SRA Life, Earth, and Physical Science Laboratories
correlation to
Virginia Science Standards of Learning
Life Science

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.

LS.1 The student will plan and conduct investigations in which:
a) data are organized into tables showing repeated trials and means.
Life Science Lab Teacher's Handbook: 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 5, *What is in the Air?,* pages 89-91; Hands-On Activity 7, *Sizes in the Solar System,* pages 97-99 **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 16, 22, 24

LS.1 The student will plan and conduct investigations in which:
b) variables are defined.
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 15, 23

LS.1 The student will plan and conduct investigations in which:
c) metric units (SI—International System of Units) are used.
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 **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

LS.1 The student will plan and conduct investigations in which:
d) models are constructed to illustrate and explain phenomena.
Life Science Lab Teacher's Handbook: 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 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 2, *Plate Boundaries in Action,* pages 77-79; Hands-On Activity 6, *Modeling a Tornado,* pages 93-95; Hands-On Activity 7, *Sizes in the Solar System,* pages 97-99 **Physical Science Lab Teacher's Handbook:** 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 20

LS.1 The student will plan and conduct investigations in which:
e) sources of experimental error are identified.
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

LS.1 The student will plan and conduct investigations in which:
f) dependent variables, independent variables, and constants are identified.
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 15, 23

LS.1 The student will plan and conduct investigations in which:
g) variables are controlled to test hypotheses, and trials are repeated.
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 15, 23

LS.1 The student will plan and conduct investigations in which:
h) continuous line graphs are constructed, interpreted, and used to make predictions.
This concept is not covered.

LS.1 The student will plan and conduct investigations in which:
i) interpretations from a set of data are evaluated and defended.
Life Science Lab Teacher's Handbook: Hands-On Activity 3, *Investigating Arthropods,* pages 85-87; 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 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 6, *Making Sound*, pages 97-99 **Classroom Resource CD-ROM:** Writing Strategy 22, 24

LS.1 The student will plan and conduct investigations in which:
j) an understanding of the nature of science is developed and reinforced.
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

LS.2 The student will investigate and understand that all living things are composed of cells. Key concepts include:
a) cell structure and organelles (cell membrane, cell wall, cytoplasm, vacuole, mitochondrion, endoplasmic reticulum, nucleus, and chloroplast).
Life Science Lab, Level A: Cards 6, 7, 8, 9, 10 **Life Science Lab, Level B:** Cards 6, 7, 8, 9, 10 **Life Science Lab Teacher's Handbook:** Hands-On Activity 1, *Examining Cells,* pages 77-79

LS.2 The student will investigate and understand that all living things are composed of cells. Key concepts include:
b) similarities and differences between plant and animal cells.
Life Science Lab, Level A: Cards 6, 7, 9 **Life Science Lab, Level B:** Cards 6, 7, 9 **Life Science Lab Teacher's Handbook:** Hands-On Activity 1, *Examining Cells,* pages 77-79

LS.2 The student will investigate and understand that all living things are composed of cells. Key concepts include:
c) development of cell theory.
Life Science Lab, Level A: Card 5 **Life Science Lab, Level B:** Card 5

LS.2 The student will investigate and understand that all living things are composed of cells. Key concepts include:
d) cell division (mitosis and meiosis).
Life Science Lab, Level A: Cards 10, 60, 61 **Life Science Lab, Level B:** Cards 10, 60, 61

LS.3 The student will investigate and understand that living things show patterns of cellular organization. Key concepts include:
a) cells, tissues, organs, and systems.
Life Science Lab, Level A: Card 44 **Life Science Lab, Level B:** Card 44

LS.3 The student will investigate and understand that living things show patterns of cellular organization. Key concepts include:
b) life functions and processes of cells, tissues, organs, and systems (respiration, removal of wastes, growth, reproduction, digestion, and cellular transport).
Life Science Lab, Level A: Cards 8, 9, 10, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58 **Life Science Lab, Level B:** Cards 8, 9, 10, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58 **Life Science Lab Teacher's Handbook:** Hands-On Activity 4, *Your Cardiovascular System*, pages 89-91

LS.4 The student will investigate and understand that the basic needs of organisms must be met in order to carry out life processes. Key concepts include:
a) plant needs (light, water, gases, and nutrients).
Life Science Lab, Level A: Cards 16, 17, 20, 21, 22, 23, 24 **Life Science Lab, Level B:** Cards 16, 17, 20, 21, 22, 23, 24

LS.4 The student will investigate and understand that the basic needs of organisms must be met in order to carry out life processes. Key concepts include:
b) animal needs (food, water, gases, shelter, space).
Life Science Lab, Level A: Cards 25, 40, 41, 43, 45, 46 **Life Science Lab, Level B:** Cards 25, 40, 41, 43, 45, 46

LS.4 The student will investigate and understand that the basic needs of organisms must be met in order to carry out life processes. Key concepts include:
c) factors that influence life processes.
Life Science Lab, Level A: Cards 1, 2, 3, 24, 41, 42, 45, 46, 62, 65, 66, 70, 71, 72, 73, 74, 75, 76, 77, 80, 83, 84, 86, 87, 88, 89, 90 **Life Science Lab, Level B:** Cards 1, 2, 3, 24, 41, 42, 45, 46, 62, 65, 66, 70, 71, 72, 73, 74, 75, 76, 77, 80, 83, 84, 86, 87, 88, 89, 90 **Life Science Lab Teacher's Handbook:** Hands-On Activity 3, *Investigating Arthropods*, pages 85-87; Hands-On Activity 6, *How Much Does Energy Cost?*, pages 97-99; Hands-On Activity 7, *The Effects of Acid Rain*, pages 101-103

LS.5 The student will investigate and understand how organisms can be classified. Key concepts include:
a) the distinguishing characteristics of kingdoms of organisms.
Life Science Lab, Level A: Cards 2, 3 **Life Science Lab, Level B:** Cards 2, 3

LS.5 The student will investigate and understand how organisms can be classified. Key concepts include:
b) the distinguishing characteristics of major animal and plant phyla.
Life Science Lab, Level A: Cards 16, 18, 19, 20, 21, 22, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40 **Life Science Lab, Level B:** Cards 16, 18, 19, 20, 21, 22, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40 **Life Science Lab Teacher's Handbook:** Hands-On Activity 3, *Investigating Arthropods*, pages 85-87

LS.5 The student will investigate and understand how organisms can be classified. Key concepts include:
c) the characteristics of the species.
Life Science Lab, Level A: Cards 16, 18, 19, 20, 21, 22, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40 **Life Science Lab, Level B:** Cards 16, 18, 19, 20, 21, 22, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40 **Life Science Lab Teacher's Handbook:** Hands-On Activity 3, *Investigating Arthropods*, pages 85-87

LS.6 The student will investigate and understand the basic physical and chemical processes of photosynthesis and its importance to plant and animal life. Key concepts include:
a) energy transfer between sunlight and chlorophyll.
Life Science Lab, Level A: Cards 7, 9, 16, 17, 76 **Life Science Lab, Level B:** Cards 7, 9, 16, 17, 76

LS.6 The student will investigate and understand the basic physical and chemical processes of photosynthesis and its importance to plant and animal life. Key concepts include:
b) transformation of water and carbon dioxide into sugar and oxygen.
Life Science Lab, Level A: Cards 16, 17 **Life Science Lab, Level B:** Cards 16, 17

LS.6 The student will investigate and understand the basic physical and chemical processes of photosynthesis and its importance to plant and animal life. Key concepts include:
c) photosynthesis as the foundation of virtually all 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

LS.7 The student will investigate and understand that organisms within an ecosystem are dependent on one another and on nonliving components of the environment. Key concepts include:
a) the carbon, water, and nitrogen cycles.
Life Science Lab, Level A: Cards 78, 79 **Life Science Lab, Level B:** Cards 78, 79 **Earth Science Lab, Level A:** Card 47 **Earth Science Lab, Level B:** Card 47

LS.7 The student will investigate and understand that organisms within an ecosystem are dependent on one another and on nonliving components of the environment. Key concepts include:
b) interactions resulting in a flow of energy and matter throughout the system.
Life Science Lab, Level A: Cards 45, 46, 72, 73, 74, 75, 76, 77, 78, 79, 80 **Life Science Lab, Level B:** Cards 45, 46, 72, 73, 74, 75, 76, 77, 78, 79, 80 **Life Science Lab Teacher's Handbook:** Hands-On Activity 6, *How Much Does Energy Cost?,* pages 97-99 **Earth Science Lab, Level A:** Cards 23, 38, 47, 49, 52, 53, 54, 56, 57, 61, 89 **Earth Science Lab, Level B:** Cards 23, 38, 47, 49, 52, 53, 54, 56, 57, 61, 89

LS.7 The student will investigate and understand that organisms within an ecosystem are dependent on one another and on nonliving components of the environment. Key concepts include:
c) complex relationships within terrestrial, freshwater, and marine ecosystems.
Life Science Lab, Level A: Cards 71, 72, 73, 74, 75, 76, 77, 80, 81, 82, 86 **Life Science Lab, Level B:** Cards 71, 72, 73, 74, 75, 76, 77, 80, 81, 82, 86 **Life Science Lab Teacher's Handbook:** Hands-On Activity 6, *How Much Does Energy Cost?,* pages 97-99 **Earth Science Lab, Level A:** Card 89 **Earth Science Lab, Level B:** Card 89

LS.7 The student will investigate and understand that organisms within an ecosystem are dependent on one another and on nonliving components of the environment. Key concepts include:
d) energy flow in food webs and energy pyramids.
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

LS.8 The student will investigate and understand that interactions exist among members of a population. Key concepts include:
a) competition, cooperation, social hierarchy, territorial imperative.
Life Science Lab, Level A: Cards 71, 72, 73, 74, 75, 76, 77, 80 **Life Science Lab, Level B:** Cards 71, 72, 73, 74, 75, 76, 77, 80

LS.8 The student will investigate and understand that interactions exist among members of a population. Key concepts include:
b) influence of behavior on a population.
Life Science Lab, Level A: Cards 24, 43, 83 **Life Science Lab, Level B:** Cards 24, 43, 83

LS.9 The student will investigate and understand interactions among populations in a biological community. Key concepts include:
a) the relationships among producers, consumers, and decomposers in 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

LS.9 The student will investigate and understand interactions among populations in a biological community. Key concepts include:
b) the relationships between predators and prey.
Life Science Lab, Level A: Cards 73, 76, 77 **Life Science Lab, Level B:** Cards 73, 76, 77 **Life Science Lab Teacher's Handbook:** Hands-On Activity 6, *How Much Does Energy Cost?,* pages 97-99

LS.9 The student will investigate and understand interactions among populations in a biological community. Key concepts include:
c) competition and cooperation.
Life Science Lab, Level A: Cards 74, 75 **Life Science Lab, Level B:** Cards 74, 75

LS.9 The student will investigate and understand interactions among populations in a biological community. Key concepts include:
d) symbiotic relationships.
Life Science Lab, Level A: Card 74 **Life Science Lab, Level B:** Card 74

LS.9 The student will investigate and understand interactions among populations in a biological community. Key concepts include:
e) niches.
Life Science Lab, Level A: Cards 70, 71, 74, 75 **Life Science Lab, Level B:** Cards 70, 71, 74, 75

LS.10 The student will investigate and understand how organisms adapt to biotic and abiotic factors in an ecosystem. Key concepts include:
a) differences between ecosystems and biomes.
Life Science Lab, Level A: Cards 71, 72, 81, 82 **Life Science Lab, Level B:** Cards 71, 72, 81, 82

LS.10 The student will investigate and understand how organisms adapt to biotic and abiotic factors in an ecosystem. Key concepts include:
b) characteristics of land, marine, and freshwater ecosystems.
Life Science Lab, Level A: Cards 81, 82 **Life Science Lab, Level B:** Cards 81, 82 **Earth Science Lab, Level A:** Card 89 **Earth Science Lab, Level B:** Card 89

LS.10 The student will investigate and understand how organisms adapt to biotic and abiotic factors in an ecosystem. Key concepts include:
c) adaptations that enable organisms to survive within a specific ecosystem.
Life Science Lab, Level A: Cards 23, 24, 41, 43, 65, 66 **Life Science Lab, Level B:** Cards 23, 24, 41, 43, 65, 66

LS.11 The student will investigate and understand that ecosystems, communities, populations, and organisms are dynamic and change over time (daily, seasonal, and long term). Key concepts include:
a) phototropism, hibernation, and dormancy.
Life Science Lab, Level A: Cards 24, 43 **Life Science Lab, Level B:** Cards 24, 43

LS.11 The student will investigate and understand that ecosystems, communities, populations, and organisms are dynamic and change over time (daily, seasonal, and long term). Key concepts include:
b) factors that increase or decrease population size.
Life Science Lab, Level A: Cards 71, 72, 73, 76, 77 **Life Science Lab, Level B:** Cards 71, 72, 73, 76, 77

LS.11 The student will investigate and understand that ecosystems, communities, populations, and organisms are dynamic and change over time (daily, seasonal, and long term). Key concepts include:
c) eutrophication, climate changes, and catastrophic disturbances.
Life Science Lab, Level A: Cards 67, 84, 86, 87, 88, 89, 90 **Life Science Lab, Level B:** Cards 67, 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 15, 17, 37, 42, 52, 53, 54, 59, 60, 61, 86 **Earth Science Lab, Level B:** Cards 15, 17, 37, 42, 52, 53, 54, 59, 60, 61, 86

LS.12 The student will investigate and understand the relationships between ecosystem dynamics and human activity. Key concepts include:
a) food production and harvest.
This concept is not covered.

LS.12 The student will investigate and understand the relationships between ecosystem dynamics and human activity. Key concepts include:
b) change in habitat size, quality, or structure.
Life Science Lab, Level A: Cards 70, 71, 72, 73, 74, 75, 87, 88, 89, 90 **Life Science Lab, Level B:** Cards 70, 71, 72, 73, 74, 75, 87, 88, 89, 90 **Life Science Lab Teacher's Handbook:** Hands-On Activity 7, *The Effects of Acid Rain,* pages 101-103

LS.12 The student will investigate and understand the relationships between ecosystem dynamics and human activity. Key concepts include:
c) change in species competition.
Life Science Lab, Level A: Cards 72, 73, 74, 75, 86 **Life Science Lab, Level B:** Cards 72, 73, 74, 75, 86

LS.12 The student will investigate and understand the relationships between ecosystem dynamics and human activity. Key concepts include:
d) population disturbances and factors that threaten or enhance species survival.
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, 16, 17, 35, 37, 42, 52, 53, 54 **Earth Science Lab, Level B:** Cards 15, 16, 17, 35, 37, 42, 52, 53, 54 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 5, *What is in the Air?,* pages 89-91

LS.12 The student will investigate and understand the relationships between ecosystem dynamics and human activity. Key concepts include:
e) environmental issues (water supply, air quality, energy production, and waste management).
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 35, 37, 42, 59, 60, 61, 85, 86 **Earth Science Lab, Level B:** Cards 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

LS.13 The student will investigate and understand that organisms reproduce and transmit genetic information to new generations. Key concepts include:
a) the role of DNA.
Life Science Lab, Level A: Cards 62, 63, 64, 65 **Life Science Lab, Level B:** Cards 62, 63, 64, 65

LS.13 The student will investigate and understand that organisms reproduce and transmit genetic information to new generations. Key concepts include:
b) the function of genes and chromosomes.
Life Science Lab, Level A: Cards 62, 63, 64 **Life Science Lab, Level B:** Cards 62, 63, 64

LS.13 The student will investigate and understand that organisms reproduce and transmit genetic information to new generations. Key concepts include:
c) genotypes and phenotypes.
Life Science Lab, Level A: Card 63 **Life Science Lab, Level B:** Card 63

LS.13 The student will investigate and understand that organisms reproduce and transmit genetic information to new generations. Key concepts include:
d) factors affecting the expression of traits.
Life Science Lab, Level A: Cards 62, 63, 64 **Life Science Lab, Level B:** Cards 62, 63, 64

LS.13 The student will investigate and understand that organisms reproduce and transmit genetic information to new generations. Key concepts include:
e) characteristics that can and cannot be inherited.
Life Science Lab, Level A: Cards 23, 24, 41, 43, 62, 63, 64, 65, 66 **Life Science Lab, Level B:** Cards 23, 24, 41, 43, 62, 63, 64, 65, 66

LS.13 The student will investigate and understand that organisms reproduce and transmit genetic information to new generations. Key concepts include:
f) genetic engineering and its applications.
Life Science Lab, Level A: Cards 65, 69 **Life Science Lab, Level B:** Cards 65, 69

LS.13 The student will investigate and understand that organisms reproduce and transmit genetic information to new generations. Key concepts include:
g) historical contributions and significance of discoveries related to genetics.
Life Science Lab, Level A: Cards 64, 69 **Life Science Lab, Level B:** Cards 64, 69

LS.14 The student will investigate and understand that organisms change over time. Key concepts include:
a) the relationships of mutation, adaptation, natural selection, and extinction.
Life Science Lab, Level A: Cards 64, 65, 66, 67 **Life Science Lab, Level B:** Cards 64, 65, 66, 67

LS.14 The student will investigate and understand that organisms change over time. Key concepts include:
b) evidence of evolution of different species in the fossil record.
Life Science Lab, Level A: Cards 66, 67, 68 **Life Science Lab, Level B:** Cards 66, 67, 68

LS.14 The student will investigate and understand that organisms change over time. Key concepts include:
c) how environmental influences, as well as genetic variation, can lead to diversity of organisms.
Life Science Lab, Level A: Cards 65, 66, 67, 68, 86 **Life Science Lab, Level B:** Cards 65, 66, 67, 68, 86

SRA Life, Earth, and Physical Science Laboratories
correlation to
Virginia Science Standards of Learning
Earth Science

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.

ES.1 The student will plan and conduct investigations in which:
a) volume, area, mass, elapsed time, direction, temperature, pressure, distance, density, and changes in elevation/depth are calculated utilizing the most appropriate tools.
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 **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

ES.1 The student will plan and conduct investigations in which:
b) technologies including computers, probe ware, and global positioning systems (GPS), are used to collect, analyze, and report data and to demonstrate concepts and simulate experimental conditions.
Life Science Lab Teacher's Handbook: Hands-On Activity 2, *Culturing Bacteria*, pages 81-83 **Classroom Resource CD-ROM:** Writing Strategy 9, 12, 25

ES.1 The student will plan and conduct investigations in which:
c) scales, diagrams, maps, charts, graphs, tables, and profiles are constructed and interpreted.
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 16, 20, 21, 24, 26, 27, 39

ES.1 The student will plan and conduct investigations in which:

d) variables are manipulated with repeated trials.

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 15, 23

ES.1 The student will plan and conduct investigations in which:

e) a scientific viewpoint is constructed and defended (the nature of science).

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

ES.2 The student will demonstrate scientific reasoning and logic by:

a) analyzing how science explains and predicts the interactions and dynamics of complex Earth Systems.

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

ES.2 The student will demonstrate scientific reasoning and logic by:

b) recognizing that evidence is required to evaluate hypotheses and 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

ES.2 The student will demonstrate scientific reasoning and logic by:

c) comparing different scientific explanations for a set of observations about the Earth.

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

ES.2 The student will demonstrate scientific reasoning and logic by:

d) explaining that observation and logic are essential for reaching a 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

Classroom Resource CD-ROM: Writing Strategy 5, 11, 14, 17, 18

ES.2 The student will demonstrate scientific reasoning and logic by:
e) evaluating evidence for scientific 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

ES.3 The student will investigate and understand how to read and interpret maps, globes, models, charts, and imagery. Key concepts include:
a) maps (bathymetric, geologic, topographic, and weather).
Earth Science Lab, Level A: Cards 19, 20 **Earth Science Lab, Level B:** Cards 19, 20 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 3, *Interpreting a Topographic Map,* pages 81-83

ES.3 The student will investigate and understand how to read and interpret maps, globes, models, charts, and imagery. Key concepts include:
b) imagery (aerial photography and satellite images).
Earth Science Lab, Level A: Cards 19, 20 **Earth Science Lab, Level B:** Cards 19, 20 **Physical Science Lab, Level A:** Card 84 **Physical Science Lab, Level B:** Card 84

ES.3 The student will investigate and understand how to read and interpret maps, globes, models, charts, and imagery. Key concepts include:
c) direction and measurements of distance on any map or globe.
Earth Science Lab, Level A: Cards 18, 19, 20 **Earth Science Lab, Level B:** Cards 18, 19, 20

ES.3 The student will investigate and understand how to read and interpret maps, globes, models, charts, and imagery. Key concepts include:
d) location by latitude and longitude and topographic profiles.
Earth Science Lab, Level A: Cards 18, 19, 20 **Earth Science Lab, Level B:** Cards 18, 19, 20

ES.4 The student will investigate and understand the characteristics of the Earth and the solar system. Key concepts include:
a) position of the Earth in the solar system.
Earth Science Lab, Level A: Cards 68, 69, 71 **Earth Science Lab, Level B:** Cards 68, 69, 71 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 7, *Sizes in the Solar System,* pages 97-99

ES.4 The student will investigate and understand the characteristics of the Earth and the solar system. Key concepts include:
b) Sun-Earth-Moon relationships (seasons, tides, eclipses).
Earth Science Lab, Level A: Cards 62, 64, 65, 66 **Earth Science Lab, Level B:** Cards 62, 64, 65, 66

ES.4 The student will investigate and understand the characteristics of the Earth and the solar system. Key concepts include:
c) characteristics of the sun, planets and their moons, comets, meteors, and asteroids.
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

ES.4 The student will investigate and understand the characteristics of the Earth and the solar system. Key concepts include:
d) the history and contributions of the space program.
Earth Science Lab, Level A: Cards 79, 80, 81 **Earth Science Lab, Level B:** Cards 79, 80, 81

ES.5 The student will investigate and understand how to identify major rock-forming and ore minerals based on physical and chemical properties.
a) hardness, color and streak, luster, cleavage, fracture, and unique properties.
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

ES.5 The student will investigate and understand how to identify major rock-forming and ore minerals based on physical and chemical properties.
b) uses 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

ES.6 The student will investigate and understand the rock cycle as it relates to the origin and transformation of rock types and how t identify common rock types based on mineral composition and textures. Key concepts include:
a) igneous (intrusive and extrusive) rocks.
Earth Science Lab, Level A: Cards 6, 9 **Earth Science Lab, Level B:** Cards 6, 9

ES.6 The student will investigate and understand the rock cycle as it relates to the origin and transformation of rock types and how t identify common rock types based on mineral composition and textures. Key concepts include:
b) sedimentary (clastic and chemical) rocks.
Earth Science Lab, Level A: Cards 7, 9 **Earth Science Lab, Level B:** Cards 7, 9

ES.6 The student will investigate and understand the rock cycle as it relates to the origin and transformation of rock types and how t identify common rock types based on mineral composition and textures. Key concepts include:
c) metamorphic (foliated and unfoliated) rocks.
Earth Science Lab, Level A: Cards 8, 9 **Earth Science Lab, Level B:** Cards 8, 9

ES.7 The student will investigate and understand the differences between renewable and nonrenewable resources. Key concepts include:
a) fossil fuels, minerals, rocks, water, and vegetation.
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 **Earth Science Lab, Level A:** Cards 3, 4, 5, 6, 7, 8, 29, 35, 85, 86, 90 **Earth Science Lab, Level B:** Cards 3, 4, 5, 6, 7, 8, 29, 35, 85, 86, 90 **Physical Science Lab, Level A:** Cards 48, 49 **Physical Science Lab, Level B:** Cards 48, 49

ES.7 The student will investigate and understand the differences between renewable and nonrenewable resources. Key concepts include:
b) advantages and disadvantages of various energy sources.
Life Science Lab, Level A: Cards 84, 89, 90 **Life Science Lab, Level B:** Cards 84, 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 35, 42, 59, 60, 61, 86 **Earth Science Lab, Level B:** Cards 35, 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:** Cards 34, 45, 46, 47, 48, 49 **Physical Science Lab, Level B:** Cards 34, 45, 46, 47, 48

ES.7 The student will investigate and understand the differences between renewable and nonrenewable resources. Key concepts include:
c) resources found in Virginia.
Life Science Lab, Level A: Cards 84, 85, 87, 90 **Life Science Lab, Level B:** Cards 84, 85, 87, 90 **Earth Science Lab, Level A:** Cards 35, 85, 86, 90 **Earth Science Lab, Level B:** Cards 35, 85, 86, 90 **Physical Science Lab, Level A:** Cards 46, 47, 48, 49 **Physical Science Lab, Level B:** Cards 46, 47, 48, 49

ES.7 The student will investigate and understand the differences between renewable and nonrenewable resources. Key concepts include:
d) making informed judgments related to resource use and its effects on Earth systems.
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 35, 37, 42, 59, 60, 61, 85, 86, 90 **Earth Science Lab, Level B:** Cards 35, 37, 42, 59, 60, 61, 85, 86, 90 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 5, *What is in the Air?*, pages 89-91 **Physical Science Lab, Level A:** Cards 34, 38, 45, 46, 47, 48, 49 **Physical Science Lab, Level B:** Cards 34, 38, 45, 46, 47, 48, 49

ES.7 The student will investigate and understand the differences between renewable and nonrenewable resources. Key concepts include:
e) environmental costs and benefits.
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 35, 37, 42, 59, 60, 61, 85, 86, 90 **Earth Science Lab, Level B:** Cards 35, 37, 42, 59, 60, 61, 85, 86, 90 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 5, *What is in the Air?*, pages 89-91 **Physical Science Lab, Level A:** Cards 34, 38, 45, 46, 47, 48, 49 **Physical Science Lab, Level B:** Cards 34, 38, 45, 46, 47, 48, 49

ES.8 The student will investigate and understand geologic processes including plate tectonics. Key concepts include:
a) how geologic processes are evidenced in the physiographic providences of Virginia including the Coastal Plain, Piedmont, Blue Ridge, Valley and Ridge, and Appalachian Plateau.
Earth Science Lab, Level A: Cards 12, 13, 14, 15, 16, 21, 22, 23, 24, 25, 26, 27, 28 **Earth Science Lab, Level B:** Cards 12, 13, 14, 15, 16, 21, 22, 23, 24, 25, 26, 27, 28 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 2, *Plate Boundaries in Action*, pages 77-79

ES.8 The student will investigate and understand geologic processes including plate tectonics. Key concepts include:
b) processes (faulting, folding, volcanism, metamorphism, weathering, erosion, deposition, and sedimentation) and their resulting features.
Earth Science Lab, Level A: Cards 14, 15, 16, 17, 22, 23, 28 **Earth Science Lab, Level B:** Cards 14, 15, 16, 17, 22, 24, 28

ES.8 The student will investigate and understand geologic processes including plate tectonics. Key concepts include:
c) tectonic processes (subduction, rifting and sea floor spreading, and continental collision).
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

ES.9 The student will investigate and understand how freshwater resources are influenced by geologic processes and the activities of humans. Key concepts include:
a) processes of soil development.
Earth Science Lab, Level A: Cards 23, 29 **Earth Science Lab, Level B:** Cards 23, 29

ES.9 The student will investigate and understand how freshwater resources are influenced by geologic processes and the activities of humans. Key concepts include:
b) development of karst topography.
Earth Science Lab, Level A: Cards 18, 19, 20, 21 **Earth Science Lab, Level B:** Cards 18, 19, 20, 21 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 3, *Interpreting a Topographic Map*, pages 81-83

ES.9 The student will investigate and understand how freshwater resources are influenced by geologic processes and the activities of humans. Key concepts include:
c) identification of groundwater zones including the water table, zone of saturation, and zone of aeration.
Life Science Lab, Level A: Cards 82, 83, 84 **Life Science Lab, Level B:** Cards 82, 83, 84

ES.9 The student will investigate and understand how freshwater resources are influenced by geologic processes and the activities of humans. Key concepts include:
d) identification of other sources of fresh water including rivers, springs, and aquifers, with reference to the hydrologic cycle.
Earth Science Lab, Level A: Cards 47, 82, 83, 84 **Earth Science Lab, Level B:** Cards 47, 82, 83, 84

ES.9 The student will investigate and understand how freshwater resources are influenced by geologic processes and the activities of humans. Key concepts include:
e) dependence on freshwater resources and the effects of human usage on water quality.
Life Science Lab, Level A: Card 90 **Life Science Lab, Level B:** Card 90 **Earth Science Lab, Level A:** Cards 82, 84, 85, 86 **Earth Science Lab, Level B:** Cards 82, 84, 85, 86

ES.9 The student will investigate and understand how freshwater resources are influenced by geologic processes and the activities of humans. Key concepts include:
f) identification of the major watershed systems in Virginia including the Chesapeake Bay and its tributaries.
Earth Science Lab, Level A: Cards 82, 83, 84 **Earth Science Lab, Level B:** Cards 82, 83, 84

ES.10 The student will investigate and understand that many aspects of the history and evolution of the Earth and life can be inferred by studying rocks and fossils. Key concepts include:
a) traces and remains of ancient, often extinct, life are preserved by various means in many sedimentary rocks.
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, 35 **Earth Science Lab, Level B:** Cards 33, 34, 35

ES.10 The student will investigate and understand that many aspects of the history and evolution of the Earth and life can be inferred by studying rocks and fossils. Key concepts include:
b) superposition, cross-cutting relationships, index fossils, and radioactive decay are methods of dating bodies of rock.
Earth Science Lab, Level A: Cards 30, 31, 32, 34 **Earth Science Lab, Level B:** Cards 30, 31, 32, 34

ES.10 The student will investigate and understand that many aspects of the history and evolution of the Earth and life can be inferred by studying rocks and fossils. Key concepts include:
c) absolute and relative dating have different applications but can be used together to determine the age of rocks and structures.
Earth Science Lab, Level A: Cards 30, 31 **Earth Science Lab, Level B:** Cards 30, 31

ES.10 The student will investigate and understand that many aspects of the history and evolution of the Earth and life can be inferred by studying rocks and fossils. Key concepts include:
d) rocks and fossils from many different geologic periods and epochs are found in Virginia.
Earth Science Lab, Level A: Cards 6, 7, 8, 9, 32, 33 **Earth Science Lab, Level B:** Cards 6, 7, 8, 9, 32, 33

ES.11 The student will investigate and understand that oceans are complex, interactive physical, chemical, and biological systems and are subject to long—and short-term variations. Key concepts include:
a) physical and chemical changes (tides, waves, currents, sea level and ice cap variations, upwelling, and salinity variations).
Earth Science Lab, Level A: Cards 26, 54, 59, 60, 61, 66, 87, 90 **Earth Science Lab, Level B:** Cards 26, 54, 59, 60, 61, 66, 87, 80 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 8, *Temperature, Salinity, and Water Density*, pages 101-103

ES.11 The student will investigate and understand that oceans are complex, interactive physical, chemical, and biological systems and are subject to long—and short-term variations. Key concepts include:
b) importance of environmental and geologic implications.
Earth Science Lab, Level A: Cards 26, 38, 40, 41, 47, 54, 57, 58, 59, 60, 61, 87, 88, 89, 90 **Earth Science Lab, Level B:** Cards 26, 38, 40, 41, 47, 54, 57, 58, 59, 60, 61, 87, 88, 89, 90 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 8, *Temperature, Salinity, and Water Density*, pages 101-103

ES.11 The student will investigate and understand that oceans are complex, interactive physical, chemical, and biological systems and are subject to long—and short-term variations. Key concepts include:
c) systems interacts (density differences, energy transfer, weather, and climate).
Earth Science Lab, Level A: Cards 26, 38, 40, 41, 47, 54, 57, 58, 59, 60, 61, 66, 87, 88, 89, 90 **Earth Science Lab, Level B:** Cards 26, 38, 40, 41, 47, 54, 57, 58, 59, 60, 61, 66, 87, 88, 89, 90 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 8, *Temperature, Salinity, and Water Density*, pages 101-103

ES.11 The student will investigate and understand that oceans are complex, interactive physical, chemical, and biological systems and are subject to long—and short-term variations. Key concepts include:
d) features of the sea floor (continental margins, trenches, mid-ocean ridges, and abyssal plains) as reflections of tectonic processes.
Earth Science Lab, Level A: Cards 12, 88 **Earth Science Lab, Level B:** Cards 12, 88

ES.11 The student will investigate and understand that oceans are complex, interactive physical, chemical, and biological systems and are subject to long—and short-term variations. Key concepts include:
e) economic and public policy issues concerning the oceans and the coastal zone including the Chesapeake Bay.
Life Science Lab, Level A: Card 90 **Life Science Lab, Level B:** Card 90 **Earth Science Lab, Level A:** Cards 85, 86, 90 **Earth Science Lab, Level B:** Cards 85, 86, 90

ES.12 The student will investigate and understand the origin and evolution of the atmosphere and the interrelationships of geologic processes, biologic processes, and human activities on its composition and dynamics. Key concepts include:
a) scientific evidence for atmospheric changes over geologic time.
Life Science Lab, Level A: Card 89 **Life Science Lab, Level B:** Card 89 **Earth Science Lab, Level A:** Cards 36, 37, 38, 60 **Earth Science Lab, Level B:** Cards 36, 37, 38, 60

ES.12 The student will investigate and understand the origin and evolution of the atmosphere and the interrelationships of geologic processes, biologic processes, and human activities on its composition and dynamics. Key concepts include:
b) current theories related to the effects of early life on the chemical makeup of the atmosphere.
Earth Science Lab, Level A: Card 36 **Earth Science Lab, Level B:** Card 36

ES.12 The student will investigate and understand the origin and evolution of the atmosphere and the interrelationships of geologic processes, biologic processes, and human activities on its composition and dynamics. Key concepts include:
c) comparison of the Earth's atmosphere to that of other planets.
Earth Science Lab, Level A: Cards 36, 37, 69, 70, 71 **Earth Science Lab, Level B:** Cards 36, 37, 69, 70, 71

ES.12 The student will investigate and understand the origin and evolution of the atmosphere and the interrelationships of geologic processes, biologic processes, and human activities on its composition and dynamics. Key concepts include:
d) atmospheric regulation mechanisms including the effects of density differences and energy transfer.
Earth Science Lab, Level A: Cards 36, 37, 38, 39, 40, 41, 42, 59 **Earth Science Lab, Level B:** Cards 36, 37, 38, 39, 40, 41, 42, 59 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 5, *What is in the Air?,* pages 89-91

ES.12 The student will investigate and understand the origin and evolution of the atmosphere and the interrelationships of geologic processes, biologic processes, and human activities on its composition and dynamics. Key concepts include:
e) potential atmospheric compositional changes due to human, biologic, and geologic activity.
Life Science Lab, Level A: Card 89 **Life Science Lab, Level B:** Card 89 **Earth Science Lab, Level A:** Cards 17, 37, 42, 59, 60, 61 **Earth Science Lab, Level B:** Cards 17, 37, 42, 59, 60, 61 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 5, *What is in the Air?,* pages 89-91

ES.13 The student will investigate and understand that energy transfer between the sun and the Earth and its atmosphere drives weather and climate on Earth. Key concepts include:
a) observation and collection of weather data.
Earth Science Lab, Level A: Cards 39, 40, 41, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61 **Earth Science Lab, Level B:** Cards 39, 40, 41, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 6, *Modeling a Tornado,* pages 93-95

ES.13 The student will investigate and understand that energy transfer between the sun and the Earth and its atmosphere drives weather and climate on Earth. Key concepts include:
b) prediction of weather patterns.
Earth Science Lab, Level A: Cards 48, 50, 51, 52, 53, 54, 55, 56, 57, 58 **Earth Science Lab, Level B:** Cards 48, 50, 51, 52, 53, 54, 55, 56, 57, 58

ES.13 The student will investigate and understand that energy transfer between the sun and the Earth and its atmosphere drives weather and climate on Earth. Key concepts include:
c) severe weather occurrences, such as tornadoes, hurricanes, and major storms.
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

ES.13 The student will investigate and understand that energy transfer between the sun and the Earth and its atmosphere drives weather and climate on Earth. Key concepts include:
d) weather phenomena and the factors that affect climate including radiation and convection.
Earth Science Lab, Level A: Cards 55, 56, 57, 58, 59, 60, 61 **Earth Science Lab, Level B:** Cards 55, 56, 57, 58, 59, 60, 61

ES.14 The student will investigate and understand scientific concepts related to the origin and evolution of the universe. Key concepts include:
a) nebulae.
Earth Science Lab, Level A: Card 76 **Earth Science Lab, Level B:** Card 76

ES.14 The student will investigate and understand scientific concepts related to the origin and evolution of the universe. Key concepts include:
b) the origin of stars and star systems.
Earth Science Lab, Level A: Card 76 **Earth Science Lab, Level B:** Card 76

ES.14 The student will investigate and understand scientific concepts related to the origin and evolution of the universe. Key concepts include:
c) stellar evolution.
Earth Science Lab, Level A: Card 76 **Earth Science Lab, Level B:** Card 76

ES.14 The student will investigate and understand scientific concepts related to the origin and evolution of the universe. Key concepts include:
d) galaxies.
Earth Science Lab, Level A: Card 77 **Earth Science Lab, Level B:** Card 77

ES.14 The student will investigate and understand scientific concepts related to the origin and evolution of the universe. Key concepts include:
e) cosmology including the big bang theory.
Earth Science Lab, Level A: Card 78 **Earth Science Lab, Level B:** Card 78

SRA Life, Earth, and Physical Science Laboratories
correlation to
Virginia Science Standards of Learning
Physical Science

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 gimps.

PS.1 The student will plan and conduct investigations in which:
a) chemicals and equipment are used safely.
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

PS.1 The student will plan and conduct investigations in which:
b) length, mass, volume, density, temperature, weight, and force are accurately measured and reported using metric units (SI—International System of Units).
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 **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

PS.1 The student will plan and conduct investigations in which:
c) conversions are made among metric units, applying appropriate prefixes.
Physical Science Lab, Level A: Cards 42, 65 **Physical Science Lab, Level B:** Cards 42, 65

PS.1 The student will plan and conduct investigations in which:
d) triple beam and electronic balances, thermometers, metric rules, graduated cylinders, and spring scales are used to gather 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

PS.1 The student will plan and conduct investigations in which:
e) numbers are expressed in scientific notation where appropriate.
Physical Science Lab, Level A: Cards 82 **Physical Science Lab, Level B:** Cards 82

PS.1 The student will plan and conduct investigations in which:
f) research skills are utilized using a variety of resources.
Life Science Lab Teacher's Handbook: Hands-On Activity 2, *Culturing Bacteria,* pages 81-83 **Classroom Resource CD-ROM:** Writing Strategy 9, 10, 12

PS.1 The student will plan and conduct investigations in which:
g) independent and dependent variables, constants, controls, and repeated trails are identified.
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 15, 23

PS.1 The student will plan and conduct investigations in which:
h) data tables showing the independent and dependent variables, derived quantities, and the number of trials are constructed and interpreted.
Life Science Lab Teacher's Handbook: Hands-On Activity 4, *Your Cardiovascular System,* pages 89-91; 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 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; Hands-On Activity 3, *Energy Conversion,* pages 85-87

PS.1 The student will plan and conduct investigations in which:
i) data tables for descriptive statistics showing specific measures of central tendency, the range of the data set, and the number of repeated trails are constructed and interpreted.
Life Science Lab Teacher's Handbook: Hands-On Activity 2, *Culturing Bacteria,* pages 81-83; Hands-On Activity 3, *Investigating Arthropods,* pages 85-87; 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 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

PS.1 The student will plan and conduct investigations in which:
j) frequency distributions, scattergrams, line plots, and histograms are constructed and interpreted.
Life Science Lab Teacher's Handbook: Hands-On Activity 4, *Your Cardiovascular System,* pages 89-91; 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 3, *Interpreting a Topographic Map,* pages 81-83; Hands-On Activity 5, *What is in the Air?,* pages 89-91; 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

PS.1 The student will plan and conduct investigations in which:
k) valid conclusions are made after analyzing data.
Life Science Lab Teacher's Handbook: 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 3, *Interpreting a Topographic Map,* pages 81-83; Hands-On Activity 5, *What is in the Air?,* pages 89-91; 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

PS.1 The student will plan and conduct investigations in which:

l) research methods are used to investigate practical problems and questions.

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

PS.1 The student will plan and conduct investigations in which:

m) experimental results are presented in appropriate written form.

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

PS.1 The student will plan and conduct investigations in which:
n) an understanding of the nature of science is developed and reinforced.
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

PS.2 The student will investigate and understand the basic nature of matter. Key concepts include:
a) the particle theory of matter.
Physical Science Lab, Level A: Cards 3, 4, 10, 11, 12 **Physical Science Lab, Level B:** Cards 3, 4, 10, 11, 12

PS.2 The student will investigate and understand the basic nature of matter. Key concepts include:
b) elements, compounds, mixtures, acids, bases, and salts.
Physical Science Lab, Level A: Cards 10, 11, 12, 13, 14, 15, 16 **Physical Science Lab, Level B:** Cards 10, 11, 12, 13, 14, 15, 16 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 1, *Measuring pH of Acids and Bases,* pages 77-79

PS.2 The student will investigate and understand the basic nature of matter. Key concepts include:
c) solids, liquids, and gases.
Physical Science Lab, Level A: Cards 5, 6, 7 **Physical Science Lab, Level B:** Cards 5, 6, 7

PS.2 The student will investigate and understand the basic nature of matter. Key concepts include:
d) characteristics of types of matter based on physical and chemical properties.
Physical Science Lab, Level A: Cards 1, 2, 5 **Physical Science Lab, Level B:** Cards 1, 2, 5

PS.2 The student will investigate and understand the basic nature of matter. Key concepts include:
e) physical properties (shapes, density, solubility, odor, melting point, boiling point, color).
Physical Science Lab, Level A: Cards 1, 2, 5, 6 **Physical Science Lab, Level B:** Cards 1, 2, 5, 6

PS.2 The student will investigate and understand the basic nature of matter. Key concepts include:
f) chemical properties (acidity, basicity, combustibility, reactivity).
Physical Science Lab, Level A: Cards 1, 14, 15, 16, 27, 30, 33 **Physical Science Lab, Level B:** Cards 1, 14, 15, 16, 27, 30, 33 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 1, *Measuring pH of Acids and Bases,* pages 77-79

PS.3 The student will investigate and understand the modern and historical models of atomic structure. Key concepts include:
a) the contributions of Dalton, Thomson, Rutherford, and Bohr in understanding the atom.
Physical Science Lab, Level A: Cards 3, 7 **Physical Science Lab, Level B:** Cards 3, 7

PS.3 The student will investigate and understand the modern and historical models of atomic structure. Key concepts include:
b) the modern model of atomic structure.
Physical Science Lab, Level A: Cards 21, 22, 23, 24, 25, 26 **Physical Science Lab, Level B:** Cards 21, 22, 23, 24, 25, 26

PS.4 The student will investigate and understand the organization and use of the periodic table of elements to obtain information. Key concepts include:
a) symbols, atomic number, atomic mass, chemical families (groups), and periods.
Physical Science Lab, Level A: Cards 17, 18, 19, 20 **Physical Science Lab, Level B:** Cards 17, 18, 19, 20

PS.4 The student will investigate and understand the organization and use of the periodic table of elements to obtain information. Key concepts include:
b) classification of elements as metals, metalloids, and nonmetals.
Physical Science Lab, Level A: Cards 18, 19, 20 **Physical Science Lab, Level B:** Cards 18, 19, 20

PS.4 The student will investigate and understand the organization and use of the periodic table of elements to obtain information. Key concepts include:
c) simple compounds (formulas and the nature of bonding).
Physical Science Lab, Level A: Cards 11, 22, 23, 24, 25, 31, 32 **Physical Science Lab, Level B:** Cards 11, 22, 23, 24, 25, 31, 32

PS.5 The student will investigate and understand changes in matter and the relationship of these changes to the Law of Conservation of Matter and Energy. Key concepts include:
a) physical changes.
Physical Science Lab, Level A: Cards 5, 6, 8, 12, 13 **Physical Science Lab, Level B:** Cards 5, 6, 8, 12, 13

PS.5 The student will investigate and understand changes in matter and the relationship of these changes to the Law of Conservation of Matter and Energy. Key concepts include:
b) nuclear reactions (products of fusion and fission and the effect of these products on humans and the environment).
Physical Science Lab, Level A: Card 34 **Physical Science Lab, Level B:** Card 34

PS.5 The student will investigate and understand changes in matter and the relationship of these changes to the Law of Conservation of Matter and Energy. Key concepts include:
c) chemical changes (types of reactions, reactants, and products; and balanced equations).
Physical Science Lab, Level A: Cards 9, 27, 28, 29, 30, 31, 32 **Physical Science Lab, Level B:** Cards 9, 27, 28, 29, 30, 31, 32 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 2, *Chemical Reaction Rates*, pages 81-83

PS.6 The student will investigate and understand states and forms of energy and how energy is transferred and transformed. Key concepts include:
a) potential and kinetic energy.
Physical Science Lab, Level A: Cards 36, 37, 39, 40, 41, 42 **Physical Science Lab, Level B:** Cards 36, 37, 39, 40, 41, 42 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 3, *Energy Conversion,* pages 85-87

PS.6 The student will investigate and understand states and forms of energy and how energy is transferred and transformed. Key concepts include:
b) mechanical, chemical, and electrical energy.
Physical Science Lab, Level A: Cards 41, 45, 66, 67, 68, 69, 70 **Physical Science Lab, Level B:** Cards 41, 45, 66, 67, 68, 69, 70 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 5, *Making a Potato Battery*, pages 93-95

PS.6 The student will investigate and understand states and forms of energy and how energy is transferred and transformed. Key concepts include:
c) heat, light, and sound.
Physical Science Lab, Level A: Cards 42, 43, 44, 77, 90 **Physical Science Lab, Level B:** Cards 42, 43, 44, 77, 90 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 6, *Making Sound,* pages 97-99

PS.7 The student will investigate and understand temperature scales, heat, and heat transfer. Key concepts include:
a) Celsius and Kelvin temperature scales and absolute zero.
Physical Science Lab, Level A: Cards 42, 43 **Physical Science Lab, Level B:** Cards 42, 43

PS.7 The student will investigate and understand temperature scales, heat, and heat transfer. Key concepts include:
b) phase change, freezing point, melting point, boiling point, vaporization, and condensation.
Physical Science Lab, Level A: Cards 6, 42, 43 **Physical Science Lab, Level B:** Cards 6, 42, 43

PS.7 The student will investigate and understand temperature scales, heat, and heat transfer. Key concepts include:
c) conduction, convection, and radiation.
Physical Science Lab, Level A: Card 43 **Physical Science Lab, Level B:** Card 43

PS.7 The student will investigate and understand temperature scales, heat, and heat transfer. Key concepts include:
d) applications of heat transfer (heat engines, thermostats, refrigeration, and heat pumps).
Physical Science Lab, Level A: Cards 42, 43 **Physical Science Lab, Level B:** Cards 42, 43

PS.8 The student will investigate and understand characteristics of sound and technological applications of sound waves. Key concepts include:
a) wavelength, frequency, speed, and amplitude.
Physical Science Lab, Level A: Cards 77, 78 **Physical Science Lab, Level B:** Cards 77, 78

PS.8 The student will investigate and understand characteristics of sound and technological applications of sound waves. Key concepts include:
b) resonance.
This concept is not covered.

PS.8 The student will investigate and understand characteristics of sound and technological applications of sound waves. Key concepts include:
c) the nature of mechanical waves.
Physical Science Lab, Level A: Cards 42, 43 **Physical Science Lab, Level B:** Cards 42, 43

PS.8 The student will investigate and understand characteristics of sound and technological applications of sound waves. Key concepts include:
d) technological applications of sound.
Physical Science Lab, Level A: Cards 79, 80, 81 **Physical Science Lab, Level B:** Cards 79, 80, 81

PS.9 The student will investigate and understand the nature and technological applications of light. Key concepts include:
a) the wave behavior of light (reflection, refraction, diffraction, and interference).
Physical Science Lab, Level A: Cards 85, 86, 87, 88 **Physical Science Lab, Level B:** Cards 85, 86, 87, 88

PS.9 The student will investigate and understand the nature and technological applications of light. Key concepts include:
b) images formed by lenses and mirrors.
Physical Science Lab, Level A: Cards 86, 87 **Physical Science Lab, Level B:** Cards 86, 87

PS.9 The student will investigate and understand the nature and technological applications of light. Key concepts include:
c) the electromagnetic spectrum.
Physical Science Lab, Level A: Cards 82, 83, 84, 85 **Physical Science Lab, Level B:** Cards 82, 83, 84, 85

PS.10 The student will investigate and understand scientific principles and technological applications of work, force, and motion. Key concepts include:
a) speed, velocity, and acceleration.
Physical Science Lab, Level A: Cards 51, 52 **Physical Science Lab, Level B:** Cards 51, 52

PS.10 The student will investigate and understand scientific principles and technological applications of work, force, and motion. Key concepts include:
b) Newton's laws of motion.
Physical Science Lab, Level A: Card 55 **Physical Science Lab, Level B:** Card 55

PS.10 The student will investigate and understand scientific principles and technological applications of work, force, and motion. Key concepts include:
c) work, force, mechanical advantage, efficiency, and power.
Physical Science Lab, Level A: Cards 54, 62, 63, 64, 65 **Physical Science Lab, Level B:** Cards 54, 62, 63, 64, 65

PS.10 The student will investigate and understand scientific principles and technological applications of work, force, and motion. Key concepts include:
d) applications (simple machines, compound machines, powered vehicles, rockets, and restraining devices).
Physical Science Lab, Level A: Cards 41, 63, 64 **Physical Science Lab, Level B:** Cards 41, 63, 64

PS.11 The student will investigate and understand basic principles of electricity and magnetism. Key concepts include:
a) static electricity, current electricity, and circuits.
Physical Science Lab, Level A: Cards 66, 67, 68, 69 **Physical Science Lab, Level B:** Cards 66, 67, 68, 69

PS.11 The student will investigate and understand basic principles of electricity and magnetism. Key concepts include:
b) magnetic fields and electromagnets.
Physical Science Lab, Level A: Cards 74, 75, 76 **Physical Science Lab, Level B:** Cards 74, 75, 76

PS.11 The student will investigate and understand basic principles of electricity and magnetism. Key concepts include:
c) motors and generators.
Physical Science Lab, Level A: Cards 69, 70 **Physical Science Lab, Level B:** Cards 69, 70 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 5, *Making a Potato Battery*, pages 93-95