific Inquiry
1. Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking.
Concept C. Evidence is used to formulate explanations.
c. Recognize the possible effects of errors in observations, measurements, and calculations on the formulation of explanations (conclusions).
Life Science Lab Teacher's Handbook: Hands-On Activity 1, *Examining Cells,* pages 77-79; Hands-On Activity 2, *Culturing Bacteria,* pages 81-83; Hands-On Activity 3, *Investigating Arthropods,* pages 85-87; Hands-On Activity 4, *Your Cardiovascular System,* pages 89-91; Hands-On Activity 5, *Making Fossils,* pages 93-95; Hands-On Activity 6, *How Much Does Energy Cost?,* pages 97-99; Hands-On Activity 7, *The Effects of Acid Rain,* pages 101-103 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 1, *Identifying Minerals with the Mohs Scale,* pages 73-75; Hands-On Activity 2, *Plate Boundaries in Action,* pages 77-79; Hands-On Activity 3, *Interpreting a Topographic Map,* pages 81-83; Hands-On Activity 4, *Using Sound Waves,* pages 85-87; Hands-On Activity 5, *What is in the Air?,* pages 89-91; Hands-On Activity 6, *Modeling a Tornado,* pages 93-95; Hands-On Activity 7, *Sizes in the Solar System,* pages 97-99; Hands-On Activity 8, *Temperature, Salinity, and Water Density,* pages 101-103 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 1, *Measuring pH of Acids and Bases,* pages 77-79; Hands-On Activity 2, *Chemical Reaction Rates,* pages 81-83; Hands-On Activity 3, *Energy Conversion,* pages 85-87; Hands-On Activity 4, *Reducing Friction,* pages 89-91; Hands-On Activity 5, *Making a Potato Battery,* pages 93-95; Hands-On Activity 6, *Making Sound,* pages 97-99

Strand 7: Scientific Inquiry
1. Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking.
Concept D. Scientific inquiry includes evaluation of explanations (hypotheses, laws, theories) in light of scientific principles (understandings).
a. Evaluate the reasonableness of an explanation (conclusion).
Life Science Lab Teacher's Handbook: Hands-On Activity 1, *Examining Cells,* pages 77-79; Hands-On Activity 2, *Culturing Bacteria,* pages 81-83; Hands-On Activity 3, *Investigating Arthropods,* pages 85-87; Hands-On Activity 4, *Your Cardiovascular System,* pages 89-91; Hands-On Activity 5, *Making Fossils,* pages 93-95; Hands-On Activity 6, *How Much Does Energy Cost?,* pages 97-99; Hands-On Activity 7, *The Effects of Acid Rain,* pages 101-103 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 1, *Identifying Minerals with the Mohs Scale,* pages 73-75; Hands-On Activity 2, *Plate Boundaries in Action,* pages 77-79; Hands-On Activity 3, *Interpreting a Topographic Map,* pages 81-83; Hands-On Activity 4, *Using Sound Waves,* pages 85-87; Hands-On Activity 5, *What is in the Air?,* pages 89-91; Hands-On Activity 6, *Modeling a Tornado,* pages 93-95; Hands-On Activity 7, *Sizes in the Solar System,* pages 97-99; Hands-On Activity 8, *Temperature, Salinity, and Water Density,* pages 101-103 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 1, *Measuring pH of Acids and Bases,* pages 77-79; Hands-On Activity 2, *Chemical Reaction Rates,* pages 81-83; Hands-On Activity 3, *Energy Conversion,* pages 85-87; Hands-On Activity 4, *Reducing Friction,* pages 89-91; Hands-On Activity 5, *Making a Potato Battery,* pages 93-95; Hands-On Activity 6, *Making Sound,* pages 97-99

Strand 7: Scientific Inquiry
1. Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking.
Concept D. Scientific inquiry includes evaluation of explanations (hypotheses, laws, theories) in light of scientific principles (understandings).
b. Analyze whether evidence (data) and scientific principles support proposed explanations (hypotheses, laws, theories).
Life Science Lab Teacher's Handbook: Hands-On Activity 1, *Examining Cells,* pages 77-79; Hands-On Activity 2, *Culturing Bacteria,* pages 81-83; Hands-On Activity 3, *Investigating Arthropods,* pages 85-87; Hands-On Activity 4, *Your Cardiovascular System,* pages 89-91; Hands-On Activity 5, *Making Fossils,* pages 93-95; Hands-On Activity 6, *How Much Does Energy Cost?,* pages 97-99; Hands-On Activity 7, *The Effects of Acid Rain,* pages 101-103 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 1, *Identifying Minerals with the Mohs Scale,* pages 73-75; Hands-On Activity 2, *Plate Boundaries in Action,* pages 77-79; Hands-On Activity 3, *Interpreting a Topographic Map,* pages 81-83; Hands-On Activity 4, *Using Sound Waves,* pages 85-87; Hands-On Activity 5, *What is in the Air?,* pages 89-91; Hands-On Activity 6, *Modeling a Tornado,* pages 93-95; Hands-On Activity 7, *Sizes in the Solar System,* pages 97-99; Hands-On Activity 8, *Temperature, Salinity, and Water Density,* pages 101-103 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 1, *Measuring pH of Acids and Bases,* pages 77-79; Hands-On Activity 2, *Chemical Reaction Rates,* pages 81-83; Hands-On Activity 3, *Energy Conversion,* pages 85-87; Hands-On Activity 4, *Reducing Friction,* pages 89-91; Hands-On Activity 5, *Making a Potato Battery,* pages 93-95; Hands-On Activity 6, *Making Sound,* pages 97-99

Strand 7: Scientific Inquiry
1. Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking.
Concept E. The nature of science relies upon communication of results and justification of explanations.
a. Communicate simple procedures and results of investigations and explanations through: • **Oral presentations** • **Drawings and maps** • **Data tables (allowing for the recording and analysis of data relevant to the experiment, such as independent and dependent variables, multiple trials, beginning and ending times or temperatures, derived quantities)** • **Graphs (bar, single line, pictograph)** • **Writings.**
Life Science Lab Teacher's Handbook: Hands-On Activity 1, *Examining Cells,* pages 77-79; Hands-On Activity 2, *Culturing Bacteria,* pages 81-83; Hands-On Activity 3, *Investigating Arthropods,* pages 85-87; Hands-On Activity 4, *Your Cardiovascular System,* pages 89-91; Hands-On Activity 5, *Making Fossils,* pages 93-95; Hands-On Activity 6, *How Much Does Energy Cost?,* pages 97-99; Hands-On Activity 7, *The Effects of Acid Rain,* pages 101-103 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 1, *Identifying Minerals with the Mohs Scale,* pages 73-75; Hands-On Activity 2, *Plate Boundaries in Action,* pages 77-79; Hands-On Activity 3, *Interpreting a Topographic Map,* pages 81-83; Hands-On Activity 4, *Using Sound Waves,* pages 85-87; Hands-On Activity 5, *What is in the Air?,* pages 89-91; Hands-On Activity 6, *Modeling a Tornado,* pages 93-95; Hands-On Activity 7, *Sizes in the Solar System,* pages 97-99; Hands-On Activity 8, *Temperature, Salinity, and Water Density,* pages 101-103 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 1, *Measuring pH of Acids and Bases,* pages 77-79; Hands-On Activity 2, *Chemical Reaction Rates,* pages 81-83; Hands-On Activity 3, *Energy Conversion,* pages 85-87; Hands-On Activity 4, *Reducing Friction,* pages 89-91; Hands-On Activity 5, *Making a Potato Battery,* pages 93-95; Hands-On Activity 6, *Making Sound,* pages 97-99 **Classroom Resource CD-ROM:** Writing Strategy 1-30

Strand 8: Impact of Science, Technology, and Human Activity
1. The nature of technology can advance, and is advanced by, science as it seeks to apply scientific knowledge in ways that meet human needs.
Concept A. Designed objects are used to do things better or more easily and to do some things that could not otherwise be done at all.
a. Explain how technological improvements, such as those developed for use in space exploration, the military, or medicine, have led to the invention of new products that may improve lives here on Earth (e.g., new materials, freeze-dried foods, infrared goggles, Velcro, satellite imagery, robotics, lasers).
Life Science Lab, Level A: Cards 49, 64, 69, 83 **Life Science Lab, Level B:** Cards 49, 64, 69, 83 **Earth Science Lab, Level A:** Cards 16, 20, 51, 54, 79, 80, 81, 88 **Earth Science Lab, Level B:** Cards 16, 20, 51, 54, 79, 80, 81, 88 **Physical Science Lab, Level A:** Cards 33, 35, 76, 81, 84, 90 **Physical Science Lab, Level B:** Cards 33, 35, 76, 81, 84, 90

Strand 8: Impact of Science, Technology, and Human Activity
1. The nature of technology can advance, and is advanced by, science as it seeks to apply scientific knowledge in ways that meet human needs.
Concept B. Advances in technology often result in improved data collection and an increase in scientific knowledge.
a. Identify the link between technological developments and the scientific discoveries made possible through their development (e.g., Hubble telescope and stellar evolution, composition and structure of the universe; the electron microscope and cell organelles; sonar and the composition of the Earth; manned and unmanned space missions and space exploration; Doppler radar and weather conditions; MRI and CAT-scans and brain activity).
Life Science Lab, Level A: Cards 5, 59, 64, 69, 83 **Life Science Lab, Level B:** Cards 5, 59, 64, 69, 83 **Earth Science Lab, Level A:** Cards 16, 20, 31, 37, 51, 54, 70, 79, 80, 81, 88 **Earth Science Lab, Level B:** Cards 16, 20, 31, 37, 51, 54, 70, 79, 80, 81, 88 **Physical Science Lab, Level A:** Cards 33, 35, 72, 73, 76, 81, 84, 90 **Physical Science Lab, Level B:** Cards 33, 35, 72, 73, 76, 81, 84, 90

Strand 8: Impact of Science, Technology, and Human Activity
1. The nature of technology can advance, and is advanced by, science as it seeks to apply scientific knowledge in ways that meet human needs.
Concept C. Technological solutions to problems often have drawbacks as well as benefits.
a. Describe how technological solutions to problems (e.g., storm water run-off, fiber optics, windmills, efficient car design, electronic trains without conductors, sonar, robotics, Hubble telescope) can have both benefits and drawbacks (e.g., design constraints, unintended consequences, risks).
Life Science Lab, Level A: Cards 49, 64, 69, 83, 87, 88, 89, 90 **Life Science Lab, Level B:** Cards 49, 64, 69, 83, 87, 88, 89, 90 **Earth Science Lab, Level A:** Cards 16, 20, 31, 51, 54, 70, 79, 80, 81, 88 **Earth Science Lab, Level B:** Cards 16, 20, 31, 51, 54, 70, 79, 80, 81, 88 **Physical Science Lab, Level A:** Cards 33, 35, 46, 47, 48, 49, 73, 76, 81, 84, 90 **Physical Science Lab, Level B:** Cards 33, 35, 46, 47, 48, 48, 73, 76, 81, 84, 90

Strand 8: Impact of Science, Technology, and Human Activity
2. Historical and cultural perspectives of scientific explanations help to improve understanding of the nature of science and how science knowledge and technology evolve over time.
Concept A. People of different gender and ethnicity have contributed to scientific discoveries and the invention of technological innovations.
a. Describe how the contributions of scientists and inventors, representing different cultures, races, and gender, have contributed to science, technology, and human activity (e.g., George Washington Carver, Thomas Edison, Thomas Jefferson, Isaac Newton, Marie Currie, Galileo, Albert Einstein, Mae Jemison, Edwin Hubble, Charles Darwin, Jonas Salk, Louis Pasteur, Jane Goodall, Tom Akers, John Wesley Powell, Rachel Carson).
Life Science Lab, Level A: Cards 2, 5, 46, 59 **Life Science Lab, Level B:** Cards 2, 5, 46, 59 **Earth Science Lab, Level A:** Cards 10, 68, 72, 78 **Earth Science Lab, Level B:** Cards 10, 68, 72, 78 **Physical Science Lab, Level A:** Cards 3, 7, 17, 55 **Physical Science Lab, Level B:** Cards 3, 7, 17, 55

Strand 8: Impact of Science, Technology, and Human Activity
2. Historical and cultural perspectives of scientific explanations help to improve understanding of the nature of science and how science knowledge and technology evolve over time.
Concept B. Scientific theories are developed based on the body of knowledge that exists at any particular time and must be rigorously questioned and tested for validity.
a. Recognize the difficulty science innovators experience as they attempt to break through accepted ideas (hypotheses, laws, theories) of their time to reach conclusions that may lead to changes in those ideas and serve to advance scientific understanding (e.g., Darwin, Copernicus, Newton).
This topic is not covered at this level.

Strand 8: Impact of Science, Technology, and Human Activity
2. Historical and cultural perspectives of scientific explanations help to improve understanding of the nature of science and how science knowledge and technology evolve over time.
Concept B. Scientific theories are developed based on the body of knowledge that exists at any particular time and must be rigorously questioned and tested for validity.
b. Recognize explanations have changed over time as a result of new evidence.
Life Science Lab, Level A: Cards 2, 5, 11, 45, 46, 49, 64, 69, 84, 86, 87, 88, 89, 90 **Life Science Lab, Level B:** Cards 2, 5, 11, 45, 46, 49, 64, 69, 84, 86, 87, 88, 89, 90 **Earth Science Lab, Level A:** Cards 10, 30, 31, 37, 51, 54, 68, 72, 78 **Earth Science Lab, Level B:** Cards 10, 30, 31, 37, 51, 54, 68, 72, 78 **Physical Science Lab, Level A:** Cards 3, 7, 17, 53, 59 **Physical Science Lab, Level B:** Cards 3, 7, 17, 53, 59

Strand 8: Impact of Science, Technology, and Human Activity
3. Science and technology affect, and are affected by society.
Concept B. Social, political, economic, ethical and environmental factors strongly influence, and are influenced by, the direction of progress of science and technology.
a. Describe ways in which science and society influence one another (e.g., scientific knowledge and the procedures used by scientists influence the way many individuals in society think about themselves, others, and the environment; societal challenges often inspire questions for scientific research; social priorities often influence research priorities through the availability of funding for research).
Life Science Lab, Level A: Cards 45, 46, 47, 49, 51, 53, 55, 57, 64, 69, 84, 85, 86, 87, 88, 89, 90 **Life Science Lab, Level B:** Cards 45, 46, 47, 49, 51, 53, 55, 57, 64, 69, 84, 85, 86, 87, 88, 89, 90 **Earth Science Lab, Level A:** Cards 20, 37, 42, 51, 54, 59, 60, 61, 70, 79, 80, 81, 85, 86, 88 **Earth Science Lab, Level B:** Cards 20, 37, 42, 51, 54, 59, 60, 61, 70, 79, 80, 81, 85, 86, 88 **Physical Science Lab, Level A:** Cards 33, 34, 35, 46, 47, 48, 49, 72, 73, 76, 81, 84, 90 **Physical Science Lab, Level B:** Cards 33, 34, 35, 46, 47, 48, 49, 72, 73, 76, 81, 84, 90

Strand 8: Impact of Science, Technology, and Human Activity
3. Science and technology affect, and are affected by society.
Concept B. Social, political, economic, ethical and environmental factors strongly influence, and are influenced by, the direction of progress of science and technology.
b. Identify and evaluate the physical, social, economic, and/or environmental problems that may be overcome using science and technology (e.g., the need for alternative fuels, human travel in space, AIDS).
Life Science Lab, Level A: Cards 84, 86, 87, 88, 89, 90 **Life Science Lab, Level B:** Cards 84, 86, 87, 88, 89, 90 **Life Science Lab Teacher's Handbook:** Hands-On Activity 7, *The Effects of Acid Rain*, pages 101-103 **Earth Science Lab, Level A:** Cards 37, 42, 59, 60, 61, 86 **Earth Science Lab, Level B:** Cards 37, 42, 59, 60, 61, 86 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 5, *What is in the Air?*, pages 89-91 **Physical Science Lab, Level A:** Card 49 **Physical Science Lab, Level B:** Card 49

SRA Life, Earth, and Physical Science Laboratories
correlation to
Missouri Science Standards
Grade 7

SRA Life, Earth, and Physical Science Laboratories provide core science content in an alternate reading format. Each *SRA Science Lab* contains 180 Science Cards covering key science concepts and vocabulary. Each lab covers 90 different science topics presented at two different reading levels to meet varied student abilities. The *Teacher's Handbook* includes hands-on inquiry activities as well as vocabulary building exercises. The *Classroom Resource CD-ROM* includes Writing Strategies in Science along with tests and vocabulary games.

Strand 1: Properties and Principles of Matter and Energy
1. Changes in properties and states of matter provide evidence of the atomic theory or matter.
Concept D. Physical changes in the state of matter that result from thermal changes can be explained by the Kinetic Theory of Matter.
a. Describe the relationship between temperature and the movement of atmospheric gases (i.e., warm air rises due to expansion of the volume of gas, cool air sinks due to contraction of the volume of gas).
Earth Science Lab, Level A: Cards 38, 40, 41 **Earth Science Lab, Level B:** Cards 38, 40, 41 **Physical Science Lab, Level A:** Cards 42, 44 **Physical Science Lab, Level B:** Cards 42, 44

Strand 1: Properties and Principles of Matter and Energy
1. Changes in properties and states of matter provide evidence of the atomic theory or matter.
Concept I. Mass is conserved during any physical or chemical change.
a. Explain that the amount of matter remains constant while being cycled through the water cycle.
Earth Science Lab, Level A: Cards 47, 48, 49, 82, 83, 84 **Earth Science Lab, Level B:** Cards 47, 48, 49, 82, 83, 84

Strand 1: Properties and Principles of Matter and Energy
2. Energy has a source, can be transferred, and can be transformed into various forms but is conserved between and within systems.
Concept A. Forms of energy have a source, a means of transfer (work and heat), and a receiver.
a. Recognize thermal energy as the random motion (kinetic energy) of molecules or atoms within a substance.
Physical Science Lab, Level A: Card 42 **Physical Science Lab, Level B:** Card 42

Strand 1: Properties and Principles of Matter and Energy
2. Energy has a source, can be transferred, and can be transformed into various forms but is conserved between and within systems.
Concept A. Forms of energy have a source, a means of transfer (work and heat), and a receiver.
b. Use the kinetic molecular model to explain changes in the temperature of a material.
Physical Science Lab, Level A: Cards 6, 7, 8, 42 **Physical Science Lab, Level B:** Cards 6, 7, 8, 42

Strand 1: Properties and Principles of Matter and Energy
2. Energy has a source, can be transferred, and can be transformed into various forms but is conserved between and within systems.
Concept A. Forms of energy have a source, a means of transfer (work and heat), and a receiver.
c. Recognize thermal energy is transferred as heat from warmer objects to cooler objects until both reach the same temperature (equilibrium).
Physical Science Lab, Level A: Cards 42, 43, 44 **Physical Science Lab, Level B:** Cards 42, 43, 44

Strand 1: Properties and Principles of Matter and Energy
2. Energy has a source, can be transferred, and can be transformed into various forms but is conserved between and within systems.
Concept A. Forms of energy have a source, a means of transfer (work and heat), and a receiver.
d. Recognize that type of materials that transfer energy by conduction, convection, and/or radiation.
Earth Science Lab, Level A: Cards 10, 38, 87 **Earth Science Lab, Level B:** Cards 10, 38, 87 **Physical Science Lab, Level A:** Cards 42, 43, 44 **Physical Science Lab, Level B:** Cards 42, 43, 44

Strand 1: Properties and Principles of Matter and Energy
2. Energy has a source, can be transferred, and can be transformed into various forms but is conserved between and within systems.
Concept A. Forms of energy have a source, a means of transfer (work and heat), and a receiver.
e. Describe how heat is transferred by conduction, convection, and radiation, and classify examples of each.
Earth Science Lab, Level A: Cards 10, 38, 41, 87 **Earth Science Lab, Level B:** Cards 10, 38, 41, 87 **Physical Science Lab, Level A:** Cards 42, 43, 44 **Physical Science Lab, Level B:** Cards 42, 43, 44

Strand 1: Properties and Principles of Matter and Energy
2. Energy has a source, can be transferred, and can be transformed into various forms but is conserved between and within systems.
Concept A. Forms of energy have a source, a means of transfer (work and heat), and a receiver.
f. Classify common materials (e.g., wood, foam, plastic, glass, aluminum foil, soil, air, water) as conductors or insulators of thermal energy.
Physical Science Lab, Level A: Card 43 **Physical Science Lab, Level B:** Card 43

Strand 1: Properties and Principles of Matter and Energy
2. Energy has a source, can be transferred, and can be transformed into various forms but is conserved between and within systems.
Concept A. Forms of energy have a source, a means of transfer (work and heat), and a receiver.
g. Predict the differences in temperature over time on different colored (black and white) objects placed under the same heat source.
Physical Science Lab, Level A: Cards 43, 85 **Physical Science Lab, Level B:** Cards 43, 85

Strand 1: Properties and Principles of Matter and Energy
2. Energy has a source, can be transferred, and can be transformed into various forms but is conserved between and within systems.
Concept A. Forms of energy have a source, a means of transfer (work and heat), and a receiver.
h. Describe the interactions (i.e., repel, attract) of like and unlike charges (i.e., magnetic, static electric, electrical).
Physical Science Lab, Level A: Cards 66, 67, 74 **Physical Science Lab, Level B:** Cards 66, 67, 74

Strand 1: Properties and Principles of Matter and Energy
2. Energy has a source, can be transferred, and can be transformed into various forms but is conserved between and within systems.
Concept A. Forms of energy have a source, a means of transfer (work and heat), and a receiver.
i. Diagram and identify a complete electric circuit by using a source (battery), means of transfer (wires), and receiver (resistance bulbs, motors, fans).
Physical Science Lab, Level A: Cards 68, 69, 70 **Physical Science Lab, Level B:** Cards 68, 69, 70 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 5, *Making a Potato Battery*, pages 93-95

Strand 1: Properties and Principles of Matter and Energy
2. Energy has a source, can be transferred, and can be transformed into various forms but is conserved between and within systems.
Concept A. Forms of energy have a source, a means of transfer (work and heat), and a receiver.
j. Observe and describe the evidence of energy transfer in a closed series circuit.
Physical Science Lab, Level A: Cards 68, 69, 70 **Physical Science Lab, Level B:** Cards 68, 69, 70 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 5, *Making a Potato Battery*, pages 93-95

Strand 1: Properties and Principles of Matter and Energy
2. Energy has a source, can be transferred, and can be transformed into various forms but is conserved between and within systems.
Concept A. Forms of energy have a source, a means of transfer (work and heat), and a receiver.
k. Describe the effects of resistance (number of receivers), amount of voltage (number of energy sources), and kinds of transfer materials on the current being transferred through a circuit (e.g., brightness of light, speed of motor).
Physical Science Lab, Level A: Cards 68, 69 **Physical Science Lab, Level B:** Cards 68, 69

Strand 1: Properties and Principles of Matter and Energy
2. Energy has a source, can be transferred, and can be transformed into various forms but is conserved between and within systems.
Concept A. Forms of energy have a source, a means of transfer (work and heat), and a receiver.
l. Classify materials as conductors or insulators of electricity when placed within a circuit (e.g., wood, pencil lead, plastic, glass, aluminum foil, lemon juice, air, water).
Physical Science Lab, Level A: Cards 68, 69, 71 **Physical Science Lab, Level B:** Cards 68, 69, 71

Strand 1: Properties and Principles of Matter and Energy
2. Energy has a source, can be transferred, and can be transformed into various forms but is conserved between and within systems.
Concept A. Forms of energy have a source, a means of transfer (work and heat), and a receiver.
m. Diagram and distinguish between complete series and parallel circuits.
Physical Science Lab, Level A: Card 68 **Physical Science Lab, Level B:** Card 68

Strand 1: Properties and Principles of Matter and Energy
2. Energy has a source, can be transferred, and can be transformed into various forms but is conserved between and within systems.
Concept A. Forms of energy have a source, a means of transfer (work and heat), and a receiver.
n. Identify advantages and disadvantages of series and parallel circuits.
Physical Science Lab, Level A: Card 68 **Physical Science Lab, Level B:** Card 68

Strand 1: Properties and Principles of Matter and Energy
2. Energy has a source, can be transferred, and can be transformed into various forms but is conserved between and within systems.
Concept C. Electromagnetic energy from the Sun (solar radiation) is a major source of energy on Earth.
a. Identify solar radiation as the primary source of energy for weather phenomena.
Earth Science Lab, Level A: Cards 36, 37, 38, 39, 40, 41, 43, 44, 45, 46, 47, 48, 49, 52, 53, 54, 57 **Earth Science Lab, Level B:** Cards 36, 37, 38, 39, 40, 41, 43, 44, 45, 46, 47, 48, 49, 52, 53, 54, 57 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 6, *Modeling a Tornado*, pages 93-95 **Physical Science Lab, Level A:** Cards 46, 47 **Physical Science Lab, Level B:** Cards 46, 47

Strand 1: Properties and Principles of Matter and Energy
2. Energy has a source, can be transferred, and can be transformed into various forms but is conserved between and within systems.
Concept F. Energy can change from one form to another within systems, but the total amount remains the same.
a. Identify the different energy transformations that occur between different systems (e.g., chemical energy in battery converted to electricity in circuit converted to light and heat from a bulb).
Life Science Lab, Level A: Cards 9, 16, 17, 76, 77 **Life Science Lab, Level B:** Cards 9, 16, 17, 76, 77 **Life Science Lab Teacher's Handbook:** Hands-On Activity 6, *How Much Does Energy Cost?*, pages 97-99 **Earth Science Lab, Level A:** Card 38 **Earth Science Lab, Level B:** Card 38 **Physical Science Lab, Level A:** Cards 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 66, 67, 76, 77, 78, 79, 82, 83 **Physical Science Lab, Level B:** Cards 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 66, 67, 76, 77, 78, 79, 82, 83 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 3, *Energy Conversion*, pages 85-87; Hands-On Activity 5, *Making a Potato Battery*, pages 93-95; Hands-On Activity 6, *Making Sound*, pages 97-99

Strand 1: Properties and Principles of Matter and Energy
2. Energy has a source, can be transferred, and can be transformed into various forms but is conserved between and within systems.
Concept F. Energy can change from one form to another within systems, but the total amount remains the same.
b. Recognize that, during an energy transformation, heat is often transferred from one object (system) to another because of a difference in temperature.
Life Science Lab, Level A: Cards 9, 16, 17, 76, 77 **Life Science Lab, Level B:** Cards 9, 16, 17, 76, 77 **Life Science Lab Teacher's Handbook:** Hands-On Activity 6, *How Much Does Energy Cost?,* pages 97-99 **Earth Science Lab, Level A:** Card 38 **Earth Science Lab, Level B:** Card 38 **Physical Science Lab, Level A:** Cards 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 66, 67, 76, 77, 78, 79, 82, 83 **Physical Science Lab, Level B:** Cards 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 66, 67, 76, 77, 78, 79, 82, 83 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 3, *Energy Conversion*, pages 85-87; Hands-On Activity 5, *Making a Potato Battery,* pages 93-95; Hands-On Activity 6, *Making Sound*, pages 97-99

Strand 1: Properties and Principles of Matter and Energy
2. Energy has a source, can be transferred, and can be transformed into various forms but is conserved between and within systems.
Concept F. Energy can change from one form to another within systems, but the total amount remains the same.
c. Recognize energy is not lost but conserved as it is transferred and transformed.
Life Science Lab, Level A: Cards 9, 16, 17, 76, 77 **Life Science Lab, Level B:** Cards 9, 16, 17, 76, 77 **Life Science Lab Teacher's Handbook:** Hands-On Activity 6, *How Much Does Energy Cost?,* pages 97-99 **Earth Science Lab, Level A:** Card 38 **Earth Science Lab, Level B:** Card 38 **Physical Science Lab, Level A:** Cards 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 66, 67, 76, 77, 78, 79, 82, 83 **Physical Science Lab, Level B:** Cards 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 66, 67, 76, 77, 78, 79, 82, 83 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 3, *Energy Conversion*, pages 85-87; Hands-On Activity 5, *Making a Potato Battery,* pages 93-95; Hands-On Activity 6, *Making Sound*, pages 97-99

Strand 2: Properties and Principles of Forces and Motion
1. The motion of an object is described by its change in position relative to another object or point.
Concept A. The motion of an object is described in position, direction, and speed relative to another object (frame of reference).
a. Describe the circular motion of a moving object as the result of a force acting toward the center.
Physical Science Lab, Level A: Cards 57, 59 **Physical Science Lab, Level B:** Cards 57, 59

Strand 2: Properties and Principles of Forces and Motion
1. The motion of an object is described by its change in position relative to another object or point.
Concept A. The motion of an object is described in position, direction, and speed relative to another object (frame of reference).
b. Classify different types of motion (e.g., straight line, projectile, circular, vibrational).
Physical Science Lab, Level A: Cards 50, 51, 52, 53, 54, 55, 56, 57, 58, 59 **Physical Science Lab, Level B:** Cards 50, 51, 52, 53, 54, 55, 56, 57, 58, 59 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 4, *Reducing Friction*, pages 89-91

Strand 2: Properties and Principles of Forces and Motion
1. The motion of an object is described by its change in position relative to another object or point.
Concept A. The motion of an object is described in position, direction, and speed relative to another object (frame of reference).
c. Given an object in motion, calculate its speed (distance/time).
Physical Science Lab, Level A: Cards 50, 51, 52 **Physical Science Lab, Level B:** Cards 50, 51, 52

Strand 2: Properties and Principles of Forces and Motion
1. The motion of an object is described by its change in position relative to another object or point.
Concept A. The motion of an object is described in position, direction, and speed relative to another object (frame of reference).
d. Interpret a line graph representing an object's motion in terms of distance over time (speed) using metric units.
Physical Science Lab, Level A: Card 51 **Physical Science Lab, Level B:** Card 51

Strand 2: Properties and Principles of Forces and Motion
2. Forces affect motion.
Concept A. Forces are classified as either contact forces (pushes, pull, friction, buoyancy) or non-contact forces (gravity, magnetism), that can be described in terms of direction and magnitude.
a. Identify and describe the types of forces acting on an object in motion, at rest, floating/sinking (i.e., type of force, direction, amount of force in Newtons).
Physical Science Lab, Level A: Cards 53, 54, 55, 56, 57, 58, 59, 60, 61 **Physical Science Lab, Level B:** Cards 53, 54, 55, 56, 57, 58, 59, 60, 61 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 4, *Reducing Friction,* pages 89-91

Strand 2: Properties and Principles of Forces and Motion
2. Forces affect motion.
Concept A. Forces are classified as either contact forces (pushes, pull, friction, buoyancy) or non-contact forces (gravity, magnetism), that can be described in terms of direction and magnitude.
b. Compare the forces acting on an object by using a spring scale to measure them to the nearest Newton.
Physical Science Lab, Level A: Card 54 **Physical Science Lab, Level B:** Card 54

Strand 2: Properties and Principles of Forces and Motion
2. Forces affect motion.
Concept B. Every object exerts a gravitational force on every other object.
a. Recognize every object exerts a gravitational force of attraction on every other object.
Physical Science Lab, Level A: Cards 57, 59 **Physical Science Lab, Level B:** Cards 57, 59

Strand 2: Properties and Principles of Forces and Motion
2. Forces affect motion.
Concept B. Every object exerts a gravitational force on every other object.
b. Recognize an object's weight is a measure of the gravitational force of a planet/moon acting on that object.
Physical Science Lab, Level A: Card 57 **Physical Science Lab, Level B:** Card 57

Strand 2: Properties and Principles of Forces and Motion
2. Forces affect motion.
Concept B. Every object exerts a gravitational force on every other object.
c. Compare the amount of gravitational force acting between objects (which is dependent upon their masses and the distance between them).
Physical Science Lab, Level A: Card 59 **Physical Science Lab, Level B:** Card 59

Strand 2: Properties and Principles of Forces and Motion
2. Forces affect motion.
Concept D. Newton's Laws of Motion explain the interaction of mass and forces, and are used to predict changes in motion.
a. Compare the effects of balanced and unbalanced forces (including magnetic, gravity, friction, push or pull) on an object's motion.
Physical Science Lab, Level A: Cards 54, 55, 56, 58, 59, 74 **Physical Science Lab, Level B:** Cards 54, 55, 56, 58, 59, 74

Strand 2: Properties and Principles of Forces and Motion
2. Forces affect motion.
Concept D. Newton's Laws of Motion explain the interaction of mass and forces, and are used to predict changes in motion.
b. Explain that when forces (including magnetic, gravity, friction, push or pull) are balanced, objects are at rest or their motion remains constant.
Physical Science Lab, Level A: Cards 54, 55, 56, 58, 59, 74 **Physical Science Lab, Level B:** Cards 54, 55, 56, 58, 59, 74

Strand 2: Properties and Principles of Forces and Motion
2. Forces affect motion.
Concept D. Newton's Laws of Motion explain the interaction of mass and forces, and are used to predict changes in motion.
c. Explain that a change in motion is the result of an unbalanced force acting upon an object.
Physical Science Lab, Level A: Cards 54, 55, 56, 58, 59 **Physical Science Lab, Level B:** Cards 54, 55, 56, 58, 59

Strand 2: Properties and Principles of Forces and Motion
2. Forces affect motion.
Concept D. Newton's Laws of Motion explain the interaction of mass and forces, and are used to predict changes in motion.
d. Explain how the acceleration of a moving object is affected by the amount of net force applied and the mass of the object.
Physical Science Lab, Level A: Card 52 **Physical Science Lab, Level B:** Card 52

Strand 2: Properties and Principles of Forces and Motion
2. Forces affect motion.
Concept F. Simple machines (levers, inclined planes, wheels and axles, pulleys) affect the forces applied to an object and/or direction of movement as work is done.
a. Recognize examples of work being done on a object (force applied and distance moved in the direction of the applied force) with and without the use of simple machines.
Physical Science Lab, Level A: Cards 62, 63, 64 **Physical Science Lab, Level B:** Cards 62, 63, 64

Strand 2: Properties and Principles of Forces and Motion
2. Forces affect motion.
Concept F. Simple machines (levers, inclined planes, wheels and axles, pulleys) affect the forces applied to an object and/or direction of movement as work is done.
b. Calculate the amount of work done when a force is applied to an object over distance (W = Fxd).
Physical Science Lab, Level A: Cards 62, 63, 64 **Physical Science Lab, Level B:** Cards 62, 63, 64

Strand 2: Properties and Principles of Forces and Motion
2. Forces affect motion.
Concept F. Simple machines (levers, inclined planes, wheels and axles, pulleys) affect the forces applied to an object and/or direction of movement as work is done.
c. Explain how simple machines affect the amount of effort force, distance through which a force is applied, and/or direction of force while doing work.
Physical Science Lab, Level A: Cards 62, 63, 64 **Physical Science Lab, Level B:** Cards 62, 63, 64

Strand 2: Properties and Principles of Forces and Motion
2. Forces affect motion.
Concept F. Simple machines (levers, inclined planes, wheels and axles, pulleys) affect the forces applied to an object and/or direction of movement as work is done.
d. Recognize the amount of work output is never greater than the amount of work input, with or without the use of a simple machine.
Physical Science Lab, Level A: Cards 62, 63, 64, 65 **Physical Science Lab, Level B:** Cards 62, 63, 64, 65

Strand 2: Properties and Principles of Forces and Motion
2. Forces affect motion.
Concept F. Simple machines (levers, inclined planes, wheels and axles, pulleys) affect the forces applied to an object and/or direction of movement as work is done.
e. Evaluate simple machine designs to determine which design requires the least amount of effort force and explain why.
Physical Science Lab, Level A: Cards 63, 64 **Physical Science Lab, Level B:** Cards 63, 64

Strand 5: Processes and Interactions of the Earth's Systems (Geosphere, Atmosphere, and Hydrosphere)
1. Earth's systems (geosphere, atmosphere, and hydrosphere) have common components and unique structures.
Concept C. The atmosphere (air) is composed of a mixture of gases, including water vapor, and minute particles.
a. Describe the composition of the Earth's atmosphere (i.e., mixture of gases, water and minute particles) and how it circulates as air masses.
Earth Science Lab, Level A: Cards 36, 37, 38, 39, 40, 41, 42, 44, 45, 46 **Earth Science Lab, Level B:** Cards 36, 37, 38, 39, 40, 41, 42, 44, 45, 46 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 5, *What is in the Air?*, pages 89-91

Strand 5: Processes and Interactions of the Earth's Systems (Geosphere, Atmosphere, and Hydrosphere)
1. Earth's systems (geosphere, atmosphere, and hydrosphere) have common components and unique structures.
Concept C. The atmosphere (air) is composed of a mixture of gases, including water vapor, and minute particles.
b. Describe the role atmosphere (e.g., clouds, ozone) plays in precipitation, reflecting and filtering light from the Sun, and trapping heat energy emitted from the Earth's surface.
Earth Science Lab, Level A: Cards 36, 37, 38, 48, 49, 59, 60, 61 **Earth Science Lab, Level B:** Cards 36, 37, 38, 48, 49, 59, 60, 61

Strand 5: Processes and Interactions of the Earth's Systems (Geosphere, Atmosphere, and Hydrosphere)
1. Earth's systems (geosphere, atmosphere, and hydrosphere) have common components and unique structures.
Concept D. Climate is a description of average weather conditions in a given area over time.
a. Differentiate between weather and climate.
Earth Science Lab, Level A: Cards 43, 55, 56, 57, 58, 60 **Earth Science Lab, Level B:** Cards 43, 55, 56, 57, 58, 60

Strand 5: Processes and Interactions of the Earth's Systems (Geosphere, Atmosphere, and Hydrosphere)
1. Earth's systems (geosphere, atmosphere, and hydrosphere) have common components and unique structures.
Concept D. Climate is a description of average weather conditions in a given area over time.
b. Identify factors that affect climate (e.g., latitude, altitude, prevailing wind currents, amount of solar radiation).
Earth Science Lab, Level A: Cards 55, 56, 57, 58, 60, 62 **Earth Science Lab, Level B:** Cards 55, 56, 57, 58, 60, 62

Strand 5: Processes and Interactions of the Earth's Systems (Geosphere, Atmosphere, and Hydrosphere)
2. Earth's systems (geosphere, atmosphere, and hydrosphere) interact with one another as they undergo change by common processes.
Concept E. Changes in the form of water as it moves through Earth's systems are described as the water cycle.
a. Explain and trace the possible paths of water through the hydrosphere, geosphere, and atmosphere (i.e., the water cycle; evaporation, condensation, precipitation, surface run-off/groundwater flow).
Earth Science Lab, Level A: Cards 47, 48, 49, 82, 83, 84, 87 **Earth Science Lab, Level B:** Cards 47, 48, 49, 82, 83, 84, 87 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 8, *Temperature, Salinity, and Water Density*, pages 101-103

Strand 5: Processes and Interactions of the Earth's Systems (Geosphere, Atmosphere, and Hydrosphere)
2. Earth's systems (geosphere, atmosphere, and hydrosphere) interact with one another as they undergo change by common processes.
Concept E. Changes in the form of water as it moves through Earth's systems are described as the water cycle.
b. Relate the different forms of water can take (i.e., snow, rain, sleet, fog, clouds, dew, humidity) as it moves through the water cycle to atmospheric conditions (i.e., temperature, pressure, wind direction and speed, humidity) at a given geographic location.
Earth Science Lab, Level A: Cards 40, 41, 43, 44, 45, 46, 47, 48, 49 **Earth Science Lab, Level B:** Cards 40, 41, 43, 44, 45, 46, 47, 48, 49

Strand 5: Processes and Interactions of the Earth's Systems (Geosphere, Atmosphere, and Hydrosphere)
2. Earth's systems (geosphere, atmosphere, and hydrosphere) interact with one another as they undergo change by common processes.
Concept E. Changes in the form of water as it moves through Earth's systems are described as the water cycle.
c. Explain how thermal energy is transferred throughout the water cycle by the processes of convection, conduction, and radiation.
Earth Science Lab, Level A: Cards 38, 47, 48, 49 **Earth Science Lab, Level B:** Cards 38, 47, 48, 49 **Physical Science Lab, Level A:** Card 44 **Physical Science Lab, Level B:** Card 44

Strand 5: Processes and Interactions of the Earth's Systems (Geosphere, Atmosphere, and Hydrosphere)
2. Earth's systems (geosphere, atmosphere, and hydrosphere) interact with one another as they undergo change by common processes.
Concept F. Constantly changing properties of the atmosphere occur in patterns which are described as weather.
a. Explain how the differences in surface temperature, due to the different heating and cooling rates of water and soil, affect the temperature and movement of the air above.
Earth Science Lab, Level A: Cards 38, 39, 40, 41, 52, 53, 54, 56, 57, 58 **Earth Science Lab, Level B:** Cards 38, 39, 40, 41, 52, 53, 54, 56, 57, 58 **Physical Science Lab, Level A:** Card 44 **Physical Science Lab, Level B:** Card 44

Strand 5: Processes and Interactions of the Earth's Systems (Geosphere, Atmosphere, and Hydrosphere)
2. Earth's systems (geosphere, atmosphere, and hydrosphere) interact with one another as they undergo change by common processes.
Concept F. Constantly changing properties of the atmosphere occur in patterns which are described as weather.
b. Recognize the characteristics of air masses (i.e., high/low barometric pressure, temperature) and predict their effect on the weather in a given location.
Earth Science Lab, Level A: Cards 39, 40, 41, 45, 46 **Earth Science Lab, Level B:** Cards 39, 40, 41, 45, 46

Strand 5: Processes and Interactions of the Earth's Systems (Geosphere, Atmosphere, and Hydrosphere)
2. Earth's systems (geosphere, atmosphere, and hydrosphere) interact with one another as they undergo change by common processes.
Concept F. Constantly changing properties of the atmosphere occur in patterns which are described as weather.
c. Identify weather conditions associated with cold fronts and warm fronts.
Earth Science Lab, Level A: Cards 46, 52, 53, 54 **Earth Science Lab, Level B:** Cards 46, 52, 53, 54 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 6, *Modeling a Tornado*, pages 93-95

Strand 5: Processes and Interactions of the Earth's Systems (Geosphere, Atmosphere, and Hydrosphere)
2. Earth's systems (geosphere, atmosphere, and hydrosphere) interact with one another as they undergo change by common processes.
Concept F. Constantly changing properties of the atmosphere occur in patterns which are described as weather.
d. Identify factors that affect weather patterns in a particular region (e.g., proximity to large bodies of water, latitude, altitude, prevailing wind currents, amount of solar radiation, location with respect to mountain ranges).
Earth Science Lab, Level A: Cards 40, 41, 54, 55, 56, 57, 58, 87 **Earth Science Lab, Level B:** Cards 40, 41, 54, 55, 56, 57, 58, 87

Strand 5: Processes and Interactions of the Earth's Systems (Geosphere, Atmosphere, and Hydrosphere)
2. Earth's systems (geosphere, atmosphere, and hydrosphere) interact with one another as they undergo change by common processes.
Concept F. Constantly changing properties of the atmosphere occur in patterns which are described as weather.
e. Collect and interpret weather data (e.g., cloud cover, precipitation, wind speed and direction) from weather instruments and maps to explain present day weather and to predict the next day's weather.
Earth Science Lab, Level A: Cards 50, 51 **Earth Science Lab, Level B:** Cards 50, 51

Strand 5: Processes and Interactions of the Earth's Systems (Geosphere, Atmosphere, and Hydrosphere)
2. Earth's systems (geosphere, atmosphere, and hydrosphere) interact with one another as they undergo change by common processes.
Concept F. Constantly changing properties of the atmosphere occur in patterns which are described as weather.
f. Recognize significant changes in temperature and barometric pressure may cause dramatic weather phenomena (i.e., severe thunderstorms, tornadoes, hurricanes.
Earth Science Lab, Level A: Cards 52, 53, 54 **Earth Science Lab, Level B:** Cards 52, 53, 54 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 6, *Modeling a Tornado*, pages 93-95

Strand 5: Processes and Interactions of the Earth's Systems (Geosphere, Atmosphere, and Hydrosphere)
3. Human activity is dependent upon and affects Earth's resources and systems.
Concept A. Earth's materials are limited natural resources affected by human activity.
a. Distinguish between renewable (e.g., geothermal, hydroelectric) and nonrenewable (e.g., fossil fuel) energy sources.
Life Science Lab, Level A: Card 84 **Life Science Lab, Level B:** Card 84 **Earth Science Lab, Level A:** Cards 35, 90 **Earth Science Lab, Level B:** Cards 35, 90 **Physical Science Lab, Level A:** Cards 34, 38, 46, 47, 48, 49 **Physical Science Lab, Level B:** Cards 34, 38, 46, 47, 48, 49

Strand 5: Processes and Interactions of the Earth's Systems (Geosphere, Atmosphere, and Hydrosphere)
3. Human activity is dependent upon and affects Earth's resources and systems.
Concept A. Earth's materials are limited natural resources affected by human activity.
b. Provide examples of how the availability of fresh water for humans and other living organisms is dependent upon the water cycle.
Life Science Lab, Level A: Card 90 **Life Science Lab, Level B:** Card 90 **Earth Science Lab, Level A:** Cards 47, 82, 83, 84, 85, 86, 87 **Earth Science Lab, Level B:** Cards 47, 82, 83, 84, 85, 86, 87

Strand 6: Composition and Structure of the Universe and the Motion of the Objects Within It
1. The universe has observable properties and structure.
Concept A. The Earth, Sun, and Moon are part of a larger system that includes other planets and smaller celestial bodies.
a. Classify celestial bodies in the solar system into categories: Sun, moon, planets, and other small bodies (i.e., asteroids, comets, meteors), based on physical properties.
Earth Science Lab, Level A: Cards 63, 67, 68, 69, 70, 71, 72, 73 **Earth Science Lab, Level B:** Cards 63, 67, 68, 69, 70, 71, 72, 73

Strand 6: Composition and Structure of the Universe and the Motion of the Objects Within It
1. The universe has observable properties and structure.
Concept A. The Earth, Sun, and Moon are part of a larger system that includes other planets and smaller celestial bodies.
b. Compare and contrast the size, composition, atmosphere, and surface of the planets (inner vs. outer) in our solar system and Earth's moon.
Earth Science Lab, Level A: Cards 69, 70, 71 **Earth Science Lab, Level B:** Cards 69, 70, 71

Strand 6: Composition and Structure of the Universe and the Motion of the Objects Within It
1. The universe has observable properties and structure.
Concept A. The Earth, Sun, and Moon are part of a larger system that includes other planets and smaller celestial bodies.
c. Identify the relative proximity of common celestial bodies (i.e., Sun, moon, planets, smaller celestial bodies such as comets and meteors and other stars) in the sky to the Earth.
Earth Science Lab, Level A: Cards 63, 67, 68, 69, 70, 71, 72, 73, 74, 75, 77 **Earth Science Lab, Level B:** Cards 63, 67, 68, 69, 70, 71, 72, 73, 74, 75, 77 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 7, *Sizes in the Solar System*, pages 97-99

Strand 6: Composition and Structure of the Universe and the Motion of the Objects Within It
1. The universe has observable properties and structure.
Concept B. The Earth has a composition and location suitable to sustain life.
a. Describe how the Earth's placement in the solar system is favorable to sustain life (i.e., distance from the Sun, temperature, atmosphere).
Earth Science Lab, Level A: Cards 68, 69 **Earth Science Lab, Level B:** Cards 68, 69

Strand 6: Composition and Structure of the Universe and the Motion of the Objects Within It
1. The universe has observable properties and structure.
Concept B. The Earth has a composition and location suitable to sustain life.
b. Compare and contrast the characteristics of Earth that support life with the characteristics of other planets that are considered favorable or unfavorable to life (e.g., atmospheric gases, extremely high/low temperatures).
Earth Science Lab, Level A: Cards 68, 69, 70, 71 **Earth Science Lab, Level B:** Cards 68, 69, 70, 71

Strand 6: Composition and Structure of the Universe and the Motion of the Objects Within It
1. The universe has observable properties and structure.
Concept C. Most of the information we know about the universe comes from the electromagnetic spectrum.
a. Recognize stars are separated from one another by vast and different distances, which causes stars to appear smaller than the Sun.
Earth Science Lab, Level A: Cards 67, 75, 76 **Earth Science Lab, Level B:** Cards 67, 75, 76

Strand 6: Composition and Structure of the Universe and the Motion of the Objects Within It
1. The universe has observable properties and structure.
Concept C. Most of the information we know about the universe comes from the electromagnetic spectrum.
b. Compare the distance light travels from the Sun to Earth to the distance light travels from other stars to Earth using light years.
Earth Science Lab, Level A: Cards 67, 74, 75 **Earth Science Lab, Level B:** Cards 67, 74, 75

Strand 6: Composition and Structure of the Universe and the Motion of the Objects Within It
2. Regular and predictable motions of objects in the universe can be described and explained as the result of gravitational forces.
Concept A. The apparent position of the Sun and other stars, as seem from Earth, change in observable patterns.
a. Relate the apparent east-to-west changes in the positions of the Sun, other stars, and planets in the sky over the course of a day to Earth's counterclockwise rotation about its axis.
Earth Science Lab, Level A: Cards 62, 75 **Earth Science Lab, Level B:** Cards 62, 75

Strand 6: Composition and Structure of the Universe and the Motion of the Objects Within It
2. Regular and predictable motions of objects in the universe can be described and explained as the result of gravitational forces.
Concept A. The apparent position of the Sun and other stars, as seem from Earth, change in observable patterns.
b. Describe the pattern that can be observed in the changes in the number of hours of visible sunlight, and the time and location of sunrise and sunset, throughout the year.
Earth Science Lab, Level A: Card 62 **Earth Science Lab, Level B:** Card 62

Strand 6: Composition and Structure of the Universe and the Motion of the Objects Within It
2. Regular and predictable motions of objects in the universe can be described and explained as the result of gravitational forces.
Concept A. The apparent position of the Sun and other stars, as seem from Earth, change in observable patterns.
c. Recognize, in the Northern Hemisphere, the Sun appears lower in the sky during the winter and higher in the sky during the summer.
Earth Science Lab, Level A: Cards 55, 62 **Earth Science Lab, Level B:** Cards 55, 62

Strand 6: Composition and Structure of the Universe and the Motion of the Objects Within It
2. Regular and predictable motions of objects in the universe can be described and explained as the result of gravitational forces.
Concept A. The apparent position of the Sun and other stars, as seem from Earth, change in observable patterns.
d. Recognize, in winter, the Sun appears to rise in the Southeast and set in the Southwest, accounting for a relatively short day length, and, in summer, the Sun appears to rise in the Northeast and set in the Northwest, accounting for a relatively long day length.
Earth Science Lab, Level A: Cards 55, 62 **Earth Science Lab, Level B:** Cards 55, 62

Strand 6: Composition and Structure of the Universe and the Motion of the Objects Within It
2. Regular and predictable motions of objects in the universe can be described and explained as the result of gravitational forces.
Concept A. The apparent position of the Sun and other stars, as seem from Earth, change in observable patterns.
e. Recognize the Sun is never directly overhead when observed from North America.
Earth Science Lab, Level A: Cards 55, 62, 67 **Earth Science Lab, Level B:** Cards 55, 62, 67

Strand 6: Composition and Structure of the Universe and the Motion of the Objects Within It
2. Regular and predictable motions of objects in the universe can be described and explained as the result of gravitational forces.
Concept B. The apparent position of the moon, as seen from Earth, and its actual position relative to Earth change in observable patterns.
a. Observe the change in time and location of moon rise, moon set, and the moon's appearance relative to time of day and month over several months, and note the pattern in this change.
Earth Science Lab, Level A: Cards 63, 64 **Earth Science Lab, Level B:** Cards 63, 64

Strand 6: Composition and Structure of the Universe and the Motion of the Objects Within It
2. Regular and predictable motions of objects in the universe can be described and explained as the result of gravitational forces.
Concept B. The apparent position of the moon, as seen from Earth, and its actual position relative to Earth change in observable patterns.
b. Recognize the moon rises later each day due to it revolution around the Earth in a counterclockwise direction.
Earth Science Lab, Level A: Cards 63, 64 **Earth Science Lab, Level B:** Cards 63, 64

Strand 6: Composition and Structure of the Universe and the Motion of the Objects Within It
2. Regular and predictable motions of objects in the universe can be described and explained as the result of gravitational forces.
Concept B. The apparent position of the moon, as seen from Earth, and its actual position relative to Earth change in observable patterns.
c. Recognize the Moon is in the sky for roughly 12 hours in a 24-hour period (i.e., if the Moon rises at about 6P.M., it will set about 6 A.M.).
Earth Science Lab, Level A: Cards 63, 64 **Earth Science Lab, Level B:** Cards 63, 64

Strand 6: Composition and Structure of the Universe and the Motion of the Objects Within It
2. Regular and predictable motions of objects in the universe can be described and explained as the result of gravitational forces.
Concept B. The apparent position of the moon, as seen from Earth, and its actual position relative to Earth change in observable patterns.
d. Recognize that one half of the Moon is always facing the Sun and, therefore, one half of the Moon is always lit.
Earth Science Lab, Level A: Cards 63, 64 **Earth Science Lab, Level B:** Cards 63, 64

Strand 6: Composition and Structure of the Universe and the Motion of the Objects Within It
2. Regular and predictable motions of objects in the universe can be described and explained as the result of gravitational forces.
Concept B. The apparent position of the moon, as seen from Earth, and its actual position relative to Earth change in observable patterns.
e. Relate the apparent change in the moon's position in the sky as it appears to move east-to-west over the course of a day to Earth's counterclockwise rotation about its axis.
Earth Science Lab, Level A: Cards 63, 64 **Earth Science Lab, Level B:** Cards 63, 64

Strand 6: Composition and Structure of the Universe and the Motion of the Objects Within It
2. Regular and predictable motions of objects in the universe can be described and explained as the result of gravitational forces.
Concept B. The apparent position of the moon, as seen from Earth, and its actual position relative to Earth change in observable patterns.
f. Describe how the appearance of the moon that can be seen from Earth changes approximately every 28 days in an observable pattern (moon phases).
Earth Science Lab, Level A: Cards 63, 64 **Earth Science Lab, Level B:** Cards 63, 64

Strand 6: Composition and Structure of the Universe and the Motion of the Objects Within It
2. Regular and predictable motions of objects in the universe can be described and explained as the result of gravitational forces.
Concept C. The regular and predictable motions of a planet and moon relative to the Sun explain natural phenomena on a planet, such as day, month, year, shadows, moon phases, eclipses, tides, and seasons.
a. Illustrate and explain a day as the time it takes a planet to make a full rotation about its axis.
Earth Science Lab, Level A: Cards 62, 69, 71, 72 **Earth Science Lab, Level B:** Cards 62, 69, 71, 72

Strand 6: Composition and Structure of the Universe and the Motion of the Objects Within It
2. Regular and predictable motions of objects in the universe can be described and explained as the result of gravitational forces.
Concept C. The regular and predictable motions of a planet and moon relative to the Sun explain natural phenomena on a planet, such as day, month, year, shadows, moon phases, eclipses, tides, and seasons.
b. Diagram the path (orbital ellipse) the Earth travels as it revolves around the Sun.
Earth Science Lab, Level A: Card 62 **Earth Science Lab, Level B:** Card 62

Strand 6: Composition and Structure of the Universe and the Motion of the Objects Within It
2. Regular and predictable motions of objects in the universe can be described and explained as the result of gravitational forces.
Concept C. The regular and predictable motions of a planet and moon relative to the Sun explain natural phenomena on a planet, such as day, month, year, shadows, moon phases, eclipses, tides, and seasons.
c. Illustrate and explain a year as the time it takes a planet to revolve around the Sun.
Earth Science Lab, Level A: Card 62 **Earth Science Lab, Level B:** Card 62

Strand 6: Composition and Structure of the Universe and the Motion of the Objects Within It
2. Regular and predictable motions of objects in the universe can be described and explained as the result of gravitational forces.
Concept C. The regular and predictable motions of a planet and moon relative to the Sun explain natural phenomena on a planet, such as day, month, year, shadows, moon phases, eclipses, tides, and seasons.
d. Explain the relationships between a planet's length of year (period of revolution) and its position in the solar system.
Earth Science Lab, Level A: Cards 62, 68, 69, 71, 72 **Earth Science Lab, Level B:** Cards 62, 68, 69, 71, 72

Strand 6: Composition and Structure of the Universe and the Motion of the Objects Within It
2. Regular and predictable motions of objects in the universe can be described and explained as the result of gravitational forces.
Concept C. The regular and predictable motions of a planet and moon relative to the Sun explain natural phenomena on a planet, such as day, month, year, shadows, moon phases, eclipses, tides, and seasons.
e. Describe how the moon's relative position changes as it revolves around the Earth.
Earth Science Lab, Level A: Cards 63, 64 **Earth Science Lab, Level B:** Cards 63, 64

Strand 6: Composition and Structure of the Universe and the Motion of the Objects Within It
2. Regular and predictable motions of objects in the universe can be described and explained as the result of gravitational forces.
Concept C. The regular and predictable motions of a planet and moon relative to the Sun explain natural phenomena on a planet, such as day, month, year, shadows, moon phases, eclipses, tides, and seasons.
f. Recognize the phases of the moon are due to the relative positions o the Moon with respect to the Earth and Sun.
Earth Science Lab, Level A: Card 64 **Earth Science Lab, Level B:** Card 64

Strand 6: Composition and Structure of the Universe and the Motion of the Objects Within It
2. Regular and predictable motions of objects in the universe can be described and explained as the result of gravitational forces.
Concept C. The regular and predictable motions of a planet and moon relative to the Sun explain natural phenomena on a planet, such as day, month, year, shadows, moon phases, eclipses, tides, and seasons.
g. Relate the axial tilt and orbital position of the Earth as it revolves around the Sun to the intensity of sunlight falling on different parts of the Earth during different seasons.
Earth Science Lab, Level A: Cards 55, 62 **Earth Science Lab, Level B:** Cards 55, 62

Strand 6: Composition and Structure of the Universe and the Motion of the Objects Within It
2. Regular and predictable motions of objects in the universe can be described and explained as the result of gravitational forces.
Concept D. Gravity is a force of attraction between objects in the solar system that governs their motion.
a. Describe how the Earth's gravity pulls any object on or near the Earth toward it (including natural and artificial satellites).
Earth Science Lab, Level A: Cards 57, 59 **Earth Science Lab, Level B:** Cards 57, 59

Strand 6: Composition and Structure of the Universe and the Motion of the Objects Within It
2. Regular and predictable motions of objects in the universe can be described and explained as the result of gravitational forces.
Concept D. Gravity is a force of attraction between objects in the solar system that governs their motion.
b. Describe how the planets' gravitational pull keeps satellites and moons in orbit around them.
Earth Science Lab, Level A: Cards 79, 80 **Earth Science Lab, Level B:** Cards 79, 80 **Physical Science Lab, Level A:** Card 59 **Physical Science Lab, Level B:** Card 59

Strand 6: Composition and Structure of the Universe and the Motion of the Objects Within It
2. Regular and predictable motions of objects in the universe can be described and explained as the result of gravitational forces.
Concept D. Gravity is a force of attraction between objects in the solar system that governs their motion.
c. Describe how the Sun's gravitational pull holds the Earth and other planets in their orbits.
Earth Science Lab, Level A: Card 68 **Earth Science Lab, Level B:** Card 68 **Physical Science Lab, Level A:** Card 59 **Physical Science Lab, Level B:** Card 59

Strand 7: Scientific Inquiry
1. Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking.
Concept A. Scientific inquiry includes the ability of students to formulate a testable question and explanation, and to select appropriate investigative methods in order to obtain evidence relevant to the explanation.
a. Formulate testable questions and hypotheses.
Life Science Lab Teacher's Handbook: Hands-On Activity 1, *Examining Cells,* pages 77-79; Hands-On Activity 2, *Culturing Bacteria,* pages 81-83; Hands-On Activity 3, *Investigating Arthropods,* pages 85-87; Hands-On Activity 4, *Your Cardiovascular System,* pages 89-91; Hands-On Activity 5, *Making Fossils,* pages 93-95; Hands-On Activity 6, *How Much Does Energy Cost?,* pages 97-99; Hands-On Activity 7, *The Effects of Acid Rain,* pages 101-103 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 1, *Identifying Minerals with the Mohs Scale,* pages 73-75; Hands-On Activity 2, *Plate Boundaries in Action,* pages 77-79; Hands-On Activity 3, *Interpreting a Topographic Map,* pages 81-83; Hands-On Activity 4, *Using Sound Waves,* pages 85-87; Hands-On Activity 5, *What is in the Air?,* pages 89-91; Hands-On Activity 6, *Modeling a Tornado,* pages 93-95; Hands-On Activity 7, *Sizes in the Solar System,* pages 97-99; Hands-On Activity 8, *Temperature, Salinity, and Water Density,* pages 101-103 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 1, *Measuring pH of Acids and Bases,* pages 77-79; Hands-On Activity 2, *Chemical Reaction Rates,* pages 81-83; Hands-On Activity 3, *Energy Conversion,* pages 85-87; Hands-On Activity 4, *Reducing Friction,* pages 89-91; Hands-On Activity 5, *Making a Potato Battery,* pages 93-95; Hands-On Activity 6, *Making Sound,* pages 97-99 **Classroom Resource CD-ROM:** Writing Strategy 8, 15

Strand 7: Scientific Inquiry
1. Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking.
Concept A. Scientific inquiry includes the ability of students to formulate a testable question and explanation, and to select appropriate investigative methods in order to obtain evidence relevant to the explanation.
b. Recognize the importance of the independent variable, dependent variables, control of constants, and multiple trials to the design of a valid experiment.
Life Science Lab Teacher's Handbook: Hands-On Activity 7, *The Effects of Acid Rain,* pages 101-103 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 8, *Temperature, Salinity, and Water Density,* pages 101-103 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 2, *Chemical Reaction Rates,* pages 81-83 **Classroom Resource CD-ROM:** Writing Strategy 23

Strand 7: Scientific Inquiry
1. Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking.
Concept A. Scientific inquiry includes the ability of students to formulate a testable question and explanation, and to select appropriate investigative methods in order to obtain evidence relevant to the explanation.
c. Design and conduct a valid experiment.
Life Science Lab Teacher's Handbook: Hands-On Activity 1, *Examining Cells,* pages 77-79; Hands-On Activity 2, *Culturing Bacteria,* pages 81-83; Hands-On Activity 3, *Investigating Arthropods,* pages 85-87; Hands-On Activity 4, *Your Cardiovascular System,* pages 89-91; Hands-On Activity 5, *Making Fossils,* pages 93-95; Hands-On Activity 6, *How Much Does Energy Cost?,* pages 97-99; Hands-On Activity 7, *The Effects of Acid Rain,* pages 101-103 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 1, *Identifying Minerals with the Mohs Scale,* pages 73-75; Hands-On Activity 2, *Plate Boundaries in Action,* pages 77-79; Hands-On Activity 3, *Interpreting a Topographic Map,* pages 81-83; Hands-On Activity 4, *Using Sound Waves,* pages 85-87; Hands-On Activity 5, *What is in the Air?,* pages 89-91; Hands-On Activity 6, *Modeling a Tornado,* pages 93-95; Hands-On Activity 7, *Sizes in the Solar System,* pages 97-99; Hands-On Activity 8, *Temperature, Salinity, and Water Density,* pages 101-103 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 1, *Measuring pH of Acids and Bases,* pages 77-79; Hands-On Activity 2, *Chemical Reaction Rates,* pages 81-83; Hands-On Activity 3, *Energy Conversion,* pages 85-87; Hands-On Activity 4, *Reducing Friction,* pages 89-91; Hands-On Activity 5, *Making a Potato Battery,* pages 93-95; Hands-On Activity 6, *Making Sound,* pages 97-99 **Classroom Resource CD-ROM:** Writing Strategy 15

Strand 7: Scientific Inquiry
1. Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking.
Concept A. Scientific inquiry includes the ability of students to formulate a testable question and explanation, and to select appropriate investigative methods in order to obtain evidence relevant to the explanation.
d. Evaluate the design of an experiment and make suggestions for reasonable improvements or extensions of an experiment.
Life Science Lab Teacher's Handbook: Hands-On Activity 1, *Examining Cells,* pages 77-79; Hands-On Activity 2, *Culturing Bacteria,* pages 81-83; Hands-On Activity 3, *Investigating Arthropods,* pages 85-87; Hands-On Activity 4, *Your Cardiovascular System,* pages 89-91; Hands-On Activity 5, *Making Fossils,* pages 93-95; Hands-On Activity 6, *How Much Does Energy Cost?,* pages 97-99; Hands-On Activity 7, *The Effects of Acid Rain,* pages 101-103 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 1, *Identifying Minerals with the Mohs Scale,* pages 73-75; Hands-On Activity 2, *Plate Boundaries in Action,* pages 77-79; Hands-On Activity 3, *Interpreting a Topographic Map,* pages 81-83; Hands-On Activity 4, *Using Sound Waves,* pages 85-87; Hands-On Activity 5, *What is in the Air?,* pages 89-91; Hands-On Activity 6, *Modeling a Tornado,* pages 93-95; Hands-On Activity 7, *Sizes in the Solar System,* pages 97-99; Hands-On Activity 8, *Temperature, Salinity, and Water Density,* pages 101-103 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 1, *Measuring pH of Acids and Bases,* pages 77-79; Hands-On Activity 2, *Chemical Reaction Rates,* pages 81-83; Hands-On Activity 3, *Energy Conversion,* pages 85-87; Hands-On Activity 4, *Reducing Friction,* pages 89-91; Hands-On Activity 5, *Making a Potato Battery,* pages 93-95; Hands-On Activity 6, *Making Sound,* pages 97-99

Strand 7: Scientific Inquiry
1. Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking.
Concept A. Scientific inquiry includes the ability of students to formulate a testable question and explanation, and to select appropriate investigative methods in order to obtain evidence relevant to the explanation.
e. Recognize different kinds of questions suggest different kinds of scientific investigations (e.g., some involve observing and describing objects, organisms, or events; some involve collecting specimens; some involve experiments; some involve making observations in nature; some involve discovery of new objects and phenomena; some involve making models).
Life Science Lab Teacher's Handbook: Hands-On Activity 1, *Examining Cells,* pages 77-79; Hands-On Activity 2, *Culturing Bacteria,* pages 81-83; Hands-On Activity 3, *Investigating Arthropods,* pages 85-87; Hands-On Activity 4, *Your Cardiovascular System,* pages 89-91; Hands-On Activity 5, *Making Fossils,* pages 93-95; Hands-On Activity 6, *How Much Does Energy Cost?,* pages 97-99; Hands-On Activity 7, *The Effects of Acid Rain,* pages 101-103 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 1, *Identifying Minerals with the Mohs Scale,* pages 73-75; Hands-On Activity 2, *Plate Boundaries in Action,* pages 77-79; Hands-On Activity 3, *Interpreting a Topographic Map,* pages 81-83; Hands-On Activity 4, *Using Sound Waves,* pages 85-87; Hands-On Activity 5, *What is in the Air?,* pages 89-91; Hands-On Activity 6, *Modeling a Tornado,* pages 93-95; Hands-On Activity 7, *Sizes in the Solar System,* pages 97-99; Hands-On Activity 8, *Temperature, Salinity, and Water Density,* pages 101-103 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 1, *Measuring pH of Acids and Bases,* pages 77-79; Hands-On Activity 2, *Chemical Reaction Rates,* pages 81-83; Hands-On Activity 3, *Energy Conversion,* pages 85-87; Hands-On Activity 4, *Reducing Friction,* pages 89-91; Hands-On Activity 5, *Making a Potato Battery,* pages 93-95; Hands-On Activity 6, *Making Sound,* pages 97-99 **Classroom Resource CD-ROM:** Writing Strategy 15

Strand 7: Scientific Inquiry
1. Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking.
Concept A. Scientific inquiry includes the ability of students to formulate a testable question and explanation, and to select appropriate investigative methods in order to obtain evidence relevant to the explanation.
f. Acknowledge there is no fixed procedure called "the scientific method," but some investigations involve scientific observations, carefully collected and relevant evidence, logical reasoning, and imagination in developing hypotheses and other explanations.
Life Science Lab Teacher's Handbook: Hands-On Activity 1, *Examining Cells,* pages 77-79; Hands-On Activity 2, *Culturing Bacteria,* pages 81-83; Hands-On Activity 3, *Investigating Arthropods,* pages 85-87; Hands-On Activity 4, *Your Cardiovascular System,* pages 89-91; Hands-On Activity 5, *Making Fossils,* pages 93-95; Hands-On Activity 6, *How Much Does Energy Cost?,* pages 97-99; Hands-On Activity 7, *The Effects of Acid Rain,* pages 101-103 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 1, *Identifying Minerals with the Mohs Scale,* pages 73-75; Hands-On Activity 2, *Plate Boundaries in Action,* pages 77-79; Hands-On Activity 3, *Interpreting a Topographic Map,* pages 81-83; Hands-On Activity 4, *Using Sound Waves,* pages 85-87; Hands-On Activity 5, *What is in the Air?,* pages 89-91; Hands-On Activity 6, *Modeling a Tornado,* pages 93-95; Hands-On Activity 7, *Sizes in the Solar System,* pages 97-99; Hands-On Activity 8, *Temperature, Salinity, and Water Density,* pages 101-103 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 1, *Measuring pH of Acids and Bases,* pages 77-79; Hands-On Activity 2, *Chemical Reaction Rates,* pages 81-83; Hands-On Activity 3, *Energy Conversion,* pages 85-87; Hands-On Activity 4, *Reducing Friction,* pages 89-91; Hands-On Activity 5, *Making a Potato Battery,* pages 93-95; Hands-On Activity 6, *Making Sound,* pages 97-99 **Classroom Resource CD-ROM:** Writing Strategy 15

Strand 7: Scientific Inquiry
1. Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking.
Concept B. Scientific inquiry relies upon gathering evidence from qualitative and quantitative observations.
a. Make qualitative observations using the five senses.
Life Science Lab Teacher's Handbook: Hands-On Activity 1, *Examining Cells,* pages 77-79; Hands-On Activity 2, *Culturing Bacteria,* pages 81-83; Hands-On Activity 3, *Investigating Arthropods,* pages 85-87; Hands-On Activity 4, *Your Cardiovascular System,* pages 89-91; Hands-On Activity 5, *Making Fossils,* pages 93-95; Hands-On Activity 6, *How Much Does Energy Cost?,* pages 97-99; Hands-On Activity 7, *The Effects of Acid Rain,* pages 101-103 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 1, *Identifying Minerals with the Mohs Scale,* pages 73-75; Hands-On Activity 2, *Plate Boundaries in Action,* pages 77-79; Hands-On Activity 3, *Interpreting a Topographic Map,* pages 81-83; Hands-On Activity 4, *Using Sound Waves,* pages 85-87; Hands-On Activity 5, *What is in the Air?,* pages 89-91; Hands-On Activity 6, *Modeling a Tornado,* pages 93-95; Hands-On Activity 7, *Sizes in the Solar System,* pages 97-99; Hands-On Activity 8, *Temperature, Salinity, and Water Density,* pages 101-103 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 1, *Measuring pH of Acids and Bases,* pages 77-79; Hands-On Activity 2, *Chemical Reaction Rates,* pages 81-83; Hands-On Activity 3, *Energy Conversion,* pages 85-87; Hands-On Activity 4, *Reducing Friction,* pages 89-91; Hands-On Activity 5, *Making a Potato Battery,* pages 93-95; Hands-On Activity 6, *Making Sound,* pages 97-99 **Classroom Resource CD-ROM:** Writing Strategy 11

Strand 7: Scientific Inquiry
1. Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking.
Concept B. Scientific inquiry relies upon gathering evidence from qualitative and quantitative observations.
b. Determine the appropriate tools and techniques to collect data.
Life Science Lab Teacher's Handbook: Hands-On Activity 1, *Examining Cells,* pages 77-79; Hands-On Activity 2, *Culturing Bacteria,* pages 81-83; Hands-On Activity 3, *Investigating Arthropods,* pages 85-87; Hands-On Activity 4, *Your Cardiovascular System,* pages 89-91; Hands-On Activity 5, *Making Fossils,* pages 93-95; Hands-On Activity 6, *How Much Does Energy Cost?,* pages 97-99; Hands-On Activity 7, *The Effects of Acid Rain,* pages 101-103 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 1, *Identifying Minerals with the Mohs Scale,* pages 73-75; Hands-On Activity 2, *Plate Boundaries in Action,* pages 77-79; Hands-On Activity 3, *Interpreting a Topographic Map,* pages 81-83; Hands-On Activity 4, *Using Sound Waves,* pages 85-87; Hands-On Activity 5, *What is in the Air?,* pages 89-91; Hands-On Activity 6, *Modeling a Tornado,* pages 93-95; Hands-On Activity 7, *Sizes in the Solar System,* pages 97-99; Hands-On Activity 8, *Temperature, Salinity, and Water Density,* pages 101-103 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 1, *Measuring pH of Acids and Bases,* pages 77-79; Hands-On Activity 2, *Chemical Reaction Rates,* pages 81-83; Hands-On Activity 3, *Energy Conversion,* pages 85-87; Hands-On Activity 4, *Reducing Friction,* pages 89-91; Hands-On Activity 5, *Making a Potato Battery,* pages 93-95; Hands-On Activity 6, *Making Sound,* pages 97-99

Strand 7: Scientific Inquiry
1. Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking.
Concept B. Scientific inquiry relies upon gathering evidence from qualitative and quantitative observations.
c. Use a variety of tools and equipment to gather data (e.g., microscopes, thermometers, analog and digital meters, computers, spring scales, balances, metric rulers, graduated cylinders, stopwatches).
Life Science Lab Teacher's Handbook: Hands-On Activity 4, *Your Cardiovascular System,* pages 89-91; Hands-On Activity 7, *The Effects of Acid Rain,* pages 101-103 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 1, *Identifying Minerals with the Mohs Scale,* pages 73-75; Hands-On Activity 3, *Interpreting a Topographic Map,* pages 81-83; Hands-On Activity 7, *Sizes in the Solar System,* pages 97-99; Hands-On Activity 8, *Temperature, Salinity, and Water Density,* pages 101-103 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 1, *Measuring pH of Acids and Bases,* pages 77-79; Hands-On Activity 2, *Chemical Reaction Rates,* pages 81-83; Hands-On Activity 3, *Energy Conversion,* pages 85-87; Hands-On Activity 4, *Reducing Friction,* pages 89-91; Hands-On Activity 6, *Making Sound,* pages 97-99

Strand 7: Scientific Inquiry
1. Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking.
Concept B. Scientific inquiry relies upon gathering evidence from qualitative and quantitative observations.
d. Measure length to the nearest millimeter, mass to the nearest gram, volume to the nearest milliliter, force (weight) to the nearest Newton, temperature to the nearest degree Celsius, time to the nearest second.
Life Science Lab Teacher's Handbook: Hands-On Activity 4, *Your Cardiovascular System,* pages 89-91; Hands-On Activity 7, *The Effects of Acid Rain,* pages 101-103 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 1, *Identifying Minerals with the Mohs Scale,* pages 73-75; Hands-On Activity 3, *Interpreting a Topographic Map,* pages 81-83; Hands-On Activity 7, *Sizes in the Solar System,* pages 97-99; Hands-On Activity 8, *Temperature, Salinity, and Water Density,* pages 101-103 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 1, *Measuring pH of Acids and Bases,* pages 77-79; Hands-On Activity 2, *Chemical Reaction Rates,* pages 81-83; Hands-On Activity 3, *Energy Conversion,* pages 85-87; Hands-On Activity 4, *Reducing Friction,* pages 89-91; Hands-On Activity 6, *Making Sound,* pages 97-99

Strand 7: Scientific Inquiry
1. Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking.
Concept B. Scientific inquiry relies upon gathering evidence from qualitative and quantitative observations.
e. Compare amounts/measurements.
Life Science Lab Teacher's Handbook: Hands-On Activity 4, *Your Cardiovascular System,* pages 89-91; Hands-On Activity 7, *The Effects of Acid Rain,* pages 101-103 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 1, *Identifying Minerals with the Mohs Scale,* pages 73-75; Hands-On Activity 3, *Interpreting a Topographic Map,* pages 81-83; Hands-On Activity 7, *Sizes in the Solar System,* pages 97-99; Hands-On Activity 8, *Temperature, Salinity, and Water Density,* pages 101-103 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 1, *Measuring pH of Acids and Bases,* pages 77-79; Hands-On Activity 2, *Chemical Reaction Rates,* pages 81-83; Hands-On Activity 3, *Energy Conversion,* pages 85-87; Hands-On Activity 4, *Reducing Friction,* pages 89-91; Hands-On Activity 6, *Making Sound,* pages 97-99

Strand 7: Scientific Inquiry
1. Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking.
Concept B. Scientific inquiry relies upon gathering evidence from qualitative and quantitative observations.
f. Judge whether measurements and computation of quantities are reasonable.
Life Science Lab Teacher's Handbook: Hands-On Activity 4, *Your Cardiovascular System,* pages 89-91; Hands-On Activity 7, *The Effects of Acid Rain,* pages 101-103 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 1, *Identifying Minerals with the Mohs Scale,* pages 73-75; Hands-On Activity 3, *Interpreting a Topographic Map,* pages 81-83; Hands-On Activity 7, *Sizes in the Solar System,* pages 97-99; Hands-On Activity 8, *Temperature, Salinity, and Water Density,* pages 101-103 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 1, *Measuring pH of Acids and Bases,* pages 77-79; Hands-On Activity 2, *Chemical Reaction Rates,* pages 81-83; Hands-On Activity 3, *Energy Conversion,* pages 85-87; Hands-On Activity 4, *Reducing Friction,* pages 89-91; Hands-On Activity 6, *Making Sound,* pages 97-99

Strand 7: Scientific Inquiry
1. Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking.
Concept B. Scientific inquiry relies upon gathering evidence from qualitative and quantitative observations.
g. Calculate the range and average/mean of a set of data.
Life Science Lab Teacher's Handbook: Hands-On Activity 2, *Culturing Bacteria,* pages 81-83; Hands-On Activity 4, *Your Cardiovascular System,* pages 89-91; Hands-On Activity 6, *How Much Does Energy Cost?,* pages 97-99 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 3, *Energy Conversion,* pages 85-87

Strand 7: Scientific Inquiry
1. Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking.
Concept C. Evidence is used to formulate explanations.
a. Use quantitative and qualitative data as support for reasonable explanations (conclusions).
Life Science Lab Teacher's Handbook: Hands-On Activity 3, *Investigating Arthropods,* pages 85-87; Hands-On Activity 4, *Your Cardiovascular System,* pages 89-91; Hands-On Activity 5, *Making Fossils,* pages 93-95; Hands-On Activity 6, *How Much Does Energy Cost?,* pages 97-99; Hands-On Activity 7, *The Effects of Acid Rain*, pages 101-103 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 1, *Identifying Minerals with the Mohs Scale,* pages 73-75; Hands-On Activity 3, *Interpreting a Topographic Map,* pages 81-83; Hands-On Activity 5, *What is in the Air?,* pages 89-91; Hands-On Activity 7, *Sizes in the Solar System,* pages 97-99; Hands-On Activity 8, *Temperature, Salinity, and Water Density,* pages 101-103 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 1, *Measuring pH of Acids and Bases,* pages 77-79; Hands-On Activity 2, *Chemical Reaction Rates,* pages 81-83; Hands-On Activity 3, *Energy Conversion,* pages 85-87; Hands-On Activity 4, *Reducing Friction,* pages 89-91; Hands-On Activity 6, *Making Sound,* pages 97-99 **Classroom Resource CD-ROM:** Writing Strategy 22, 24

Strand 7: Scientific Inquiry
1. Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking.
Concept C. Evidence is used to formulate explanations.
b. Use data as support for observed patterns and relationships, and to make predictions to be tested.
Life Science Lab Teacher's Handbook: Hands-On Activity 3, *Investigating Arthropods,* pages 85-87; Hands-On Activity 4, *Your Cardiovascular System,* pages 89-91; Hands-On Activity 5, *Making Fossils,* pages 93-95; Hands-On Activity 6, *How Much Does Energy Cost?,* pages 97-99; Hands-On Activity 7, *The Effects of Acid Rain,* pages 101-103 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 1, *Identifying Minerals with the Mohs Scale,* pages 73-75; Hands-On Activity 3, *Interpreting a Topographic Map,* pages 81-83; Hands-On Activity 5, *What is in the Air?,* pages 89-91; Hands-On Activity 7, *Sizes in the Solar System,* pages 97-99; Hands-On Activity 8, *Temperature, Salinity, and Water Density,* pages 101-103 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 1, *Measuring pH of Acids and Bases,* pages 77-79; Hands-On Activity 2, *Chemical Reaction Rates,* pages 81-83; Hands-On Activity 3, *Energy Conversion,* pages 85-87; Hands-On Activity 4, *Reducing Friction,* pages 89-91; Hands-On Activity 6, *Making Sound,* pages 97-99 **Classroom Resource CD-ROM:** Writing Strategy 22, 24

Strand 7: Scientific Inquiry
1. Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking.
Concept C. Evidence is used to formulate explanations.
c. Recognize the possible effects of errors in observations, measurements, and calculations on the formulation of explanations (conclusions).
Life Science Lab Teacher's Handbook: Hands-On Activity 1, *Examining Cells,* pages 77-79; Hands-On Activity 2, *Culturing Bacteria,* pages 81-83; Hands-On Activity 3, *Investigating Arthropods,* pages 85-87; Hands-On Activity 4, *Your Cardiovascular System,* pages 89-91; Hands-On Activity 5, *Making Fossils,* pages 93-95; Hands-On Activity 6, *How Much Does Energy Cost?,* pages 97-99; Hands-On Activity 7, *The Effects of Acid Rain,* pages 101-103 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 1, *Identifying Minerals with the Mohs Scale,* pages 73-75; Hands-On Activity 2, *Plate Boundaries in Action,* pages 77-79; Hands-On Activity 3, *Interpreting a Topographic Map,* pages 81-83; Hands-On Activity 4, *Using Sound Waves,* pages 85-87; Hands-On Activity 5, *What is in the Air?,* pages 89-91; Hands-On Activity 6, *Modeling a Tornado,* pages 93-95; Hands-On Activity 7, *Sizes in the Solar System,* pages 97-99; Hands-On Activity 8, *Temperature, Salinity, and Water Density,* pages 101-103 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 1, *Measuring pH of Acids and Bases,* pages 77-79; Hands-On Activity 2, *Chemical Reaction Rates,* pages 81-83; Hands-On Activity 3, *Energy Conversion,* pages 85-87; Hands-On Activity 4, *Reducing Friction,* pages 89-91; Hands-On Activity 5, *Making a Potato Battery,* pages 93-95; Hands-On Activity 6, *Making Sound,* pages 97-99

Strand 7: Scientific Inquiry
1. Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking.
Concept D. Scientific inquiry includes evaluation of explanations (hypotheses, laws, theories) in light of scientific principles (understandings).
a. Evaluate the reasonableness of an explanation (conclusion).
Life Science Lab Teacher's Handbook: Hands-On Activity 1, *Examining Cells,* pages 77-79; Hands-On Activity 2, *Culturing Bacteria,* pages 81-83; Hands-On Activity 3, *Investigating Arthropods,* pages 85-87; Hands-On Activity 4, *Your Cardiovascular System,* pages 89-91; Hands-On Activity 5, *Making Fossils,* pages 93-95; Hands-On Activity 6, *How Much Does Energy Cost?,* pages 97-99; Hands-On Activity 7, *The Effects of Acid Rain,* pages 101-103 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 1, *Identifying Minerals with the Mohs Scale,* pages 73-75; Hands-On Activity 2, *Plate Boundaries in Action,* pages 77-79; Hands-On Activity 3, *Interpreting a Topographic Map,* pages 81-83; Hands-On Activity 4, *Using Sound Waves,* pages 85-87; Hands-On Activity 5, *What is in the Air?,* pages 89-91; Hands-On Activity 6, *Modeling a Tornado,* pages 93-95; Hands-On Activity 7, *Sizes in the Solar System,* pages 97-99; Hands-On Activity 8, *Temperature, Salinity, and Water Density,* pages 101-103 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 1, *Measuring pH of Acids and Bases,* pages 77-79; Hands-On Activity 2, *Chemical Reaction Rates,* pages 81-83; Hands-On Activity 3, *Energy Conversion,* pages 85-87; Hands-On Activity 4, *Reducing Friction,* pages 89-91; Hands-On Activity 5, *Making a Potato Battery,* pages 93-95; Hands-On Activity 6, *Making Sound,* pages 97-99

Strand 7: Scientific Inquiry
1. Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking.
Concept D. Scientific inquiry includes evaluation of explanations (hypotheses, laws, theories) in light of scientific principles (understandings).
b. Analyze whether evidence (data) and scientific principles support proposed explanations (hypotheses, laws, theories).
Life Science Lab Teacher's Handbook: Hands-On Activity 1, *Examining Cells,* pages 77-79; Hands-On Activity 2, *Culturing Bacteria,* pages 81-83; Hands-On Activity 3, *Investigating Arthropods,* pages 85-87; Hands-On Activity 4, *Your Cardiovascular System,* pages 89-91; Hands-On Activity 5, *Making Fossils,* pages 93-95; Hands-On Activity 6, *How Much Does Energy Cost?,* pages 97-99; Hands-On Activity 7, *The Effects of Acid Rain,* pages 101-103 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 1, *Identifying Minerals with the Mohs Scale,* pages 73-75; Hands-On Activity 2, *Plate Boundaries in Action,* pages 77-79; Hands-On Activity 3, *Interpreting a Topographic Map,* pages 81-83; Hands-On Activity 4, *Using Sound Waves,* pages 85-87; Hands-On Activity 5, *What is in the Air?,* pages 89-91; Hands-On Activity 6, *Modeling a Tornado,* pages 93-95; Hands-On Activity 7, *Sizes in the Solar System,* pages 97-99; Hands-On Activity 8, *Temperature, Salinity, and Water Density,* pages 101-103 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 1, *Measuring pH of Acids and Bases,* pages 77-79; Hands-On Activity 2, *Chemical Reaction Rates,* pages 81-83; Hands-On Activity 3, *Energy Conversion,* pages 85-87; Hands-On Activity 4, *Reducing Friction,* pages 89-91; Hands-On Activity 5, *Making a Potato Battery,* pages 93-95; Hands-On Activity 6, *Making Sound,* pages 97-99

Strand 7: Scientific Inquiry

1. Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking.

Concept E. The nature of science relies upon communication of results and justification of explanations.

a. Communicate simple procedures and results of investigations and explanations through:

- **Oral presentations**
- **Drawings and maps**
- **Data tables (allowing for the recording and analysis of data relevant to the experiment, such as independent and dependent variables, multiple trials, beginning and ending times or temperatures, derived quantities)**
- **Graphs (bar, single line, pictograph)**
- **Writings.**

Life Science Lab Teacher's Handbook: Hands-On Activity 1, *Examining Cells,* pages 77-79; Hands-On Activity 2, *Culturing Bacteria,* pages 81-83; Hands-On Activity 3, *Investigating Arthropods,* pages 85-87; Hands-On Activity 4, *Your Cardiovascular System,* pages 89-91; Hands-On Activity 5, *Making Fossils,* pages 93-95; Hands-On Activity 6, *How Much Does Energy Cost?,* pages 97-99; Hands-On Activity 7, *The Effects of Acid Rain,* pages 101-103

Earth Science Lab Teacher's Handbook: Hands-On Activity 1, *Identifying Minerals with the Mohs Scale,* pages 73-75; Hands-On Activity 2, *Plate Boundaries in Action,* pages 77-79; Hands-On Activity 3, *Interpreting a Topographic Map,* pages 81-83; Hands-On Activity 4, *Using Sound Waves,* pages 85-87; Hands-On Activity 5, *What is in the Air?,* pages 89-91; Hands-On Activity 6, *Modeling a Tornado,* pages 93-95; Hands-On Activity 7, *Sizes in the Solar System,* pages 97-99; Hands-On Activity 8, *Temperature, Salinity, and Water Density,* pages 101-103

Physical Science Lab Teacher's Handbook: Hands-On Activity 1, *Measuring pH of Acids and Bases,* pages 77-79; Hands-On Activity 2, *Chemical Reaction Rates,* pages 81-83; Hands-On Activity 3, *Energy Conversion,* pages 85-87; Hands-On Activity 4, *Reducing Friction,* pages 89-91; Hands-On Activity 5, *Making a Potato Battery,* pages 93-95; Hands-On Activity 6, *Making Sound,* pages 97-99

Classroom Resource CD-ROM: Writing Strategy 1-30

Strand 8: Impact of Science, Technology, and Human Activity

1. The nature of technology can advance, and is advanced by, science as it seeks to apply scientific knowledge in ways that meet human needs.

Concept A. Designed objects are used to do things better or more easily and to do some things that could not otherwise be done at all.

a. Explain how technological improvements, such as those developed for use in space exploration, the military, or medicine, have led to the invention of new products that may improve lives here on Earth (e.g., new materials, freeze-dried foods, infrared goggles, Velcro, satellite imagery, robotics, lasers).

Life Science Lab, Level A: Cards 49, 64, 69, 83
Life Science Lab, Level B: Cards 49, 64, 69, 83

Earth Science Lab, Level A: Cards 16, 20, 51, 54, 79, 80, 81, 88
Earth Science Lab, Level B: Cards 16, 20, 51, 54, 79, 80, 81, 88

Physical Science Lab, Level A: Cards 33, 35, 76, 81, 84, 90
Physical Science Lab, Level B: Cards 33, 35, 76, 81, 84, 90

Strand 8: Impact of Science, Technology, and Human Activity
1. The nature of technology can advance, and is advanced by, science as it seeks to apply scientific knowledge in ways that meet human needs.
Concept B. Advances in technology often result in improved data collection and an increase in scientific knowledge.
a. Identify the link between technological developments and the scientific discoveries made possible through their development (e.g., Hubble telescope and stellar evolution, composition and structure of the universe; the electron microscope and cell organelles; sonar and the composition of the Earth; manned and unmanned space missions and space exploration; Doppler radar and weather conditions; MRI and CAT-scans and brain activity).
Life Science Lab, Level A: Cards 5, 59, 64, 69, 83 **Life Science Lab, Level B:** Cards 5, 59, 64, 69, 83 **Earth Science Lab, Level A:** Cards 16, 20, 31, 37, 51, 54, 70, 79, 80, 81, 88 **Earth Science Lab, Level B:** Cards 16, 20, 31, 37, 51, 54, 70, 79, 80, 81, 88 **Physical Science Lab, Level A:** Cards 33, 35, 72, 73, 76, 81, 84, 90 **Physical Science Lab, Level B:** Cards 33, 35, 72, 73, 76, 81, 84, 90

Strand 8: Impact of Science, Technology, and Human Activity
1. The nature of technology can advance, and is advanced by, science as it seeks to apply scientific knowledge in ways that meet human needs.
Concept C. Technological solutions to problems often have drawbacks as well as benefits.
a. Describe how technological solutions to problems (e.g., storm water run-off, fiber optics, windmills, efficient car design, electronic trains without conductors, sonar, robotics, Hubble telescope) can have both benefits and drawbacks (e.g., design constraints, unintended consequences, risks).
Life Science Lab, Level A: Cards 49, 64, 69, 83, 87, 88, 89, 90 **Life Science Lab, Level B:** Cards 49, 64, 69, 83, 87, 88, 89, 90 **Earth Science Lab, Level A:** Cards 16, 20, 31, 51, 54, 70, 79, 80, 81, 88 **Earth Science Lab, Level B:** Cards 16, 20, 31, 51, 54, 70, 79, 80, 81, 88 **Physical Science Lab, Level A:** Cards 33, 35, 46, 47, 48, 49, 73, 76, 81, 84, 90 **Physical Science Lab, Level B:** Cards 33, 35, 46, 47, 48, 48, 73, 76, 81, 84, 90

Strand 8: Impact of Science, Technology, and Human Activity
2. Historical and cultural perspectives of scientific explanations help to improve understanding of the nature of science and how science knowledge and technology evolve over time.
Concept A. People of different gender and ethnicity have contributed to scientific discoveries and the invention of technological innovations.
a. Describe how the contributions of scientists and inventors, representing different cultures, races, and gender, have contributed to science, technology, and human activity (e.g., George Washington Carver, Thomas Edison, Thomas Jefferson, Isaac Newton, Marie Currie, Galileo, Albert Einstein, Mae Jemison, Edwin Hubble, Charles Darwin, Jonas Salk, Louis Pasteur, Jane Goodall, Tom Akers, John Wesley Powell, Rachel Carson).
Life Science Lab, Level A: Cards 2, 5, 46, 59 **Life Science Lab, Level B:** Cards 2, 5, 46, 59 **Earth Science Lab, Level A:** Cards 10, 68, 72, 78 **Earth Science Lab, Level B:** Cards 10, 68, 72, 78 **Physical Science Lab, Level A:** Cards 3, 7, 17, 55 **Physical Science Lab, Level B:** Cards 3, 7, 17, 55

Strand 8: Impact of Science, Technology, and Human Activity
2. Historical and cultural perspectives of scientific explanations help to improve understanding of the nature of science and how science knowledge and technology evolve over time.
Concept B. Scientific theories are developed based on the body of knowledge that exists at any particular time and must be rigorously questioned and tested for validity.
a. Recognize the difficulty science innovators experience as they attempt to break through accepted ideas (hypotheses, laws, theories) of their time to reach conclusions that may lead to changes in those ideas and serve to advance scientific understanding (e.g., Darwin, Copernicus, Newton).
This topic is not covered at this level.

Strand 8: Impact of Science, Technology, and Human Activity
2. Historical and cultural perspectives of scientific explanations help to improve understanding of the nature of science and how science knowledge and technology evolve over time.
Concept B. Scientific theories are developed based on the body of knowledge that exists at any particular time and must be rigorously questioned and tested for validity.
b. Recognize explanations have changed over time as a result of new evidence.
Life Science Lab, Level A: Cards 2, 5, 11, 45, 46, 49, 64, 69, 84, 86, 87, 88, 89, 90 **Life Science Lab, Level B:** Cards 2, 5, 11, 45, 46, 49, 64, 69, 84, 86, 87, 88, 89, 90 **Earth Science Lab, Level A:** Cards 10, 30, 31, 37, 51, 54, 68, 72, 78 **Earth Science Lab, Level B:** Cards 10, 30, 31, 37, 51, 54, 68, 72, 78 **Physical Science Lab, Level A:** Cards 3, 7, 17, 53, 59 **Physical Science Lab, Level B:** Cards 3, 7, 17, 53, 59

Strand 8: Impact of Science, Technology, and Human Activity
3. Science and technology affect, and are affected by society.
Concept B. Social, political, economic, ethical and environmental factors strongly influence, and are influenced by, the direction of progress of science and technology.
a. Describe ways in which science and society influence one another (e.g., scientific knowledge and the procedures used by scientists influence the way many individuals in society think about themselves, others, and the environment; societal challenges often inspire questions for scientific research; social priorities often influence research priorities through the availability of funding for research).
Life Science Lab, Level A: Cards 45, 46, 47, 49, 51, 53, 55, 57, 64, 69, 84, 85, 86, 87, 88, 89, 90 **Life Science Lab, Level B:** Cards 45, 46, 47, 49, 51, 53, 55, 57, 64, 69, 84, 85, 86, 87, 88, 89, 90 **Earth Science Lab, Level A:** Cards 20, 37, 42, 51, 54, 59, 60, 61, 70, 79, 80, 81, 85, 86, 88 **Earth Science Lab, Level B:** Cards 20, 37, 42, 51, 54, 59, 60, 61, 70, 79, 80, 81, 85, 86, 88 **Physical Science Lab, Level A:** Cards 33, 34, 35, 46, 47, 48, 49, 72, 73, 76, 81, 84, 90 **Physical Science Lab, Level B:** Cards 33, 34, 35, 46, 47, 48, 49, 72, 73, 76, 81, 84, 90

Strand 8: Impact of Science, Technology, and Human Activity
3. Science and technology affect, and are affected by society.
Concept B. Social, political, economic, ethical and environmental factors strongly influence, and are influenced by, the direction of progress of science and technology.
b. Identify and evaluate the physical, social, economic, and/or environmental problems that may be overcome using science and technology (e.g., the need for alternative fuels, human travel in space, AIDS).
Life Science Lab, Level A: Cards 84, 86, 87, 88, 89, 90 **Life Science Lab, Level B:** Cards 84, 86, 87, 88, 89, 90 **Life Science Lab Teacher's Handbook:** Hands-On Activity 7, *The Effects of Acid Rain*, pages 101-103 **Earth Science Lab, Level A:** Cards 37, 42, 59, 60, 61, 86 **Earth Science Lab, Level B:** Cards 37, 42, 59, 60, 61, 86 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 5, *What is in the Air?*, pages 89-91 **Physical Science Lab, Level A:** Card 49 **Physical Science Lab, Level B:** Card 49

SRA Life, Earth, and Physical Science Laboratories
correlation to
Missouri Science Standards
Grade 8

SRA Life, Earth, and Physical Science Laboratories provide core science content in an alternate reading format. Each *SRA Science Lab* contains 180 Science Cards covering key science concepts and vocabulary. Each lab covers 90 different science topics presented at two different reading levels to meet varied student abilities. The *Teacher's Handbook* includes hands-on inquiry activities as well as vocabulary building exercises. The *Classroom Resource CD-ROM* includes Writing Strategies in Science along with tests and vocabulary games.

Strand 1: Properties and Principles of Matter and Energy
1. Changes in properties and states of matter provide evidence of the atomic theory or matter.
Concept A. Objects, and the materials they are made of, have properties that can be used to describe and classify them.
a. Recognize elements (unique atoms) and compounds (molecules or crystals) are pure substances that have characteristic properties.
Earth Science Lab, Level A: Cards 3, 4, 10, 11 **Earth Science Lab, Level B:** Cards 3, 4, 10, 11

Strand 1: Properties and Principles of Matter and Energy
1. Changes in properties and states of matter provide evidence of the atomic theory or matter.
Concept A. Objects, and the materials they are made of, have properties that can be used to describe and classify them.
b. Describe the physical and chemical properties (e.g., magnetic attraction, conductivity, melting point and boiling point, reactivity) of pure substances (elements or compounds) (e.g., copper wire, aluminum wire, iron, charcoal, sulfur, water, salt, sugar, sodium bicarbonate, galena, quartz, magnetite, pyrite) using appropriate senses and tools).
Earth Science Lab, Level A: Cards 4, 5 **Earth Science Lab, Level B:** Cards 4, 5 **Physical Science Lab, Level A:** Cards 1, 2, 10, 11, 18, 19, 20, 71, 74 **Physical Science Lab, Level B:** Cards 1, 2, 10, 11, 18, 19, 20, 71, 74

Strand 1: Properties and Principles of Matter and Energy
1. Changes in properties and states of matter provide evidence of the atomic theory or matter.
Concept C. Properties of matter can be explained in terms of moving particles too small to be seen without tremendous magnification.
a. Describe evidence (diffusion of colored materials into clear material such as water; light reflecting off dust particles in the air; changes in physical properties and reactivity such as gold hammered into foil, oil spreading on the surface of water, decay of organic matter, condensation of water vapor by increased pressure) that supports the theory that matter is composed of moving particles too small to be seen (atoms, molecules).
Physical Science Lab, Level A: Cards 3, 4, 5, 7, 42 **Physical Science Lab, Level B:** Cards 3, 4, 5, 7, 42

Strand 1: Properties and Principles of Matter and Energy
1. Changes in properties and states of matter provide evidence of the atomic theory or matter.
Concept D. Physical changes in the state of matter that result from thermal changes can be explained by the Kinetic Theory of Matter.
a. Using the Kinetic Theory model, illustrate and account for the physical properties (i.e., shape, volume, malleability, viscosity) of a solid, liquid, or gas in terms of the arrangement and motion of molecules in a substance.
Physical Science Lab, Level A: Cards 5, 6, 7, 42 **Physical Science Lab, Level B:** Cards 5, 6, 7, 42

Strand 1: Properties and Principles of Matter and Energy
1. Changes in properties and states of matter provide evidence of the atomic theory or matter.
Concept D. Physical changes in the state of matter that result from thermal changes can be explained by the Kinetic Theory of Matter.
b. Use the Kinetic Theory model to explain changes in the volume, shape, and viscosity of materials in response to temperature changes during a phase change.
Physical Science Lab, Level A: Cards 5, 6, 7, 42 **Physical Science Lab, Level B:** Cards 5, 6, 7, 42

Strand 1: Properties and Principles of Matter and Energy
1. Changes in properties and states of matter provide evidence of the atomic theory or matter.
Concept D. Physical changes in the state of matter that result from thermal changes can be explained by the Kinetic Theory of Matter.
c. Predict the effect of transfer on the physical properties of a substance as it changes to or from a solid, liquid, or gas (i.e., phase changes the occur during freezing, melting, evaporation, boiling, condensation).
Physical Science Lab, Level A: Cards 5, 6, 7, 42 **Physical Science Lab, Level B:** Cards 5, 6, 7, 42

Strand 1: Properties and Principles of Matter and Energy
1. Changes in properties and states of matter provide evidence of the atomic theory or matter.
Concept F. The periodic table organizes the elements according to their atomic structure and chemical reactivity.
a. Recognize more than 100 known elements (unique atoms) exist that may be combined in nature or by man to produce compounds that make up the living and nonliving substances in the environment.
Physical Science Lab, Level A: Cards 10, 17, 18, 19, 20 **Physical Science Lab, Level B:** Cards 10, 17, 18, 19, 20

Strand 1: Properties and Principles of Matter and Energy
1. Changes in properties and states of matter provide evidence of the atomic theory or matter.
Concept I. Mass is conserved during any physical or chemical change.
a. Provide evidence that mass is conserved during a chemical change in a closed system (e.g., vinegar + baking soda, mold growing in a closed container, steel wool rusting).
Physical Science Lab, Level A: Cards 9, 27, 28, 29, 30 **Physical Science Lab, Level B:** Cards 9, 27, 28, 29, 30 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 2, *Chemical Reaction Rates,* pages 81-83

Strand 1: Properties and Principles of Matter and Energy
1. Changes in properties and states of matter provide evidence of the atomic theory or matter.
Concept I. Mass is conserved during any physical or chemical change.
b. Explain that the amount of matter remains constant while being recycled through the rock cycle.
Physical Science Lab, Level A: Cards 6, 7, 8, 9 **Physical Science Lab, Level B:** Cards 6, 7, 8, 9

Strand 1: Properties and Principles of Matter and Energy
1. Changes in properties and states of matter provide evidence of the atomic theory or matter.
Concept I. Mass is conserved during any physical or chemical change.
c. Explain that the amount of matter remains constant while being recycled through food chains and food webs.
Life Science Lab, Level A: Cards 76, 77 **Life Science Lab, Level B:** Cards 76, 77 **Life Science Lab Teacher's Handbook:** Hands-On Activity 6, *How Much Does Energy Cost?,* pages 97-99

Strand 1: Properties and Principles of Matter and Energy
2. Energy has a source, can be transferred, and can be transformed into various forms but is conserved between and within systems.
Concept A. Forms of energy have a source, a means of transfer (work and heat), and a receiver.
a. Recognize chemical energy is stored in chemical compounds (e.g., energy stored in and released from food molecules, batteries, nitrogen explosives, fireworks, organic fuels).
Life Science Lab, Level A: Cards 9, 16, 17, 46, 76, 77, 84 **Life Science Lab, Level B:** Cards 9, 16, 17, 46, 76, 77, 84 **Earth Science Lab, Level A:** Card 35 **Earth Science Lab, Level B:** Card 35 **Physical Science Lab, Level A:** Cards 9, 27, 28, 29, 30, 34, 38, 45, 49, 70 **Physical Science Lab, Level B:** Cards 9, 27, 28, 29, 30, 34, 38, 45, 49, 70 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 2, *Chemical Reaction Rates,* pages 81-83

Strand 1: Properties and Principles of Matter and Energy
2. Energy has a source, can be transferred, and can be transformed into various forms but is conserved between and within systems.
Concept F. Energy can change from one form to another within systems, but the total amount remains the same.
a. Identify the evidence of different energy transformations (e.g., explosion of light, heat, and sound, temperature change, electrical charge) that may occur as chemical energy release during a chemical reaction.
Life Science Lab, Level A: Cards 16, 17 **Life Science Lab, Level B:** Cards 16, 17 **Earth Science Lab, Level A:** Card 35 **Earth Science Lab, Level B:** Card 35 **Physical Science Lab, Level A:** Cards 9, 27, 28, 29, 30, 34, 37, 38, 45, 49, 70 **Physical Science Lab, Level B:** Cards 9, 27, 28, 29, 30, 34, 37, 38, 45, 49, 70

Strand 3: Characteristics and Interactions of Living Organisms
1. There is a fundamental unity underlying the diversity of all living organisms.
Concept A. Organisms have basic needs for survival.
a. Recognize that most plants and animal require food and oxygen (needed to release the energy from that food).
Life Science Lab, Level A: Cards 1, 9, 13, 16, 17, 34, 44, 45, 46, 76, 77 **Life Science Lab, Level B:** Cards 1, 9, 13, 16, 17, 34, 44, 45, 46, 76, 77

Strand 3: Characteristics and Interactions of Living Organisms
1. There is a fundamental unity underlying the diversity of all living organisms.
Concept D. Plants and animals have different structures that serve similar functions necessary for the survival of the organism.
a. Identify and contrast the structures of plants and animals that serve similar functions (e.g., taking in water and oxygen, support, response to stimuli, obtaining energy, circulation, digestion, excretion, reproduction).
Life Science Lab, Level A: Cards 6, 7, 16, 18, 19, 20, 21, 22, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58 **Life Science Lab, Level B:** Cards 6, 7, 16, 18, 19, 20, 21, 22, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58 **Life Science Lab Teacher's Handbook:** Hands-On Activity 1, *Examining Cells,* pages 77-79; Hands-On Activity 3, *Investigating Arthropods,* pages 85-87; Hands-On Activity 4, *Your Cardiovascular System,* pages 89-91

Strand 3: Characteristics and Interactions of Living Organisms
2. Living organisms carry out life processes in order to survive.
Concept A. The cell contains a set of structures call organelles that interact to carry out life processes through physical and chemical means.
a. Recognize the cell membrane helps regulate the transfer of materials in and out of the cell.
Life Science Lab, Level A: Card 8 **Life Science Lab, Level B:** Card 8

Strand 3: Characteristics and Interactions of Living Organisms
2. Living organisms carry out life processes in order to survive.
Concept A. The cell contains a set of structures call organelles that interact to carry out life processes through physical and chemical means.
b. Recognize the function of the chloroplast in photosynthesis.
Life Science Lab, Level A: Cards 7, 9, 16, 17 **Life Science Lab, Level B:** Cards 7, 9, 16, 17

Strand 3: Characteristics and Interactions of Living Organisms
2. Living organisms carry out life processes in order to survive.
Concept B. Photosynthesis and cellular respiration are complementary processes necessary to the survival of most organisms on Earth.
a. Recognize photosynthesis is a chemical change with reactants (water and carbon dioxide) and products (energy-rich sugar molecules and oxygen) take takes place in the presence of light and chlorophyll.
Life Science Lab, Level A: Cards 7, 9, 16, 17, 76 **Life Science Lab, Level B:** Cards 7, 9, 16, 17, 76

Strand 3: Characteristics and Interactions of Living Organisms
2. Living organisms carry out life processes in order to survive.
Concept B. Photosynthesis and cellular respiration are complementary processes necessary to the survival of most organisms on Earth.
b. Recognize oxygen is needed by all cells of most organisms for the release of energy from nutrient (sugar) molecules.
Life Science Lab, Level A: Cards 1, 9 **Life Science Lab, Level B:** Cards 1, 9

Strand 3: Characteristics and Interactions of Living Organisms
2. Living organisms carry out life processes in order to survive.
Concept B. Photosynthesis and cellular respiration are complementary processes necessary to the survival of most organisms on Earth.
c. Describe the importance of the transport and exchange of oxygen and carbon dioxide to the survival of the organism.
Life Science Lab, Level A: Cards 1, 9, 16, 47, 51 **Life Science Lab, Level B:** Cards 1, 9, 16, 47, 51

Strand 3: Characteristics and Interactions of Living Organisms
2. Living organisms carry out life processes in order to survive.
Concept C. Complex multicellular organisms have systems that interact to carry out life processes through physical and chemical means.
a. Identify and give examples of each level of organization (cell, tissue, organ, organ system) in multicellular organisms (plants, animals).
Life Science Lab, Level A: Cards 6, 7, 44, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58 **Life Science Lab, Level B:** Cards 6, 7, 44, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58 **Life Science Lab Teacher's Handbook:** Hands-On Activity 1, *Examining Cells,* pages 77-79; Hands-On Activity 4, *Your Cardiovascular System,* pages 89-91

Strand 3: Characteristics and Interactions of Living Organisms
2. Living organisms carry out life processes in order to survive.
Concept C. Complex multicellular organisms have systems that interact to carry out life processes through physical and chemical means.
b. Illustrate and explain the path water and nutrients take as they move through the transport system of a plant.
Life Science Lab, Level A: Cards 18, 19, 20 **Life Science Lab, Level B:** Cards 18, 19, 20

Strand 3: Characteristics and Interactions of Living Organisms
2. Living organisms carry out life processes in order to survive.
Concept C. Complex multicellular organisms have systems that interact to carry out life processes through physical and chemical means.
c. Explain the interactions between the circulatory and digestive systems as nutrients are processed by the digestive system, passed into the blood stream, and transported in and out of the cell.
Life Science Lab, Level A: Cards 47, 48, 50 **Life Science Lab, Level B:** Cards 47, 48, 50

Strand 3: Characteristics and Interactions of Living Organisms
2. Living organisms carry out life processes in order to survive.
Concept C. Complex multicellular organisms have systems that interact to carry out life processes through physical and chemical means.
d. Compare and contrast the processes of mechanical and chemical digestion, and their role in providing materials necessary for survival of the cell and organism.
Life Science Lab, Level A: Cards 8, 9, 50 **Life Science Lab, Level B:** Cards 8, 9, 50

Strand 3: Characteristics and Interactions of Living Organisms
2. Living organisms carry out life processes in order to survive.
Concept C. Complex multicellular organisms have systems that interact to carry out life processes through physical and chemical means.
e. Identify the importance of the transport and exchange of nutrient and waste molecules to the survival of the cell and organism.
Life Science Lab, Level A: Cards 8, 9, 47, 48, 50, 52 **Life Science Lab, Level B:** Cards 8, 9, 47, 48, 50, 52

Strand 3: Characteristics and Interactions of Living Organisms
2. Living organisms carry out life processes in order to survive.
Concept C. Complex multicellular organisms have systems that interact to carry out life processes through physical and chemical means.
f. Explain the interactions between the circulatory and respiratory systems in exchanging oxygen and carbon dioxide between cells and the atmosphere (when oxygen enters the body, passes into the blood stream, and is transported into the cell; carbon dioxide is transported out of the cell, passes into the blood stream, and exits the body).
Life Science Lab, Level A: Cards 47, 48, 51 **Life Science Lab, Level B:** Cards 47, 48, 51

Strand 3: Characteristics and Interactions of Living Organisms
2. Living organisms carry out life processes in order to survive.
Concept C. Complex multicellular organisms have systems that interact to carry out life processes through physical and chemical means.
g. Explain the interactions between the nervous and muscular systems when an organism responds to a stimulus.
Life Science Lab, Level A: Cards 54, 55 **Life Science Lab, Level B:** Cards 54, 55

Strand 3: Characteristics and Interactions of Living Organisms
2. Living organisms carry out life processes in order to survive.
Concept F. Cellular activities and responses can maintain stability internally while external conditions are changing (homeostasis).
a. Predict the response the body may take to maintain internal balance during environmental change (e.g., shivering when cold, slowing metabolism when food supply decreases or when dehydrated, adrenaline rush when frightened).
Life Science Lab, Level A: Cards 44, 57 **Life Science Lab, Level B:** Cards 44, 57

Strand 3: Characteristics and Interactions of Living Organisms
2. Living organisms carry out life processes in order to survive.
Concept G. Life processes can be disrupted by disease (intrinsic failures of the organ systems or by infection due to other organisms).
a. Explain the cause and effect of diseases (e.g., AIDS, cancer, diabetes, hypertension) on the human body.
Life Science Lab, Level A: Cards 47, 49, 51, 53, 55, 57 **Life Science Lab, Level B:** Cards 47, 49, 51, 53, 55, 57

Strand 3: Characteristics and Interactions of Living Organisms
2. Living organisms carry out life processes in order to survive.
Concept G. Life processes can be disrupted by disease (intrinsic failures of the organ systems or by infection due to other organisms).
b. Relate some common diseases (i.e., cold, influenza, strep throat, dysentery, fungal infections) to the organisms that cause them (bacteria, viruses, protists, fungi).
Life Science Lab, Level A: Cards 11, 12, 14, 15, 49 **Life Science Lab, Level B:** Cards 11, 12, 14, 15, 49

Strand 3: Characteristics and Interactions of Living Organisms
2. Living organisms carry out life processes in order to survive.
Concept G. Life processes can be disrupted by disease (intrinsic failures of the organ systems or by infection due to other organisms).
c. Differentiate between infectious and noninfectious diseases.
Life Science Lab, Level A: Cards 11, 12, 49 **Life Science Lab, Level B:** Cards 11, 12, 49

Strand 3: Characteristics and Interactions of Living Organisms
2. Living organisms carry out life processes in order to survive.
Concept G. Life processes can be disrupted by disease (intrinsic failures of the organ systems or by infection due to other organisms).
d. Explain the role of antibiotics and vaccines in the treatment and prevention of diseases.
Life Science Lab, Level A: Cards 11, 12, 49 **Life Science Lab, Level B:** Cards 11, 12, 49

Strand 3: Characteristics and Interactions of Living Organisms
3. There is a genetic basis for the transfer of biological characteristics from one generation to the next through reproductive processes.
Concept A. Reproduction can occur asexually or sexually.
a. Compare and contrast the processes of asexual and sexual reproduction, including the type and number of cells involved (one body cell in asexual, two sex cells in sexual), and the number of gene sets (body cell has two sets, sex cells have one set each) passed from parent(s) to offspring.
Life Science Lab, Level A: Cards 58, 60, 61 **Life Science Lab, Level B:** Cards 58, 60, 61

Strand 3: Characteristics and Interactions of Living Organisms
3. There is a genetic basis for the transfer of biological characteristics from one generation to the next through reproductive processes.
Concept A. Reproduction can occur asexually or sexually.
b. Identify examples of asexual reproduction (i.e., plants budding, binary fission of single cell organisms).
Life Science Lab, Level A: Cards 10, 60 **Life Science Lab, Level B:** Cards 10, 60

Strand 3: Characteristics and Interactions of Living Organisms
3. There is a genetic basis for the transfer of biological characteristics from one generation to the next through reproductive processes.
Concept A. Reproduction can occur asexually or sexually.
c. Compare and contrast the reproductive mechanisms of classes of vertebrates (i.e., internal vs. external fertilization).
Life Science Lab, Level A: Cards 58, 61 **Life Science Lab, Level B:** Cards 58, 61

Strand 3: Characteristics and Interactions of Living Organisms
3. There is a genetic basis for the transfer of biological characteristics from one generation to the next through reproductive processes.
Concept A. Reproduction can occur asexually or sexually.
d. Explain how flowering plants reproduce sexually.
Life Science Lab, Level A: Card 22 **Life Science Lab, Level B:** Card 22

Strand 3: Characteristics and Interactions of Living Organisms
3. There is a genetic basis for the transfer of biological characteristics from one generation to the next through reproductive processes.
Concept C. Chromosomes are components of cells that occur in pairs and carry hereditary information from one cell to daughter cells and from parent to offspring during reproduction.
a. Identify chromosomes as cellular structures that occur in pairs that carry hereditary information in units called genes.
Life Science Lab, Level A: Cards 10, 61, 62, 63 **Life Science Lab, Level B:** Cards 10, 61, 62, 63

Strand 3: Characteristics and Interactions of Living Organisms
3. There is a genetic basis for the transfer of biological characteristics from one generation to the next through reproductive processes.
Concept C. Chromosomes are components of cells that occur in pairs and carry hereditary information from one cell to daughter cells and from parent to offspring during reproduction.
b. Recognize that when asexual reproduction occurs, the same genetic information found in the parent cell is copied and passed on to each new daughter cell.
Life Science Lab, Level A: Cards 10, 60 **Life Science Lab, Level B:** Cards 10, 60

Strand 3: Characteristics and Interactions of Living Organisms
3. There is a genetic basis for the transfer of biological characteristics from one generation to the next through reproductive processes.
Concept C. Chromosomes are components of cells that occur in pairs and carry hereditary information from one cell to daughter cells and from parent to offspring during reproduction.
c. Recognize that when sexual reproduction occurs, genetic material from both parents is passed on and combined to form the genetic code for the new organisms.
Life Science Lab, Level A: Cards 58, 61, 62 **Life Science Lab, Level B:** Cards 58, 61, 62

Strand 3: Characteristics and Interactions of Living Organisms
3. There is a genetic basis for the transfer of biological characteristics from one generation to the next through reproductive processes.
Concept D. There is heritable variation within every species or organism.
a. Recognize that when asexual reproduction occurs, the daughter cell is identical to the parent cell (assuming no change in the parent genes).
Life Science Lab, Level A: Cards 10, 60 **Life Science Lab, Level B:** Cards 10, 60

Strand 3: Characteristics and Interactions of Living Organisms
3. There is a genetic basis for the transfer of biological characteristics from one generation to the next through reproductive processes.
Concept D. There is heritable variation within every species or organism.
b. Recognize that when sexual reproduction occurs, the offspring is not identical to either parent due to the combining of the different genetic codes contained in each sex cell.
Life Science Lab, Level A: Cards 61, 62, 63, 64 **Life Science Lab, Level B:** Cards 61, 62, 63, 64

Strand 4: Changes in Ecosystems and Interactions of Organisms with their Environments
1. Organisms are interdependent with one another and with their environment.
Concept D. The diversity of species within an ecosystem is affected by changes in the environment, which can be caused by other organisms or outside processes.
a. Explain the beneficial or detrimental impact that some organisms (i.e., viruses, bacteria, protists, fungi) may have on other organisms (e.g., diseases, antibiotics, breakdown of waste, fermentation).
Life Science Lab, Level A: Cards 11, 12, 13, 14, 15, 74, 76 **Life Science Lab, Level B:** Cards 11, 12, 13, 14, 15, 74, 75

Strand 4: Changes in Ecosystems and Interactions of Organisms with their Environments
2. Matter and energy flow through an ecosystem.
Concept B. Matter is recycled through an ecosystem.
a. Illustrate the oxygen/carbon dioxide cycles.
Life Science Lab, Level A: Cards 9, 16, 17 **Life Science Lab, Level B:** Cards 9, 16, 17

Strand 4: Changes in Ecosystems and Interactions of Organisms with their Environments
2. Matter and energy flow through an ecosystem.
Concept B. Matter is recycled through an ecosystem.
b. Describe the processes involved in the recycling of matter in the oxygen/carbon dioxide cycles.
Life Science Lab, Level A: Cards 9, 16, 17 **Life Science Lab, Level B:** Cards 9, 16, 17

Strand 5: Processes and Interactions of the Earth's Systems (Geosphere, Atmosphere, and Hydrosphere)
1. Earth's systems (geosphere, atmosphere, and hydrosphere) have common components and unique structures.
Concept A. The Earth's crust is composed of various materials, including soil, minerals, and rocks, with characteristic properties.
a. Differentiate between minerals and rocks (which are composed of different kinds of minerals).
Earth Science Lab, Level A: Cards 3, 4, 5, 6, 7, 8 **Earth Science Lab, Level B:** Cards 3, 4, 5, 6, 7, 8 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 1, *Identifying Minerals with the Mohs Scale*, pages 73-75

Strand 5: Processes and Interactions of the Earth's Systems (Geosphere, Atmosphere, and Hydrosphere)
1. Earth's systems (geosphere, atmosphere, and hydrosphere) have common components and unique structures.
Concept A. The Earth's crust is composed of various materials, including soil, minerals, and rocks, with characteristic properties.
b. Describe the distinguishing properties that can be used to classify minerals (i.e., texture, smell, luster, hardness, crystal shape, streak, reaction to magnets and acids).
Earth Science Lab, Level A: Cards 3, 4, 5 **Earth Science Lab, Level B:** Cards 3, 4, 5 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 1, *Identifying Minerals with the Mohs Scale*, pages 73-75

Strand 5: Processes and Interactions of the Earth's Systems (Geosphere, Atmosphere, and Hydrosphere)
1. Earth's systems (geosphere, atmosphere, and hydrosphere) have common components and unique structures.
Concept A. The Earth's crust is composed of various materials, including soil, minerals, and rocks, with characteristic properties.
c. Describe the methods used to identify the distinguishing properties of minerals.
Earth Science Lab, Level A: Cards 3, 4, 5 **Earth Science Lab, Level B:** Cards 3, 4, 5 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 1, *Identifying Minerals with the Mohs Scale*, pages 73-75

Strand 5: Processes and Interactions of the Earth's Systems (Geosphere, Atmosphere, and Hydrosphere)
1. Earth's systems (geosphere, atmosphere, and hydrosphere) have common components and unique structures.
Concept A. The Earth's crust is composed of various materials, including soil, minerals, and rocks, with characteristic properties.
d. Classify rocks as sedimentary, igneous, or metamorphic.
Earth Science Lab, Level A: Cards 6, 7, 8, 9 **Earth Science Lab, Level B:** Cards 6, 7, 8, 9

Strand 5: Processes and Interactions of the Earth's Systems (Geosphere, Atmosphere, and Hydrosphere)
2. Earth's systems (geosphere, atmosphere, and hydrosphere) interact with one another as they undergo change by common processes.
Concept B. There are internal processes and sources of energy within the geosphere that cause changes in Earth's crustal plates.
a. Explain convection currents are the result of uneven heating inside the mantle resulting in the melting or rock materials, convection of magma, eruption/flow of magma, and movement of crustal plates.
Earth Science Lab, Level A: Cards 10, 11, 12, 13, 14, 15, 16, 17, 88 **Earth Science Lab, Level B:** Cards 10, 11, 12, 13, 14, 15, 16, 17, 88 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 2, *Plate Boundaries in Action*, pages 77-79

Strand 5: Processes and Interactions of the Earth's Systems (Geosphere, Atmosphere, and Hydrosphere)
2. Earth's systems (geosphere, atmosphere, and hydrosphere) interact with one another as they undergo change by common processes.
Concept B. There are internal processes and sources of energy within the geosphere that cause changes in Earth's crustal plates.
b. Explain how rock layers are affected by the folding, breaking, and uplifting of rock layers due to plate motion.
Earth Science Lab, Level A: Cards 9, 13, 14, 30 **Earth Science Lab, Level B:** Cards 9, 13, 14, 30

Strand 5: Processes and Interactions of the Earth's Systems (Geosphere, Atmosphere, and Hydrosphere)
2. Earth's systems (geosphere, atmosphere, and hydrosphere) interact with one another as they undergo change by common processes.
Concept B. There are internal processes and sources of energy within the geosphere that cause changes in Earth's crustal plates.
c. Describe how the movement of crustal plates can cause earthquakes and volcanic eruptions that can result in mountain building and trench formation.
Earth Science Lab, Level A: Cards 12, 15, 16, 17, 88 **Earth Science Lab, Level B:** Cards 12, 15, 16, 17, 88

Strand 5: Processes and Interactions of the Earth's Systems (Geosphere, Atmosphere, and Hydrosphere)
2. Earth's systems (geosphere, atmosphere, and hydrosphere) interact with one another as they undergo change by common processes.
Concept C. Continental changes in the Earth's materials and surface that result from internal and external processes is described by the rock cycle.
a. Explain how heating and cooling of the mantle layer leads to the formation of metamorphic rocks and some igneous rocks.
Earth Science Lab, Level A: Cards 6, 8, 9, 17 **Earth Science Lab, Level B:** Cards 6, 8, 9, 17

Strand 5: Processes and Interactions of the Earth's Systems (Geosphere, Atmosphere, and Hydrosphere)
2. Earth's systems (geosphere, atmosphere, and hydrosphere) interact with one another as they undergo change by common processes.
Concept C. Continental changes in the Earth's materials and surface that result from internal and external processes is described by the rock cycle.
b. Make inferences about the formation of igneous and metamorphic rocks from their physical properties (e.g., crystal size indicates rate of cooling, air pockets or glassy texture indicate volcanic activity).
Earth Science Lab, Level A: Cards 6, 8, 9, 17 **Earth Science Lab, Level B:** Cards 6, 8, 9, 17

Strand 5: Processes and Interactions of the Earth's Systems (Geosphere, Atmosphere, and Hydrosphere)
2. Earth's systems (geosphere, atmosphere, and hydrosphere) interact with one another as they undergo change by common processes.
Concept C. Continental changes in the Earth's materials and surface that result from internal and external processes is described by the rock cycle.
c. Explain and diagram the external and internal processes of the rock cycle (e.g., weathering and erosion, sedimentation, compaction, heating, recrystallization, resurfacing due to forces that drive plate motion).
Earth Science Lab, Level A: Cards 6, 8, 9, 17 **Earth Science Lab, Level B:** Cards 6, 8, 9, 17

Strand 5: Processes and Interactions of the Earth's Systems (Geosphere, Atmosphere, and Hydrosphere)
2. Earth's systems (geosphere, atmosphere, and hydrosphere) interact with one another as they undergo change by common processes.
Concept D. Changes in the Earth over time can be inferred through rock and fossil evidence.
a. Describe the methods used to estimate geologic time and the age of the Earth (e.g., techniques used to date rocks and rock layers, presence of fossils).
Life Science Lab, Level A: Card 67 **Life Science Lab, Level B:** Card 67 **Life Science Lab Teacher's Handbook:** Hands-On Activity 5, *Making Fossils,* pages 93-95 **Earth Science Lab, Level A:** Cards 30, 31, 32, 33, 34 **Earth Science Lab, Level B:** Cards 30, 31, 32, 33, 34

Strand 5: Processes and Interactions of the Earth's Systems (Geosphere, Atmosphere, and Hydrosphere)
2. Earth's systems (geosphere, atmosphere, and hydrosphere) interact with one another as they undergo change by common processes.
Concept D. Changes in the Earth over time can be inferred through rock and fossil evidence.
b. Use rock and fossil evidence to make inferences about the age, history, and changing life forms and environment of the Earth (i.e., changes in successive layers of sedimentary rock and the fossils contained in different geographic locations, similarities between fossils and organisms present today, fossils of organisms indicating changes in climate, fossils of extinct organisms).
Life Science Lab, Level A: Card 67 **Life Science Lab, Level B:** Card 67 **Life Science Lab Teacher's Handbook:** Hands-On Activity 5, *Making Fossils,* pages 93-95 **Earth Science Lab, Level A:** Cards 30, 31, 32, 33, 34 **Earth Science Lab, Level B:** Cards 30, 31, 32, 33, 34

Strand 7: Scientific Inquiry
1. Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking.
Concept A. Scientific inquiry includes the ability of students to formulate a testable question and explanation, and to select appropriate investigative methods in order to obtain evidence relevant to the explanation.
a. Formulate testable questions and hypotheses.
Life Science Lab Teacher's Handbook: Hands-On Activity 1, *Examining Cells,* pages 77-79; Hands-On Activity 2, *Culturing Bacteria,* pages 81-83; Hands-On Activity 3, *Investigating Arthropods,* pages 85-87; Hands-On Activity 4, *Your Cardiovascular System,* pages 89-91; Hands-On Activity 5, *Making Fossils,* pages 93-95; Hands-On Activity 6, *How Much Does Energy Cost?,* pages 97-99; Hands-On Activity 7, *The Effects of Acid Rain,* pages 101-103 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 1, *Identifying Minerals with the Mohs Scale,* pages 73-75; Hands-On Activity 2, *Plate Boundaries in Action,* pages 77-79; Hands-On Activity 3, *Interpreting a Topographic Map,* pages 81-83; Hands-On Activity 4, *Using Sound Waves,* pages 85-87; Hands-On Activity 5, *What is in the Air?,* pages 89-91; Hands-On Activity 6, *Modeling a Tornado,* pages 93-95; Hands-On Activity 7, *Sizes in the Solar System,* pages 97-99; Hands-On Activity 8, *Temperature, Salinity, and Water Density,* pages 101-103 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 1, *Measuring pH of Acids and Bases,* pages 77-79; Hands-On Activity 2, *Chemical Reaction Rates,* pages 81-83; Hands-On Activity 3, *Energy Conversion,* pages 85-87; Hands-On Activity 4, *Reducing Friction,* pages 89-91; Hands-On Activity 5, *Making a Potato Battery,* pages 93-95; Hands-On Activity 6, *Making Sound,* pages 97-99 **Classroom Resource CD-ROM:** Writing Strategy 8, 15

Strand 7: Scientific Inquiry
1. Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking.
Concept A. Scientific inquiry includes the ability of students to formulate a testable question and explanation, and to select appropriate investigative methods in order to obtain evidence relevant to the explanation.
b. Recognize the importance of the independent variable, dependent variables, control of constants, and multiple trials to the design of a valid experiment.
Life Science Lab Teacher's Handbook: Hands-On Activity 7, *The Effects of Acid Rain,* pages 101-103 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 8, *Temperature, Salinity, and Water Density,* pages 101-103 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 2, *Chemical Reaction Rates,* pages 81-83 **Classroom Resource CD-ROM:** Writing Strategy 23

Strand 7: Scientific Inquiry
1. Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking.
Concept A. Scientific inquiry includes the ability of students to formulate a testable question and explanation, and to select appropriate investigative methods in order to obtain evidence relevant to the explanation.
c. Design and conduct a valid experiment.
Life Science Lab Teacher's Handbook: Hands-On Activity 1, *Examining Cells,* pages 77-79; Hands-On Activity 2, *Culturing Bacteria,* pages 81-83; Hands-On Activity 3, *Investigating Arthropods,* pages 85-87; Hands-On Activity 4, *Your Cardiovascular System,* pages 89-91; Hands-On Activity 5, *Making Fossils,* pages 93-95; Hands-On Activity 6, *How Much Does Energy Cost?,* pages 97-99; Hands-On Activity 7, *The Effects of Acid Rain,* pages 101-103 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 1, *Identifying Minerals with the Mohs Scale,* pages 73-75; Hands-On Activity 2, *Plate Boundaries in Action,* pages 77-79; Hands-On Activity 3, *Interpreting a Topographic Map,* pages 81-83; Hands-On Activity 4, *Using Sound Waves,* pages 85-87; Hands-On Activity 5, *What is in the Air?,* pages 89-91; Hands-On Activity 6, *Modeling a Tornado,* pages 93-95; Hands-On Activity 7, *Sizes in the Solar System,* pages 97-99; Hands-On Activity 8, *Temperature, Salinity, and Water Density,* pages 101-103 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 1, *Measuring pH of Acids and Bases,* pages 77-79; Hands-On Activity 2, *Chemical Reaction Rates,* pages 81-83; Hands-On Activity 3, *Energy Conversion,* pages 85-87; Hands-On Activity 4, *Reducing Friction,* pages 89-91; Hands-On Activity 5, *Making a Potato Battery,* pages 93-95; Hands-On Activity 6, *Making Sound,* pages 97-99 **Classroom Resource CD-ROM:** Writing Strategy 15

Strand 7: Scientific Inquiry
1. Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking.
Concept A. Scientific inquiry includes the ability of students to formulate a testable question and explanation, and to select appropriate investigative methods in order to obtain evidence relevant to the explanation.
d. Evaluate the design of an experiment and make suggestions for reasonable improvements or extensions of an experiment.
Life Science Lab Teacher's Handbook: Hands-On Activity 1, *Examining Cells,* pages 77-79; Hands-On Activity 2, *Culturing Bacteria,* pages 81-83; Hands-On Activity 3, *Investigating Arthropods,* pages 85-87; Hands-On Activity 4, *Your Cardiovascular System,* pages 89-91; Hands-On Activity 5, *Making Fossils,* pages 93-95; Hands-On Activity 6, *How Much Does Energy Cost?,* pages 97-99; Hands-On Activity 7, *The Effects of Acid Rain,* pages 101-103 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 1, *Identifying Minerals with the Mohs Scale,* pages 73-75; Hands-On Activity 2, *Plate Boundaries in Action,* pages 77-79; Hands-On Activity 3, *Interpreting a Topographic Map,* pages 81-83; Hands-On Activity 4, *Using Sound Waves,* pages 85-87; Hands-On Activity 5, *What is in the Air?,* pages 89-91; Hands-On Activity 6, *Modeling a Tornado,* pages 93-95; Hands-On Activity 7, *Sizes in the Solar System,* pages 97-99; Hands-On Activity 8, *Temperature, Salinity, and Water Density,* pages 101-103 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 1, *Measuring pH of Acids and Bases,* pages 77-79; Hands-On Activity 2, *Chemical Reaction Rates,* pages 81-83; Hands-On Activity 3, *Energy Conversion,* pages 85-87; Hands-On Activity 4, *Reducing Friction,* pages 89-91; Hands-On Activity 5, *Making a Potato Battery,* pages 93-95; Hands-On Activity 6, *Making Sound,* pages 97-99

Strand 7: Scientific Inquiry
1. Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking.
Concept A. Scientific inquiry includes the ability of students to formulate a testable question and explanation, and to select appropriate investigative methods in order to obtain evidence relevant to the explanation.
e. Recognize different kinds of questions suggest different kinds of scientific investigations (e.g., some involve observing and describing objects, organisms, or events; some involve collecting specimens; some involve experiments; some involve making observations in nature; some involve discovery of new objects and phenomena; some involve making models).
Life Science Lab Teacher's Handbook: Hands-On Activity 1, *Examining Cells,* pages 77-79; Hands-On Activity 2, *Culturing Bacteria,* pages 81-83; Hands-On Activity 3, *Investigating Arthropods,* pages 85-87; Hands-On Activity 4, *Your Cardiovascular System,* pages 89-91; Hands-On Activity 5, *Making Fossils,* pages 93-95; Hands-On Activity 6, *How Much Does Energy Cost?,* pages 97-99; Hands-On Activity 7, *The Effects of Acid Rain,* pages 101-103 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 1, *Identifying Minerals with the Mohs Scale,* pages 73-75; Hands-On Activity 2, *Plate Boundaries in Action,* pages 77-79; Hands-On Activity 3, *Interpreting a Topographic Map,* pages 81-83; Hands-On Activity 4, *Using Sound Waves,* pages 85-87; Hands-On Activity 5, *What is in the Air?,* pages 89-91; Hands-On Activity 6, *Modeling a Tornado,* pages 93-95; Hands-On Activity 7, *Sizes in the Solar System,* pages 97-99; Hands-On Activity 8, *Temperature, Salinity, and Water Density,* pages 101-103 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 1, *Measuring pH of Acids and Bases,* pages 77-79; Hands-On Activity 2, *Chemical Reaction Rates,* pages 81-83; Hands-On Activity 3, *Energy Conversion,* pages 85-87; Hands-On Activity 4, *Reducing Friction,* pages 89-91; Hands-On Activity 5, *Making a Potato Battery,* pages 93-95; Hands-On Activity 6, *Making Sound,* pages 97-99 **Classroom Resource CD-ROM:** Writing Strategy 15

Strand 7: Scientific Inquiry

1. Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking.

Concept A. Scientific inquiry includes the ability of students to formulate a testable question and explanation, and to select appropriate investigative methods in order to obtain evidence relevant to the explanation.

f. Acknowledge there is no fixed procedure called "the scientific method," but some investigations involve scientific observations, carefully collected and relevant evidence, logical reasoning, and imagination in developing hypotheses and other explanations.

Life Science Lab Teacher's Handbook: Hands-On Activity 1, *Examining Cells,* pages 77-79; Hands-On Activity 2, *Culturing Bacteria,* pages 81-83; Hands-On Activity 3, *Investigating Arthropods,* pages 85-87; Hands-On Activity 4, *Your Cardiovascular System,* pages 89-91; Hands-On Activity 5, *Making Fossils,* pages 93-95; Hands-On Activity 6, *How Much Does Energy Cost?,* pages 97-99; Hands-On Activity 7, *The Effects of Acid Rain,* pages 101-103

Earth Science Lab Teacher's Handbook: Hands-On Activity 1, *Identifying Minerals with the Mohs Scale,* pages 73-75; Hands-On Activity 2, *Plate Boundaries in Action,* pages 77-79; Hands-On Activity 3, *Interpreting a Topographic Map,* pages 81-83; Hands-On Activity 4, *Using Sound Waves,* pages 85-87; Hands-On Activity 5, *What is in the Air?,* pages 89-91; Hands-On Activity 6, *Modeling a Tornado,* pages 93-95; Hands-On Activity 7, *Sizes in the Solar System,* pages 97-99; Hands-On Activity 8, *Temperature, Salinity, and Water Density,* pages 101-103

Physical Science Lab Teacher's Handbook: Hands-On Activity 1, *Measuring pH of Acids and Bases,* pages 77-79; Hands-On Activity 2, *Chemical Reaction Rates,* pages 81-83; Hands-On Activity 3, *Energy Conversion,* pages 85-87; Hands-On Activity 4, *Reducing Friction,* pages 89-91; Hands-On Activity 5, *Making a Potato Battery,* pages 93-95; Hands-On Activity 6, *Making Sound,* pages 97-99

Classroom Resource CD-ROM: Writing Strategy 15

Strand 7: Scientific Inquiry

1. Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking.

Concept B. Scientific inquiry relies upon gathering evidence from qualitative and quantitative observations.

a. Make qualitative observations using the five senses.

Life Science Lab Teacher's Handbook: Hands-On Activity 1, *Examining Cells,* pages 77-79; Hands-On Activity 2, *Culturing Bacteria,* pages 81-83; Hands-On Activity 3, *Investigating Arthropods,* pages 85-87; Hands-On Activity 4, *Your Cardiovascular System,* pages 89-91; Hands-On Activity 5, *Making Fossils,* pages 93-95; Hands-On Activity 6, *How Much Does Energy Cost?,* pages 97-99; Hands-On Activity 7, *The Effects of Acid Rain,* pages 101-103

Earth Science Lab Teacher's Handbook: Hands-On Activity 1, *Identifying Minerals with the Mohs Scale,* pages 73-75; Hands-On Activity 2, *Plate Boundaries in Action,* pages 77-79; Hands-On Activity 3, *Interpreting a Topographic Map,* pages 81-83; Hands-On Activity 4, *Using Sound Waves,* pages 85-87; Hands-On Activity 5, *What is in the Air?,* pages 89-91; Hands-On Activity 6, *Modeling a Tornado,* pages 93-95; Hands-On Activity 7, *Sizes in the Solar System,* pages 97-99; Hands-On Activity 8, *Temperature, Salinity, and Water Density,* pages 101-103

Physical Science Lab Teacher's Handbook: Hands-On Activity 1, *Measuring pH of Acids and Bases,* pages 77-79; Hands-On Activity 2, *Chemical Reaction Rates,* pages 81-83; Hands-On Activity 3, *Energy Conversion,* pages 85-87; Hands-On Activity 4, *Reducing Friction,* pages 89-91; Hands-On Activity 5, *Making a Potato Battery,* pages 93-95; Hands-On Activity 6, *Making Sound,* pages 97-99

Classroom Resource CD-ROM: Writing Strategy 11

Strand 7: Scientific Inquiry
1. Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking.
Concept B. Scientific inquiry relies upon gathering evidence from qualitative and quantitative observations.
b. Determine the appropriate tools and techniques to collect data.
Life Science Lab Teacher's Handbook: Hands-On Activity 1, *Examining Cells,* pages 77-79; Hands-On Activity 2, *Culturing Bacteria,* pages 81-83; Hands-On Activity 3, *Investigating Arthropods,* pages 85-87; Hands-On Activity 4, *Your Cardiovascular System,* pages 89-91; Hands-On Activity 5, *Making Fossils,* pages 93-95; Hands-On Activity 6, *How Much Does Energy Cost?,* pages 97-99; Hands-On Activity 7, *The Effects of Acid Rain,* pages 101-103 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 1, *Identifying Minerals with the Mohs Scale,* pages 73-75; Hands-On Activity 2, *Plate Boundaries in Action,* pages 77-79; Hands-On Activity 3, *Interpreting a Topographic Map,* pages 81-83; Hands-On Activity 4, *Using Sound Waves,* pages 85-87; Hands-On Activity 5, *What is in the Air?,* pages 89-91; Hands-On Activity 6, *Modeling a Tornado,* pages 93-95; Hands-On Activity 7, *Sizes in the Solar System,* pages 97-99; Hands-On Activity 8, *Temperature, Salinity, and Water Density,* pages 101-103 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 1, *Measuring pH of Acids and Bases,* pages 77-79; Hands-On Activity 2, *Chemical Reaction Rates,* pages 81-83; Hands-On Activity 3, *Energy Conversion,* pages 85-87; Hands-On Activity 4, *Reducing Friction,* pages 89-91; Hands-On Activity 5, *Making a Potato Battery,* pages 93-95; Hands-On Activity 6, *Making Sound,* pages 97-99

Strand 7: Scientific Inquiry
1. Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking.
Concept B. Scientific inquiry relies upon gathering evidence from qualitative and quantitative observations.
c. Use a variety of tools and equipment to gather data (e.g., microscopes, thermometers, analog and digital meters, computers, spring scales, balances, metric rulers, graduated cylinders, stopwatches).
Life Science Lab Teacher's Handbook: Hands-On Activity 4, *Your Cardiovascular System,* pages 89-91; Hands-On Activity 7, *The Effects of Acid Rain,* pages 101-103 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 1, *Identifying Minerals with the Mohs Scale,* pages 73-75; Hands-On Activity 3, *Interpreting a Topographic Map,* pages 81-83; Hands-On Activity 7, *Sizes in the Solar System,* pages 97-99; Hands-On Activity 8, *Temperature, Salinity, and Water Density,* pages 101-103 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 1, *Measuring pH of Acids and Bases,* pages 77-79; Hands-On Activity 2, *Chemical Reaction Rates,* pages 81-83; Hands-On Activity 3, *Energy Conversion,* pages 85-87; Hands-On Activity 4, *Reducing Friction,* pages 89-91; Hands-On Activity 6, *Making Sound,* pages 97-99

Strand 7: Scientific Inquiry
1. Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking.
Concept B. Scientific inquiry relies upon gathering evidence from qualitative and quantitative observations.
d. Measure length to the nearest millimeter, mass to the nearest gram, volume to the nearest milliliter, force (weight) to the nearest Newton, temperature to the nearest degree Celsius, time to the nearest second.
Life Science Lab Teacher's Handbook: Hands-On Activity 4, *Your Cardiovascular System,* pages 89-91; Hands-On Activity 7, *The Effects of Acid Rain,* pages 101-103 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 1, *Identifying Minerals with the Mohs Scale,* pages 73-75; Hands-On Activity 3, *Interpreting a Topographic Map,* pages 81-83; Hands-On Activity 7, *Sizes in the Solar System,* pages 97-99; Hands-On Activity 8, *Temperature, Salinity, and Water Density,* pages 101-103 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 1, *Measuring pH of Acids and Bases,* pages 77-79; Hands-On Activity 2, *Chemical Reaction Rates,* pages 81-83; Hands-On Activity 3, *Energy Conversion,* pages 85-87; Hands-On Activity 4, *Reducing Friction,* pages 89-91; Hands-On Activity 6, *Making Sound,* pages 97-99

Strand 7: Scientific Inquiry
1. Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking.
Concept B. Scientific inquiry relies upon gathering evidence from qualitative and quantitative observations.
e. Compare amounts/measurements.
Life Science Lab Teacher's Handbook: Hands-On Activity 4, *Your Cardiovascular System,* pages 89-91; Hands-On Activity 7, *The Effects of Acid Rain,* pages 101-103 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 1, *Identifying Minerals with the Mohs Scale,* pages 73-75; Hands-On Activity 3, *Interpreting a Topographic Map,* pages 81-83; Hands-On Activity 7, *Sizes in the Solar System,* pages 97-99; Hands-On Activity 8, *Temperature, Salinity, and Water Density,* pages 101-103 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 1, *Measuring pH of Acids and Bases,* pages 77-79; Hands-On Activity 2, *Chemical Reaction Rates,* pages 81-83; Hands-On Activity 3, *Energy Conversion,* pages 85-87; Hands-On Activity 4, *Reducing Friction,* pages 89-91; Hands-On Activity 6, *Making Sound,* pages 97-99

Strand 7: Scientific Inquiry
1. Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking.
Concept B. Scientific inquiry relies upon gathering evidence from qualitative and quantitative observations.
f. Judge whether measurements and computation of quantities are reasonable.
Life Science Lab Teacher's Handbook: Hands-On Activity 4, *Your Cardiovascular System,* pages 89-91; Hands-On Activity 7, *The Effects of Acid Rain,* pages 101-103 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 1, *Identifying Minerals with the Mohs Scale,* pages 73-75; Hands-On Activity 3, *Interpreting a Topographic Map,* pages 81-83; Hands-On Activity 7, *Sizes in the Solar System,* pages 97-99; Hands-On Activity 8, *Temperature, Salinity, and Water Density,* pages 101-103 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 1, *Measuring pH of Acids and Bases,* pages 77-79; Hands-On Activity 2, *Chemical Reaction Rates,* pages 81-83; Hands-On Activity 3, *Energy Conversion,* pages 85-87; Hands-On Activity 4, *Reducing Friction,* pages 89-91; Hands-On Activity 6, *Making Sound,* pages 97-99

Strand 7: Scientific Inquiry
1. Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking.
Concept B. Scientific inquiry relies upon gathering evidence from qualitative and quantitative observations.
g. Calculate the range and average/mean of a set of data.
Life Science Lab Teacher's Handbook: Hands-On Activity 2, *Culturing Bacteria,* pages 81-83; Hands-On Activity 4, *Your Cardiovascular System,* pages 89-91; Hands-On Activity 6, *How Much Does Energy Cost?,* pages 97-99 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 3, *Energy Conversion,* pages 85-87

Strand 7: Scientific Inquiry
1. Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking.
Concept C. Evidence is used to formulate explanations.
a. Use quantitative and qualitative data as support for reasonable explanations (conclusions).
Life Science Lab Teacher's Handbook: Hands-On Activity 3, *Investigating Arthropods,* pages 85-87; Hands-On Activity 4, *Your Cardiovascular System,* pages 89-91; Hands-On Activity 5, *Making Fossils,* pages 93-95; Hands-On Activity 6, *How Much Does Energy Cost?,* pages 97-99; Hands-On Activity 7, *The Effects of Acid Rain,* pages 101-103 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 1, *Identifying Minerals with the Mohs Scale,* pages 73-75; Hands-On Activity 3, *Interpreting a Topographic Map,* pages 81-83; Hands-On Activity 5, *What is in the Air?,* pages 89-91; Hands-On Activity 7, *Sizes in the Solar System,* pages 97-99; Hands-On Activity 8, *Temperature, Salinity, and Water Density,* pages 101-103 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 1, *Measuring pH of Acids and Bases,* pages 77-79; Hands-On Activity 2, *Chemical Reaction Rates,* pages 81-83; Hands-On Activity 3, *Energy Conversion,* pages 85-87; Hands-On Activity 4, *Reducing Friction,* pages 89-91; Hands-On Activity 6, *Making Sound,* pages 97-99 **Classroom Resource CD-ROM:** Writing Strategy 22, 24

Strand 7: Scientific Inquiry
1. Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking.
Concept C. Evidence is used to formulate explanations.
b. Use data as support for observed patterns and relationships, and to make predictions to be tested.
Life Science Lab Teacher's Handbook: Hands-On Activity 3, *Investigating Arthropods,* pages 85-87; Hands-On Activity 4, *Your Cardiovascular System,* pages 89-91; Hands-On Activity 5, *Making Fossils,* pages 93-95; Hands-On Activity 6, *How Much Does Energy Cost?,* pages 97-99; Hands-On Activity 7, *The Effects of Acid Rain,* pages 101-103 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 1, *Identifying Minerals with the Mohs Scale,* pages 73-75; Hands-On Activity 3, *Interpreting a Topographic Map,* pages 81-83; Hands-On Activity 5, *What is in the Air?,* pages 89-91; Hands-On Activity 7, *Sizes in the Solar System,* pages 97-99; Hands-On Activity 8, *Temperature, Salinity, and Water Density,* pages 101-103 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 1, *Measuring pH of Acids and Bases,* pages 77-79; Hands-On Activity 2, *Chemical Reaction Rates,* pages 81-83; Hands-On Activity 3, *Energy Conversion,* pages 85-87; Hands-On Activity 4, *Reducing Friction,* pages 89-91; Hands-On Activity 6, *Making Sound,* pages 97-99 **Classroom Resource CD-ROM:** Writing Strategy 22, 24

Strand 7: Scientific Inquiry
1. Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking.
Concept C. Evidence is used to formulate explanations.
c. Recognize the possible effects of errors in observations, measurements, and calculations on the formulation of explanations (conclusions).
Life Science Lab Teacher's Handbook: Hands-On Activity 1, *Examining Cells,* pages 77-79; Hands-On Activity 2, *Culturing Bacteria,* pages 81-83; Hands-On Activity 3, *Investigating Arthropods,* pages 85-87; Hands-On Activity 4, *Your Cardiovascular System,* pages 89-91; Hands-On Activity 5, *Making Fossils,* pages 93-95; Hands-On Activity 6, *How Much Does Energy Cost?,* pages 97-99; Hands-On Activity 7, *The Effects of Acid Rain,* pages 101-103 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 1, *Identifying Minerals with the Mohs Scale,* pages 73-75; Hands-On Activity 2, *Plate Boundaries in Action,* pages 77-79; Hands-On Activity 3, *Interpreting a Topographic Map,* pages 81-83; Hands-On Activity 4, *Using Sound Waves,* pages 85-87; Hands-On Activity 5, *What is in the Air?,* pages 89-91; Hands-On Activity 6, *Modeling a Tornado,* pages 93-95; Hands-On Activity 7, *Sizes in the Solar System,* pages 97-99; Hands-On Activity 8, *Temperature, Salinity, and Water Density,* pages 101-103 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 1, *Measuring pH of Acids and Bases,* pages 77-79; Hands-On Activity 2, *Chemical Reaction Rates,* pages 81-83; Hands-On Activity 3, *Energy Conversion,* pages 85-87; Hands-On Activity 4, *Reducing Friction,* pages 89-91; Hands-On Activity 5, *Making a Potato Battery,* pages 93-95; Hands-On Activity 6, *Making Sound,* pages 97-99

Strand 7: Scientific Inquiry
1. Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking.
Concept D. Scientific inquiry includes evaluation of explanations (hypotheses, laws, theories) in light of scientific principles (understandings).
a. Evaluate the reasonableness of an explanation (conclusion).
Life Science Lab Teacher's Handbook: Hands-On Activity 1, *Examining Cells,* pages 77-79; Hands-On Activity 2, *Culturing Bacteria,* pages 81-83; Hands-On Activity 3, *Investigating Arthropods,* pages 85-87; Hands-On Activity 4, *Your Cardiovascular System,* pages 89-91; Hands-On Activity 5, *Making Fossils,* pages 93-95; Hands-On Activity 6, *How Much Does Energy Cost?,* pages 97-99; Hands-On Activity 7, *The Effects of Acid Rain,* pages 101-103 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 1, *Identifying Minerals with the Mohs Scale,* pages 73-75; Hands-On Activity 2, *Plate Boundaries in Action,* pages 77-79; Hands-On Activity 3, *Interpreting a Topographic Map,* pages 81-83; Hands-On Activity 4, *Using Sound Waves,* pages 85-87; Hands-On Activity 5, *What is in the Air?,* pages 89-91; Hands-On Activity 6, *Modeling a Tornado,* pages 93-95; Hands-On Activity 7, *Sizes in the Solar System,* pages 97-99; Hands-On Activity 8, *Temperature, Salinity, and Water Density,* pages 101-103 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 1, *Measuring pH of Acids and Bases,* pages 77-79; Hands-On Activity 2, *Chemical Reaction Rates,* pages 81-83; Hands-On Activity 3, *Energy Conversion,* pages 85-87; Hands-On Activity 4, *Reducing Friction,* pages 89-91; Hands-On Activity 5, *Making a Potato Battery,* pages 93-95; Hands-On Activity 6, *Making Sound,* pages 97-99

Strand 7: Scientific Inquiry
1. Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking.
Concept D. Scientific inquiry includes evaluation of explanations (hypotheses, laws, theories) in light of scientific principles (understandings).
b. Analyze whether evidence (data) and scientific principles support proposed explanations (hypotheses, laws, theories).
Life Science Lab Teacher's Handbook: Hands-On Activity 1, *Examining Cells,* pages 77-79; Hands-On Activity 2, *Culturing Bacteria,* pages 81-83; Hands-On Activity 3, *Investigating Arthropods,* pages 85-87; Hands-On Activity 4, *Your Cardiovascular System,* pages 89-91; Hands-On Activity 5, *Making Fossils,* pages 93-95; Hands-On Activity 6, *How Much Does Energy Cost?,* pages 97-99; Hands-On Activity 7, *The Effects of Acid Rain,* pages 101-103 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 1, *Identifying Minerals with the Mohs Scale,* pages 73-75; Hands-On Activity 2, *Plate Boundaries in Action,* pages 77-79; Hands-On Activity 3, *Interpreting a Topographic Map,* pages 81-83; Hands-On Activity 4, *Using Sound Waves,* pages 85-87; Hands-On Activity 5, *What is in the Air?,* pages 89-91; Hands-On Activity 6, *Modeling a Tornado,* pages 93-95; Hands-On Activity 7, *Sizes in the Solar System,* pages 97-99; Hands-On Activity 8, *Temperature, Salinity, and Water Density,* pages 101-103 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 1, *Measuring pH of Acids and Bases,* pages 77-79; Hands-On Activity 2, *Chemical Reaction Rates,* pages 81-83; Hands-On Activity 3, *Energy Conversion,* pages 85-87; Hands-On Activity 4, *Reducing Friction,* pages 89-91; Hands-On Activity 5, *Making a Potato Battery,* pages 93-95; Hands-On Activity 6, *Making Sound,* pages 97-99

Strand 7: Scientific Inquiry
1. Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking.
Concept E. The nature of science relies upon communication of results and justification of explanations.
a. Communicate simple procedures and results of investigations and explanations through: • **Oral presentations** • **Drawings and maps** • **Data tables (allowing for the recording and analysis of data relevant to the experiment, such as independent and dependent variables, multiple trials, beginning and ending times or temperatures, derived quantities)** • **Graphs (bar, single line, pictograph)** • **Writings.**
Life Science Lab Teacher's Handbook: Hands-On Activity 1, *Examining Cells,* pages 77-79; Hands-On Activity 2, *Culturing Bacteria,* pages 81-83; Hands-On Activity 3, *Investigating Arthropods,* pages 85-87; Hands-On Activity 4, *Your Cardiovascular System,* pages 89-91; Hands-On Activity 5, *Making Fossils,* pages 93-95; Hands-On Activity 6, *How Much Does Energy Cost?,* pages 97-99; Hands-On Activity 7, *The Effects of Acid Rain,* pages 101-103 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 1, *Identifying Minerals with the Mohs Scale,* pages 73-75; Hands-On Activity 2, *Plate Boundaries in Action,* pages 77-79; Hands-On Activity 3, *Interpreting a Topographic Map,* pages 81-83; Hands-On Activity 4, *Using Sound Waves,* pages 85-87; Hands-On Activity 5, *What is in the Air?,* pages 89-91; Hands-On Activity 6, *Modeling a Tornado,* pages 93-95; Hands-On Activity 7, *Sizes in the Solar System,* pages 97-99; Hands-On Activity 8, *Temperature, Salinity, and Water Density,* pages 101-103 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 1, *Measuring pH of Acids and Bases,* pages 77-79; Hands-On Activity 2, *Chemical Reaction Rates,* pages 81-83; Hands-On Activity 3, *Energy Conversion,* pages 85-87; Hands-On Activity 4, *Reducing Friction,* pages 89-91; Hands-On Activity 5, *Making a Potato Battery,* pages 93-95; Hands-On Activity 6, *Making Sound,* pages 97-99 **Classroom Resource CD-ROM:** Writing Strategy 1-30

Strand 8: Impact of Science, Technology, and Human Activity
1. The nature of technology can advance, and is advanced by, science as it seeks to apply scientific knowledge in ways that meet human needs.
Concept A. Designed objects are used to do things better or more easily and to do some things that could not otherwise be done at all.
a. Explain how technological improvements, such as those developed for use in space exploration, the military, or medicine, have led to the invention of new products that may improve lives here on Earth (e.g., new materials, freeze-dried foods, infrared goggles, Velcro, satellite imagery, robotics, lasers).
Life Science Lab, Level A: Cards 49, 64, 69, 83 **Life Science Lab, Level B:** Cards 49, 64, 69, 83 **Earth Science Lab, Level A:** Cards 16, 20, 51, 54, 79, 80, 81, 88 **Earth Science Lab, Level B:** Cards 16, 20, 51, 54, 79, 80, 81, 88 **Physical Science Lab, Level A:** Cards 33, 35, 76, 81, 84, 90 **Physical Science Lab, Level B:** Cards 33, 35, 76, 81, 84, 90

Strand 8: Impact of Science, Technology, and Human Activity
1. The nature of technology can advance, and is advanced by, science as it seeks to apply scientific knowledge in ways that meet human needs.
Concept B. Advances in technology often result in improved data collection and an increase in scientific knowledge.
a. Identify the link between technological developments and the scientific discoveries made possible through their development (e.g., Hubble telescope and stellar evolution, composition and structure of the universe; the electron microscope and cell organelles; sonar and the composition of the Earth; manned and unmanned space missions and space exploration; Doppler radar and weather conditions; MRI and CAT-scans and brain activity).
Life Science Lab, Level A: Cards 5, 59, 64, 69, 83 **Life Science Lab, Level B:** Cards 5, 59, 64, 69, 83 **Earth Science Lab, Level A:** Cards 16, 20, 31, 37, 51, 54, 70, 79, 80, 81, 88 **Earth Science Lab, Level B:** Cards 16, 20, 31, 37, 51, 54, 70, 79, 80, 81, 88 **Physical Science Lab, Level A:** Cards 33, 35, 72, 73, 76, 81, 84, 90 **Physical Science Lab, Level B:** Cards 33, 35, 72, 73, 76, 81, 84, 90

Strand 8: Impact of Science, Technology, and Human Activity
1. The nature of technology can advance, and is advanced by, science as it seeks to apply scientific knowledge in ways that meet human needs.
Concept C. Technological solutions to problems often have drawbacks as well as benefits.
a. Describe how technological solutions to problems (e.g., storm water run-off, fiber optics, windmills, efficient car design, electronic trains without conductors, sonar, robotics, Hubble telescope) can have both benefits and drawbacks (e.g., design constraints, unintended consequences, risks).
Life Science Lab, Level A: Cards 49, 64, 69, 83, 87, 88, 89, 90 **Life Science Lab, Level B:** Cards 49, 64, 69, 83, 87, 88, 89, 90 **Earth Science Lab, Level A:** Cards 16, 20, 31, 51, 54, 70, 79, 80, 81, 88 **Earth Science Lab, Level B:** Cards 16, 20, 31, 51, 54, 70, 79, 80, 81, 88 **Physical Science Lab, Level A:** Cards 33, 35, 46, 47, 48, 49, 73, 76, 81, 84, 90 **Physical Science Lab, Level B:** Cards 33, 35, 46, 47, 48, 48, 73, 76, 81, 84, 90

Strand 8: Impact of Science, Technology, and Human Activity
2. Historical and cultural perspectives of scientific explanations help to improve understanding of the nature of science and how science knowledge and technology evolve over time.
Concept A. People of different gender and ethnicity have contributed to scientific discoveries and the invention of technological innovations.
a. Describe how the contributions of scientists and inventors, representing different cultures, races, and gender, have contributed to science, technology, and human activity (e.g., George Washington Carver, Thomas Edison, Thomas Jefferson, Isaac Newton, Marie Currie, Galileo, Albert Einstein, Mae Jemison, Edwin Hubble, Charles Darwin, Jonas Salk, Louis Pasteur, Jane Goodall, Tom Akers, John Wesley Powell, Rachel Carson).
Life Science Lab, Level A: Cards 2, 5, 46, 59 **Life Science Lab, Level B:** Cards 2, 5, 46, 59 **Earth Science Lab, Level A:** Cards 10, 68, 72, 78 **Earth Science Lab, Level B:** Cards 10, 68, 72, 78 **Physical Science Lab, Level A:** Cards 3, 7, 17, 55 **Physical Science Lab, Level B:** Cards 3, 7, 17, 55

Strand 8: Impact of Science, Technology, and Human Activity
2. Historical and cultural perspectives of scientific explanations help to improve understanding of the nature of science and how science knowledge and technology evolve over time.
Concept B. Scientific theories are developed based on the body of knowledge that exists at any particular time and must be rigorously questioned and tested for validity.
a. Recognize the difficulty science innovators experience as they attempt to break through accepted ideas (hypotheses, laws, theories) of their time to reach conclusions that may lead to changes in those ideas and serve to advance scientific understanding (e.g., Darwin, Copernicus, Newton).
This concept is not covered at this level.

Strand 8: Impact of Science, Technology, and Human Activity
2. Historical and cultural perspectives of scientific explanations help to improve understanding of the nature of science and how science knowledge and technology evolve over time.
Concept B. Scientific theories are developed based on the body of knowledge that exists at any particular time and must be rigorously questioned and tested for validity.
b. Recognize explanations have changed over time as a result of new evidence.
Life Science Lab, Level A: Cards 2, 5, 11, 45, 46, 49, 64, 69, 84, 86, 87, 88, 89, 90 **Life Science Lab, Level B:** Cards 2, 5, 11, 45, 46, 49, 64, 69, 84, 86, 87, 88, 89, 90 **Earth Science Lab, Level A:** Cards 10, 30, 31, 37, 51, 54, 68, 72, 78 **Earth Science Lab, Level B:** Cards 10, 30, 31, 37, 51, 54, 68, 72, 78 **Physical Science Lab, Level A:** Cards 3, 7, 17, 53, 59 **Physical Science Lab, Level B:** Cards 3, 7, 17, 53, 59

Strand 8: Impact of Science, Technology, and Human Activity
3. Science and technology affect, and are affected by society.
Concept B. Social, political, economic, ethical and environmental factors strongly influence, and are influenced by, the direction of progress of science and technology.
a. Describe ways in which science and society influence one another (e.g., scientific knowledge and the procedures used by scientists influence the way many individuals in society think about themselves, others, and the environment; societal challenges often inspire questions for scientific research; social priorities often influence research priorities through the availability of funding for research).
Life Science Lab, Level A: Cards 45, 46, 47, 49, 51, 53, 55, 57, 64, 69, 84, 85, 86, 87, 88, 89, 90 **Life Science Lab, Level B:** Cards 45, 46, 47, 49, 51, 53, 55, 57, 64, 69, 84, 85, 86, 87, 88, 89, 90 **Earth Science Lab, Level A:** Cards 20, 37, 42, 51, 54, 59, 60, 61, 70, 79, 80, 81, 85, 86, 88 **Earth Science Lab, Level B:** Cards 20, 37, 42, 51, 54, 59, 60, 61, 70, 79, 80, 81, 85, 86, 88 **Physical Science Lab, Level A:** Cards 33, 34, 35, 46, 47, 48, 49, 72, 73, 76, 81, 84, 90 **Physical Science Lab, Level B:** Cards 33, 34, 35, 46, 47, 48, 49, 72, 73, 76, 81, 84, 90

Strand 8: Impact of Science, Technology, and Human Activity
3. Science and technology affect, and are affected by society.
Concept B. Social, political, economic, ethical and environmental factors strongly influence, and are influenced by, the direction of progress of science and technology.
b. Identify and evaluate the physical, social, economic, and/or environmental problems that may be overcome using science and technology (e.g., the need for alternative fuels, human travel in space, AIDS).
Life Science Lab, Level A: Cards 84, 86, 87, 88, 89, 90 **Life Science Lab, Level B:** Cards 84, 86, 87, 88, 89, 90 **Life Science Lab Teacher's Handbook:** Hands-On Activity 7, *The Effects of Acid Rain*, pages 101-103 **Earth Science Lab, Level A:** Cards 37, 42, 59, 60, 61, 86 **Earth Science Lab, Level B:** Cards 37, 42, 59, 60, 61, 86 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 5, *What is in the Air?*, pages 89-91 **Physical Science Lab, Level A:** Card 49 **Physical Science Lab, Level B:** Card 49