SRA Life, Earth, and Physical Science Laboratories
correlation to
Arizona Science Standard Articulated by Grade Level
Grade 6

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

Strand 1: Inquiry Process **Inquiry Process establishes the basis for students' learning in science. Students use scientific processes: questioning, planning and conducting investigations, using appropriate tools and techniques to gather data, thinking critically and logically about relationships between evidence and explanations, and communicating results.**
Concept 1: Observations, Questions, and Hypotheses **Formulate predictions, questions, or hypotheses based on observations. Locate appropriate resources.**
PO 1. Differentiate among a question, hypothesis, and prediction.
Life Science Lab Teacher's Handbook: Hands-On Activity 1, *Examining Cells,* pages 77-79; Hands-On Activity 2, *Culturing Bacteria,* pages 81-83; Hands-On Activity 3, *Investigating Arthropods,* pages 85-87; Hands-On Activity 4, *Your Cardiovascular System,* pages 89-91; Hands-On Activity 5, *Making Fossils,* pages 93-95; Hands-On Activity 6, *How Much Does Energy Cost?,* pages 97-99; Hands-On Activity 7, *The Effects of Acid Rain,* pages 101-103 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 1, *Identifying Minerals with the Mohs Scale,* pages 73-75; Hands-On Activity 2, *Plate Boundaries in Action,* pages 77-79; Hands-On Activity 3, *Interpreting a Topographic Map,* pages 81-83; Hands-On Activity 4, *Using Sound Waves,* pages 85-87; Hands-On Activity 5, *What is in the Air?,* pages 89-91; Hands-On Activity 6, *Modeling a Tornado,* pages 93-95; Hands-On Activity 7, *Sizes in the Solar System,* pages 97-99; Hands-On Activity 8, *Temperature, Salinity, and Water Density,* pages 101-103 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 1, *Measuring pH of Acids and Bases,* pages 77-79; Hands-On Activity 2, *Chemical Reaction Rates,* pages 81-83; Hands-On Activity 3, *Energy Conversion,* pages 85-87; Hands-On Activity 4, *Reducing Friction,* pages 89-91; Hands-On Activity 5, *Making a Potato Battery,* pages 93-95; Hands-On Activity 6, *Making Sound,* pages 97-99

Strand 1: Inquiry Process **Inquiry Process establishes the basis for students' learning in science. Students use scientific processes: questioning, planning and conducting investigations, using appropriate tools and techniques to gather data, thinking critically and logically about relationships between evidence and explanations, and communicating results.**
Concept 1: Observations, Questions, and Hypotheses **Formulate predictions, questions, or hypotheses based on observations. Locate appropriate resources.**
PO 2. Formulate questions based on observations that lead to the development of 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

Strand 1: Inquiry Process **Inquiry Process establishes the basis for students' learning in science. Students use scientific processes: questioning, planning and conducting investigations, using appropriate tools and techniques to gather data, thinking critically and logically about relationships between evidence and explanations, and communicating results.**
Concept 1: Observations, Questions, and Hypotheses **Formulate predictions, questions, or hypotheses based on observations. Locate appropriate resources.**
PO 3. Locate research information, not limited to a single source, for use in the design of a controlled investigation.
Classroom Resource CD-ROM: Writing Strategy 9, 12, 125, 28

Strand 1: Inquiry Process **Inquiry Process establishes the basis for students' learning in science. Students use scientific processes: questioning, planning and conducting investigations, using appropriate tools and techniques to gather data, thinking critically and logically about relationships between evidence and explanations, and communicating results.**
Concept 2: Scientific Testing (Investigating and Modeling) **Design and conduct controlled investigations.**
PO 1. Demonstrate safe behavior and appropriate procedures (e.g., use and care of technology, materials, organisms) in all science inquiry.
Life Science Lab Teacher's Handbook: Hands-On Activity 1, *Examining Cells,* pages 77-79; Hands-On Activity 2, *Culturing Bacteria,* pages 81-83; Hands-On Activity 3, *Investigating Arthropods,* pages 85-87; Hands-On Activity 4, *Your Cardiovascular System,* pages 89-91; Hands-On Activity 5, *Making Fossils,* pages 93-95; Hands-On Activity 6, *How Much Does Energy Cost?,* pages 97-99; Hands-On Activity 7, *The Effects of Acid Rain,* pages 101-103 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 1, *Identifying Minerals with the Mohs Scale,* pages 73-75; Hands-On Activity 2, *Plate Boundaries in Action,* pages 77-79; Hands-On Activity 3, *Interpreting a Topographic Map,* pages 81-83; Hands-On Activity 4, *Using Sound Waves,* pages 85-87; Hands-On Activity 5, *What is in the Air?,* pages 89-91; Hands-On Activity 6, *Modeling a Tornado,* pages 93-95; Hands-On Activity 7, *Sizes in the Solar System,* pages 97-99; Hands-On Activity 8, *Temperature, Salinity, and Water Density,* pages 101-103 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 1, *Measuring pH of Acids and Bases,* pages 77-79; Hands-On Activity 2, *Chemical Reaction Rates,* pages 81-83; Hands-On Activity 3, *Energy Conversion,* pages 85-87; Hands-On Activity 4, *Reducing Friction,* pages 89-91; Hands-On Activity 5, *Making a Potato Battery,* pages 93-95; Hands-On Activity 6, *Making Sound,* pages 97-99

Strand 1: Inquiry Process **Inquiry Process establishes the basis for students' learning in science. Students use scientific processes: questioning, planning and conducting investigations, using appropriate tools and techniques to gather data, thinking critically and logically about relationships between evidence and explanations, and communicating results.**
Concept 2: Scientific Testing (Investigating and Modeling) **Design and conduct controlled investigations.**
PO 2. Plan an investigation to test individual variables using scientific processes.
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

Strand 1: Inquiry Process **Inquiry Process establishes the basis for students' learning in science. Students use scientific processes: questioning, planning and conducting investigations, using appropriate tools and techniques to gather data, thinking critically and logically about relationships between evidence and explanations, and communicating results.**
Concept 2: Scientific Testing (Investigating and Modeling) **Design and conduct controlled investigations.**
PO 3. Conduct a controlled investigation using scientific processes.
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

Strand 1: Inquiry Process **Inquiry Process establishes the basis for students' learning in science. Students use scientific processes: questioning, planning and conducting investigations, using appropriate tools and techniques to gather data, thinking critically and logically about relationships between evidence and explanations, and communicating results.**
Concept 2: Scientific Testing (Investigating and Modeling) **Design and conduct controlled investigations.**
PO 4. Perform measurements using appropriate scientific tools (e.g., balances, microscopes, probes, micrometers).
Life Science Lab Teacher's Handbook: Hands-On Activity 4, *Your Cardiovascular System*, pages 89-91; Hands-On Activity 7, *The Effects of Acid Rain*, pages 101-103 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 1, *Identifying Minerals with the Mohs Scale*, pages 73-75; Hands-On Activity 3, *Interpreting a Topographic Map*, pages 81-83; Hands-On Activity 7, *Sizes in the Solar System*, pages 97-99; Hands-On Activity 8, *Temperature, Salinity, and Water Density*, pages 101-103 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 1, *Measuring pH of Acids and Bases*, pages 77-79; Hands-On Activity 2, *Chemical Reaction Rates*, pages 81-83; Hands-On Activity 3, *Energy Conversion*, pages 85-87; Hands-On Activity 4, *Reducing Friction*, pages 89-91; Hands-On Activity 6, *Making Sound*, pages 97-99

Strand 1: Inquiry Process
Inquiry Process establishes the basis for students' learning in science. Students use scientific processes: questioning, planning and conducting investigations, using appropriate tools and techniques to gather data, thinking critically and logically about relationships between evidence and explanations, and communicating results.

Concept 2: Scientific Testing (Investigating and Modeling)
Design and conduct controlled investigations.

PO 5. Keep a record of observations, notes, sketches, questions, and ideas using tools such as written and/or computer logs.

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, 15

Strand 1: Inquiry Process
Inquiry Process establishes the basis for students' learning in science. Students use scientific processes: questioning, planning and conducting investigations, using appropriate tools and techniques to gather data, thinking critically and logically about relationships between evidence and explanations, and communicating results.

Concept 3: Analysis and Conclusions
Analyze and interpret data to explain correlations and results; formulate new questions.

PO 1. Analyze data obtained in a scientific investigation to identify trends.

Life Science Lab Teacher's Handbook: Hands-On Activity 3, *Investigating Arthropods,* pages 85-87; Hands-On Activity 4, *Your Cardiovascular System,* pages 89-91; Hands-On Activity 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 2, *Chemical Reaction Rates,* pages 81-83

Classroom Resource CD-ROM: Writing Strategy 22, 24

Strand 1: Inquiry Process
Inquiry Process establishes the basis for students' learning in science. Students use scientific processes: questioning, planning and conducting investigations, using appropriate tools and techniques to gather data, thinking critically and logically about relationships between evidence and explanations, and communicating results.

Concept 3: Analysis and Conclusions
Analyze and interpret data to explain correlations and results; formulate new questions.

PO 2. Form a logical argument about a correlation between variables or sequence of events (e.g., construct a cause-and-effect chain that explains a sequence of events).

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 2, *Plate Boundaries in Action,* pages 77-79; Hands-On Activity 6, *Modeling a Tornado,* pages 93-95

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; Hands-On Activity 4, *Reducing Friction,* pages 89-91

Classroom Resource CD-ROM: Writing Strategy 7, 23

Strand 1: Inquiry Process
Inquiry Process establishes the basis for students' learning in science. Students use scientific processes: questioning, planning and conducting investigations, using appropriate tools and techniques to gather data, thinking critically and logically about relationships between evidence and explanations, and communicating results.

Concept 3: Analysis and Conclusions
Analyze and interpret data to explain correlations and results; formulate new questions.

PO 3. Evaluate the observations and data reported by others.

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

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

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

Strand 1: Inquiry Process
Inquiry Process establishes the basis for students' learning in science. Students use scientific processes: questioning, planning and conducting investigations, using appropriate tools and techniques to gather data, thinking critically and logically about relationships between evidence and explanations, and communicating results.

Concept 3: Analysis and Conclusions
Analyze and interpret data to explain correlations and results; formulate new questions.

PO 4. Interpret simple tables and graphs produced by others.

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 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; 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 16, 22, 24

Strand 1: Inquiry Process
Inquiry Process establishes the basis for students' learning in science. Students use scientific processes: questioning, planning and conducting investigations, using appropriate tools and techniques to gather data, thinking critically and logically about relationships between evidence and explanations, and communicating results.

Concept 3: Analysis and Conclusions
Analyze and interpret data to explain correlations and results; formulate new questions.

PO 5. Analyze the results from previous and/or similar investigations to verify the results of the current investigation.

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

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

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

Strand 1: Inquiry Process
Inquiry Process establishes the basis for students' learning in science. Students use scientific processes: questioning, planning and conducting investigations, using appropriate tools and techniques to gather data, thinking critically and logically about relationships between evidence and explanations, and communicating results.

Concept 3: Analysis and Conclusions
Analyze and interpret data to explain correlations and results; formulate new questions.

PO 6. Formulate new questions based on the results of a completed investigation.

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

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

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

Strand 1: Inquiry Process
Inquiry Process establishes the basis for students' learning in science. Students use scientific processes: questioning, planning and conducting investigations, using appropriate tools and techniques to gather data, thinking critically and logically about relationships between evidence and explanations, and communicating results.

Concept 4: Communication
Communicate results of investigations.

PO 1. Choose an appropriate graphic representation for collected data:

- **Line graph**
- **Double bar graph**
- **Stem and leaf plot**
- **Histogram.**

Life Science Lab Teacher's Handbook: Hands-On Activity 4, *Your Cardiovascular System,* pages 89-91

Earth Science Lab Teacher's Handbook: Hands-On Activity 3, *Interpreting a Topographic Map,* pages 81-83

Strand 1: Inquiry Process
Inquiry Process establishes the basis for students' learning in science. Students use scientific processes: questioning, planning and conducting investigations, using appropriate tools and techniques to gather data, thinking critically and logically about relationships between evidence and explanations, and communicating results.

Concept 4: Communication
Communicate results of investigations.

PO 2. Display data collected from a controlled investigation.

Life Science Lab Teacher's Handbook: Hands-On Activity 3, *Investigating Arthropods,* pages 85-87; Hands-On Activity 4, *Your Cardiovascular System,* pages 89-91; Hands-On Activity 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 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 16, 22, 24

Strand 1: Inquiry Process
Inquiry Process establishes the basis for students' learning in science. Students use scientific processes: questioning, planning and conducting investigations, using appropriate tools and techniques to gather data, thinking critically and logically about relationships between evidence and explanations, and communicating results.

Concept 4: Communication
Communicate results of investigations.

PO 3. Communicate the results of an investigation with appropriate use of qualitative and quantitative information.

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, 16, 22

Strand 1: Inquiry Process
Inquiry Process establishes the basis for students' learning in science. Students use scientific processes: questioning, planning and conducting investigations, using appropriate tools and techniques to gather data, thinking critically and logically about relationships between evidence and explanations, and communicating results.

Concept 4: Communication
Communicate results of investigations.

PO 4. Create a list of instructions that others can follow in carrying out a procedure (without the use of personal pronouns).

Classroom Resource CD-ROM: Writing Strategy 6, 15

Strand 1: Inquiry Process
Inquiry Process establishes the basis for students' learning in science. Students use scientific processes: questioning, planning and conducting investigations, using appropriate tools and techniques to gather data, thinking critically and logically about relationships between evidence and explanations, and communicating results.

Concept 4: Communication
Communicate results of investigations.

PO 5. Communicate the results and conclusion of the investigation.

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

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

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

Classroom Resource CD-ROM: Writing Strategy 15

Strand 2: History and Nature of Science
Scientific investigation grows from the contributions of many people. History and Nature of Science emphasizes the importance of the conclusion of historical perspectives and the advances that each new development brings to technology and human knowledge. This strand focuses on the human aspects of science and the role that scientists play in the development of various cultures.

Concept 1: History of Science as a Human Endeavor
Identify individual, cultural, and technological contributions to scientific knowledge.

PO 1. Identify how diverse people and/or cultures, past and present, have made important contributions to scientific innovations (e.g., Jacques Cousteau [inventor, marine explorer], supports Strand 4; William Beebe [scientists] supports Stand 4; Thor Heyerdahl [anthropologist] supports Strand 6).

Life Science Lab, Level A: Cards 2, 5, 46, 59
Life Science Lab, Level B: Cards 2, 5, 46, 59

Earth Science Lab, Level A: Cards 10, 68, 72, 78
Earth Science Lab, Level B: Cards 10, 68, 72, 78

Physical Science Lab, Level A: Cards 3, 7, 17, 55
Physical Science Lab, Level B: Cards 3, 7, 17, 55

Strand 2: History and Nature of Science **Scientific investigation grows from the contributions of many people. History and Nature of Science emphasizes the importance of the conclusion of historical perspectives and the advances that each new development brings to technology and human knowledge. This strand focuses on the human aspects of science and the role that scientists play in the development of various cultures.**
Concept 1: History of Science as a Human Endeavor **Identify individual, cultural, and technological contributions to scientific knowledge.**
PO 2. Describe how a major milestone in science or technology has revolutionized the thinking of the time (e.g., Cell Theory, sonar, SCUBA, underwater robotics).
Life Science Lab, Level A: Cards 5, 49, 59, 64, 69, 83 **Life Science Lab, Level B:** Cards 5, 49, 59, 64, 69, 83 **Earth Science Lab, Level A:** Cards 16, 20, 31, 70, 72, 79, 80, 81, 88 **Earth Science Lab, Level B:** Cards 16, 20, 31, 70, 72, 79, 80, 81, 88 **Physical Science Lab, Level A:** Cards 33, 34, 35, 76, 81, 82, 90 **Physical Science Lab, Level B:** Cards 33, 34, 35, 76, 81, 82, 90

Strand 2: History and Nature of Science **Scientific investigation grows from the contributions of many people. History and Nature of Science emphasizes the importance of the conclusion of historical perspectives and the advances that each new development brings to technology and human knowledge. This strand focuses on the human aspects of science and the role that scientists play in the development of various cultures.**
Concept 1: History of Science as a Human Endeavor **Identify individual, cultural, and technological contributions to scientific knowledge.**
PO 3. Analyze the impact of a major scientific development occurring within the past decade.
Life Science Lab, Level A: Cards 64, 69, 83 **Life Science Lab, Level B:** Cards 64, 69, 83 **Earth Science Lab, Level A:** Cards 20, 72, 79 **Earth Science Lab, Level B:** Cards 20, 72, 79 **Physical Science Lab, Level A:** Cards 33, 35, 81, 84 **Physical Science Lab, Level B:** Cards 33, 35, 81, 84

Strand 2: History and Nature of Science **Scientific investigation grows from the contributions of many people. History and Nature of Science emphasizes the importance of the conclusion of historical perspectives and the advances that each new development brings to technology and human knowledge. This strand focuses on the human aspects of science and the role that scientists play in the development of various cultures.**
Concept 1: History of Science as a Human Endeavor **Identify individual, cultural, and technological contributions to scientific knowledge.**
PO 4. Describe the use of technology in science-related careers.
This concept is not covered at this level.

Strand 2: History and Nature of Science **Scientific investigation grows from the contributions of many people. History and Nature of Science emphasizes the importance of the conclusion of historical perspectives and the advances that each new development brings to technology and human knowledge. This strand focuses on the human aspects of science and the role that scientists play in the development of various cultures.**
Concept 2: Nature of Scientific Knowledge **Understand how science is a process for generating knowledge.**
PO 1. Describe how science is an ongoing process that changes in response to new information and discoveries.
Life Science Lab, Level A: Cards 5, 64, 69 **Life Science Lab, Level B:** Cards 5, 64, 69 **Earth Science Lab, Level A:** Cards 10, 20, 31, 68, 72, 78, 79 **Earth Science Lab, Level B:** Cards 10, 20, 31, 68, 72, 78, 79 **Physical Science Lab, Level A:** Cards 3, 7, 17, 33, 35, 53, 55, 81, 84 **Physical Science Lab, Level B:** Cards 3, 7, 17, 33, 35, 53, 55, 81, 84

Strand 2: History and Nature of Science **Scientific investigation grows from the contributions of many people. History and Nature of Science emphasizes the importance of the conclusion of historical perspectives and the advances that each new development brings to technology and human knowledge. This strand focuses on the human aspects of science and the role that scientists play in the development of various cultures.**
Concept 2: Nature of Scientific Knowledge **Understand how science is a process for generating knowledge.**
PO 2. Describe how scientific knowledge is subject to change as new information and/or technology challenges prevailing theories.
Life Science Lab, Level A: Cards 1, 49, 64, 69 **Life Science Lab, Level B:** Cards 1, 49, 64, 69 **Earth Science Lab, Level A:** Cards 10, 68, 72, 78 **Earth Science Lab, Level B:** Cards 10, 68, 72, 78 **Physical Science Lab, Level A:** Cards 3, 81, 84 **Physical Science Lab, Level B:** Cards 3, 81, 84

Strand 2: History and Nature of Science
Scientific investigation grows from the contributions of many people. History and Nature of Science emphasizes the importance of the conclusion of historical perspectives and the advances that each new development brings to technology and human knowledge. This strand focuses on the human aspects of science and the role that scientists play in the development of various cultures.

Concept 2: Nature of Scientific Knowledge
Understand how science is a process for generating knowledge.

PO 3. Apply the following scientific processes to other problem solving or decision making situations:

- **Observing**
- **Questioning**
- **Communicating**
- **Comparing**
- **Measuring**
- **Classifying**
- **Predicting**
- **Organizing data**
- **Inferring**
- **Generating hypotheses**
- **Identifying variables.**

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

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

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

Strand 3: Science in Personal and Social Perspectives
Science in personal and Social Perspectives emphasizes developing the ability to design a solution to a problem, to understand the relationship between science and technology, and the ways people are involved in both. Students understand the impact of science and technology on human activity and the environment. This strand affords students the opportunity to understand their place in the world—as living creatures, consumers, decision makers, problem solvers, managers, and planners.

Concept 1: Changes in Environments
Describe the interactions between human populations, natural hazards, and the environment.

PO 1. Evaluate the effects of the following natural hazards:

- **Sandstorm**
- **Hurricane**
- **Tornado**
- **Ultraviolet light**
- **Lightning- caused fire.**

Life Science Lab, Level A: Card 80
Life Science Lab, Level B: Card 80

Earth Science Lab, Level A: Cards 15, 16, 17, 52, 53, 54, 60
Earth Science Lab, Level B: Cards 15, 16, 17, 52, 53, 54, 60

Strand 3: Science in Personal and Social Perspectives
Science in personal and Social Perspectives emphasizes developing the ability to design a solution to a problem, to understand the relationship between science and technology, and the ways people are involved in both. Students understand the impact of science and technology on human activity and the environment. This strand affords students the opportunity to understand their place in the world—as living creatures, consumers, decision makers, problem solvers, managers, and planners.

Concept 1: Changes in Environments
Describe the interactions between human populations, natural hazards, and the environment.

PO 2. Describe how people plan for, and respond to, the following natural disasters:

- **Drought**
- **Flooding**
- **Tornadoes.**

Earth Science Lab, Level A: Cards 15, 17, 52, 53, 54
Earth Science Lab, Level B: Cards 15, 17, 52, 53, 54

Strand 3: Science in Personal and Social Perspectives
Science in personal and Social Perspectives emphasizes developing the ability to design a solution to a problem, to understand the relationship between science and technology, and the ways people are involved in both. Students understand the impact of science and technology on human activity and the environment. This strand affords students the opportunity to understand their place in the world—as living creatures, consumers, decision makers, problem solvers, managers, and planners.

Concept 2: Science and Technology in Society
Develop viable solutions to a need or problem.

PO 1. Propose viable methods of responding to an identified need or problem.

PO 2. Compare possible solutions to best address an identified need of problem.

PO 3. Design and construct a solution to an identified need or problem using simple classroom materials.

PO 4. Describe a technological discovery that influences science.

This concept is not covered at this level.

Strand 4: Life Science
Life Science expands students' biological understanding of life by focusing on the characteristics of living things, the diversity of life, and how organisms and populations change over time in terms of biological adaptation and genetics. This understanding includes the relationship of structures to their functions and life cycles, interrelationships of matter and energy in living organisms, and the interactions of living organisms with their environment.

Concept 1: Structure and Function in Living Systems
Understand the relationships between structures and functions of organisms.

PO 1. Explain the importance of water to organisms.

Life Science Lab, Level A: Cards 16, 17, 45, 46, 52, 70, 82, 90
Life Science Lab, Level B: Cards 16, 17, 45, 46, 52, 70, 82, 90

Earth Science Lab, Level A: Card 47
Earth Science Lab, Level B: Card 47

Strand 4: Life Science
Life Science expands students' biological understanding of life by focusing on the characteristics of living things, the diversity of life, and how organisms and populations change over time in terms of biological adaptation and genetics. This understanding includes the relationship of structures to their functions and life cycles, interrelationships of matter and energy in living organisms, and the interactions of living organisms with their environment.

Concept 1: Structure and Function in Living Systems
Understand the relationships between structures and functions of organisms.

PO 2. Describe the basic structure of a cell, including:

- **Cell wall**
- **Cell membrane**
- **Nucleus.**

Life Science Lab, Level A: Cards 6, 7, 8
Life Science Lab, Level B: Cards 6, 7, 8
Life Science Lab Teacher's Handbook: Hands-On Activity 1, *Examining Cells*, pages 77-79

Strand 4: Life Science
Life Science expands students' biological understanding of life by focusing on the characteristics of living things, the diversity of life, and how organisms and populations change over time in terms of biological adaptation and genetics. This understanding includes the relationship of structures to their functions and life cycles, interrelationships of matter and energy in living organisms, and the interactions of living organisms with their environment.

Concept 1: Structure and Function in Living Systems
Understand the relationships between structures and functions of organisms.

PO 3. Describe the function of each of the following cell parts:

- **Cell wall**
- **Cell membrane**
- **Nucleus.**

Life Science Lab, Level A: Cards 6, 7, 8
Life Science Lab, Level B: Cards 6, 7, 8
Life Science Lab Teacher's Handbook: Hands-On Activity 1, *Examining Cells*, pages 77-79

Strand 4: Life Science
Life Science expands students' biological understanding of life by focusing on the characteristics of living things, the diversity of life, and how organisms and populations change over time in terms of biological adaptation and genetics. This understanding includes the relationship of structures to their functions and life cycles, interrelationships of matter and energy in living organisms, and the interactions of living organisms with their environment.

Concept 1: Structure and Function in Living Systems
Understand the relationships between structures and functions of organisms.

PO 4. Differentiate between plant and animal cells.

Life Science Lab, Level A: Cards 6, 7
Life Science Lab, Level B: Cards 6, 7

Strand 4: Life Science
Life Science expands students' biological understanding of life by focusing on the characteristics of living things, the diversity of life, and how organisms and populations change over time in terms of biological adaptation and genetics. This understanding includes the relationship of structures to their functions and life cycles, interrelationships of matter and energy in living organisms, and the interactions of living organisms with their environment.

Concept 1: Structure and Function in Living Systems
Understand the relationships between structures and functions of organisms.

PO 5. Explain the hierarchy of cells, tissues, organs, and systems.

Life Science Lab, Level A: Card 44
Life Science Lab, Level B: Card 44

Strand 4: Life Science
Life Science expands students' biological understanding of life by focusing on the characteristics of living things, the diversity of life, and how organisms and populations change over time in terms of biological adaptation and genetics. This understanding includes the relationship of structures to their functions and life cycles, interrelationships of matter and energy in living organisms, and the interactions of living organisms with their environment.

Concept 1: Structure and Function in Living Systems
Understand the relationships between structures and functions of organisms.

PO 6. Relate the following structures of living organisms to their functions:
Animals

- **Respiration—gills, lungs**
- **Digestion—stomach, intestines**
- **Circulation—heart, veins, arteries, capillaries**
- **Locomotion—muscles, skeleton.**

Plants

- **Transpiration—stomata, roots, xylem, phloem**
- **Absorption—roots, xylem, phloem**
- **Response to stimulus (phototropism, hydrotropism, geotropism)—roots, xylem, phloem.**

Life Science Lab, Level A: Cards 16, 17, 18, 20, 24, 47, 48, 50, 51, 53, 54
Life Science Lab, Level B: Cards 16, 17, 18, 20, 24, 47, 48, 50, 51, 53, 54
Life Science Lab Teacher's Handbook: Hands-On Activity 4, *Your Cardiovascular System,* pages 89-91

Strand 4: Life Science
Life Science expands students' biological understanding of life by focusing on the characteristics of living things, the diversity of life, and how organisms and populations change over time in terms of biological adaptation and genetics. This understanding includes the relationship of structures to their functions and life cycles, interrelationships of matter and energy in living organisms, and the interactions of living organisms with their environment.

Concept 1: Structure and Function in Living Systems
Understand the relationships between structures and functions of organisms.

PO 7. Describe how the various systems of living organisms work together to perform a vital function:

- **Respiratory and circulatory**
- **Muscular and skeletal**
- **Digestive and excretory.**

Life Science Lab, Level A: Cards 47, 48, 50, 51, 52, 53, 54, 55
Life Science Lab, Level B: Cards 47, 48, 50, 51, 52, 53, 54, 55
Life Science Lab Teacher's Handbook: Hands-On Activity 4, *Your Cardiovascular System,* pages 89-91

Strand 4: Life Science
Life Science expands students' biological understanding of life by focusing on the characteristics of living things, the diversity of life, and how organisms and populations change over time in terms of biological adaptation and genetics. This understanding includes the relationship of structures to their functions and life cycles, interrelationships of matter and energy in living organisms, and the interactions of living organisms with their environment.

Concept 3: Populations of Organisms in an Ecosystem
Analyze the relationships among various organisms and their environment.

PO 1. Explain that sunlight is the major source of energy for most ecosystems.

Life Science Lab, Level A: Cards 16, 17, 76, 89
Life Science Lab, Level B: Cards 16, 17, 76, 89

Earth Science Lab, Level A: Cards 37, 38, 43, 47, 82
Earth Science Lab, Level B: Cards 37, 38, 43, 47, 82

Physical Science Lab, Level A: Card 46
Physical Science Lab, Level B: Card 46

Strand 4: Life Science
Life Science expands students' biological understanding of life by focusing on the characteristics of living things, the diversity of life, and how organisms and populations change over time in terms of biological adaptation and genetics. This understanding includes the relationship of structures to their functions and life cycles, interrelationships of matter and energy in living organisms, and the interactions of living organisms with their environment.

Concept 3: Populations of Organisms in an Ecosystem
Analyze the relationships among various organisms and their environment.

PO 2. Describe how the following environmental conditions affect the quality of life:

- **Water quality**
- **Climate**
- **Population density**
- **Smog.**

Life Science Lab, Level A: Cards 84, 87, 88, 89, 90
Life Science Lab, Level B: Cards 84, 86, 87, 88, 89, 90
Life Science Lab Teacher's Handbook: Hands-On Activity 7, *The Effects of Acid Rain,* pages 101-103

Earth Science Lab, Level A: Cards 37, 42, 56, 59, 60, 61, 85, 86
Earth Science Lab, Level B: Cards 37, 42, 56, 59, 60, 61, 85, 86
Earth Science Lab Teacher's Handbook: Hands-On Activity 5, *What is in the Air?,* pages 89-91

Strand 5: Physical Science
Physical Science affords students the opportunity to increase their understanding of the characteristics of objects and materials they encounter daily. Students gain an understanding of the nature of matter and energy, including their forms, the changes they undergo, and their interactions. By studying objects and the forces that act upon them, students develop an understanding of the fundamental laws of motion, knowledge of the various ways energy is stored in systems, and the processes by which energy is transferred between systems and surroundings.

Concept 3: Transfer of Energy
Understand that energy can be stored and transferred.

PO 1. Identify various ways in which electrical energy is generated using renewable and nonrenewable resources (e.g., wind, dams, fossil fuels, nuclear reactions).

Earth Science Lab, Level A: Cards 35, 90
Earth Science Lab, Level B: Cards 35, 90

Physical Science Lab, Level A: Cards 34, 38, 46, 47, 48, 49
Physical Science Lab, Level B: Cards 34, 38, 46, 47, 48, 49

Strand 5: Physical Science
Physical Science affords students the opportunity to increase their understanding of the characteristics of objects and materials they encounter daily. Students gain an understanding of the nature of matter and energy, including their forms, the changes they undergo, and their interactions. By studying objects and the forces that act upon them, students develop an understanding of the fundamental laws of motion, knowledge of the various ways energy is stored in systems, and the processes by which energy is transferred between systems and surroundings.

Concept 3: Transfer of Energy
Understand that energy can be stored and transferred.

PO 2. Identify several ways in which energy can be stored.

Life Science Lab, Level A: Card 46
Life Science Lab, Level B: Card 46

Physical Science Lab, Level A: Cards 38, 40, 46, 49, 70
Physical Science Lab, Level B: Cards 38, 40, 46, 49, 70

Strand 5: Physical Science
Physical Science affords students the opportunity to increase their understanding of the characteristics of objects and materials they encounter daily. Students gain an understanding of the nature of matter and energy, including their forms, the changes they undergo, and their interactions. By studying objects and the forces that act upon them, students develop an understanding of the fundamental laws of motion, knowledge of the various ways energy is stored in systems, and the processes by which energy is transferred between systems and surroundings.

Concept 3: Transfer of Energy
Understand that energy can be stored and transferred.

PO 3. Compare the following ways in which energy may be transformed:

- **Mechanical to electrical**
- **Electrical to thermal.**

Physical Science Lab, Level A: Cards 37, 41, 68, 69, 72
Physical Science Lab, Level B: Cards 37, 41, 68, 69, 72
Physical Science Lab Teacher's Handbook: Hands-On Activity 5, *Making a Potato Battery*, pages 93-95

Strand 5: Physical Science
Physical Science affords students the opportunity to increase their understanding of the characteristics of objects and materials they encounter daily. Students gain an understanding of the nature of matter and energy, including their forms, the changes they undergo, and their interactions. By studying objects and the forces that act upon them, students develop an understanding of the fundamental laws of motion, knowledge of the various ways energy is stored in systems, and the processes by which energy is transferred between systems and surroundings.

Concept 3: Transfer of Energy
Understand that energy can be stored and transferred.

PO 4. Explain how thermal energy (heat energy) can be transferred by:

- **Conduction**
- **Convection**
- **Radiation.**

Earth Science Lab, Level A: Card 38
Earth Science Lab, Level B: Card 38

Physical Science Lab, Level A: Card 43
Physical Science Lab, Level B: Card 43

Strand 6: Earth and Space Science
Earth and Space Science provides the foundation for students to develop an understanding of the Earth, its history, composition, and formative processes, and an understanding of the solar system and the universe. Students study the regularities of the interrelated systems of the natural world. In doing so, they develop understanding of the basic laws, theories, and models that explain the world (NSES, 1995). By studying the Earth from both a historical and current time frame, student can make informed decisions about issues affecting the planets on which they live.

Concept 1: Structure of the Earth
Describe the composition and interactions between the structure of the Earth and its atmosphere.

PO 1. Describe the properties and the composition of the layers of the atmosphere.

Earth Science Lab, Level A: Cards 36, 37
Earth Science Lab, Level B: Cards 36, 37

Strand 6: Earth and Space Science **Earth and Space Science provides the foundation for students to develop an understanding of the Earth, its history, composition, and formative processes, and an understanding of the solar system and the universe. Students study the regularities of the interrelated systems of the natural world. In doing so, they develop understanding of the basic laws, theories, and models that explain the world (NSES, 1995). By studying the Earth from both a historical and current time frame, student can make informed decisions about issues affecting the planets on which they live.**
Concept 1: Structure of the Earth **Describe the composition and interactions between the structure of the Earth and its atmosphere.**
PO 2. Explain the composition, properties, and structure of the Earth's lakes and rivers.
Earth Science Lab, Level A: Cards 82, 83, 84 **Earth Science Lab, Level B:** Cards 82, 83, 84

Strand 6: Earth and Space Science **Earth and Space Science provides the foundation for students to develop an understanding of the Earth, its history, composition, and formative processes, and an understanding of the solar system and the universe. Students study the regularities of the interrelated systems of the natural world. In doing so, they develop understanding of the basic laws, theories, and models that explain the world (NSES, 1995). By studying the Earth from both a historical and current time frame, student can make informed decisions about issues affecting the planets on which they live.**
Concept 1: Structure of the Earth **Describe the composition and interactions between the structure of the Earth and its atmosphere.**
PO 3. Explain the composition, properties, and structures of the oceans' zones and layers.
Earth Science Lab, Level A: Cards 82, 87, 88, 89, 90 **Earth Science Lab, Level B:** Cards 82, 87, 88, 89, 90 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 8, *Temperature, Salinity, and Water Density*, pages 101-103

Strand 6: Earth and Space Science **Earth and Space Science provides the foundation for students to develop an understanding of the Earth, its history, composition, and formative processes, and an understanding of the solar system and the universe. Students study the regularities of the interrelated systems of the natural world. In doing so, they develop understanding of the basic laws, theories, and models that explain the world (NSES, 1995). By studying the Earth from both a historical and current time frame, student can make informed decisions about issues affecting the planets on which they live.**
Concept 1: Structure of the Earth **Describe the composition and interactions between the structure of the Earth and its atmosphere.**
PO 3. Analyze the interactions between the Earth's atmosphere and the Earth's bodies of water (water cycle).
Earth Science Lab, Level A: Cards 41, 45, 47, 48, 49, 54, 57, 60, 61 **Earth Science Lab, Level B:** Cards 41, 45, 47, 48, 49, 54, 57, 60, 61

Strand 6: Earth and Space Science **Earth and Space Science provides the foundation for students to develop an understanding of the Earth, its history, composition, and formative processes, and an understanding of the solar system and the universe. Students study the regularities of the interrelated systems of the natural world. In doing so, they develop understanding of the basic laws, theories, and models that explain the world (NSES, 1995). By studying the Earth from both a historical and current time frame, student can make informed decisions about issues affecting the planets on which they live.**
Concept 1: Structure of the Earth **Describe the composition and interactions between the structure of the Earth and its atmosphere.**
PO 5. Describe ways scientists explore the Earth's atmosphere and bodies of water.
Earth Science Lab, Level A: Cards 20, 36, 37, 39, 43, 44, 49, 50, 51, 88 **Earth Science Lab, Level B:** Cards 20, 36, 37, 39, 43, 44, 49, 50, 51, 88

Strand 6: Earth and Space Science **Earth and Space Science provides the foundation for students to develop an understanding of the Earth, its history, composition, and formative processes, and an understanding of the solar system and the universe. Students study the regularities of the interrelated systems of the natural world. In doing so, they develop understanding of the basic laws, theories, and models that explain the world (NSES, 1995). By studying the Earth from both a historical and current time frame, student can make informed decisions about issues affecting the planets on which they live.**
Concept 2: Earth's Processes and Systems **Understand the processes acting on the Earth and their interaction with the Earth's systems.**
PO 1. Explain how water is cycled in nature.
Earth Science Lab, Level A: Cards 47, 48, 49, 82, 83, 84 **Earth Science Lab, Level B:** Cards 47, 48, 49, 82, 83, 84

Strand 6: Earth and Space Science **Earth and Space Science provides the foundation for students to develop an understanding of the Earth, its history, composition, and formative processes, and an understanding of the solar system and the universe. Students study the regularities of the interrelated systems of the natural world. In doing so, they develop understanding of the basic laws, theories, and models that explain the world (NSES, 1995). By studying the Earth from both a historical and current time frame, student can make informed decisions about issues affecting the planets on which they live.**
Concept 2: Earth's Processes and Systems **Understand the processes acting on the Earth and their interaction with the Earth's systems.**
PO 2. Identify the distribution of water within or among the following: • **Atmosphere** • **Lithosphere** • **Hydrosphere.**
Earth Science Lab, Level A: Cards 43, 44, 47, 48, 49, 82, 83, 84, 87 **Earth Science Lab, Level B:** Cards 43, 44, 47, 48, 49, 82, 83, 84, 87

Strand 6: Earth and Space Science **Earth and Space Science provides the foundation for students to develop an understanding of the Earth, its history, composition, and formative processes, and an understanding of the solar system and the universe. Students study the regularities of the interrelated systems of the natural world. In doing so, they develop understanding of the basic laws, theories, and models that explain the world (NSES, 1995). By studying the Earth from both a historical and current time frame, student can make informed decisions about issues affecting the planets on which they live.**
Concept 2: Earth's Processes and Systems **Understand the processes acting on the Earth and their interaction with the Earth's systems.**
PO 3. Analyze the effects that bodies of water have on the climate of a region.
Earth Science Lab, Level A: Cards 56, 57, 58, 60, 61 **Earth Science Lab, Level B:** Cards 56, 57, 58, 60, 61

Strand 6: Earth and Space Science **Earth and Space Science provides the foundation for students to develop an understanding of the Earth, its history, composition, and formative processes, and an understanding of the solar system and the universe. Students study the regularities of the interrelated systems of the natural world. In doing so, they develop understanding of the basic laws, theories, and models that explain the world (NSES, 1995). By studying the Earth from both a historical and current time frame, student can make informed decisions about issues affecting the planets on which they live.**
Concept 2: Earth's Processes and Systems **Understand the processes acting on the Earth and their interaction with the Earth's systems.**
PO 4. Analyze the following factors that affect climate: • **Ocean currents** • **Elevation** • **Location.**
Earth Science Lab, Level A: Cards 55, 56, 57, 58 **Earth Science Lab, Level B:** Cards 55, 56, 57, 58

Strand 6: Earth and Space Science **Earth and Space Science provides the foundation for students to develop an understanding of the Earth, its history, composition, and formative processes, and an understanding of the solar system and the universe. Students study the regularities of the interrelated systems of the natural world. In doing so, they develop understanding of the basic laws, theories, and models that explain the world (NSES, 1995). By studying the Earth from both a historical and current time frame, student can make informed decisions about issues affecting the planets on which they live.**
Concept 2: Earth's Processes and Systems **Understand the processes acting on the Earth and their interaction with the Earth's systems.**
PO 5. Analyze the impact of large-scale weather systems on the local weather.
Earth Science Lab, Level A: Cards 40, 41, 45, 46, 52, 53, 54, 56, 57, 58, 59, 60, 61 **Earth Science Lab, Level B:** Cards 40, 41, 45, 46, 52, 53, 54, 56, 57, 58, 59, 60, 61

Strand 6: Earth and Space Science **Earth and Space Science provides the foundation for students to develop an understanding of the Earth, its history, composition, and formative processes, and an understanding of the solar system and the universe. Students study the regularities of the interrelated systems of the natural world. In doing so, they develop understanding of the basic laws, theories, and models that explain the world (NSES, 1995). By studying the Earth from both a historical and current time frame, student can make informed decisions about issues affecting the planets on which they live.**
Concept 2: Earth's Processes and Systems **Understand the processes acting on the Earth and their interaction with the Earth's systems.**
PO 6. Create a weather system model that includes: • **The Sun** • **The atmosphere** • **Bodies of water.**
Earth Science Lab, Level A: Cards 40, 41, 43, 44, 45, 46, 47, 48, 49, 50, 52, 53, 54, 56, 57, 59, 60, 61 **Earth Science Lab, Level B:** Cards 40, 41, 43, 44, 45, 46, 47, 48, 49, 50, 52, 53, 54, 56, 57, 59, 60, 61

SRA Life, Earth, and Physical Science Laboratories
correlation to
Arizona Science Standard Articulated by Grade Level
Grade 7

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

Strand 1: Inquiry Process **Inquiry Process establishes the basis for students' learning in science. Students use scientific processes: questioning, planning and conducting investigations, using appropriate tools and techniques to gather data, thinking critically and logically about relationships between evidence and explanations, and communicating results.**
Concept 1: Observations, Questions, and Hypotheses **Formulate predictions, questions, or hypotheses based on observations. Locate appropriate resources.**
PO 1. Formulate questions based on observations that lead to the development of 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

Strand 1: Inquiry Process **Inquiry Process establishes the basis for students' learning in science. Students use scientific processes: questioning, planning and conducting investigations, using appropriate tools and techniques to gather data, thinking critically and logically about relationships between evidence and explanations, and communicating results.**
Concept 1: Observations, Questions, and Hypotheses **Formulate predictions, questions, or hypotheses based on observations. Locate appropriate resources.**
PO 2. Select appropriate resources for background information related to a question, for use in the design of a controlled investigation.
Classroom Resource CD-ROM: Writing Strategy 9, 12, 125, 28

Strand 1: Inquiry Process **Inquiry Process establishes the basis for students' learning in science. Students use scientific processes: questioning, planning and conducting investigations, using appropriate tools and techniques to gather data, thinking critically and logically about relationships between evidence and explanations, and communicating results.**
Concept 1: Observations, Questions, and Hypotheses **Formulate predictions, questions, or hypotheses based on observations. Locate appropriate resources.**
PO 3. Explain the role of a hypothesis in a scientific inquiry.
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

Strand 1: Inquiry Process
Inquiry Process establishes the basis for students' learning in science. Students use scientific processes: questioning, planning and conducting investigations, using appropriate tools and techniques to gather data, thinking critically and logically about relationships between evidence and explanations, and communicating results.

Concept 2: Scientific Testing (Investigating and Modeling)
Design and conduct controlled investigations.

PO 1. Demonstrate safe behavior and appropriate procedures (e.g., use and care of technology, materials, organisms) in all science inquiry.

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

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

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

Strand 1: Inquiry Process
Inquiry Process establishes the basis for students' learning in science. Students use scientific processes: questioning, planning and conducting investigations, using appropriate tools and techniques to gather data, thinking critically and logically about relationships between evidence and explanations, and communicating results.

Concept 2: Scientific Testing (Investigating and Modeling)
Design and conduct controlled investigations.

PO 2. Design an investigation to test individual variables using scientific processes.

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

Strand 1: Inquiry Process
Inquiry Process establishes the basis for students' learning in science. Students use scientific processes: questioning, planning and conducting investigations, using appropriate tools and techniques to gather data, thinking critically and logically about relationships between evidence and explanations, and communicating results.

Concept 2: Scientific Testing (Investigating and Modeling)
Design and conduct controlled investigations.

PO 3. Conduct a controlled investigation, utilizing multiple trials, to test a hypothesis using scientific processes.

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

Strand 1: Inquiry Process
Inquiry Process establishes the basis for students' learning in science. Students use scientific processes: questioning, planning and conducting investigations, using appropriate tools and techniques to gather data, thinking critically and logically about relationships between evidence and explanations, and communicating results.

Concept 2: Scientific Testing (Investigating and Modeling)
Design and conduct controlled investigations.

PO 4. Perform measurements using appropriate scientific tools (e.g., balances, microscopes, probes, micrometers).

Life Science Lab Teacher's Handbook: Hands-On Activity 4, *Your Cardiovascular System,* pages 89-91; Hands-On Activity 7, *The Effects of Acid Rain,* pages 101-103

Earth Science Lab Teacher's Handbook: Hands-On Activity 1, *Identifying Minerals with the Mohs Scale,* pages 73-75; Hands-On Activity 3, *Interpreting a Topographic Map,* pages 81-83; Hands-On Activity 7, *Sizes in the Solar System,* pages 97-99; Hands-On Activity 8, *Temperature, Salinity, and Water Density,* pages 101-103

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

Strand 1: Inquiry Process
Inquiry Process establishes the basis for students' learning in science. Students use scientific processes: questioning, planning and conducting investigations, using appropriate tools and techniques to gather data, thinking critically and logically about relationships between evidence and explanations, and communicating results.

Concept 2: Scientific Testing (Investigating and Modeling)
Design and conduct controlled investigations.

PO 5. Keep a record of observations, notes, sketches, questions, and ideas using tools such as written and/or computer logs.

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, 15

Strand 1: Inquiry Process
Inquiry Process establishes the basis for students' learning in science. Students use scientific processes: questioning, planning and conducting investigations, using appropriate tools and techniques to gather data, thinking critically and logically about relationships between evidence and explanations, and communicating results.

Concept 3: Analysis and Conclusions
Analyze and interpret data to explain correlations and results; formulate new questions.

PO 1. Analyze data obtained in a scientific investigation to identify trends.

Life Science Lab Teacher's Handbook: Hands-On Activity 3, *Investigating Arthropods,* pages 85-87; Hands-On Activity 4, *Your Cardiovascular System,* pages 89-91; Hands-On Activity 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 2, *Chemical Reaction Rates,* pages 81-83

Classroom Resource CD-ROM: Writing Strategy 22, 24

Strand 1: Inquiry Process
Inquiry Process establishes the basis for students' learning in science. Students use scientific processes: questioning, planning and conducting investigations, using appropriate tools and techniques to gather data, thinking critically and logically about relationships between evidence and explanations, and communicating results.

Concept 3: Analysis and Conclusions
Analyze and interpret data to explain correlations and results; formulate new questions.

PO 2. Form a logical argument about a correlation between variables or sequence of events (e.g., construct a cause-and-effect chain that explains a sequence of events).

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 2, *Plate Boundaries in Action,* pages 77-79; Hands-On Activity 6, *Modeling a Tornado,* pages 93-95

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; Hands-On Activity 4, *Reducing Friction,* pages 89-91

Classroom Resource CD-ROM: Writing Strategy 7, 23

Strand 1: Inquiry Process
Inquiry Process establishes the basis for students' learning in science. Students use scientific processes: questioning, planning and conducting investigations, using appropriate tools and techniques to gather data, thinking critically and logically about relationships between evidence and explanations, and communicating results.

Concept 3: Analysis and Conclusions
Analyze and interpret data to explain correlations and results; formulate new questions.

PO 3. Analyze results of data collection in order to accept or reject the hypothesis.

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

Earth Science Lab Teacher's Handbook: Hands-On Activity 1, *Identifying Minerals with the Mohs Scale,* pages 73-75; Hands-On Activity 3, *Interpreting a Topographic Map,* pages 81-83; Hands-On Activity 5, *What is in the Air?,* pages 89-91; Hands-On Activity 8, *Temperature, Salinity, and Water Density,* pages 101-103

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

Classroom Resource CD-ROM: Writing Strategy 22, 24

Strand 1: Inquiry Process
Inquiry Process establishes the basis for students' learning in science. Students use scientific processes: questioning, planning and conducting investigations, using appropriate tools and techniques to gather data, thinking critically and logically about relationships between evidence and explanations, and communicating results.

Concept 3: Analysis and Conclusions
Analyze and interpret data to explain correlations and results; formulate new questions.

PO 4. Determine the validity and reliability of results of an investigation.

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

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

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

Strand 1: Inquiry Process
Inquiry Process establishes the basis for students' learning in science. Students use scientific processes: questioning, planning and conducting investigations, using appropriate tools and techniques to gather data, thinking critically and logically about relationships between evidence and explanations, and communicating results.

Concept 3: Analysis and Conclusions
Analyze and interpret data to explain correlations and results; formulate new questions.

PO 5. Formulate a conclusion based on data analysis.

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

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

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

Strand 1: Inquiry Process
Inquiry Process establishes the basis for students' learning in science. Students use scientific processes: questioning, planning and conducting investigations, using appropriate tools and techniques to gather data, thinking critically and logically about relationships between evidence and explanations, and communicating results.

Concept 3: Analysis and Conclusions
Analyze and interpret data to explain correlations and results; formulate new questions.

PO 6. Refine hypotheses based on the results from investigations.

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

Strand 1: Inquiry Process
Inquiry Process establishes the basis for students' learning in science. Students use scientific processes: questioning, planning and conducting investigations, using appropriate tools and techniques to gather data, thinking critically and logically about relationships between evidence and explanations, and communicating results.

Concept 3: Analysis and Conclusions
Analyze and interpret data to explain correlations and results; formulate new questions.

PO 7. Formulate new questions based on the results of a previous investigation.

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

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

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

Strand 1: Inquiry Process
Inquiry Process establishes the basis for students' learning in science. Students use scientific processes: questioning, planning and conducting investigations, using appropriate tools and techniques to gather data, thinking critically and logically about relationships between evidence and explanations, and communicating results.

Concept 4: Communication
Communicate results of investigations.

PO 1. Choose an appropriate graphic representation for collected data:

- **Line graph**
- **Double bar graph**
- **Stem and leaf plot**
- **Histogram.**

Life Science Lab Teacher's Handbook: Hands-On Activity 4, *Your Cardiovascular System,* pages 89-91

Earth Science Lab Teacher's Handbook: Hands-On Activity 3, *Interpreting a Topographic Map,* pages 81-83

Strand 1: Inquiry Process
Inquiry Process establishes the basis for students' learning in science. Students use scientific processes: questioning, planning and conducting investigations, using appropriate tools and techniques to gather data, thinking critically and logically about relationships between evidence and explanations, and communicating results.

Concept 4: Communication
Communicate results of investigations.

PO 2. Display data collected from a controlled investigation.

Life Science Lab Teacher's Handbook: Hands-On Activity 3, *Investigating Arthropods,* pages 85-87; Hands-On Activity 4, *Your Cardiovascular System,* pages 89-91; Hands-On Activity 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 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 16, 22, 24

Strand 1: Inquiry Process
Inquiry Process establishes the basis for students' learning in science. Students use scientific processes: questioning, planning and conducting investigations, using appropriate tools and techniques to gather data, thinking critically and logically about relationships between evidence and explanations, and communicating results.

Concept 4: Communication
Communicate results of investigations.

PO 3. Communicate the results of an investigation with appropriate use of qualitative and quantitative information.

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, 16, 22

Strand 1: Inquiry Process
Inquiry Process establishes the basis for students' learning in science. Students use scientific processes: questioning, planning and conducting investigations, using appropriate tools and techniques to gather data, thinking critically and logically about relationships between evidence and explanations, and communicating results.

Concept 4: Communication
Communicate results of investigations.

PO 4. Write clear, step-by-step instructions for following procedures (without the use of personal pronouns).

Classroom Resource CD-ROM: Writing Strategy 6, 15

Strand 1: Inquiry Process
Inquiry Process establishes the basis for students' learning in science. Students use scientific processes: questioning, planning and conducting investigations, using appropriate tools and techniques to gather data, thinking critically and logically about relationships between evidence and explanations, and communicating results.

Concept 4: Communication
Communicate results of investigations.

PO 5. Communicate the results and conclusion of the investigation.

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

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

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

Classroom Resource CD-ROM: Writing Strategy 15

Strand 2: History and Nature of Science
Scientific investigation grows from the contributions of many people. History and Nature of Science emphasizes the importance of the conclusion of historical perspectives and the advances that each new development brings to technology and human knowledge. This strand focuses on the human aspects of science and the role that scientists play in the development of various cultures.

Concept 1: History of Science as a Human Endeavor
Identify individual, cultural, and technological contributions to scientific knowledge.

PO 1. Identify how diverse people and/or cultures, past and present, have made important contributions to scientific innovations (e.g., Rachel Carson [scientist] supports Strand 4; Luis Alvarez [scientist] and Walter Alvarez [scientist] supports Stand 6; Percival Lowell [scientist] supports Strand 6; Copernicus [scientist] support Strand 6).

Life Science Lab, Level A: Cards 2, 5, 46, 59
Life Science Lab, Level B: Cards 2, 5, 46, 59

Earth Science Lab, Level A: Cards 10, 68, 72, 78
Earth Science Lab, Level B: Cards 10, 68, 72, 78

Physical Science Lab, Level A: Cards 3, 7, 17, 55
Physical Science Lab, Level B: Cards 3, 7, 17, 55

Strand 2: History and Nature of Science **Scientific investigation grows from the contributions of many people. History and Nature of Science emphasizes the importance of the conclusion of historical perspectives and the advances that each new development brings to technology and human knowledge. This strand focuses on the human aspects of science and the role that scientists play in the development of various cultures.**
Concept 1: History of Science as a Human Endeavor **Identify individual, cultural, and technological contributions to scientific knowledge.**
PO 2. Describe how a major milestone in science or technology has revolutionized the thinking of the time (e.g., global positioning system, telescopes, seismographs, photography).
Life Science Lab, Level A: Cards 5, 49, 59, 64, 69, 83 **Life Science Lab, Level B:** Cards 5, 49, 59, 64, 69, 83 **Earth Science Lab, Level A:** Cards 16, 20, 31, 70, 72, 79, 80, 81, 88 **Earth Science Lab, Level B:** Cards 16, 20, 31, 70, 72, 79, 80, 81, 88 **Physical Science Lab, Level A:** Cards 33, 34, 35, 76, 81, 82, 90 **Physical Science Lab, Level B:** Cards 33, 34, 35, 76, 81, 82, 90

Strand 2: History and Nature of Science **Scientific investigation grows from the contributions of many people. History and Nature of Science emphasizes the importance of the conclusion of historical perspectives and the advances that each new development brings to technology and human knowledge. This strand focuses on the human aspects of science and the role that scientists play in the development of various cultures.**
Concept 1: History of Science as a Human Endeavor **Identify individual, cultural, and technological contributions to scientific knowledge.**
PO 3. Analyze the impact of a major scientific development occurring within the past decade.
Life Science Lab, Level A: Cards 64, 69, 83 **Life Science Lab, Level B:** Cards 64, 69, 83 **Earth Science Lab, Level A:** Cards 20, 72, 79 **Earth Science Lab, Level B:** Cards 20, 72, 79 **Physical Science Lab, Level A:** Cards 33, 35, 81, 84 **Physical Science Lab, Level B:** Cards 33, 35, 81, 84

Strand 2: History and Nature of Science **Scientific investigation grows from the contributions of many people. History and Nature of Science emphasizes the importance of the conclusion of historical perspectives and the advances that each new development brings to technology and human knowledge. This strand focuses on the human aspects of science and the role that scientists play in the development of various cultures.**
Concept 1: History of Science as a Human Endeavor **Identify individual, cultural, and technological contributions to scientific knowledge.**
PO 4. Analyze the use of technology in science-related careers.
This concept is not covered at this level.

Strand 2: History and Nature of Science **Scientific investigation grows from the contributions of many people. History and Nature of Science emphasizes the importance of the conclusion of historical perspectives and the advances that each new development brings to technology and human knowledge. This strand focuses on the human aspects of science and the role that scientists play in the development of various cultures.**
Concept 2: Nature of Scientific Knowledge **Understand how science is a process for generating knowledge.**
PO 1. Describe how science is an ongoing process that changes in response to new information and discoveries.
Life Science Lab, Level A: Cards 5, 64, 69 **Life Science Lab, Level B:** Cards 5, 64, 69 **Earth Science Lab, Level A:** Cards 10, 20, 31, 68, 72, 78, 79 **Earth Science Lab, Level B:** Cards 10, 20, 31, 68, 72, 78, 79 **Physical Science Lab, Level A:** Cards 3, 7, 17, 33, 35, 53, 55, 81, 84 **Physical Science Lab, Level B:** Cards 3, 7, 17, 33, 35, 53, 55, 81, 84

Strand 2: History and Nature of Science **Scientific investigation grows from the contributions of many people. History and Nature of Science emphasizes the importance of the conclusion of historical perspectives and the advances that each new development brings to technology and human knowledge. This strand focuses on the human aspects of science and the role that scientists play in the development of various cultures.**
Concept 2: Nature of Scientific Knowledge **Understand how science is a process for generating knowledge.**
PO 2. Describe how scientific knowledge is subject to change as new information and/or technology challenges prevailing theories.
Life Science Lab, Level A: Cards 1, 49, 64, 69 **Life Science Lab, Level B:** Cards 1, 49, 64, 69 **Earth Science Lab, Level A:** Cards 10, 68, 72, 78 **Earth Science Lab, Level B:** Cards 10, 68, 72, 78 **Physical Science Lab, Level A:** Cards 3, 81, 84 **Physical Science Lab, Level B:** Cards 3, 81, 84

Strand 2: History and Nature of Science
Scientific investigation grows from the contributions of many people. History and Nature of Science emphasizes the importance of the conclusion of historical perspectives and the advances that each new development brings to technology and human knowledge. This strand focuses on the human aspects of science and the role that scientists play in the development of various cultures.

Concept 2: Nature of Scientific Knowledge
Understand how science is a process for generating knowledge.

PO 3. Apply the following scientific processes to other problem solving or decision making situations:

- **Observing**
- **Questioning**
- **Communicating**
- **Comparing**
- **Measuring**
- **Classifying**
- **Predicting**
- **Organizing data**
- **Inferring**
- **Generating hypotheses**
- **Identifying variables.**

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

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

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

Strand 3: Science in Personal and Social Perspectives
Science in personal and Social Perspectives emphasizes developing the ability to design a solution to a problem, to understand the relationship between science and technology, and the ways people are involved in both. Students understand the impact of science and technology on human activity and the environment. This strand affords students the opportunity to understand their place in the world—as living creatures, consumers, decision makers, problem solvers, managers, and planners.

Concept 1: Changes in Environments
Describe the interactions between human populations, natural hazards, and the environment.

PO 1. Analyze environmental risks (e.g., pollution, destruction of habitat) caused by human interaction with biological or geological 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 37, 42, 59, 60, 61, 86
Earth Science Lab, Level B: Cards 37, 42, 59, 60, 61, 86
Earth Science Lab Teacher's Handbook: Hands-On Activity 5, *What is in the Air?,* pages 89-91

Strand 3: Science in Personal and Social Perspectives
Science in personal and Social Perspectives emphasizes developing the ability to design a solution to a problem, to understand the relationship between science and technology, and the ways people are involved in both. Students understand the impact of science and technology on human activity and the environment. This strand affords students the opportunity to understand their place in the world—as living creatures, consumers, decision makers, problem solvers, managers, and planners.

Concept 1: Changes in Environments
Describe the interactions between human populations, natural hazards, and the environment.

PO 2. Analyze environmental benefits of the following human interactions with biological or geological systems:

- **Reforestation**
- **Habitat restoration**
- **Construction of dams.**

Life Science Lab, Level A: Cards 85, 86, 88, 90
Life Science Lab, Level B: Cards 85, 86, 88, 90

Earth Science Lab, Level A: Cards 42, 85
Earth Science Lab, Level B: Cards 42, 85

Strand 3: Science in Personal and Social Perspectives
Science in personal and Social Perspectives emphasizes developing the ability to design a solution to a problem, to understand the relationship between science and technology, and the ways people are involved in both. Students understand the impact of science and technology on human activity and the environment. This strand affords students the opportunity to understand their place in the world—as living creatures, consumers, decision makers, problem solvers, managers, and planners.

Concept 1: Changes in Environments
Describe the interactions between human populations, natural hazards, and the environment.

PO 3. Propose possible solutions to address the environmental risks in biological and geological 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 37, 42, 59, 60, 61, 86
Earth Science Lab, Level B: Cards 37, 42, 59, 60, 61, 86
Earth Science Lab Teacher's Handbook: Hands-On Activity 5, *What is in the Air?*, pages 89-91

Strand 3: Science in Personal and Social Perspectives
Science in personal and Social Perspectives emphasizes developing the ability to design a solution to a problem, to understand the relationship between science and technology, and the ways people are involved in both. Students understand the impact of science and technology on human activity and the environment. This strand affords students the opportunity to understand their place in the world—as living creatures, consumers, decision makers, problem solvers, managers, and planners.

Concept 2: Science and Technology in Society
Develop viable solutions to a need or problem.

PO 1. Propose viable methods of responding to an identified need or problem.

PO 2. Compare possible solutions to best address an identified need of problem.

PO 3. Design and construct a solution to an identified need or problem using simple classroom materials.

PO 4. Describe a technological discovery that influences technology.

This concept is not covered at this level.

Strand 4: Life Science **Life Science expands students' biological understanding of life by focusing on the characteristics of living things, the diversity of life, and how organisms and populations change over time in terms of biological adaptation and genetics. This understanding includes the relationship of structures to their functions and life cycles, interrelationships of matter and energy in living organisms, and the interactions of living organisms with their environment.**
Concept 3: Populations of Organisms in an Ecosystem **Analyze the relationships among various organisms and their environment.**
PO 1. Compare food chains in a specified ecosystem and their corresponding food web.
Life Science Lab, Level A: Cards 76, 77 **Life Science Lab, Level B:** Cards 76, 77 **Life Science Lab Teacher's Handbook:** Hands-On Activity 6, *How Much Does Energy Cost?,* pages 97-99

Strand 4: Life Science **Life Science expands students' biological understanding of life by focusing on the characteristics of living things, the diversity of life, and how organisms and populations change over time in terms of biological adaptation and genetics. This understanding includes the relationship of structures to their functions and life cycles, interrelationships of matter and energy in living organisms, and the interactions of living organisms with their environment.**
Concept 3: Populations of Organisms in an Ecosystem **Analyze the relationships among various organisms and their environment.**
PO 2. Explain how organisms obtain and use resources to develop and thrive in: • **Niches** • **Predator/prey relationships.**
Life Science Lab, Level A: Cards 73, 74, 75 **Life Science Lab, Level B:** Cards 73, 74, 75

Strand 4: Life Science **Life Science expands students' biological understanding of life by focusing on the characteristics of living things, the diversity of life, and how organisms and populations change over time in terms of biological adaptation and genetics. This understanding includes the relationship of structures to their functions and life cycles, interrelationships of matter and energy in living organisms, and the interactions of living organisms with their environment.**
Concept 3: Populations of Organisms in an Ecosystem **Analyze the relationships among various organisms and their environment.**
PO 3. Analyze the interactions of living organisms with their ecosystems: • **Limiting factors** • **Carrying capacity.**
Life Science Lab, Level A: Card 72 **Life Science Lab, Level B:** Card 72

Strand 4: Life Science **Life Science expands students' biological understanding of life by focusing on the characteristics of living things, the diversity of life, and how organisms and populations change over time in terms of biological adaptation and genetics. This understanding includes the relationship of structures to their functions and life cycles, interrelationships of matter and energy in living organisms, and the interactions of living organisms with their environment.**
Concept 3: Populations of Organisms in an Ecosystem **Analyze the relationships among various organisms and their environment.**
PO 4. Evaluate data related to problems associated with population growth (e.g., overgrazing, forest management, invasion of non-native species) and the possible solutions.
Life Science Lab, Level A: Cards 72, 86 **Life Science Lab, Level B:** Cards 72, 86

Strand 4: Life Science
Life Science expands students' biological understanding of life by focusing on the characteristics of living things, the diversity of life, and how organisms and populations change over time in terms of biological adaptation and genetics. This understanding includes the relationship of structures to their functions and life cycles, interrelationships of matter and energy in living organisms, and the interactions of living organisms with their environment.

Concept 3: Populations of Organisms in an Ecosystem
Analyze the relationships among various organisms and their environment.

PO 5. Predict how environmental factors (floods, droughts, temperature changes) affect survival rates in living organisms.

Life Science Lab, Level A: Cards 72, 80, 86
Life Science Lab, Level B: Cards 72, 80, 86

Earth Science Lab, Level A: Cards 15, 16, 53, 54, 60, 61
Earth Science Lab, Level B: Cards 15, 16, 53, 54, 60, 61

Strand 4: Life Science
Life Science expands students' biological understanding of life by focusing on the characteristics of living things, the diversity of life, and how organisms and populations change over time in terms of biological adaptation and genetics. This understanding includes the relationship of structures to their functions and life cycles, interrelationships of matter and energy in living organisms, and the interactions of living organisms with their environment.

Concept 3: Populations of Organisms in an Ecosystem
Analyze the relationships among various organisms and their environment.

PO 6. Create a model of the interactions of living organisms within an ecosystem.

Life Science Lab, Level A: Cards 73, 74, 75, 76, 77
Life Science Lab, Level B: Cards 73, 74, 75, 76, 77
Life Science Lab Teacher's Handbook: Hands-On Activity 6, *How Much Does Energy Cost?,* pages 97-99

Strand 6: Earth and Space Science
Earth and Space Science provides the foundation for students to develop an understanding of the Earth, its history, composition, and formative processes, and an understanding of the solar system and the universe. Students study the regularities of the interrelated systems of the natural world. In doing so, they develop understanding of the basic laws, theories, and models that explain the world (NSES, 1995). By studying the Earth from both a historical and current time frame, student can make informed decisions about issues affecting the planets on which they live.

Concept 1: Structure of the Earth
Describe the composition and interactions between the structure of the Earth and its atmosphere.

PO 1. Classify rocks and minerals by the following observable properties:

- **Grain**
- **Color**
- **Texture**
- **Hardness.**

Earth Science Lab, Level A: Cards 3, 4, 5, 6, 7, 8, 9
Earth Science Lab, Level B: Cards 3, 4, 5, 6, 7, 8, 9
Earth Science Lab Teacher's Handbook: Hands-On Activity 1, *Identifying Minerals with the Mohs Scale*, pages 73-75

Strand 6: Earth and Space Science
Earth and Space Science provides the foundation for students to develop an understanding of the Earth, its history, composition, and formative processes, and an understanding of the solar system and the universe. Students study the regularities of the interrelated systems of the natural world. In doing so, they develop understanding of the basic laws, theories, and models that explain the world (NSES, 1995). By studying the Earth from both a historical and current time frame, student can make informed decisions about issues affecting the planets on which they live.

Concept 1: Structure of the Earth
Describe the composition and interactions between the structure of the Earth and its atmosphere.

PO 2. Describe the properties and the composition of the following major layers of the Earth:

- **Crust**
- **Mantle**
- **Core.**

Earth Science Lab, Level A: Cards 1, 2
Earth Science Lab, Level B: Cards 1, 2

Strand 6: Earth and Space Science
Earth and Space Science provides the foundation for students to develop an understanding of the Earth, its history, composition, and formative processes, and an understanding of the solar system and the universe. Students study the regularities of the interrelated systems of the natural world. In doing so, they develop understanding of the basic laws, theories, and models that explain the world (NSES, 1995). By studying the Earth from both a historical and current time frame, student can make informed decisions about issues affecting the planets on which they live.

Concept 1: Structure of the Earth
Describe the composition and interactions between the structure of the Earth and its atmosphere.

PO 3. Explain the following processes involved in the formation of the Earth's structure:

- **Erosion**
- **Deposition**
- **Plate tectonics**
- **Volcanism.**

Earth Science Lab, Level A: Cards 10, 11, 12, 13, 14, 15, 16, 17, 24, 25, 26, 27, 28
Earth Science Lab, Level B: Cards 10, 11, 12, 13, 14, 15, 16, 17, 24, 25, 26, 27, 28
Earth Science Lab Teacher's Handbook: Hands-On Activity 2, *Plate Boundaries in Action*, pages 77-79

Strand 6: Earth and Space Science
Earth and Space Science provides the foundation for students to develop an understanding of the Earth, its history, composition, and formative processes, and an understanding of the solar system and the universe. Students study the regularities of the interrelated systems of the natural world. In doing so, they develop understanding of the basic laws, theories, and models that explain the world (NSES, 1995). By studying the Earth from both a historical and current time frame, student can make informed decisions about issues affecting the planets on which they live.

Concept 1: Structure of the Earth
Describe the composition and interactions between the structure of the Earth and its atmosphere.

PO 4. Describe how the rock and fossil record show that environmental conditions have changed over geological and recent time.

Earth Science Lab, Level A: Cards 7, 30, 31, 32, 33, 34
Earth Science Lab, Level B: Cards 7, 30, 31, 32, 33, 34

Strand 6: Earth and Space Science
Earth and Space Science provides the foundation for students to develop an understanding of the Earth, its history, composition, and formative processes, and an understanding of the solar system and the universe. Students study the regularities of the interrelated systems of the natural world. In doing so, they develop understanding of the basic laws, theories, and models that explain the world (NSES, 1995). By studying the Earth from both a historical and current time frame, student can make informed decisions about issues affecting the planets on which they live.

Concept 2: Earth's Processes and Systems
Understand the processes acting on the Earth and their interaction with the Earth's systems.

PO 1. Explain the rock cycle.

Earth Science Lab, Level A: Card 9
Earth Science Lab, Level B: Card 9

Strand 6: Earth and Space Science
Earth and Space Science provides the foundation for students to develop an understanding of the Earth, its history, composition, and formative processes, and an understanding of the solar system and the universe. Students study the regularities of the interrelated systems of the natural world. In doing so, they develop understanding of the basic laws, theories, and models that explain the world (NSES, 1995). By studying the Earth from both a historical and current time frame, student can make informed decisions about issues affecting the planets on which they live.

Concept 2: Earth's Processes and Systems
Understand the processes acting on the Earth and their interaction with the Earth's systems.

PO 2. Distinguish the components and characteristics of the rock cycle for the following types of rocks:

- **Igneous**
- **Metamorphic**
- **Sedimentary.**

Earth Science Lab, Level A: Cards 6, 7, 8, 9
Earth Science Lab, Level B: Cards 6, 7, 8, 9

Strand 6: Earth and Space Science
Earth and Space Science provides the foundation for students to develop an understanding of the Earth, its history, composition, and formative processes, and an understanding of the solar system and the universe. Students study the regularities of the interrelated systems of the natural world. In doing so, they develop understanding of the basic laws, theories, and models that explain the world (NSES, 1995). By studying the Earth from both a historical and current time frame, student can make informed decisions about issues affecting the planets on which they live.

Concept 2: Earth's Processes and Systems
Understand the processes acting on the Earth and their interaction with the Earth's systems.

PO 3. Analyze the evidence that lithospheric plate movements occur.

Earth Science Lab, Level A: Cards 10, 11, 12, 13, 14, 15, 16, 17
Earth Science Lab, Level B: Cards 10, 11, 12, 13, 14, 15, 16, 17
Earth Science Lab Teacher's Handbook: Hands-On Activity 2, *Plate Boundaries in Action*, pages 77-79

Strand 6: Earth and Space Science
Earth and Space Science provides the foundation for students to develop an understanding of the Earth, its history, composition, and formative processes, and an understanding of the solar system and the universe. Students study the regularities of the interrelated systems of the natural world. In doing so, they develop understanding of the basic laws, theories, and models that explain the world (NSES, 1995). By studying the Earth from both a historical and current time frame, student can make informed decisions about issues affecting the planets on which they live.

Concept 2: Earth's Processes and Systems
Understand the processes acting on the Earth and their interaction with the Earth's systems.

PO 4. Explain lithospheric plate movement as a result of convection.

Earth Science Lab, Level A: Cards 10, 11, 12, 13
Earth Science Lab, Level B: Cards 10, 11, 12, 13

Strand 6: Earth and Space Science
Earth and Space Science provides the foundation for students to develop an understanding of the Earth, its history, composition, and formative processes, and an understanding of the solar system and the universe. Students study the regularities of the interrelated systems of the natural world. In doing so, they develop understanding of the basic laws, theories, and models that explain the world (NSES, 1995). By studying the Earth from both a historical and current time frame, student can make informed decisions about issues affecting the planets on which they live.

Concept 2: Earth's Processes and Systems
Understand the processes acting on the Earth and their interaction with the Earth's systems.

PO 5. Relate plate boundary movements to their resulting landforms, including:

- **Mountains**
- **Faults**
- **Rift valleys**
- **Trenches**
- **Volcanoes.**

Earth Science Lab, Level A: Cards 11, 12, 13, 14, 15, 16, 17, 88
Earth Science Lab, Level B: Cards 11, 12, 13, 14, 15, 16, 17, 88
Earth Science Lab Teacher's Handbook: Hands-On Activity 2, *Plate Boundaries in Action*, pages 77-79

Strand 6: Earth and Space Science
Earth and Space Science provides the foundation for students to develop an understanding of the Earth, its history, composition, and formative processes, and an understanding of the solar system and the universe. Students study the regularities of the interrelated systems of the natural world. In doing so, they develop understanding of the basic laws, theories, and models that explain the world (NSES, 1995). By studying the Earth from both a historical and current time frame, student can make informed decisions about issues affecting the planets on which they live.

Concept 2: Earth's Processes and Systems
Understand the processes acting on the Earth and their interaction with the Earth's systems.

PO 6. Describe how earthquakes are measured.

Earth Science Lab, Level A: Cards 15, 16
Earth Science Lab, Level B: Cards 15, 16

Strand 6: Earth and Space Science
Earth and Space Science provides the foundation for students to develop an understanding of the Earth, its history, composition, and formative processes, and an understanding of the solar system and the universe. Students study the regularities of the interrelated systems of the natural world. In doing so, they develop understanding of the basic laws, theories, and models that explain the world (NSES, 1995). By studying the Earth from both a historical and current time frame, student can make informed decisions about issues affecting the planets on which they live.

Concept 3: Earth in the Solar System
Understand the relationships of the Earth and other objects in the solar system.

PO 1. Explain the phases of the Moon in terms of the relative positions of the Earth, Sun, and Moon.

Earth Science Lab, Level A: Card 64
Earth Science Lab, Level B: Card 64

Strand 6: Earth and Space Science
Earth and Space Science provides the foundation for students to develop an understanding of the Earth, its history, composition, and formative processes, and an understanding of the solar system and the universe. Students study the regularities of the interrelated systems of the natural world. In doing so, they develop understanding of the basic laws, theories, and models that explain the world (NSES, 1995). By studying the Earth from both a historical and current time frame, student can make informed decisions about issues affecting the planets on which they live.

Concept 3: Earth in the Solar System
Understand the relationships of the Earth and other objects in the solar system.

PO 2. Construct a model for the relative positions of the Earth, Sun, and Moon as they relate to corresponding eclipses.

Earth Science Lab, Level A: Card 65
Earth Science Lab, Level B: Card 65

Strand 6: Earth and Space Science
Earth and Space Science provides the foundation for students to develop an understanding of the Earth, its history, composition, and formative processes, and an understanding of the solar system and the universe. Students study the regularities of the interrelated systems of the natural world. In doing so, they develop understanding of the basic laws, theories, and models that explain the world (NSES, 1995). By studying the Earth from both a historical and current time frame, student can make informed decisions about issues affecting the planets on which they live.

Concept 3: Earth in the Solar System
Understand the relationships of the Earth and other objects in the solar system.

PO 3. Explain the interrelationship between the Earth's tides and the Moon.

Earth Science Lab, Level A: Card 66
Earth Science Lab, Level B: Card 66

Physical Science Lab, Level A: Card 48
Physical Science Lab, Level B: Card 48

Strand 6: Earth and Space Science
Earth and Space Science provides the foundation for students to develop an understanding of the Earth, its history, composition, and formative processes, and an understanding of the solar system and the universe. Students study the regularities of the interrelated systems of the natural world. In doing so, they develop understanding of the basic laws, theories, and models that explain the world (NSES, 1995). By studying the Earth from both a historical and current time frame, student can make informed decisions about issues affecting the planets on which they live.

Concept 3: Earth in the Solar System
Understand the relationships of the Earth and other objects in the solar system.

PO 4. Explain the seasons in the Northern and Southern Hemisphere in terms of the tilt of the Earth's axis relative to the Earth's revolution around the Sun.

Earth Science Lab, Level A: Card 62
Earth Science Lab, Level B: Card 62

Strand 6: Earth and Space Science
Earth and Space Science provides the foundation for students to develop an understanding of the Earth, its history, composition, and formative processes, and an understanding of the solar system and the universe. Students study the regularities of the interrelated systems of the natural world. In doing so, they develop understanding of the basic laws, theories, and models that explain the world (NSES, 1995). By studying the Earth from both a historical and current time frame, student can make informed decisions about issues affecting the planets on which they live.

Concept 3: Earth in the Solar System
Understand the relationships of the Earth and other objects in the solar system.

PO 5. Identify the following major constellations visible (seasonally) from the Northern Hemisphere:

- **Orion**
- **Ursa Major (Great Bear)**
- **Cygnus**
- **Scorpius**
- **Cassiopeia.**

Earth Science Lab, Level A: Card 75
Earth Science Lab, Level B: Card 75

Strand 6: Earth and Space Science
Earth and Space Science provides the foundation for students to develop an understanding of the Earth, its history, composition, and formative processes, and an understanding of the solar system and the universe. Students study the regularities of the interrelated systems of the natural world. In doing so, they develop understanding of the basic laws, theories, and models that explain the world (NSES, 1995). By studying the Earth from both a historical and current time frame, student can make informed decisions about issues affecting the planets on which they live.

Concept 3: Earth in the Solar System
Understand the relationships of the Earth and other objects in the solar system.

PO 6. Explain the relationship among common objects in the solar system, galaxy, and the universe.

Earth Science Lab, Level A: Cards 67, 68, 69, 70, 71, 72, 73, 75, 76, 77, 78
Earth Science Lab, Level B: Cards 67, 68, 69, 70, 71, 72, 73, 75, 76, 77, 78

SRA Life, Earth, and Physical Science Laboratories
correlation to
Arizona Science Standard Articulated by Grade Level
Grade 8

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

Strand 1: Inquiry Process **Inquiry Process establishes the basis for students' learning in science. Students use scientific processes: questioning, planning and conducting investigations, using appropriate tools and techniques to gather data, thinking critically and logically about relationships between evidence and explanations, and communicating results.**
Concept 1: Observations, Questions, and Hypotheses **Formulate predictions, questions, or hypotheses based on observations. Locate appropriate resources.**
PO 1. Formulate questions based on observations that lead to the development of 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

Strand 1: Inquiry Process **Inquiry Process establishes the basis for students' learning in science. Students use scientific processes: questioning, planning and conducting investigations, using appropriate tools and techniques to gather data, thinking critically and logically about relationships between evidence and explanations, and communicating results.**
Concept 1: Observations, Questions, and Hypotheses **Formulate predictions, questions, or hypotheses based on observations. Locate appropriate resources.**
PO 2. Use appropriate research information, not limited to a single source, to use in the development of a testable hypothesis.
Classroom Resource CD-ROM: Writing Strategy 9, 12, 125, 28

Strand 1: Inquiry Process **Inquiry Process establishes the basis for students' learning in science. Students use scientific processes: questioning, planning and conducting investigations, using appropriate tools and techniques to gather data, thinking critically and logically about relationships between evidence and explanations, and communicating results.**
Concept 1: Observations, Questions, and Hypotheses **Formulate predictions, questions, or hypotheses based on observations. Locate appropriate resources.**
PO 3. Generate a hypothesis that can be tested.
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

Strand 1: Inquiry Process
Inquiry Process establishes the basis for students' learning in science. Students use scientific processes: questioning, planning and conducting investigations, using appropriate tools and techniques to gather data, thinking critically and logically about relationships between evidence and explanations, and communicating results.

Concept 2: Scientific Testing (Investigating and Modeling)
Design and conduct controlled investigations.

PO 1. Demonstrate safe behavior and appropriate procedures (e.g., use and care of technology, materials, organisms) in all science inquiry.

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

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

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

Strand 1: Inquiry Process
Inquiry Process establishes the basis for students' learning in science. Students use scientific processes: questioning, planning and conducting investigations, using appropriate tools and techniques to gather data, thinking critically and logically about relationships between evidence and explanations, and communicating results.

Concept 2: Scientific Testing (Investigating and Modeling)
Design and conduct controlled investigations.

PO 2. Design a controlled investigation to support or reject a hypothesis.

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

Strand 1: Inquiry Process
Inquiry Process establishes the basis for students' learning in science. Students use scientific processes: questioning, planning and conducting investigations, using appropriate tools and techniques to gather data, thinking critically and logically about relationships between evidence and explanations, and communicating results.

Concept 2: Scientific Testing (Investigating and Modeling)
Design and conduct controlled investigations.

PO 3. Conduct a controlled investigation to support or reject a hypothesis.

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

Strand 1: Inquiry Process
Inquiry Process establishes the basis for students' learning in science. Students use scientific processes: questioning, planning and conducting investigations, using appropriate tools and techniques to gather data, thinking critically and logically about relationships between evidence and explanations, and communicating results.

Concept 2: Scientific Testing (Investigating and Modeling)
Design and conduct controlled investigations.

PO 4. Perform measurements using appropriate scientific tools (e.g., balances, microscopes, probes, micrometers).

Life Science Lab Teacher's Handbook: Hands-On Activity 4, *Your Cardiovascular System,* pages 89-91; Hands-On Activity 7, *The Effects of Acid Rain,* pages 101-103

Earth Science Lab Teacher's Handbook: Hands-On Activity 1, *Identifying Minerals with the Mohs Scale,* pages 73-75; Hands-On Activity 3, *Interpreting a Topographic Map,* pages 81-83; Hands-On Activity 7, *Sizes in the Solar System,* pages 97-99; Hands-On Activity 8, *Temperature, Salinity, and Water Density,* pages 101-103

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

Strand 1: Inquiry Process
Inquiry Process establishes the basis for students' learning in science. Students use scientific processes: questioning, planning and conducting investigations, using appropriate tools and techniques to gather data, thinking critically and logically about relationships between evidence and explanations, and communicating results.

Concept 2: Scientific Testing (Investigating and Modeling)
Design and conduct controlled investigations.

PO 5. Keep a record of observations, notes, sketches, questions, and ideas using tools such as written and/or computer logs.

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, 15

Strand 1: Inquiry Process
Inquiry Process establishes the basis for students' learning in science. Students use scientific processes: questioning, planning and conducting investigations, using appropriate tools and techniques to gather data, thinking critically and logically about relationships between evidence and explanations, and communicating results.

Concept 3: Analysis and Conclusions
Analyze and interpret data to explain correlations and results; formulate new questions.

PO 1. Analyze data obtained in a scientific investigation to identify trends.

Life Science Lab Teacher's Handbook: Hands-On Activity 3, *Investigating Arthropods,* pages 85-87; Hands-On Activity 4, *Your Cardiovascular System,* pages 89-91; Hands-On Activity 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 2, *Chemical Reaction Rates,* pages 81-83

Classroom Resource CD-ROM: Writing Strategy 22, 24

Strand 1: Inquiry Process
Inquiry Process establishes the basis for students' learning in science. Students use scientific processes: questioning, planning and conducting investigations, using appropriate tools and techniques to gather data, thinking critically and logically about relationships between evidence and explanations, and communicating results.

Concept 3: Analysis and Conclusions
Analyze and interpret data to explain correlations and results; formulate new questions.

PO 2. Form a logical argument about a correlation between variables or sequence of events (e.g., construct a cause-and-effect chain that explains a sequence of events).

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 2, *Plate Boundaries in Action,* pages 77-79; Hands-On Activity 6, *Modeling a Tornado,* pages 93-95

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; Hands-On Activity 4, *Reducing Friction,* pages 89-91

Classroom Resource CD-ROM: Writing Strategy 7, 23

Strand 1: Inquiry Process
Inquiry Process establishes the basis for students' learning in science. Students use scientific processes: questioning, planning and conducting investigations, using appropriate tools and techniques to gather data, thinking critically and logically about relationships between evidence and explanations, and communicating results.

Concept 3: Analysis and Conclusions
Analyze and interpret data to explain correlations and results; formulate new questions.

PO 3. Interpret data that show a variety of possible relationships between the two variables, including:

- **Positive relationship**
- **Negative relationship**
- **No relationship.**

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

Strand 1: Inquiry Process
Inquiry Process establishes the basis for students' learning in science. Students use scientific processes: questioning, planning and conducting investigations, using appropriate tools and techniques to gather data, thinking critically and logically about relationships between evidence and explanations, and communicating results.

Concept 3: Analysis and Conclusions
Analyze and interpret data to explain correlations and results; formulate new questions.

PO 4. Formulate a future investigation based on the data collected.

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

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

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

Strand 1: Inquiry Process
Inquiry Process establishes the basis for students' learning in science. Students use scientific processes: questioning, planning and conducting investigations, using appropriate tools and techniques to gather data, thinking critically and logically about relationships between evidence and explanations, and communicating results.

Concept 3: Analysis and Conclusions
Analyze and interpret data to explain correlations and results; formulate new questions.

PO 5. Explain how evidence supports the validity and reliability of 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

Strand 1: Inquiry Process
Inquiry Process establishes the basis for students' learning in science. Students use scientific processes: questioning, planning and conducting investigations, using appropriate tools and techniques to gather data, thinking critically and logically about relationships between evidence and explanations, and communicating results.

Concept 3: Analysis and Conclusions
Analyze and interpret data to explain correlations and results; formulate new questions.

PO 6. Identify the potential investigational error that may occur (e.g., flawed investigational design, inaccurate measurement, computational errors, unethical reporting).

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

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

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

Strand 1: Inquiry Process
Inquiry Process establishes the basis for students' learning in science. Students use scientific processes: questioning, planning and conducting investigations, using appropriate tools and techniques to gather data, thinking critically and logically about relationships between evidence and explanations, and communicating results.

Concept 3: Analysis and Conclusions
Analyze and interpret data to explain correlations and results; formulate new questions.

PO 7. Critique scientific reports from periodicals, television, or other media.

This concept is not covered at this level.

Strand 1: Inquiry Process
Inquiry Process establishes the basis for students' learning in science. Students use scientific processes: questioning, planning and conducting investigations, using appropriate tools and techniques to gather data, thinking critically and logically about relationships between evidence and explanations, and communicating results.

Concept 3: Analysis and Conclusions
Analyze and interpret data to explain correlations and results; formulate new questions.

PO 8. Formulate new questions based on the results of a previous investigation.

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

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

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

Strand 1: Inquiry Process
Inquiry Process establishes the basis for students' learning in science. Students use scientific processes: questioning, planning and conducting investigations, using appropriate tools and techniques to gather data, thinking critically and logically about relationships between evidence and explanations, and communicating results.

Concept 4: Communication
Communicate results of investigations.

PO 1. Communicate the results of an investigation.

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, 16, 22

Strand 1: Inquiry Process
Inquiry Process establishes the basis for students' learning in science. Students use scientific processes: questioning, planning and conducting investigations, using appropriate tools and techniques to gather data, thinking critically and logically about relationships between evidence and explanations, and communicating results.

Concept 4: Communication
Communicate results of investigations.

PO 2. Choose an appropriate graphic representation for collected data:

- **Line graph**
- **Double bar graph**
- **Stem and leaf plot**
- **Histogram.**

Life Science Lab Teacher's Handbook: Hands-On Activity 4, *Your Cardiovascular System,* pages 89-91

Earth Science Lab Teacher's Handbook: Hands-On Activity 3, *Interpreting a Topographic Map,* pages 81-83

Strand 1: Inquiry Process **Inquiry Process establishes the basis for students' learning in science. Students use scientific processes: questioning, planning and conducting investigations, using appropriate tools and techniques to gather data, thinking critically and logically about relationships between evidence and explanations, and communicating results.**
Concept 4: Communication **Communicate results of investigations.**
PO 3. Present analyses and conclusions in clear, concise formats.
Life Science Lab Teacher's Handbook: Hands-On Activity 1, *Examining Cells,* pages 77-79; Hands-On Activity 2, *Culturing Bacteria,* pages 81-83; Hands-On Activity 3, *Investigating Arthropods,* pages 85-87; Hands-On Activity 4, *Your Cardiovascular System,* pages 89-91; Hands-On Activity 5, *Making Fossils,* pages 93-95; Hands-On Activity 6, *How Much Does Energy Cost?,* pages 97-99; Hands-On Activity 7, *The Effects of Acid Rain,* pages 101-103 **Earth Science Lab Teacher's Handbook:** Hands-On Activity 1, *Identifying Minerals with the Mohs Scale,* pages 73-75; Hands-On Activity 2, *Plate Boundaries in Action,* pages 77-79; Hands-On Activity 3, *Interpreting a Topographic Map,* pages 81-83; Hands-On Activity 4, *Using Sound Waves,* pages 85-87; Hands-On Activity 5, *What is in the Air?,* pages 89-91; Hands-On Activity 6, *Modeling a Tornado,* pages 93-95; Hands-On Activity 7, *Sizes in the Solar System,* pages 97-99; Hands-On Activity 8, *Temperature, Salinity, and Water Density,* pages 101-103 **Physical Science Lab Teacher's Handbook:** Hands-On Activity 1, *Measuring pH of Acids and Bases,* pages 77-79; Hands-On Activity 2, *Chemical Reaction Rates,* pages 81-83; Hands-On Activity 3, *Energy Conversion,* pages 85-87; Hands-On Activity 4, *Reducing Friction,* pages 89-91; Hands-On Activity 5, *Making a Potato Battery,* pages 93-95; Hands-On Activity 6, *Making Sound,* pages 97-99 **Classroom Resource CD-ROM:** Writing Strategy 15

Strand 1: Inquiry Process **Inquiry Process establishes the basis for students' learning in science. Students use scientific processes: questioning, planning and conducting investigations, using appropriate tools and techniques to gather data, thinking critically and logically about relationships between evidence and explanations, and communicating results.**
Concept 4: Communication **Communicate results of investigations.**
PO 4. Write clear, step-by-step instructions for conducting investigations or operating equipment (without the use of personal pronouns).
Classroom Resource CD-ROM: Writing Strategy 6, 15

Strand 1: Inquiry Process
Inquiry Process establishes the basis for students' learning in science. Students use scientific processes: questioning, planning and conducting investigations, using appropriate tools and techniques to gather data, thinking critically and logically about relationships between evidence and explanations, and communicating results.

Concept 4: Communication
Communicate results of investigations.

PO 5. Communicate the results and conclusion of the investigation.

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

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

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

Classroom Resource CD-ROM: Writing Strategy 15

Strand 2: History and Nature of Science
Scientific investigation grows from the contributions of many people. History and Nature of Science emphasizes the importance of the conclusion of historical perspectives and the advances that each new development brings to technology and human knowledge. This strand focuses on the human aspects of science and the role that scientists play in the development of various cultures.

Concept 1: History of Science as a Human Endeavor
Identify individual, cultural, and technological contributions to scientific knowledge.

PO 1. Identify how diverse people and/or cultures, past and present, have made important contributions to scientific innovations (e.g., Watson and Crick [scientists] supports Strand 4; Rosalind Franklin [scientist] supports Stand 4; Charles Darwin [scientist] supports Strand 4; George Washington Carver [scientist, inventor] support Strand 4; Joseph Priestley [scientist] supports Strand 5; Sir Frances Bacon [philosopher] supports Strand 5; Isaac Newton [scientist] supports Strand 5).

Life Science Lab, Level A: Cards 2, 5, 46, 59
Life Science Lab, Level B: Cards 2, 5, 46, 59

Earth Science Lab, Level A: Cards 10, 68, 72, 78
Earth Science Lab, Level B: Cards 10, 68, 72, 78

Physical Science Lab, Level A: Cards 3, 7, 17, 55
Physical Science Lab, Level B: Cards 3, 7, 17, 55

Strand 2: History and Nature of Science **Scientific investigation grows from the contributions of many people. History and Nature of Science emphasizes the importance of the conclusion of historical perspectives and the advances that each new development brings to technology and human knowledge. This strand focuses on the human aspects of science and the role that scientists play in the development of various cultures.**
Concept 1: History of Science as a Human Endeavor **Identify individual, cultural, and technological contributions to scientific knowledge.**
PO 2. Evaluate the effects of the following major scientific milestones on society: • **Mendelian Genetics** • **Newton's Laws.**
Life Science Lab, Level A: Cards 63, 64 **Life Science Lab, Level B:** Cards 63, 64 **Physical Science Lab, Level A:** Card 55 **Physical Science Lab, Level B:** Card 55

Strand 2: History and Nature of Science **Scientific investigation grows from the contributions of many people. History and Nature of Science emphasizes the importance of the conclusion of historical perspectives and the advances that each new development brings to technology and human knowledge. This strand focuses on the human aspects of science and the role that scientists play in the development of various cultures.**
Concept 1: History of Science as a Human Endeavor **Identify individual, cultural, and technological contributions to scientific knowledge.**
PO 3. Evaluate the impact of a major scientific development within the past decade.
Life Science Lab, Level A: Cards 64, 69, 83 **Life Science Lab, Level B:** Cards 64, 69, 83 **Earth Science Lab, Level A:** Cards 20, 72, 79 **Earth Science Lab, Level B:** Cards 20, 72, 79 **Physical Science Lab, Level A:** Cards 33, 35, 81, 84 **Physical Science Lab, Level B:** Cards 33, 35, 81, 84

Strand 2: History and Nature of Science **Scientific investigation grows from the contributions of many people. History and Nature of Science emphasizes the importance of the conclusion of historical perspectives and the advances that each new development brings to technology and human knowledge. This strand focuses on the human aspects of science and the role that scientists play in the development of various cultures.**
Concept 1: History of Science as a Human Endeavor **Identify individual, cultural, and technological contributions to scientific knowledge.**
PO 4. Evaluate career opportunities related to life and physical sciences.
This concept is not covered at this level.

Strand 2: History and Nature of Science
Scientific investigation grows from the contributions of many people. History and Nature of Science emphasizes the importance of the conclusion of historical perspectives and the advances that each new development brings to technology and human knowledge. This strand focuses on the human aspects of science and the role that scientists play in the development of various cultures.

Concept 2: Nature of Scientific Knowledge
Understand how science is a process for generating knowledge.

PO 1. Apply the following scientific processes to other problem solving or decision making situations:

- **Observing**
- **Questioning**
- **Communicating**
- **Comparing**
- **Measuring**
- **Classifying**
- **Predicting**
- **Organizing data**
- **Inferring**
- **Generating hypotheses**
- **Identifying variables.**

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

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

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

Strand 2: History and Nature of Science
Scientific investigation grows from the contributions of many people. History and Nature of Science emphasizes the importance of the conclusion of historical perspectives and the advances that each new development brings to technology and human knowledge. This strand focuses on the human aspects of science and the role that scientists play in the development of various cultures.

Concept 2: Nature of Scientific Knowledge
Understand how science is a process for generating knowledge.

PO 2. Describe how scientific knowledge is subject to change as new information and/or technology challenges prevailing theories.

Life Science Lab, Level A: Cards 1, 49, 64, 69
Life Science Lab, Level B: Cards 1, 49, 64, 69

Earth Science Lab, Level A: Cards 10, 68, 72, 78
Earth Science Lab, Level B: Cards 10, 68, 72, 78

Physical Science Lab, Level A: Cards 3, 81, 84
Physical Science Lab, Level B: Cards 3, 81, 84

Strand 2: History and Nature of Science
Scientific investigation grows from the contributions of many people. History and Nature of Science emphasizes the importance of the conclusion of historical perspectives and the advances that each new development brings to technology and human knowledge. This strand focuses on the human aspects of science and the role that scientists play in the development of various cultures.

Concept 2: Nature of Scientific Knowledge
Understand how science is a process for generating knowledge.

PO 3. Defend the principles that accurate record keeping, openness, and replication are essential for maintaining an investigator's credibility with other scientists and society.

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

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

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

Strand 3: Science in Personal and Social Perspectives
Science in personal and Social Perspectives emphasizes developing the ability to design a solution to a problem, to understand the relationship between science and technology, and the ways people are involved in both. Students understand the impact of science and technology on human activity and the environment. This strand affords students the opportunity to understand their place in the world—as living creatures, consumers, decision makers, problem solvers, managers, and planners.

Concept 1: Changes in Environments
Describe the interactions between human populations, natural hazards, and the environment.

PO 1. Analyze the risk factors associated with natural, human induced, and/or biological hazards, including:

- **Waste disposal of industrial chemicals**
- **Greenhouse gases.**

Life Science Lab, Level A: Cards 84, 87, 88, 89, 90
Life Science Lab, Level B: Cards 84, 87, 88, 89, 90
Life Science Lab Teacher's Handbook: Hands-On Activity 7, *The Effects of Acid Rain,* pages 101-103

Earth Science Lab, Level A: Cards 37, 42, 59, 61, 86
Earth Science Lab, Level B: Cards 37, 42, 59, 61, 86
Earth Science Lab Teacher's Handbook: Hands-On Activity 5, *What is in the Air?,* pages 89-91

Strand 3: Science in Personal and Social Perspectives
Science in personal and Social Perspectives emphasizes developing the ability to design a solution to a problem, to understand the relationship between science and technology, and the ways people are involved in both. Students understand the impact of science and technology on human activity and the environment. This strand affords students the opportunity to understand their place in the world—as living creatures, consumers, decision makers, problem solvers, managers, and planners.

Concept 1: Changes in Environments
Describe the interactions between human populations, natural hazards, and the environment.

PO 2. Analyze possible solutions to address the environmental risks associated with chemical and biological 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 29, 35, 37, 42, 59, 60, 61, 85, 86
Earth Science Lab, Level B: Cards 29, 35, 37, 42, 59, 60, 61, 85, 86
Earth Science Lab Teacher's Handbook: Hands-On Activity 5, *What is in the Air?,* pages 89-91

Physical Science Lab, Level A: Cards 34, 49
Physical Science Lab, Level B: Cards 34, 49

Strand 3: Science in Personal and Social Perspectives
Science in personal and Social Perspectives emphasizes developing the ability to design a solution to a problem, to understand the relationship between science and technology, and the ways people are involved in both. Students understand the impact of science and technology on human activity and the environment. This strand affords students the opportunity to understand their place in the world—as living creatures, consumers, decision makers, problem solvers, managers, and planners.

Concept 2: Science and Technology in Society
Develop viable solutions to a need or problem.

PO 1. Propose viable methods of responding to an identified need or problem.

PO 2. Compare possible solutions to best address an identified need of problem.

PO 3. Design and construct a solution to an identified need or problem using simple classroom materials.

PO 4. Compare risks and benefits of the following technological advances:

- **Radiation treatments**
- **Genetic engineering**
- **Airbags.**

This concept is not covered at this level.

Strand 4: Life Science
Life Science expands students' biological understanding of life by focusing on the characteristics of living things, the diversity of life, and how organisms and populations change over time in terms of biological adaptation and genetics. This understanding includes the relationship of structures to their functions and life cycles, interrelationships of matter and energy in living organisms, and the interactions of living organisms with their environment.

Concept 2: Reproduction and Heredity
Understand the basic principles of heredity.

PO 1. Explain the purposes of cell division:

- **Growth and repair**
- **Reproduction.**

Life Science Lab, Level A: Cards 10, 60, 61
Life Science Lab, Level B: Cards 10, 60, 61

Strand 4: Life Science **Life Science expands students' biological understanding of life by focusing on the characteristics of living things, the diversity of life, and how organisms and populations change over time in terms of biological adaptation and genetics. This understanding includes the relationship of structures to their functions and life cycles, interrelationships of matter and energy in living organisms, and the interactions of living organisms with their environment.**
Concept 2: Reproduction and Heredity **Understand the basic principles of heredity.**
PO 2. Explain the basic principles of heredity using the human examples of: • **Eye color** • **Widow's peak** • **Blood type.**
Life Science Lab, Level A: Cards 62, 63 **Life Science Lab, Level B:** Cards 62, 63

Strand 4: Life Science **Life Science expands students' biological understanding of life by focusing on the characteristics of living things, the diversity of life, and how organisms and populations change over time in terms of biological adaptation and genetics. This understanding includes the relationship of structures to their functions and life cycles, interrelationships of matter and energy in living organisms, and the interactions of living organisms with their environment.**
Concept 2: Reproduction and Heredity **Understand the basic principles of heredity.**
PO 3. Distinguish between the nature of dominant and recessive traits in humans.
Life Science Lab, Level A: Cards 62, 63 **Life Science Lab, Level B:** Cards 62, 63

Strand 4: Life Science **Life Science expands students' biological understanding of life by focusing on the characteristics of living things, the diversity of life, and how organisms and populations change over time in terms of biological adaptation and genetics. This understanding includes the relationship of structures to their functions and life cycles, interrelationships of matter and energy in living organisms, and the interactions of living organisms with their environment.**
Concept 4: Diversity, Adaptation, and Behavior **Identify structural and behavioral adaptations.**
PO 1. Explain how an organism's behavior allows it to survive in an environment.
Life Science Lab, Level A: Cards 23, 24, 41, 43, 73, 83 **Life Science Lab, Level B:** Cards 23, 24, 41, 43, 73, 83

Strand 4: Life Science **Life Science expands students' biological understanding of life by focusing on the characteristics of living things, the diversity of life, and how organisms and populations change over time in terms of biological adaptation and genetics. This understanding includes the relationship of structures to their functions and life cycles, interrelationships of matter and energy in living organisms, and the interactions of living organisms with their environment.**
Concept 4: Diversity, Adaptation, and Behavior **Identify structural and behavioral adaptations.**
PO 2. Describe how an organism can maintain a stable internal environment while living in a constantly changing external environment.
Life Science Lab, Level A: Card 44 **Life Science Lab, Level B:** Card 44

Strand 4: Life Science **Life Science expands students' biological understanding of life by focusing on the characteristics of living things, the diversity of life, and how organisms and populations change over time in terms of biological adaptation and genetics. This understanding includes the relationship of structures to their functions and life cycles, interrelationships of matter and energy in living organisms, and the interactions of living organisms with their environment.**
Concept 4: Diversity, Adaptation, and Behavior **Identify structural and behavioral adaptations.**
PO 3. Determine characteristics of organisms that could change over several generations.
Life Science Lab, Level A: Cards 64, 65, 66 **Life Science Lab, Level B:** Cards 64, 65, 66

Strand 4: Life Science **Life Science expands students' biological understanding of life by focusing on the characteristics of living things, the diversity of life, and how organisms and populations change over time in terms of biological adaptation and genetics. This understanding includes the relationship of structures to their functions and life cycles, interrelationships of matter and energy in living organisms, and the interactions of living organisms with their environment.**
Concept 4: Diversity, Adaptation, and Behavior **Identify structural and behavioral adaptations.**
PO 4. Compare the symbiotic and competitive relationships in organisms within an ecosystem (e.g., lichen, mistletoe/tree, clownfish/sea anemone, native/non-native species).
Life Science Lab, Level A: Cards 74, 75 **Life Science Lab, Level B:** Cards 74, 75

Strand 4: Life Science **Life Science expands students' biological understanding of life by focusing on the characteristics of living things, the diversity of life, and how organisms and populations change over time in terms of biological adaptation and genetics. This understanding includes the relationship of structures to their functions and life cycles, interrelationships of matter and energy in living organisms, and the interactions of living organisms with their environment.**
Concept 4: Diversity, Adaptation, and Behavior **Identify structural and behavioral adaptations.**
PO 5. Analyze the following behavioral cycles of organisms: • **Hibernation** • **Migration** • **Dormancy (plants).**
Life Science Lab, Level A: Cards 24, 43, 83 **Life Science Lab, Level B:** Cards 24, 43, 83

Strand 4: Life Science **Life Science expands students' biological understanding of life by focusing on the characteristics of living things, the diversity of life, and how organisms and populations change over time in terms of biological adaptation and genetics. This understanding includes the relationship of structures to their functions and life cycles, interrelationships of matter and energy in living organisms, and the interactions of living organisms with their environment.**
Concept 4: Diversity, Adaptation, and Behavior **Identify structural and behavioral adaptations.**
PO 6. Describe the following factors that allow for the survival of living organisms: • **Protective coloration** • **Beak design** • **Seed dispersal** • **Pollination.**
Life Science Lab, Level A: Cards 20, 21, 23, 41, 73 **Life Science Lab, Level B:** Cards 20, 21, 23, 41, 73

Strand 5: Physical Science
Physical Science affords students the opportunity to increase their understanding of the characteristics of objects and materials they encounter daily. Students gain an understanding of the nature of matter and energy, including their forms, the changes they undergo, and their interactions. By studying objects and the forces that act upon them, students develop an understanding of the fundamental laws of motion, knowledge of the various ways energy is stored in systems, and the processes by which energy is transferred between systems and surroundings.

Concept 1: Properties and Changes of Properties in Matter
Understand physical and chemical properties of matter.

PO 1. Identify different kinds of matter based on the following physical properties:

- **States**
- **Density**
- **Boiling point**
- **Melting point**
- **Solubility.**

Physical Science Lab, Level A: Cards 1, 2, 5, 6
Physical Science Lab, Level B: Cards 1, 2, 5, 6

Strand 5: Physical Science
Physical Science affords students the opportunity to increase their understanding of the characteristics of objects and materials they encounter daily. Students gain an understanding of the nature of matter and energy, including their forms, the changes they undergo, and their interactions. By studying objects and the forces that act upon them, students develop an understanding of the fundamental laws of motion, knowledge of the various ways energy is stored in systems, and the processes by which energy is transferred between systems and surroundings.

Concept 1: Properties and Changes of Properties in Matter
Understand physical and chemical properties of matter.

PO 2. Identify different kinds of matter based on the following chemical properties:

- **Reactivity**
- **pH**
- **oxidation (corrosion).**

Physical Science Lab, Level A: Cards 9, 16, 27, 28, 29
Physical Science Lab, Level B: Cards 9, 16, 27, 28, 29

Strand 5: Physical Science
Physical Science affords students the opportunity to increase their understanding of the characteristics of objects and materials they encounter daily. Students gain an understanding of the nature of matter and energy, including their forms, the changes they undergo, and their interactions. By studying objects and the forces that act upon them, students develop an understanding of the fundamental laws of motion, knowledge of the various ways energy is stored in systems, and the processes by which energy is transferred between systems and surroundings.

Concept 1: Properties and Changes of Properties in Matter
Understand physical and chemical properties of matter.

PO 3. Identify the following types of evidence that a chemical reaction has occurred:

- **formation of a precipitate**
- **generation of a gas**
- **color change**
- **absorption or release of 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

Strand 5: Physical Science **Physical Science affords students the opportunity to increase their understanding of the characteristics of objects and materials they encounter daily. Students gain an understanding of the nature of matter and energy, including their forms, the changes they undergo, and their interactions. By studying objects and the forces that act upon them, students develop an understanding of the fundamental laws of motion, knowledge of the various ways energy is stored in systems, and the processes by which energy is transferred between systems and surroundings.**
Concept 1: Properties and Changes of Properties in Matter **Understand physical and chemical properties of matter.**
PO 4. Classify matter in terms of elements, compounds, or mixtures.
Physical Science Lab, Level A: Cards 10, 11, 12, 13 **Physical Science Lab, Level B:** Cards 10, 11, 12, 13

Strand 5: Physical Science **Physical Science affords students the opportunity to increase their understanding of the characteristics of objects and materials they encounter daily. Students gain an understanding of the nature of matter and energy, including their forms, the changes they undergo, and their interactions. By studying objects and the forces that act upon them, students develop an understanding of the fundamental laws of motion, knowledge of the various ways energy is stored in systems, and the processes by which energy is transferred between systems and surroundings.**
Concept 1: Properties and Changes of Properties in Matter **Understand physical and chemical properties of matter.**
PO 5. Classify mixtures as being homogeneous or heterogeneous.
Physical Science Lab, Level A: Card 12 **Physical Science Lab, Level B:** Card 12

Strand 5: Physical Science **Physical Science affords students the opportunity to increase their understanding of the characteristics of objects and materials they encounter daily. Students gain an understanding of the nature of matter and energy, including their forms, the changes they undergo, and their interactions. By studying objects and the forces that act upon them, students develop an understanding of the fundamental laws of motion, knowledge of the various ways energy is stored in systems, and the processes by which energy is transferred between systems and surroundings.**
Concept 1: Properties and Changes of Properties in Matter **Understand physical and chemical properties of matter.**
PO 6. Explain the systematic organization of the periodic table.
Physical Science Lab, Level A: Cards 17, 18, 19, 20 **Physical Science Lab, Level B:** Cards 17, 18, 19, 20

Strand 5: Physical Science **Physical Science affords students the opportunity to increase their understanding of the characteristics of objects and materials they encounter daily. Students gain an understanding of the nature of matter and energy, including their forms, the changes they undergo, and their interactions. By studying objects and the forces that act upon them, students develop an understanding of the fundamental laws of motion, knowledge of the various ways energy is stored in systems, and the processes by which energy is transferred between systems and surroundings.**
Concept 1: Properties and Changes of Properties in Matter **Understand physical and chemical properties of matter.**
PO 7. Investigate how the transfer of energy can affect the physical and chemical properties of matter,
Physical Science Lab, Level A: Cards 6, 7, 8, 9, 27, 28 **Physical Science Lab, Level B:** Cards 6, 7, 8, 9, 27, 28

Strand 5: Physical Science **Physical Science affords students the opportunity to increase their understanding of the characteristics of objects and materials they encounter daily. Students gain an understanding of the nature of matter and energy, including their forms, the changes they undergo, and their interactions. By studying objects and the forces that act upon them, students develop an understanding of the fundamental laws of motion, knowledge of the various ways energy is stored in systems, and the processes by which energy is transferred between systems and surroundings.**
Concept 2: Motion and Forces **Understand the relationship between force and motion.**
PO 1. Demonstrate velocity as the rate of change of position over time.
Physical Science Lab, Level A: Card 51 **Physical Science Lab, Level B:** Card 51

Strand 5: Physical Science **Physical Science affords students the opportunity to increase their understanding of the characteristics of objects and materials they encounter daily. Students gain an understanding of the nature of matter and energy, including their forms, the changes they undergo, and their interactions. By studying objects and the forces that act upon them, students develop an understanding of the fundamental laws of motion, knowledge of the various ways energy is stored in systems, and the processes by which energy is transferred between systems and surroundings.**
Concept 2: Motion and Forces **Understand the relationship between force and motion.**
PO 2. Identify the conditions under which an object will continue in its state of motion (Newton's 1st Law of Motion).
Physical Science Lab, Level A: Card 55 **Physical Science Lab, Level B:** Card 55

Strand 5: Physical Science **Physical Science affords students the opportunity to increase their understanding of the characteristics of objects and materials they encounter daily. Students gain an understanding of the nature of matter and energy, including their forms, the changes they undergo, and their interactions. By studying objects and the forces that act upon them, students develop an understanding of the fundamental laws of motion, knowledge of the various ways energy is stored in systems, and the processes by which energy is transferred between systems and surroundings.**
Concept 2: Motion and Forces **Understand the relationship between force and motion.**
PO 3. Describe how the acceleration of a body is dependent on its mass and the net applied force (Newton's 2nd Law of Motion).
Physical Science Lab, Level A: Card 55 **Physical Science Lab, Level B:** Card 55

Strand 5: Physical Science **Physical Science affords students the opportunity to increase their understanding of the characteristics of objects and materials they encounter daily. Students gain an understanding of the nature of matter and energy, including their forms, the changes they undergo, and their interactions. By studying objects and the forces that act upon them, students develop an understanding of the fundamental laws of motion, knowledge of the various ways energy is stored in systems, and the processes by which energy is transferred between systems and surroundings.**
Concept 2: Motion and Forces **Understand the relationship between force and motion.**
PO 4. Describe forces as interactions between bodies (Newton's 3rd Law of Motion).
Physical Science Lab, Level A: Card 55 **Physical Science Lab, Level B:** Card 55

Strand 5: Physical Science
Physical Science affords students the opportunity to increase their understanding of the characteristics of objects and materials they encounter daily. Students gain an understanding of the nature of matter and energy, including their forms, the changes they undergo, and their interactions. By studying objects and the forces that act upon them, students develop an understanding of the fundamental laws of motion, knowledge of the various ways energy is stored in systems, and the processes by which energy is transferred between systems and surroundings.

Concept 2: Motion and Forces
Understand the relationship between force and motion.

PO 5. Create a graph devised from measurements of moving objects and their interactions, including:

- **position-time graphs**
- **velocity-time graphs.**

Physical Science Lab, Level A: Cards 51, 52
Physical Science Lab, Level B: Cards 51, 52