SRA Life, Earth, and Physical Science Laboratories
correlation to
California Science Content 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.

Earth Science
Plate Tectonics and Earth's Structure
1. Plate tectonics accounts for important features of Earth's surface and major geologic events. As a basis for understanding this concept:
a. Students know evidence for plate tectonics is derived from the fit of the continents; the location of earthquakes, volcanoes, and midocean ridges; and the distribution of fossils, rock types, and ancient climate zones.
Earth Science Lab, Level A: Cards 10, 11, 12, 13, 14, 15, 16, 17, 30, 32, 33, 34, 88 **Earth Science Lab, Level B:** Cards 10, 11, 12, 13, 14, 15, 16, 17, 30, 32, 33, 34, 88 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 2, *Plate Boundaries in Action,* pages 77-79

Earth Science
Plate Tectonics and Earth's Structure
1. Plate tectonics accounts for important features of Earth's surface and major geologic events. As a basis for understanding this concept:
b. Students know Earth is composed of several layers; a cold, brittle lithosphere; a hot, convecting mantle; and a dense, metallic core.
Earth Science Lab, Level A: Cards 1, 2 **Earth Science Lab, Level B:** Cards 1, 2

Earth Science
Plate Tectonics and Earth's Structure
1. Plate tectonics accounts for important features of Earth's surface and major geologic events. As a basis for understanding this concept:
c. Students know lithospheric plate the size of continents and oceans move at rates of centimeters per year in response to movements in the mantle.
Earth Science Lab, Level A: Cards 10, 11, 12, 13, 14 **Earth Science Lab, Level B:** Cards 10, 11, 12, 13, 14 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 2, *Plate Boundaries in Action,* pages 77-79

Earth Science
Plate Tectonics and Earth's Structure
1. Plate tectonics accounts for important features of Earth's surface and major geologic events. As a basis for understanding this concept:
d. Students know that earthquakes are sudden motions along breaks in the crust called faults and that volcanoes and fissures are locations where magma reaches the surface.
Earth Science Lab, Level A: Cards 15, 16, 17 **Earth Science Lab, Level B:** Cards 15, 16, 17

Earth Science
Plate Tectonics and Earth's Structure
1. Plate tectonics accounts for important features of Earth's surface and major geologic events. As a basis for understanding this concept:
e. Students know major geologic events, such as earthquakes, volcanic eruptions, and mountain building, result from plate motions.
Earth Science Lab, Level A: Cards 12, 13, 14, 15, 16, 17, 88 **Earth Science Lab, Level B:** Cards 12, 13, 14, 15, 16, 17, 88 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 2, *Plate Boundaries in Action,* pages 77-79

Earth Science
Plate Tectonics and Earth's Structure
1. Plate tectonics accounts for important features of Earth's surface and major geologic events. As a basis for understanding this concept:
f. Students know how to explain major features of California geology (including mountains, faults, volcanoes) to terms of plate tectonics.
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

Earth Science
Plate Tectonics and Earth's Structure
1. Plate tectonics accounts for important features of Earth's surface and major geologic events. As a basis for understanding this concept:
g. Students know how to determine the epicenter of an earthquake and know that the effects of an earthquake in any region vary, depending on the size of the earthquake, the distance of the region from the epicenter, the local geology, and the type of construction in the region.
Earth Science Lab, Level A: Cards 15, 16 **Earth Science Lab, Level B:** Cards 15, 16

Earth Science
Shaping Earth's Surface
2. Topography is reshaped by the weathering of rock and soil and by the transportation and deposition of sediment. As a basis for understanding this concept:
a. Students know water running downhill is the dominant process in shaping the landscape, including California's landscape.
Earth Science Lab, Level A: Cards 21, 24, 25, 28 **Earth Science Lab, Level B:** Cards 21, 24, 25, 28

Earth Science
Shaping Earth's Surface
2. Topography is reshaped by the weathering of rock and soil and by the transportation and deposition of sediment. As a basis for understanding this concept:
b. Students know rivers and streams are dynamic systems that erode, transport sediment, change course, and flood their banks in natural and recurring patterns.
Earth Science Lab, Level A: Card 25 **Earth Science Lab, Level B:** Card 25

Earth Science
Shaping Earth's Surface
2. Topography is reshaped by the weathering of rock and soil and by the transportation and deposition of sediment. As a basis for understanding this concept:
c. Students know beaches are dynamic systems in which the sand is supplied by rivers and moved along the coast by the action of waves.
Earth Science Lab, Level A: Card 26 **Earth Science Lab, Level B:** Card 26

Earth Science
Shaping Earth's Surface
2. Topography is reshaped by the weathering of rock and soil and by the transportation and deposition of sediment. As a basis for understanding this concept:
d. Students know earthquakes, volcanic eruptions, landslides, and floods change human and wildlife habitats.
Earth Science Lab, Level A: Cards 15, 16, 17, 24, 25 **Earth Science Lab, Level B:** Cards 15, 16, 17, 24, 25

Physical Science
Heat (Thermal Energy)
3. Heat moves in a predictable flow from warmer objects to cooler objects until all the objects are at the same temperature. As a basis for understanding this concept:
a. Students know energy can be carried from one place to another by heat flow or by waves, including water, light and sound waves, or by moving objects.
Physical Science Lab, Level A: Cards 42, 43, 44, 46, 48, 77, 78, 79, 80, 82, 83, 85, 86, 87, 88 **Physical Science Lab, Level B:** Cards 42, 43, 44, 46, 48, 77, 78, 79, 80, 82, 83, 85, 86, 87, 88 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 6, *Making Sound*, pages 97-99

Physical Science
Heat (Thermal Energy)
3. Heat moves in a predictable flow from warmer objects to cooler objects until all the objects are at the same temperature. As a basis for understanding this concept:
b. Students know that when fuel is consumed, most of the energy released becomes heat energy.
Physical Science Lab, Level A: Cards 27, 28, 29, 30, 34, 37, 38, 45, 46 **Physical Science Lab, Level B:** Cards 27, 28, 29, 30, 34, 37, 38, 45, 46

Physical Science
Heat (Thermal Energy)
3. Heat moves in a predictable flow from warmer objects to cooler objects until all the objects are at the same temperature. As a basis for understanding this concept:
c. Students know heat flows in solids by conduction (which involves no flow of matter) and in fluids by conduction and by convection (which involves flow of matter).
Physical Science Lab, Level A: Cards 42, 43 **Physical Science Lab, Level B:** Cards 42, 43

Physical Science
Heat (Thermal Energy)
3. Heat moves in a predictable flow from warmer objects to cooler objects until all the objects are at the same temperature. As a basis for understanding this concept:
d. Students know heat energy is also transferred between objects by radiation (radiation can travel through space).
Physical Science Lab, Level A: Cards 43, 44, 46, 83 **Physical Science Lab, Level B:** Cards 43, 44, 46, 83

Physical Science
Energy in the Earth System
4. Many phenomena on Earth's surface are affected by the transfer of energy through radiation and convection currents. As a basis for understanding this concept:
a. Students know the sun is the major source of energy for phenomena on Earth's surface; it powers winds, ocean currents, and the water cycle.
Life Science Lab, Level A: Cards 17, 76 **Life Science Lab, Level B:** Cards 17, 76 **Earth Science Lab, Level A:** Cards 38, 39, 40, 41, 45, 46, 47, 52, 53, 54, 67, 87 **Earth Science Lab, Level B:** Cards 38, 39, 40, 41, 45, 46, 47, 52, 53, 54, 67, 87 **Physical Science Lab, Level A:** Cards 44, 46 **Physical Science Lab, Level B:** Cards 44, 46

Earth Science
Energy in the Earth System
4. Many phenomena on Earth's surface are affected by the transfer of energy through radiation and convection currents. As a basis for understanding this concept:
b. Students know solar energy reaches Earth through radiation, mostly in the form of visible light.
Earth Science Lab, Level A: Card 37 **Earth Science Lab, Level B:** Card 37 **Physical Science Lab, Level A:** Cards 46, 82, 83 **Physical Science Lab, Level B:** Cards 46, 82, 83

Earth Science
Energy in the Earth System
4. Many phenomena on Earth's surface are affected by the transfer of energy through radiation and convection currents. As a basis for understanding this concept:
c. Students know heat from Earth's interior reaches the surface primarily through convection.
Earth Science Lab, Level A: Cards 10, 11, 12, 17, 88 **Earth Science Lab, Level B:** Cards 10, 11, 12, 17, 88

Earth Science
Energy in the Earth System
4. Many phenomena on Earth's surface are affected by the transfer of energy through radiation and convection currents. As a basis for understanding this concept:
d. Students know convection currents distribute heat in the atmosphere and oceans.
Earth Science Lab, Level A: Cards 38, 87 **Earth Science Lab, Level B:** Cards 38, 87 **Physical Science Lab, Level A:** Card 44 **Physical Science Lab, Level B:** Card 44

Earth Science
Energy in the Earth System
4. Many phenomena on Earth's surface are affected by the transfer of energy through radiation and convection currents. As a basis for understanding this concept:
e. Students know differences in pressure, heat, air movement, and humidity result in changes of weather.
Earth Science Lab, Level A: Cards 38, 39, 40, 41, 43, 44, 45, 46, 48, 49 **Earth Science Lab, Level B:** Cards 38, 39, 40, 41, 43, 44, 45, 46, 48, 49

Life Science
Ecology
5. Organisms in ecosystems exchange energy and nutrients among themselves and with the environment. As a basis for understanding this concept:
a. Students know energy entering ecosystems as sunlight is transferred by producers into chemical energy through photosynthesis and then from organism to organism through food webs.
Life Science Lab, Level A: Cards 17, 76, 77 **Life Science Lab, Level B:** Cards 17, 76, 77 **Life Science Lab Teacher's Handbook:** Hands-On Activity 6, *How Much Does Energy Cost?*, pages 97-99

Life Science
Ecology
5. Organisms in ecosystems exchange energy and nutrients among themselves and with the environment. As a basis for understanding this concept:
b. Students know matter is transferred over time from one organism to others in the food web and between organisms and the physical environment.
Life Science Lab, Level A: Cards 13, 74, 76, 77, 78, 79 **Life Science Lab, Level B:** Cards 13, 74, 76, 77, 78, 79 **Life Science Lab Teacher's Handbook:** Hands-On Activity 6, *How Much Does Energy Cost?*, pages 97-99

Life Science
Ecology
5. Organisms in ecosystems exchange energy and nutrients among themselves and with the environment. As a basis for understanding this concept:
c. Students know populations of organisms can be categorized by the functions they serve in an ecosystem.
Life Science Lab, Level A: Cards 71, 73, 74, 75, 76, 77 **Life Science Lab, Level B:** Cards 71, 73, 74, 75, 76, 77

Life Science
Ecology
5. Organisms in ecosystems exchange energy and nutrients among themselves and with the environment. As a basis for understanding this concept:
d. Students know different kinds of organisms may play similar ecological roles in similar biomes.
Life Science Lab, Level A: Cards 13, 75, 81, 82, 86 **Life Science Lab, Level B:** Cards 13, 75, 81, 82, 86

Life Science
Ecology
5. Organisms in ecosystems exchange energy and nutrients among themselves and with the environment. As a basis for understanding this concept:
e. Students know the number and types of organisms an ecosystem can support depends on the resources available and on abiotic factors, such as quantities of light and water, a range of temperatures, and soil composition.
Life Science Lab, Level A: Cards 72, 86, 87 **Life Science Lab, Level B:** Cards 72, 86, 87

Earth Science
Resources
6. Sources of energy and materials differ in amounts, distribution, usefulness, and the time required for their formation. As a basis for understanding this concept:
a. Students know the utility of energy sources is determined by factors that are involved in converting these sources to useful forms and the consequences of the conversion process.
Earth Science Lab, Level A: Card 35 **Earth Science Lab, Level B:** Card 35 **Physical Science Lab, Level A:** Cards 34, 36, 37, 38, 42, 45, 46, 47, 48, 49 **Physical Science Lab, Level B:** Cards 34, 36, 37, 38, 42, 45, 46, 47, 48, 49 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 3, *Energy Conversion,* pages 85-87

Earth Science
Resources
6. Sources of energy and materials differ in amounts, distribution, usefulness, and the time required for their formation. As a basis for understanding this concept:
b. Students know different natural energy and material resources, including air, soil, rocks, minerals, petroleum, fresh water, wildlife, and forests, and know how to classify them as renewable or nonrenewable.
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, 23, 29, 35, 36, 37, 82 **Earth Science Lab, Level B:** Cards 3, 4, 5, 6, 7, 8, 23, 29, 35, 36, 37, 82 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 1, *Identifying Minerals with the Mohs Scale,* pages 73-75

Earth Science
Resources
6. Sources of energy and materials differ in amounts, distribution, usefulness, and the time required for their formation. As a basis for understanding this concept:
c. Students know the natural origin of the materials used to make common objects.
Earth Science Lab, Level A: Cards 5, 35 **Earth Science Lab, Level B:** Cards 5, 35

Investigation and Experimentation
7. Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will:
a. Develop a hypothesis.
Life Science Lab Teacher's Handbook: Hands-On Activity 3, *Investigating Arthropods,* pages 85-87 **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 **Classroom Resource CD-ROM:** Writing Strategy 8, 15

Investigation and Experimentation
7. Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will:
b. Select and use appropriate tools and technology (including calculators, computers, balances, spring scales, microscopes, and binoculars) to perform tests, collect data, and display 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 **Classroom Resource CD-ROM:** Writing Strategy 15

Investigation and Experimentation
7. Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will:
c. Conduct appropriate graphs from data and develop qualitative statements about the relationship between variables.
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 3, *Interpreting a Topographic Map,* pages 81-83; 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 **Classroom Resource CD-ROM:** Writing Strategy 23

Investigation and Experimentation
7. Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will:
d. Communicate the steps and results from an investigation in written reports and oral presentations.
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, 2, 5, 10, 11, 12, 15

Investigation and Experimentation
7. Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will:
e. Recognize whether evidence is consistent with a proposed explanation.
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

Investigation and Experimentation
7. Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will:
f. Read a topographical map and a geologic map for evidence provided on the maps and construct and interpret a simple map scale.
Earth Science Lab, Level A: Cards 18, 19, 20 **Earth Science Lab, Level B:** Cards 18, 19, 20 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 3, *Interpreting a Topographic Map,* pages 81-83; Hands-On Activity 7, *Sizes in the Solar System,* pages 97-99

Investigation and Experimentation
7. Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will:
g. Interpret events by sequence and time from natural phenomena (e.g., the relative ages of rocks and intrusions).
Life Science Lab, Level A: Cards 66, 67, 68, 80 **Life Science Lab, Level B:** Cards 66, 67, 68, 80 **Earth Science Lab, Level A:** Cards 9, 10, 15, 16, 30, 31, 32, 33, 34, 74, 76, 78 **Earth Science Lab, Level B:** Cards 9, 10, 15, 16, 30, 31, 32, 33, 34, 74, 76, 78 **Earth Science Lab Teacher's Handbook:** Hands-On Activity ; Hands-On Activity 7, *Sizes in the Solar System*, pages 97-99 **Physical Science Lab, Level A:** Cards 27, 28, 29, 30 **Physical Science Lab, Level B:** Cards 27, 28, 29, 30

Investigation and Experimentation
7. Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will:
h. Identify changes in natural phenomena over time without manipulating the phenomena (e.g., tree limb, a grove of trees, a stream, a hill slope).
Life Science Lab Teacher's Handbook: Hands-On Activity 2, *Culturing Bacteria*, pages 81-83; Hands-On Activity 3, *Investigating Arthropods*, pages 85-87 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 5, *What is in the Air?*, pages 89-91

SRA Life, Earth, and Physical Science Laboratories
correlation to
California Science Content 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.

Life Science
Cell Biology
1. All living organisms are composed of cell, from just one to many trillions, whose details usually are visible only through a microscope. As a basis for understanding this concept:
a. Students know cells function similarly in all living organisms.
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

Life Science
Cell Biology
1. All living organisms are composed of cell, from just one to many trillions, whose details usually are visible only through a microscope. As a basis for understanding this concept:
b. Students know the characteristics that distinguish plant cells from animal cell, including chloroplasts and cell walls.
Life Science Lab, Level A: Cards 6, 7 **Life Science Lab, Level B:** Cards 6, 7 **Life Science Lab Teacher's Handbook:** Hands-On Activity 1, *Examining Cells,* pages 77-79

Life Science
Cell Biology
1. All living organisms are composed of cell, from just one to many trillions, whose details usually are visible only through a microscope. As a basis for understanding this concept:
c. Students know the nucleus is the repository for genetic information in plant and animal cells.
Life Science Lab, Level A: Cards 6, 7, 61, 62 **Life Science Lab, Level B:** Cards 6, 7, 61, 62 **Life Science Lab Teacher's Handbook:** Hands-On Activity 1, *Examining Cells,* pages 77-79

Life Science
Cell Biology
1. All living organisms are composed of cell, from just one to many trillions, whose details usually are visible only through a microscope. As a basis for understanding this concept:
d. Students know that mitochondria liberate energy for the work that cells so and that chloroplast capture sunlight energy for photosynthesis.
Life Science Lab, Level A: Cards 7, 9 **Life Science Lab, Level B:** Cards 7, 9

Life Science
Cell Biology
1. All living organisms are composed of cell, from just one to many trillions, whose details usually are visible only through a microscope. As a basis for understanding this concept:
e. Students know cells divide to increase their numbers through a process of mitosis, which results in two daughter cells with identical sets of chromosomes.
Life Science Lab, Level A: Cards 10, 60 **Life Science Lab, Level B:** Cards 10, 60

Life Science
Cell Biology
1. All living organisms are composed of cell, from just one to many trillions, whose details usually are visible only through a microscope. As a basis for understanding this concept:
f. Students know that as multicellular organisms develop, their cells differentiate.
Life Science Lab, Level A: Cards 10, 44 **Life Science Lab, Level B:** Cards 10, 44

Life Science
Genetics
2. A typical cell of any organism contains genetic instructions that specify its traits. Those traits may be modified by environmental influences. As a basis for understanding this concept:
a. Students know the differences between the life cycles and reproduction methods of sexual and asexual organisms.
Life Science Lab, Level A: Cards 18, 19, 20, 21, 22, 40, 42, 60, 61 **Life Science Lab, Level B:** Cards 18, 19, 20, 21, 22, 40, 42, 60, 61

Life Science
Genetics
2. A typical cell of any organism contains genetic instructions that specify its traits. Those traits may be modified by environmental influences. As a basis for understanding this concept:
b. Students know sexual reproduction produces offspring that inherit half their genes from each parent.
Life Science Lab, Level A: Cards 61, 62, 63 **Life Science Lab, Level B:** Cards 61, 62, 63

Life Science
Genetics
2. A typical cell of any organism contains genetic instructions that specify its traits. Those traits may be modified by environmental influences. As a basis for understanding this concept:
c. Students know an inherited trait can be determined by one or more genes.
Life Science Lab, Level A: Cards 62, 63 **Life Science Lab, Level B:** Cards 62, 63

Life Science
Genetics
2. A typical cell of any organism contains genetic instructions that specify its traits. Those traits may be modified by environmental influences. As a basis for understanding this concept:
d. Students know plant and animal cells contain many thousands of different genes and typically have two copies of every gene. The two copies (or alleles) of the gene may or may not be identical, and one may be dominant in determining the phenotype while the other is recessive.
Life Science Lab, Level A: Cards 62, 63 **Life Science Lab, Level B:** Cards 62, 63

Life Science
Genetics
2. A typical cell of any organism contains genetic instructions that specify its traits. Those traits may be modified by environmental influences. As a basis for understanding this concept:
e. Students know DNA (deoxyribonucleic acid) is the genetic material of living organisms and is located in the chromosomes of each cell.
Life Science Lab, Level A: Card 64 **Life Science Lab, Level B:** Card 64

Life Science
Evolution
3. Biological evolution accounts for the diversity of species developed through gradual processes over many generations. As a basis for understanding this concept:
a. Students know both genetic variation and environmental factors are causes of evolution and diversity of organisms.
Life Science Lab, Level A: Cards 64, 65, 66 **Life Science Lab, Level B:** Cards 64, 65, 66

Life Science
Evolution
3. Biological evolution accounts for the diversity of species developed through gradual processes over many generations. As a basis for understanding this concept:
b. Students know the reasoning used by Charles Darwin in reaching his conclusion that natural selection is the mechanism of evolution.
Life Science Lab, Level A: Cards 65, 66 **Life Science Lab, Level B:** Cards 65, 66

Life Science
Evolution
3. Biological evolution accounts for the diversity of species developed through gradual processes over many generations. As a basis for understanding this concept:
c. Students know how independent lines of evidence from geology, fossils, and comparative anatomy provide the bases for the theory of evolution.
Life Science Lab, Level A: Cards 66, 67, 68 **Life Science Lab, Level B:** Cards 66, 67, 68 **Earth Science Lab, Level A:** Cards 33, 34 **Earth Science Lab, Level B:** Cards 33, 34

Life Science
Evolution
3. Biological evolution accounts for the diversity of species developed through gradual processes over many generations. As a basis for understanding this concept:
d. Students know how to construct a simple branching diagram to classify living groups of organisms by shared derived characteristics and how to expand the diagram to include fossil organisms.
Life Science Lab, Level A: Cards 2, 3 **Life Science Lab, Level B:** Cards 2, 3

Life Science
Evolution
3. Biological evolution accounts for the diversity of species developed through gradual processes over many generations. As a basis for understanding this concept:
e. Students know that extinction of a species occurs when the environment changes and the adaptive characteristics of a species are insufficient for its survival.
Life Science Lab, Level A: Cards 67, 86 **Life Science Lab, Level B:** Cards 67, 86 **Earth Science Lab, Level A:** Cards 59, 61 **Earth Science Lab, Level B:** Cards 59, 61

Earth Science
Earth and Life History
4. Evidence from rocks allows us to understand the evolution of life on Earth. As a basis for understanding this concept:
a. Students know Earth processes today are similar to those that occurred in the past and show geologic processes have large cumulative effects over long periods of time.
Earth Science Lab, Level A: Cards 9, 10, 11, 12, 13, 14, 15, 17, 24, 25, 26, 27, 28 **Earth Science Lab, Level B:** Cards 9, 10, 11, 12, 13, 14, 15, 17, 24, 25, 26, 27, 28 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 2, *Plate Boundaries in Action*, pages 77-79

Earth Science
Earth and Life History
4. Evidence from rocks allows us to understand the evolution of life on Earth. As a basis for understanding this concept:
b. Students know the history of life on Earth has been disrupted by major catastrophic events, such as major volcanic eruptions or the impacts of asteroids.
Earth Science Lab, Level A: Cards 15, 17, 32, 34, 73 **Earth Science Lab, Level B:** Cards 15, 17, 32, 34, 73

Earth Science
Earth and Life History
4. Evidence from rocks allows us to understand the evolution of life on Earth. As a basis for understanding this concept:
c. Students know that the rock cycle includes the formation of new sediment and rocks and that rocks are found in layers, with the oldest generally on the bottom.
Earth Science Lab, Level A: Cards 6, 7, 8, 9, 30 **Earth Science Lab, Level B:** Cards 6, 7, 8, 9, 30

Earth Science
Earth and Life History
4. Evidence from rocks allows us to understand the evolution of life on Earth. As a basis for understanding this concept:
d. Students know that evidence from geologic layers and radioactive dating indicates Earth is approximately 4.6 billion years old and that life on this planet has existed for more than 3 billion years.
Earth Science Lab, Level A: Cards 30, 31, 32, 33, 34 **Earth Science Lab, Level B:** Cards 30, 31, 32, 33, 34

Earth Science
Earth and Life History
4. Evidence from rocks allows us to understand the evolution of life on Earth. As a basis for understanding this concept:
e. Students know fossils provide evidence of how life and environmental conditions have changed.
Life Science Lab, Level A: Card 67 **Life Science Lab, Level B:** Card 67 **Earth Science Lab, Level A:** Cards 30, 31, 32, 33, 34, 35 **Earth Science Lab, Level B:** Cards 30, 31, 32, 33, 34, 35

Earth Science
Earth and Life History
4. Evidence from rocks allows us to understand the evolution of life on Earth. As a basis for understanding this concept:
f. Students know how movements of Earth's continental and oceanic plates through time, with associated changes in climate and geographic connections, have affected the past and present distribution of organisms.
Life Science Lab, Level A: Card 86 **Life Science Lab, Level B:** Card 86 **Earth Science Lab, Level A:** Cards 1, 32, 34, 73 **Earth Science Lab, Level B:** Cards 1, 32, 34, 73

Earth Science
Earth and Life History
4. Evidence from rocks allows us to understand the evolution of life on Earth. As a basis for understanding this concept:
g. Students know how to explain significant developments and extinctions of plant and animal life on the geologic time scale.
Life Science Lab, Level A: Cards 67, 86 **Life Science Lab, Level B:** Cards 67, 86 **Earth Science Lab, Level A:** Cards 32, 33, 34, 61, 73 **Earth Science Lab, Level B:** Cards 32, 33, 34, 61, 73

Life Science
Structure and Function in Living Systems
5. The anatomy and physiology of plants and animals illustrate the complementary nature of structure and function. As a basis for understanding this concept:
a. Students know plants and animals have levels of organization for structure and function, including cells, tissues, organs, organ systems, and the whole organism.
Life Science Lab, Level A: Cards 6, 7, 16, 18, 19, 20, 21, 22, 25, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 44 **Life Science Lab, Level B:** Cards 6, 7, 16, 18, 19, 20, 21, 22, 25, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 44 **Life Science Lab Teacher's Handbook:** Hands-On Activity 1, *Examining Cells,* pages 77-79

Life Science
Structure and Function in Living Systems
5. The anatomy and physiology of plants and animals illustrate the complementary nature of structure and function. As a basis for understanding this concept:
b. Students know organ systems function because of the contributions of individual organs, tissues, and cells. The failure of any part can affect the entire system.
Life Science Lab, Level A: Cards 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58 **Life Science Lab, Level B:** Cards 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

Life Science
Structure and Function in Living Systems
5. The anatomy and physiology of plants and animals illustrate the complementary nature of structure and function. As a basis for understanding this concept:
c. Students know how bones and muscles work together to provide a structural framework for movement.
Life Science Lab, Level A: Cards 53, 55 **Life Science Lab, Level B:** Cards 53, 55

Life Science
Structure and Function in Living Systems
5. The anatomy and physiology of plants and animals illustrate the complementary nature of structure and function. As a basis for understanding this concept:
d. Students know how the reproductive organs of the human female and male generate eggs and sperm and how sexual activity may lead to fertilization and pregnancy.
Life Science Lab, Level A: Cards 58, 61 **Life Science Lab, Level B:** Cards 58, 61

Life Science
Structure and Function in Living Systems
5. The anatomy and physiology of plants and animals illustrate the complementary nature of structure and function. As a basis for understanding this concept:
e. Students know the function of the umbilicus and placenta during pregnancy.
Life Science Lab, Level A: Card 40 **Life Science Lab, Level B:** Card 40

Life Science
Structure and Function in Living Systems
5. The anatomy and physiology of plants and animals illustrate the complementary nature of structure and function. As a basis for understanding this concept:
f. Students know the structures and processes by which flowering plants generate pollen, ovules, seeds, and fruit.
Life Science Lab, Level A: Cards 20, 22 **Life Science Lab, Level B:** Cards 20, 22

Life Science
Structure and Function in Living Systems
5. The anatomy and physiology of plants and animals illustrate the complementary nature of structure and function. As a basis for understanding this concept:
g. Students know how to relate the structure of the eye and ear to their functions.
Physical Science Lab, Level A: Card 89 **Physical Science Lab, Level B:** Card 89

Physical Science
Physical Principles in Living Systems
6. Physical principles underlie biological structures and functions. As a basis for understanding this concept:
a. Students know visible light is a small band within a very broad electromagnetic spectrum.
Physical Science Lab, Level A: Cards 82, 85 **Physical Science Lab, Level B:** Cards 82, 85

Physical Science
Physical Principles in Living Systems
6. Physical principles underlie biological structures and functions. As a basis for understanding this concept:
b. Students know that for an object to be seen, light emitted by or scattered from it must be detected by the eye.
Physical Science Lab, Level A: Cards 87, 89 **Physical Science Lab, Level B:** Cards 87, 89

Physical Science
Physical Principles in Living Systems
6. Physical principles underlie biological structures and functions. As a basis for understanding this concept:
c. Students know light travels in straight lines if the medium it travels through does not change.
Physical Science Lab, Level A: Cards 82, 83, 84, 85, 87, 88 **Physical Science Lab, Level B:** Cards 82, 83, 84, 85, 87, 88

Physical Science
Physical Principles in Living Systems
6. Physical principles underlie biological structures and functions. As a basis for understanding this concept:
d. Students know how simple lenses are used in a magnifying glass, the eye, a camera, a telescope, and a microscope.
Physical Science Lab, Level A: Cards 87, 90 **Physical Science Lab, Level B:** Cards 87, 90

Physical Science
Physical Principles in Living Systems
6. Physical principles underlie biological structures and functions. As a basis for understanding this concept:
e. Students know that white light is a mixture of many wavelengths (colors) and that retinal cells react differently to different wavelengths.
Physical Science Lab, Level A: Cards 85, 89 **Physical Science Lab, Level B:** Cards 85, 89

Physical Science
Physical Principles in Living Systems
6. Physical principles underlie biological structures and functions. As a basis for understanding this concept:
f. Students know light can be reflected, refracted, transmitted, and absorbed by matter.
Physical Science Lab, Level A: Cards 85, 86, 87, 88 **Physical Science Lab, Level B:** Cards 85, 86, 87, 88

Physical Science
Physical Principles in Living Systems
6. Physical principles underlie biological structures and functions. As a basis for understanding this concept:
g. Students know the angle of reflection of a light beam is equal to the angle of incidence.
Physical Science Lab, Level A: Card 86 **Physical Science Lab, Level B:** Card 86

Physical Science
Physical Principles in Living Systems
6. Physical principles underlie biological structures and functions. As a basis for understanding this concept:
h. Students know how to compare joints in the body (wrist, shoulder, thigh) with structures used in machines and simple devices (hinge, ball-and-socket, and sliding joints).
Physical Science Lab, Level A: Card 64 **Physical Science Lab, Level B:** Card 64

Physical Science
Physical Principles in Living Systems
6. Physical principles underlie biological structures and functions. As a basis for understanding this concept:
i. Students know how levers confer mechanical advantage and how the application of this principle applies to the musculoskeletal system.
Physical Science Lab, Level A: Card 64 **Physical Science Lab, Level B:** Card 64

Physical Science
Physical Principles in Living Systems
6. Physical principles underlie biological structures and functions. As a basis for understanding this concept:
j. Students know that contractions of the heart generate blood pressure and that heart valves prevent back flow in the circulatory system.
Life Science Lab, Level A: Card 47 **Life Science Lab, Level B:** Card 47

Investigation and Experimentation
7. Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will:
a. Select and use appropriate tools and technology (including calculators, computers, balances, spring scales, microscopes, and binoculars) to perform tests, collect data, and display 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

Investigation and Experimentation
7. Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will:
b. Use a variety of print and electronic resources (including World Wide Web) to collect information and evidence as part of a research project.
Life Science Lab Teacher's Handbook: Hands-On Activity 2, *Culturing Bacteria,* pages 81-83 **Classroom Resource CD-ROM:** Writing Strategy 9, 12, 25

Investigation and Experimentation
7. Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will:
c. Communicate the logical connection among hypotheses, science concepts, tests conducted, data collected, and conclusions drawn from the scientific evidence.
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

Investigation and Experimentation
7. Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will:
d. Construct scale models, maps, and appropriately labeled diagrams to communicate scientific knowledge (e.g., motion of Earth's plates and cell structure).
Life Science Lab Teacher's Handbook: Hands-On Activity 1, *Examining Cells,* pages 77-79; 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 3, *Interpreting a Topographic Map,* pages 81-83; Hands-On Activity 4, *Using Sound Waves,* pages 85-87; 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 5, *Making a Potato Battery,* pages 93-95; Hands-On Activity 6, *Making Sound,* pages 97-99 **Classroom Resource CD-ROM:** Writing Strategy 20, 27

Investigation and Experimentation
7. Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will:
e. Communicate the steps and results from an investigation in written reports and oral presentations.
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, 2, 5, 11, 12, 15, 18

SRA Life, Earth, and Physical Science Laboratories
correlation to
California Science Content 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.

Physical Science
Motion
1. The velocity of an object is the rate of change of its position. As a basis for understanding this concept:
a. Students know position is defined in relation to some choice of a standard reference point and a set of reference directions.
Physical Science Lab, Level A: Card 50 **Physical Science Lab, Level B:** Card 50

Physical Science
Motion
1. The velocity of an object is the rate of change of its position. As a basis for understanding this concept:
b. Students know that average speed it the total distance traveled divided by the total time elapsed and that the speed of an object along the path traveled can vary.
Physical Science Lab, Level A: Card 51 **Physical Science Lab, Level B:** Card 51

Physical Science
Motion
1. The velocity of an object is the rate of change of its position. As a basis for understanding this concept:
c. Students know how to solve problems involving distance, time, and average speed.
Physical Science Lab, Level A: Cards 50, 51, 52 **Physical Science Lab, Level B:** Cards 50, 51, 52

Physical Science
Motion
1. The velocity of an object is the rate of change of its position. As a basis for understanding this concept:
d. Students know the velocity of an object must be described by specifying both the direction and the speed of the object.
Physical Science Lab, Level A: Card 51 **Physical Science Lab, Level B:** Card 51

Physical Science
Motion
1. The velocity of an object is the rate of change of its position. As a basis for understanding this concept:
e. Students know changes in velocity may be due to changes in speed, direction, or both.
Physical Science Lab, Level A: Card 51 **Physical Science Lab, Level B:** Card 51

Physical Science
Motion
1. The velocity of an object is the rate of change of its position. As a basis for understanding this concept:
f. Students know how to interpret graphs of position versus time and graphs of speed versus time for motion in a single direction.
Physical Science Lab, Level A: Card 51 **Physical Science Lab, Level B:** Card 51

Physical Science
Forces
2. Unbalanced forces cause changes in velocity. As a basis for understanding this concept:
a. Students know a force has both direction and magnitude.
Physical Science Lab, Level A: Cards 54, 56 **Physical Science Lab, Level B:** Cards 54, 56

Physical Science
Forces
2. Unbalanced forces cause changes in velocity. As a basis for understanding this concept:
b. Students know when an object is subject to two or more forces at once, the result is the cumulative effect of all the forces.
Physical Science Lab, Level A: Cards 54, 55, 56 **Physical Science Lab, Level B:** Cards 54, 55, 56 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 4, *Reducing Friction*, pages 89-91

Physical Science
Forces
2. Unbalanced forces cause changes in velocity. As a basis for understanding this concept:
c. Students know when the forces on an object are balanced, the motion of the object does not change.
Physical Science Lab, Level A: Cards 55, 56 **Physical Science Lab, Level B:** Cards 55, 56

Physical Science
Forces
2. Unbalanced forces cause changes in velocity. As a basis for understanding this concept:
d. Students know how to identify separately the two or more forces that are acting on a single static object, including gravity, elastic forces due to tension or compression in matter, and friction.
Physical Science Lab, Level A: Cards 54, 55, 56, 57, 58, 59 **Physical Science Lab, Level B:** Cards 54, 55, 56, 57, 58, 59 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 4, *Reducing Friction*, pages 89-91

Physical Science
Forces
2. Unbalanced forces cause changes in velocity. As a basis for understanding this concept:
e. Students know that when the forces on an object are unbalanced, the object will change its velocity (that is, it will speed up, slow down, or change direction).
Physical Science Lab, Level A: Cards 51, 53, 54, 55, 56, 58, 59 **Physical Science Lab, Level B:** Cards 51, 53, 54, 55, 56, 58, 59 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 4, *Reducing Friction*, pages 89-91

Physical Science
Forces
2. Unbalanced forces cause changes in velocity. As a basis for understanding this concept:
f. Students know the greater the mass of an object, the more force is needed to achieve the same rate of change in motion.
Physical Science Lab, Level A: Cards 54, 55, 56 **Physical Science Lab, Level B:** Cards 54, 55, 56

Physical Science
Forces
2. Unbalanced forces cause changes in velocity. As a basis for understanding this concept:
g. Students know the role of gravity in forming and maintaining the shapes of planets, stars, and the solar system.
Physical Science Lab, Level A: Cards 57, 59 **Physical Science Lab, Level B:** Cards 57, 59

Physical Science
Structure of Matter
3. Each of the more than 100 elements of matter has distinct properties and a distinct atomic structure. All forms of matter are composed of one or more of the elements. As a basis for understanding this concept:
a. Students know the structure of the atom and know it is composed of protons, neutrons, and electrons.
Physical Science Lab, Level A: Cards 3, 21 **Physical Science Lab, Level B:** Cards 3, 21

Physical Science
Structure of Matter
3. Each of the more than 100 elements of matter has distinct properties and a distinct atomic structure. All forms of matter are composed of one or more of the elements. As a basis for understanding this concept:
b. Students know that compounds are formed by combining two or more different elements and that compounds have properties that are different from their constituent elements.
Physical Science Lab, Level A: Cards 11, 31, 32, 35 **Physical Science Lab, Level B:** Cards 11, 31, 32, 35

Physical Science
Structure of Matter
3. Each of the more than 100 elements of matter has distinct properties and a distinct atomic structure. All forms of matter are composed of one or more of the elements. As a basis for understanding this concept:
c. Students know atoms and molecules form solids by building up repeating patterns, such as the crystal structure of NaCl or long-chain polymers.
Physical Science Lab, Level A: Cards 3, 4, 5, 26 **Physical Science Lab, Level B:** Cards 3, 4, 5, 26

Physical Science
Structure of Matter
3. Each of the more than 100 elements of matter has distinct properties and a distinct atomic structure. All forms of matter are composed of one or more of the elements. As a basis for understanding this concept:
d. Students know the states of matter (solid, liquid, gas) depend on molecular motion.
Physical Science Lab, Level A: Cards 5, 6, 7 **Physical Science Lab, Level B:** Cards 5, 6, 7

Physical Science
Structure of Matter
3. Each of the more than 100 elements of matter has distinct properties and a distinct atomic structure. All forms of matter are composed of one or more of the elements. As a basis for understanding this concept:
e. Students know that in solids the atoms are closely locked in position and can only vibrate; in liquids that atoms and molecules are more loosely connected and can collide with and move past one another; and in gases the atoms and molecules are free to move independently, colliding frequently.
Physical Science Lab, Level A: Cards 5, 6, 7, 42 **Physical Science Lab, Level B:** Cards 5, 6, 7, 42

Physical Science
Structure of Matter
3. Each of the more than 100 elements of matter has distinct properties and a distinct atomic structure. All forms of matter are composed of one or more of the elements. As a basis for understanding this concept:
f. Students know how to use the periodic table to identify elements in simple compounds.
Physical Science Lab, Level A: Cards 17, 18, 19, 20 **Physical Science Lab, Level B:** Cards 17, 18, 19, 20

Earth Science
Earth in the Solar System
4. The structure and composition of the universe can be learned from studying stars and galaxies and their evolution. As a basis for understanding this concept:
a. Students know galaxies are clusters of billions of stars and may have different shapes.
Earth Science Lab, Level A: Cards 77, 78 **Earth Science Lab, Level B:** Cards 77, 78

Earth Science
Earth in the Solar System
4. The structure and composition of the universe can be learned from studying stars and galaxies and their evolution. As a basis for understanding this concept:
b. Students know that the Sun is one of many stars in the Milky Way galaxy and that stars may differ in size, temperature, and color.
Earth Science Lab, Level A: Cards 67, 75, 76 **Earth Science Lab, Level B:** Cards 67, 75, 76

Earth Science
Earth in the Solar System
4. The structure and composition of the universe can be learned from studying stars and galaxies and their evolution. As a basis for understanding this concept:
c. Students know how to use astronomical units and light years as measures of distances between the Sun, stars, and Earth.
Earth Science Lab, Level A: Card 74 **Earth Science Lab, Level B:** Card 74

Earth Science
Earth in the Solar System
4. The structure and composition of the universe can be learned from studying stars and galaxies and their evolution. As a basis for understanding this concept:
d. Students know that stars are the source of light for all bright objects in outer space and that the Moon and planets shine by reflected sunlight, not by their own light.
Earth Science Lab, Level A: Cards 63, 64, 65, 67, 75 **Earth Science Lab, Level B:** Cards 63, 64, 65, 67, 75

Earth Science
Earth in the Solar System
4. The structure and composition of the universe can be learned from studying stars and galaxies and their evolution. As a basis for understanding this concept:
e. Students know the appearance, general composition, relative position and size, and motion of objects in the solar system, including planets, planetary satellites, comets, 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 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 7, *Sizes in the Solar System,* pages 97-99

Physical Science
Reactions
5. Chemical reactions are processes in which atoms are rearranged into different combinations of molecules. As a basis for understanding this concept:
a. Students know reactant atoms and molecules interact to form products with different chemical properties.
Physical Science Lab, Level A: Cards 9, 11, 27, 28, 29, 30, 31, 32, 35 **Physical Science Lab, Level B:** Cards 9, 11, 27, 28, 29, 30, 31, 32, 35 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 2, *Chemical Reaction Rates,* pages 81-83

Physical Science
Reactions
5. Chemical reactions are processes in which atoms are rearranged into different combinations of molecules. As a basis for understanding this concept:
b. Students know the idea of atoms explains the conservation of matter: In chemical reactions the number of atoms stays the same no matter how they are arranged, so their total mass stays the same.
Physical Science Lab, Level A: Card 9 **Physical Science Lab, Level B:** Card 9

Physical Science
Reactions
5. Chemical reactions are processes in which atoms are rearranged into different combinations of molecules. As a basis for understanding this concept:
c. Students know chemical reactions usually liberate heat or absorb heat.
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

Physical Science
Reactions
5. Chemical reactions are processes in which atoms are rearranged into different combinations of molecules. As a basis for understanding this concept:
d. Students know physical processes include freezing and boiling, in which a materials changes form with no chemical reaction.
Physical Science Lab, Level A: Cards 6, 8 **Physical Science Lab, Level B:** Cards 6, 8

Physical Science
Reactions
5. Chemical reactions are processes in which atoms are rearranged into different combinations of molecules. As a basis for understanding this concept:
e. Students know how to determine whether a solution is acidic, basic, or neutral.
Physical Science Lab, Level A: Cards 14, 15, 16 **Physical Science Lab, Level B:** Cards 14, 15, 16 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 1, *Measuring pH of Acids and Bases*, pages 77-79

Life Science
Chemistry of Living Systems
6. Principles of chemistry underlie the functioning of biological systems. As a basis for understanding this concept:
a. Students know that carbon, because of its ability to combine in many ways with itself and other elements, has a central role in the chemistry of living organisms.
Life Science Lab, Level A: Card 78 **Life Science Lab, Level B:** Card 78 **Physical Science Lab, Level A:** Cards 31, 32 **Physical Science Lab, Level B:** Cards 31, 32

Life Science
Chemistry of Living Systems
6. Principles of chemistry underlie the functioning of biological systems. As a basis for understanding this concept:
b. Students know that living organisms are made of molecules consisting largely of carbon, hydrogen, nitrogen, oxygen, phosphorus, and sulfur.
Life Science Lab, Level A: Card 4 **Life Science Lab, Level B:** Card 4 **Physical Science Lab, Level A:** Card 32 **Physical Science Lab, Level B:** Card 32

Life Science
Chemistry of Living Systems
6. Principles of chemistry underlie the functioning of biological systems. As a basis for understanding this concept:
c. Students know that living organisms have many different kinds of molecules, including small ones, such as water and salt, and very large ones, such as carbohydrates, fats, proteins, and DNA.
Life Science Lab, Level A: Card 4 **Life Science Lab, Level B:** Card 4 **Physical Science Lab, Level A:** Card 32 **Physical Science Lab, Level B:** Card 32

Physical Science
Periodic Table
7. The organization of the periodic table is based on the properties of the elements and reflects the structure of atoms. As a basis for understanding this concept:
a. Students know how to identify regions corresponding to metals, nonmetals, and inert gases.
Physical Science Lab, Level A: Cards 17, 18, 19, 20 **Physical Science Lab, Level B:** Cards 17, 18, 19, 20

Physical Science
Periodic Table
7. The organization of the periodic table is based on the properties of the elements and reflects the structure of atoms. As a basis for understanding this concept:
b. Students know each elements has a specific number of protons in the nucleus (the atomic number) and each isotope of the elements has a different but specific number of neutrons in the nucleus.
Physical Science Lab, Level A: Cards 21, 22, 23, 24, 25, 26 **Physical Science Lab, Level B:** Cards 21, 22, 23, 24, 25, 26

Physical Science
Periodic Table
7. The organization of the periodic table is based on the properties of the elements and reflects the structure of atoms. As a basis for understanding this concept:
c. Students know substances can be classified by their properties, including their melting temperature, density, hardness, and thermal and electrical conductivity.
Physical Science Lab, Level A: Cards 1, 2, 6, 35, 71, 74 **Physical Science Lab, Level B:** Cards 1, 2, 6, 35, 71, 74

Physical Science
Density and Buoyancy
8. All objects experience a buoyant force when immersed in a fluid. As a basis for understanding this concept:
a. Students know density is mass per unit volume.
Physical Science Lab, Level A: Card 2 **Physical Science Lab, Level B:** Card 2

Physical Science
Density and Buoyancy
8. All objects experience a buoyant force when immersed in a fluid. As a basis for understanding this concept:
b. Students know how to calculate the density of substances (regular and irregular solids and liquids) from measurements of mass and volume.
Physical Science Lab, Level A: Card 2 **Physical Science Lab, Level B:** Card 2

Physical Science
Density and Buoyancy
8. All objects experience a buoyant force when immersed in a fluid. As a basis for understanding this concept:
c. Students know the buoyant force on an object is a fluid is an upward force equal to the weight of the fluid the object has displaced.
Physical Science Lab, Level A: Cards 60, 61 **Physical Science Lab, Level B:** Cards 60, 61

Physical Science
Density and Buoyancy
8. All objects experience a buoyant force when immersed in a fluid. As a basis for understanding this concept:
d. Students know how to predict whether an object will float or sink.
Physical Science Lab, Level A: Cards 60, 61 **Physical Science Lab, Level B:** Cards 60, 61

Investigation and Experimentation
9. Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will:
a. Plan and conduct a scientific investigation to test a hypothesis.
Life Science Lab Teacher's Handbook: Hands-On Activity 3, *Investigating Arthropods*, pages 85-87 **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 **Classroom Resource CD-ROM:** Writing Strategy 8, 15

Investigation and Experimentation
9. Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will:
b. Evaluate the accuracy and reproducibility of 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 **Classroom Resource CD-ROM:** Writing Strategy 22, 24

Investigation and Experimentation
9. Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will:
c. Distinguish between variable and controlled parameters in a test.
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

Investigation and Experimentation
9. Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will:
d. Recognize the slope of the linear graph as the constant in the relationship y=kx and apply this principle in interpreting graphs constructed from data.
This concept is not covered at this level.

Investigation and Experimentation
9. Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will:
e. Construct appropriate graphs from data and develop quantitative statements about the relationships between variables.
Life Science Lab Teacher's Handbook: Hands-On Activity 4, *Your Cardiovascular System,* pages 89-91 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 3, *Energy Conversion*, pages 85-87 **Classroom Resource CD-ROM:** Writing Strategy 23

Investigation and Experimentation
9. Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will:
f. Apply simple mathematical relationships to determine a missing quantity in a mathematical expression, given the two remaining terms (including speed = distance/time, density = mass/volume, force = pressure x area, volume = area x height).
Earth Science Lab Teacher's Handbook: 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 3, *Energy Conversion*, pages 85-87

Investigation and Experimentation
9. Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will:
g. Distinguish between linear and nonlinear relationships on a graph of data.
This concept is not covered at this level.