

School District of La Crosse

**Grade 8 Science
Curriculum**

2005-2006

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Guiding Principles for Curriculum Development

School District of LaCrosse

Board of Education's ENDS Policies
Adopted 2001

E-1 District Mission

Students will discover their talents and abilities and will be prepared to pursue their dreams and aspirations while contributing effectively to their diverse communities.

E-2 Academic Achievement Goals

Students will demonstrate continuous improvement toward a high level of individual success in all required and elective academic/curricular areas using multiple measures of performance.

E-3 Involved Citizenship

Students will strive for mutual understanding as contributing citizens in a diverse world.

E-4 Responsible Life Choices

Students will acquire the knowledge and skills necessary to make effective and responsible life choices.

Wisconsin Academic Model Standards

All district curricula will be aligned to the Wisconsin Model Academic Standards available on the web at <http://www.dpi.state.wi.us/dpi/standards/sciintro.html>

District Non-Discrimination Policy

It is the policy of the School District of La Crosse that no person may be denied admission to any public school in this district or be denied participation in, be denied the benefits of, or be discriminated against in any curricular, extracurricular, pupil service, recreation, or other program or activity because of the person's sex, race, religion, national origin, ancestry, creed, pregnancy, marital or parental status, sexual orientation, or physical, mental, emotional, or learning disability or handicap as required by s. 118.13 Wis. Stats., and/or section 504 of the Rehabilitation Act of 1973.

8th Grade Major Topics

- Foundations of Earth Science
- Geology
- Geologic Time
- Oceanography
- Earth's Internal Processes
- Astronomy
- Meteorology
- Hydrology
- Environmental

Science: Eighth Grade

Unit: Foundations of Earth Science

Time Line: 2-3 Weeks

Unit Sub-Topics:

- What is Earth Science?
- Science Inquiry Techniques and Safety Issues
- SI Measurement System
- Atoms, Matter and Their Properties
- Density

Wisconsin State Standards:

A8.1, A8.2, A8.6, B8.1, C8.1, C8.2,
D8.1, D8.2, D8.3, G8.1, H8.3

Learner Outcomes:

Students will learn:

- To differentiate between Physical Science, Earth Science and Life Science.
- To use the tools of science to gather, analyze, and draw conclusions about the organization and properties of matter (define matter, atoms, and elements).
- To use proper lab techniques to assure personal health and safety.
- To use SI units of measurement for length, mass, and volume to calculate the density of objects.
- That atoms combine to form molecules which have chemical and physical properties.
- What a compound is (review).
- To interpret and explain the structure of a periodic table.

Instructional Strategies:

- Scientific method format and understanding
- Current Events
- Concept Maps
- Venn Diagrams
- KWL
- Density Labs
- Demonstration of Measurement lab – Volume, Mass and Length
- Schematic Map – Atoms → Elements → Minerals → Rocks

Suggested Activities/Resources:

- Textbook - Prentice Hall Earth Science, pages 4-13, interspersed throughout units within textbook
- Triple Beam Balance
- Graduated Cylinders
- Beakers
- Wood Blocks
- Rock Samples

- Meter Sticks
- Aluminum Cubes and Bar
- Glass and Steel Marbles

Suggested Assessments:

- Chapter/Unit Tests
- Projects
- Science Notebooks (journals)
- Performance Assessments
- Quizzes
- Oral and Written Reports
- Research Papers

Science: Eighth Grade

Unit: Geology

Time Line: 5-6 Weeks

Unit Sub-Topics:

- Identify Minerals and Their Uses
- Comparing and Contrasting Rocks and Minerals
- Rock Cycle
- Identifying, Comparing, and Contrasting Igneous, Metamorphic and Sedimentary Rocks
- Glacial Geology

Wisconsin State Standards:

A.8.1, A.8.2, A.8.6, B.8.1, C.8.1, D.8.2, D.8.1, D.8.2, D.8.3, G.8.1, H.8.3

Learner Outcomes:

Students will learn:

- The physical characteristics needed to identify minerals (hardness, color, crystal, structure, etc.).
- The five characteristics of all minerals (naturally occurring, inorganic, solid, crystal, shape, and composition).
- The characteristics and uses of minerals.
- To differentiate rocks and minerals.
- The 3 categories of rocks/rock cycle.
- Cave features and the processes that forms them.
- How glaciers form and how they form the glacial features (moraine, drumlin, kames, etc.) on the land.
- The glacial history of Wisconsin.

Instructional Strategies:

- Scientific method format and understanding
- Current Events
- Concept Maps
- Venn Diagrams
- KWL
- Mineral Detective Lab
- Rock Cycle Diagram

Suggested Activities/Resources:

- Textbook – Prentice Hall Earth Science, Chapters 2 and 3, pages 6 and 7, 620, 269-273, Appendix E, pages 260-261
- Rock Kit at each school
- Mineral Kit at each school
- Mineral Testing Materials
- Wisconsin Maps
- DNR Pamphlets

- Field trips to local caves
- Catastrophic Events Kit

Suggested Assessments:

- Chapter/unit tests,
- Projects
- Science notebooks (journals)
- Performance assessments
- Quizzes
- Oral and written reports
- Research papers

Science: Eighth Grade

Unit: Earth's Internal Processes

Time Line: 3 weeks

Unit Sub-Topics:

- Earth Structure
- Plate Tectonics
- Earthquakes
- Volcanoes

Wisconsin State Standards:

A.8.1, A.8.2, A.8.4, A.8.5, A.8.6, A.8.8,
B.8.1, B.8.2, B.8.3, B.8.4, D.8.1, D.8.5,
D.8.6, D.8.8, E.8.1, E.8.2, E.8.5, G.8.1,
G.8.2, G.8.3, H.8.1, H.8.3

Learner Outcomes:

Students will learn:

- To diagram and describe the earth's internal structure.
- To compare and contrast the theories of continental drift and sea floor spreading.
- The theory of plate tectonics.
- To compare and contrast divergent, convergent, and transform plate boundaries.
- How convection currents may cause plate movements.
- The cause and characteristics of earthquakes (fault and wave types).
- Seismic wave information and its uses (magnitude and epicenter location).
- Earthquake safety (personal and structural).
- The features (intrusive, igneous, structure, magma types, neck and caldera) and types of volcanoes (shield, cinder cone, and composite).
- The relationship between volcanoes, earthquakes and plate tectonics.
- The potential use of geothermal energy.

Instructional Strategies:

- Current Events
- Concept Maps
- Venn Diagrams
- KWL
- Earthquake, Volcano, and Plate Tectonic Mapping Activity
- Magma Stimulation (GAK making activity)
- Plate Tectonic Puzzle
- Finding Epicenters
- Seismic waves/ slinky activity
- Build a volcano (3-D) or draw a volcano poster
- Famous Volcanoes Research Project (Mary Puza – Longfellow)
- Lab: Identify types of volcanoes

Suggested Activities/Resources:

- Textbook – Prentice Hall Earth Science Chapters 4, 5, and 6
- Videos: Volcanoes! by Krafts (National Geographic)
Slides of Mt. St. Helen
“Core” video segment
- Laser Disk – Understanding the Earth Series – DMC
- Laser Disk – “Plate Tectonics” – DMC
 - *Earthquakes: Understanding the Hazards
 - *Volcanoes: Understanding the Hazards
 - *Plate Tectonics
- Catastrophic Events Kit

Suggested Assessments:

- Chapter/Unit Tests
- Projects
- Science Notebooks (journals)
- Performance Assessments
- Quizzes
- Oral and Written Reports
- Lab Reports
- Research Papers

Science: Eighth Grade

Unit: Geologic Time

Time Line: 1-2 Weeks

Unit Sub-Topics:

- Fossils
- Extinction Theories
- Processes Used to Determine the Age of Rocks
- Geologic Time Scale

Wisconsin State Standards:

A.8.1, A.8.2, A.8.3, A.8.4, A.8.5, A.8.6,
A.8.8, B.8.1, B.8.2, B.8.3, B.8.4, B.8.5,
B.8.6, E.8.5, F.8.2, F.8.9, F.8.10, G.8.1,
G.8.3

Learner Outcomes:

Students will learn:

- How fossils form and how they are the key to past life on earth.
- Several methods used to date rock layers relative to other rock layers (laws of superposition, relative/absolute dating, radioactive decay, radiometric dating).
- That geologic time is divided into units.
- The dominant life forms in each major era/period of Earth's history.
- That the earth and its life forms, undergo a constant process of evolution.
- The most commonly accepted dinosaur extinction theories.
- The relationship of humans and species extinction.

Instructional Strategies:

- Current Events
- Concept Maps
- Venn Diagrams
- KWL
- Timeline
- Fossil Identification and Making
- Lab: Making molds and casts

Suggested Activities/Resources:

- Textbook – Prentice Hall Earth Science, Chapter 9; Merrill's Earth Science Chapters 16 and 17 (old book as a reference)
- Fossil kits for fossil identification and/or samples
- Mississippi Valley Archaeology Center (MVAC)

Suggested Assessments:

- Chapter/unit tests
- Projects
- Science Notebooks (Journals)
- Performance Assessments
- Quizzes
- Oral and Written Reports
- Lab Reports
- Research Papers

Science: Eighth Grade

Unit: Oceanography

Time Line: 3 Weeks

Unit Sub-Topics:

- Ocean Location
- Ocean Water Composition
- Water Circulation
- Shoreline Formation
- Ocean Floor Features
- Life in the Ocean

Wisconsin State Standards:

A.8.1, A.8.3, A.8.4, A.8.5, A.8.6, A.8.7,
A.8.8, B.8.1, B.8.2, B.8.3, B.8.5, B.8.6,
D.8.8, E.8.1, E.8.3, F.8.2, F.8.8, F.8.9,
F.8.10, G.8.1, G.8.2, G.8.3, H.8.1,
H.8.2, H.8.3

Learner Outcomes:

Students will learn:

- The location of the major oceans (4 or 5).
- The origin and composition of sea water.
- The causes of ocean currents (wind and density).
- The parts of a wave and the forces that cause waves and tides.
- How humans benefit from ocean resources (desalination, tidal energy, etc.)
- The processes that form shorelines (waves, tides, and currents).
- To compare and contrast shoreline features (rock versus sand and sand origins).
- To map the features of the ocean floor (continental shelf, slope, etc.)
- The key characteristics and survival mechanism of plankton, nektons and benthos.
- To compare and contrast photosynthesis, respiration, and chemosynthesis.
- How humans impact the ocean.

Instructional Strategies:

- Current Events
- Concept Maps
- Venn Diagrams
- KWL
- Sea Search Map Activity
- Pop-Up Coral Reef
- Graphing the Ocean Floor
- Density Tank Lab

Suggested Activities/Resources:

- Textbook – Prentice Hall Earth Science Chapters 13 and 14
- Laser Disk – Great Ocean Rescue (at Logan Middle)
- Videos: Search for the Titanic (at Logan Middle)
Mysteries of the Coral Reef
Tsunami: Killer Wave

Suggested Assessments:

- Chapter/Unit Tests
- Projects
- Science Notebooks (journals)
- Performance Assessments
- Quizzes
- Oral and Written Reports
- Lab Reports
- Research Reports

Science: Eighth Grade

Unit: Astronomy

Time Line: 4 Weeks

Unit Sub-Topics:

- Major Events in Space Exploration
- Earth – Moon System
- The Solar System
- Stars and Galaxies

Wisconsin State Standards:

A.8.1, A.8.2, A.8.4, A.8.5, A.8.6, A.8.7,
A.8.8, B.8.1, B.8.2, B.8.3, B.8.4, B.8.5,
B.8.6, D.8.1, D.8.8, E.8.7, E.8.8, G.8.1,
G.8.2, G.8.3, H.8.1, H.8.2

Learner Outcomes:

Students will learn:

- The history of space travel and the major discoveries in space (see activities).
- The three earth movements and their relationships to seasons, year and day/night.
- The motion and phases of the moon.
- To compare solar and lunar eclipses.
- The contributions of astronomers (i.e., Copernicus & Galileo).
- The major theories on the formation of the solar system.
- The difference between comets, meteoroids, and asteroids.
- To determine star distance and classification (parallax, magnitude, HR diagram).
- The life cycle of a star.
- The parts of our sun and its production.
- Galaxy formation theories and types (spiral, elliptical, irregular).

Instructional Strategies:

- Current Events
- Concept Maps
- Venn Diagrams
- KWL
- Mini Lab – How much light pollution is there?
- Mini Lab – How can gravity be simulated in a space station?
- Matching Spectra Activity
- Globe demonstration of day and night (rotation) and the seasons (evolution)
- Top demonstration – earth's rotation
- Basketball/overhead projector activity (phases of the moon)
- Marooned on earth activity
- Parallax lab
- Constellation Identification Project
- Planetarium Trip
- Space Exploration Trivial Pursuit Activity

Suggested Activities/Resources:

- Textbook – Prentice Hall Earth Science, Chapter 19, 20, and 21, Appendix F
- Videos: Apollo 11 and Apollo 15
Moon Hoax
NASA Video (Mary Puza at Longfellow)
- Laser Video: Exploring Our Solar System
- Cooperative Learning Project: The Planets of the Solar System

Suggested Assessments:

- Chapter/Unit Tests
- Projects
- Science Notebooks (journals)
- Performance Assessment
- Quizzes
- Oral and Written Reports
- Lab Reports
- Research Papers

Science: Eighth Grade

Unit: Meteorology

Time Line: 4-5 Weeks

Unit Sub-Topics:

- Earth's Atmosphere
- Air Pressure
- Renewable Energy Sources
- Movement of Air
- Weather Conditions and Mapping
- Global Climate Zones
- Global Warming

Wisconsin State Standards:

A.8.1, A.8.2, A.8.3, A.8.4, A.8.5, A.8.6, A.8.7, A.8.8, B.8.1, B.8.3, B.8.4, B.8.5, B.8.6, D.8.1, D.8.3, D.8.8, E.8.1, E.8.3, E.8.4, F.8.9, G.8.1, G.8.2, G.8.3, H.8.1, H.8.2, H.8.3

Learner Outcomes:

Students will learn:

- The components of the layers of the atmosphere and how it protects the earth.
- The causes and effects of air pressure.
- The forms of heat energy (radiation, conduction, and convection).
- The Coriolis effect and various wind systems.
- The water cycle.
- The role of water, vapor, humidity, clouds and precipitation types as they relate to weather.
- The weather associated with fronts and high and low pressure areas.
- To compare and contrast thunderstorms, tornadoes, and hurricanes development and effects.
- How to make weather maps.
- To contrast tropical, temperate, and polar climates.
- How large bodies of water and mountains effect climate.
- The factors influencing global climate change (the greenhouse effect, ozone depletion, and global warming).

Instructional Strategies:

- Current Events
- Concept Maps
- Venn Diagrams
- KWL
- Chlorofluorocarbon molecule ozone activity (colored marshmallows and add toothpicks)
- Egg in the bottle activity
- Crush the can activity
- Card on the glass activity
- Volcano in a flask activity
- Chalk and globe activity – Coriolis effect

- Follow the Front – weather map activity
- Air pressure activity
- Students build water barometers
- Barometer demonstration
- Making a cloud kit
- Mini-lab/Making fog

Suggested Activities/Resources:

- Textbook – Prentice Hall Earth Science, Chapter 15, 16, 17, and 18, pages 333-339
- Videos: “Within Our Power”, “Coriolis Effect”
- Tornado tubes
- Catastrophic Events Kit

Suggested Assessments:

- Chapter/Unit Tests
- Projects
- Science Notebooks (journals)
- Performance Assessment
- Quizzes
- Oral and Written Reports
- Lab Reports
- Research Papers

Science: Eighth Grade

Unit: Hydrology

Time Line: 3 Weeks

Unit Sub-Topics:

- Hydrologic Cycle
- Underground Water Systems
- Watersheds
- Water Resources & Water Quality
- Hydroelectric Power
- River and Lake Issues

Wisconsin State Standards:

A.8.1, A.8.7, B.8.6, D.8.1, D.8.6, E.8.1, E.8.6, F.8.10, G.8.1, G.8.3, G.8.5 H.8.1, H.8.2, H.8.3

Learner Outcomes:

Students will learn:

- The hydrologic cycle.
- About underground water systems (water table, springs, geysers and limestone caves).
- How river drainage systems combine to form a watershed.
- That fresh water is a limited resource.
- Factors that affect water quality.
- How water is used to produce electricity.
- The impact humans have had on rivers and lakes (sedimentation, land use, locks and dams, flood plains, barge traffic, etc.)

Instructional Strategies:

- Current Events
- Concept Maps
- Venn Diagrams
- KWL
- DNR water use and water cycle chart
- Wisconsin topographic maps – drainage system
- City Water Department
- Identification of rivers and lakes of Wisconsin
- Studies of rivers and lakes (Richard Frost)
- Water Testing

Suggested Activities/Resources:

- Textbook – Prentice Hall Earth Science, Chapters 11 and 12
- Field trip to the Marsh
- Field trip to the Mississippi River

Suggested Assessments:

- Chapter/Unit Tests
- Projects
- Science Notebooks (journals)
- Performance Assessment
- Quizzes
- Oral and Written Reports
- Lab Reports
- Research Papers

Science: Eighth Grade

Unit: Environmental

Time Line: 2-3 Weeks or Integrated throughout the year

Unit Sub-Topics:

- Energy
- Human Impact on Environment: Population, Land Use
- Recycling
- Pollutants – Air and Water

Wisconsin State Standards:

A.8.1, A.8.2, A.8.3, A.8.4, A.8.5, A.8.6, A.8.7, A.8.8, B.8.1, B.8.6, C.8.1, C.8.2, C.8.3, C.8.4, C.8.5, C.8.6, C.8.7, C.8.8, C.8.9, C.8.10, C.8.11, E.8.4, E.8.6, F.8.9, F.8.10, G.8.1, G.8.2, G.8.3, G.8.4, G.8.5, H.8.1, H.8.2, H.8.3

Learner Outcomes:

Students will learn:

- The evolution of non-reusable energy sources (fossil fuels)
- To compare and contrast renewable energy sources (solar, wind and hydroelectric).
- To describe nuclear energy production and its benefits and hazards.
- Exponential population growth and its environment effects.
- The environmental impact on land use (mining, deforestations, housing and transportation, and soil issues).
- About recycling issues (land fills versus incineration, etc.).
- About sources of air pollution (smog, refrigerants, etc.).
- About sources of water pollution (industrial waste, water runoff, etc.).
- Ways to reduce pollution.

Instructional Strategies:

- Current Events
- Concept Maps
- Venn Diagrams
- KWL
- Insulation Lab
- A Crowded Encounter
- A Model Landfill
- Can One Person Make A Difference
- Mini-Lab: Do we have acid rain?
- Activity: Water Use
- Lab Activity: What's in the air?

Suggested Activities/Resources:

- Textbook – Prentice Hall Earth Science, parts of Chapters 7 and all of Chapter 10 and other pertinent chapters
- Videos – A Visit With Amory & Hunter Lovins
Energy Efficient Home Building
Use of Solar Power
Within Our Power (DMC)
- Films: Wisconsin’s Air
Acid Rain
- Field trip to the La Crosse River Marsh

Suggested Assessments:

- Chapter/Unit Tests
- Projects
- Science Notebooks (journals)
- Performance Assessment
- Quizzes
- Oral and Written Reports
- Lab Reports
- Research Papers

Wisconsin Model Academic Standards 8 th Grade Standards Analysis		6 th	7 th	8 th
		A. Science Connections		
A.8.1	Develop their understanding of the science themes by using the themes to frame questions about science-related issues and problems.	✓	✓	✓
A.8.2	Describe limitations of science systems and give reasons why specific science themes are included in or excluded from those systems.	✓	✓	✓
A.8.3	Defend explanations and models by collecting and organizing evidence that supports them and critique explanations and models by collecting and organizing evidence that conflicts with them.	✓	✓	✓
A.8.4	Collect evidence to show that models developed as explanations for events were (and are) based on the evidence available to scientists at the time.	✓	✓	✓
A.8.5	Show how models and explanations, based on systems, were changed as new evidence accumulated (the effects of constancy, evolution, change, and measurement should all be part of these explanations.)	✓	✓	✓
A.8.6	Use models and explanations to predict actions and events in the natural world.	✓	✓	✓
A.8.7	Design real or thought investigations to test the usefulness and limitations of a model.	✓	✓	✓
A.8.8	Use the themes of evolution, equilibrium, and energy to predict future events or changes in the natural world.	✓	✓	✓
B. Nature of Science				
B.8.1	Describe how scientific knowledge and concepts have changed over time in the earth and space, life and environmental, and physical sciences.	✓	✓	✓
B.8.2	Identify and describe major changes that have occurred over in conceptual models and explanations in the earth and space, life and environmental, and physical sciences and identify the people, cultures, and conditions that led to these developments.	✓	✓	✓
B.8.3	Explain how the general rules of science apply to the development and use of evidence in science investigations, model making, and applications.	✓	✓	✓
B.8.4	Describe types of reasoning and evidence used outside of science to draw conclusions about the natural world.		✓	✓
B.8.5	Explain ways in which science knowledge is shared, checked, and extended, and show how these processes change over time.	✓	✓	✓
B.8.6	Explain the ways in which scientific knowledge is useful and also limited when applied to social issues.	✓	✓	✓
C. Science Inquiry				
C.8.1	Identify questions they can investigate using resources and equipment they have available.	✓	✓	✓
C.8.2	Identify data and locate sources of information including their own records to answer the questions being investigated.	✓	✓	✓
C.8.3	Design and safely conduct investigations that provide reliable quantitative or qualitative data, as appropriate, to answer their questions.	✓	✓	✓
C.8.4	Use inferences to help decide possible results of their investigations, use observations	✓	✓	✓

Wisconsin Model Academic Standards 8 th Grade Standards Analysis		6 th	7 th	8 th
			to check their inferences.	
C.8.5	Use accepted scientific knowledge, models, and theories to explain their results and to raise further questions about their investigations.	✓	✓	✓
C.8.6	State what they have learned from investigations, relating their inferences to scientific knowledge and to data they have collected.	✓	✓	✓
C.8.7	Explain their data and conclusions in ways that allow an audience to understand the questions they selected for investigations and the answers they have developed.	✓	✓	✓
C.8.8	Use computer software and other technologies to organize, process, and present their data.	✓	✓	✓
C.8.9	Evaluate, explain, and defend the validity of questions, hypotheses, and conclusions to their investigations.	✓	✓	✓
C.8.10	Discuss the importance of their results and implications of their work with peers, teachers, and other adults.	✓	✓	✓
C.8.11	Raise further questions which still need to be answered.	✓	✓	✓
D. Physical Science				
PROPERTIES AND CHANGES OF PROPERTIES IN MATTER				
D.8.1	Observe, describe, and measure physical and chemical properties of elements and other substances to identify and group them according to properties such as density, melting points, boiling points, conductivity, magnetic attraction, solubility, and reactions to common physical and chemical tests.	✓		✓
D.8.2	Use the major ideas of atomic theory and molecular theory to describe physical and chemical interactions among substances, including solids, liquids, and gases.	✓	✓	✓
D.8.3	Understand how chemical interactions and behaviors lead to new substances with different properties.	✓	✓	✓
D.8.4	While conducting investigations, use the science themes to develop explanations of physical and chemical interactions and energy exchanges.	✓	✓	
MOTIONS AND FORCES				
D.8.5	While conducting investigations, explain the motion of objects by describing the forces acting on them.	✓		✓
D.8.6	While conducting investigations, explain the motion of objects using concepts of speed, velocity, acceleration, friction, momentum, and changes over time, among others, and apply these concepts and explanations to real-life situations outside the classroom.			✓
D.8.7	While conducting investigations of common physical and chemical interactions occurring in the laboratory and the outside world, use commonly accepted definitions of energy and the idea of energy conservation.	✓		
D.8.8	Describe and investigate the properties of light, heat, gravity, radio waves, magnetic fields, electrical fields, and sound waves as they interact with material objects in common situations.	✓		✓
D.8.9	Explain the behaviors of various forms of energy by using the models of energy transmission, both in the laboratory and in real-life situations in the outside world.	✓		

Wisconsin Model Academic Standards 8 th Grade Standards Analysis		6 th	7 th	8 th
		D.8.10	Explain how models of the atomic structure of matter have changed over time, including historical models and modern atomic theory.	✓
E. Earth and Space Science				
STRUCTURE OF EARTH SYSTEM				
E.8.1	Using the science themes, explain and predict changes in major features of land, water and atmospheric systems.		✓	✓
E.8.2	Describe underlying structures of the earth that cause changes in the earth's surface.			✓
E.8.3	Using the science themes during the process of investigation, describe climate, weather, ocean currents, soil movements and changes in the forces acting on the earth.			✓
E.8.4	Using the science themes, analyze the influence living organisms have had on the earth's systems, including their impact on the composition of the atmosphere and the weathering of rocks.		✓	✓
EARTH'S HISTORY				
E.8.5	Analyze the geologic and life history of the earth, including change over time, using various forms of scientific evidence.		✓	✓
E.8.6	Describe through investigations the use of the earth's resources by humans in both past and current cultures, particularly how changes in the resources used for the past 100 years are the basis for efforts to conserve and recycle renewable and non-renewable resources.			✓
EARTH IN THE SOLAR SYSTEM				
E.8.7	Describe the general structure of the solar system, galaxies, and the universe, explaining the nature of the evidence used to develop current models of the universe.			✓
E.8.8	Using past and current models of the structure of the solar system, explain the daily, monthly, yearly, and long-term cycles of the earth, citing evidence gained from personal observation as well as evidence used by scientists			✓
F. Life and Environmental Science				
STRUCTURE AND FUNCTION IN LIVING THINGS				
F.8.1	Understand the structure and function of cells, organs, tissues, organ systems, and whole organisms.		✓	
F.8.2	Show how organisms have adapted structures to match their functions, providing means of encouraging individual and group survival within specific environments.		✓	✓
F.8.3	Differentiate between single-celled and multiple-celled organisms (humans) through investigation, comparing the cell functions of specialized cells for each type of organism.		✓	
REPRODUCTION AND HEREDITY				
F.8.4	Investigate and explain that heredity is comprised of the characteristic traits found in genes within the cell of an organism.		✓	
F.8.5	Show how different structures both reproduce and pass on characteristics of their group.		✓	

Wisconsin Model Academic Standards 8 th Grade Standards Analysis		6 th	7 th	8 th
		REGULATION AND BEHAVIOR		
F.8.6	Understand that an organism is regulated both internally and externally.		✓	
F.8.7	Understand that an organism's behavior evolves through adaptation to its environment.		✓	
POPULATIONS AND ECOSYSTEMS				
F.8.8	Show through investigations how organisms both depend on and contribute to the balance or imbalance of populations and/or ecosystems, which in turn contribute to the total system of life on the planet.		✓	✓
DIVERSITY AND ADAPTATIONS OF ORGANISMS				
F.8.9	Explain how some of the changes on the earth are contributing to changes in the balance of life and affecting the survival or population growth of certain species.		✓	✓
F.8.10	Project how current trends in human resource use and population growth will influence the natural environment, and show how current policies affect those trends.		✓	✓
G. Science Applications				
G.8.1	Identify and investigate the skills people need for a career in science or technology and identify the academic courses that a person pursuing such a career would need.	✓	✓	✓
G.8.2	Explain how current scientific and technological discoveries have an influence on the work people do and how some of these discoveries also lead to new careers.	✓	✓	✓
G.8.3	Illustrate the impact that science and technology have had, both good and bad, on careers, systems, society, environment, and quality of life.	✓	✓	✓
G.8.4	Propose a design (or re-design) of an applied science model or a machine that will have an impact in the community or elsewhere in the world and show how the design (or re-design) might work, including potential side-effects.			✓
G.8.5	Investigate a specific local problem to which there has been a scientific or technological solution, including proposals for alternative courses of action, the choices that were made, reasons for the choices, any new problems created, and subsequent community satisfaction.		✓	✓
G.8.6	Use current texts, encyclopedias, source books, computers, experts, the popular press, or other relevant sources to identify examples of how scientific discoveries have resulted in new technology.	✓	✓	
G.8.7	Show evidence of how science and technology are interdependent, using some examples drawn from personally conducted investigations.			
H. Science in Personal and Social Perspectives				
H.8.1	Evaluate the scientific evidence used in various media (for example, television, radio, Internet, popular press, and scientific journals) to address a social issue, using criteria of accuracy, logic, bias, relevance of data, and credibility of sources.		✓	✓
H.8.2	Present a scientific solution to a problem involving the earth and space, life and environmental, or physical sciences and participate in a consensus-building discussion to arrive at a group decision.		✓	✓
H.8.3	Understand the consequences of decisions affecting personal health and safety.	✓	✓	✓

8th Grade Explanatory Notes on Wisconsin State Standards in Relation to School Curriculum 1999-2000

Foundations of Earth

A. Science Connections

Students in Wisconsin will understand that there are unifying themes: (systems, order, organization, and interactions); (evidence, models, and explanations); (constancy, change, and measurement); (evolution, equilibrium, and energy); (form and function) among the scientific disciplines.

A.8.1 Measurement, systems – atoms, molecules, states of matter

A.8.2 Differentiate Physical Science, Life and Earth Science

A.8.6 Prediction of Density

B. Nature of Science

Students in Wisconsin will understand that science is ongoing and inventive, and that scientific understandings have changed over time as new evidence is found.

B.8.1 Four States of Matters

B.8.3 Rules of Density – Make Model

C. Science Inquiry

Students in Wisconsin will investigate questions using scientific methods and tools, revise their personal understanding to accommodate knowledge, and communicate these understandings to others.

C.8.1 Density of Equipment

C.8.2 Blocks of Different Woods – Density

D. Physical Science

Students in Wisconsin will demonstrate an understanding of the physical and chemical properties of matter, the forms and properties of energy, and the ways in which matter and energy interact.

Not covered in this unit.

E. Earth and Space Science

Students in Wisconsin will demonstrate an understanding of the structure and systems of the earth and other bodies in the universe and their interactions.

Not covered in this unit.

F. Life and Environmental Science

Students in Wisconsin will demonstrate an understanding of the structure and systems of the earth and the other bodies in the universe and their interactions.

Not covered in this unit.

G. Science Applications

Students in Wisconsin will demonstrate an understanding of the relationship between science and technology and the ways in which that relationship influences human activities.

G.8.1 Careers in Life, Physical and Earth Science

H. Science in Social and Personal Perspective

Students in Wisconsin will use scientific information and skills to make decisions about themselves, Wisconsin, and the world in which they live.

H.8.3 Lab Safety

Geology

A. Science Connections

Students in Wisconsin will understand that there are unifying themes: (systems, order, organization, and interactions); (evidence, models, and explanations); (constancy, change, and measurement); (evolution, equilibrium, and energy); (form and function) among the scientific disciplines.

A.8.1 Systems, order, organization and interactions – glacial history
Form and Function – Rock characteristics and their uses
Constancy, change and measurement – Rock Cycle

A.8.2 Some rocks and minerals are not clearly identifiable
Erosion and Human Impact

A.8.6 The effects of erosion, rock cycle and the continuous changes.

B. Nature of Science

Students in Wisconsin will understand that science is ongoing and inventive, and that scientific understandings have changed over time as new evidence is found.

B.8.1 We are gaining a better understanding of glacial history.

C. Science Inquiry

Students in Wisconsin will investigate questions using scientific methods and tools, revise their personal understanding to accommodate knowledge, and communicate these understandings to others.

C.8.1 & C.8.2 – Self-explanatory

D. Physical Science

Students in Wisconsin will demonstrate an understanding of the physical and chemical properties of matter, the forms and properties of energy, and the ways in which matter and energy interact.

D.8.1, D.8.2, and D.8.3 – Self-explanatory

E. Earth and Space Science

Students in Wisconsin will demonstrate an understanding of the structure and systems of the earth and other bodies in the universe and their interactions.

Not covered in this unit.

F. Life and Environmental Science

Students in Wisconsin will demonstrate an understanding of the characteristics and structures of living things, the processes of life, and how living things interact with one another and their environment.

Not covered in this unit.

G. Science Applications

Students in Wisconsin will demonstrate an understanding of the relationship between science and technology and the ways in which that relationship influences human activities.

G.8.1 Self-explanatory

H. Science in Social and Personal Perspectives

Students in Wisconsin will use scientific information and skills to make decisions about themselves, Wisconsin, and the world in which they live.

H.8.3 Self-explanatory

Geologic Time

A. Science Connections

Students in Wisconsin will understand that there are unifying themes: (systems, order, organization, and interactions); (evidence, models, and explanations); (constancy, change, and measurement); (evolution, equilibrium, and energy); (form and function) among the scientific disciplines.

A.8.1 Evolution, Evidence – Fossils & Rocks

A.8.2 Extinction Theories

A.8.3 Extinction Theories, Relative Dating

A.8.4 Extinction Theories, Geologic Time Scale

A.8.5 Geologic Time Scale

A.8.6 Plate Tectonics and Human Impact on Species Extinction

A.8.8 Human Impact on Species Extinction

B. Nature of Science

Students in Wisconsin will understand that science is ongoing and inventive, and that scientific understandings have changed over time as new evidence is found.

B.8.1 Geologic Time Scale, Extinction Theories

B.8.2 Human Impact on Species Extinction

B.8.3 Dating of Rocks Methods

B.8.4 Evolution versus Creationism

B.8.5 Geologic Time and Extinction Theories

B.8.6 Human Impact on Species Extinction

C. Science Inquiry

Students in Wisconsin will investigate questions using scientific methods and tools, revise their personal understanding to accommodate knowledge, and communicate these understandings to others.

Not covered in this unit.

D. Physical Science

Students in Wisconsin will demonstrate an understanding of the physical and chemical properties of matter, the forms and properties of energy, and the ways in which matter and energy interact.

Not covered in this unit.

E. Earth and Space Science

Students in Wisconsin will demonstrate an understanding of the structure and systems of the earth and other bodies in the universe and their interactions.

E.8.5 Self-explanatory

E. Life and Environmental Science

Students in Wisconsin will demonstrate an understanding of the characteristics and structures of living things, the processes of life, and how living things interact with one another and their environment.

F.8.2 Animals adaptations between eras

F.8.9 Species Extinction

F.8.10 Human Impact on Species Extinction

G. Science Applications

Students in Wisconsin will demonstrate an understanding of the relationship between science and technology and the ways in which that relationship influences human activities.

G.8.1 Skills and courses needed for a career in this area.

G.8.3 Pesticides, Lead Shot, Herbicides

H. Science in Social and Personal Perspectives

Students in Wisconsin will use scientific information and skills to make decisions about themselves, Wisconsin, and the world in which they live.

Not covered in this unit.

Oceanography

A. Science Connections

Students in Wisconsin will understand that there are unifying themes: (systems, order, organization, and interactions); (evidence, models, and explanations); (constancy, change, and measurement); (evolution, equilibrium, and energy); (form and function) among the scientific disciplines.

A.8.1 System Interactions – Oceans and Ocean Life
Evidence & Models – Ocean Floor & Shorelines
Constancy, Change and Measurement – Shoreline

- A.8.3 Ocean floor, shoreline
- A.8.4 Chemosynthesis
- A.8.5 Chemosynthesis – Ocean Floors, feature changes
- A.8.6 Tides, Oceans, Currents
- A.8.7 Density Tank, Trained Egg Investigation
- A.8.8 Ocean warming and its effects on weather

B. Nature of Science

Students in Wisconsin will understand that science is ongoing and inventive, and that scientific understandings have changed over time as new evidence is found.

- B.8.1 Discovery of Ocean floor vents and new animal life
- B.8.2 Robert Ballard an Oceanographer, Geologist
Discoveries involving the ocean floor
- B.8.3 Understanding the density, gradients, and gravity and their effects
- B.8.5 The growth of our knowledge and understanding of the ocean
- B.8.6 Human impact: Disposal of garbage, fishing issues

C. Science Inquiry

Students in Wisconsin will investigate questions using scientific methods and tools, revise their personal understanding to accommodate knowledge, and communicate these understandings to others.

Not covered in this unit.

D. Physical Science

Students in Wisconsin will demonstrate an understanding of the physical and chemical properties of matter, the forms and properties of energy, and the ways in which matter and energy interact.

- D.8.8 Gravity, Sonar Waves

E. Earth and Space Science

Students in Wisconsin will demonstrate an understanding of the structure and systems of the earth and other bodies in the universe and their interactions.

E.8.1 Shorelines, systems order and organization and interactions
Water Circulation

E.8.3 Self-explanatory

F. Life and Environmental Science

Students in Wisconsin will demonstrate an understanding of the characteristics and structures of living things, the processes of life, and how living things interact with one another and their environment.

F.8.2 Ocean Life Adaptations

F.8.8 Food chains – Great Ocean Rescue

F.8.9 El Nino’s effect on populations

F.8.10 Deforestations, Coral Reef destruction, garbage disposal

G. Science Applications

Students in Wisconsin will demonstrate an understanding of the relationship between science and technology and the ways in which that relationship influences human activities.

G.8.1 Career discussions – Robert Ballard

G.8.2 Deep water research

G.8.3 Desalination, technology to predict ocean temperature and tidal waves

H. Science in Social and Personal Perspectives

Students in Wisconsin will use scientific information and skills to make decisions about themselves, Wisconsin, and the world in which they live.

H.8.1 Ocean garbage disposal

H.8.2 Great Ocean Rescue – Discussion

H.8.3 Self-explanatory

Earth’s Internal Processes

A. Science Connections

Students in Wisconsin will understand that there are unifying themes: (systems, order, organization, and interactions); (evidence, models, and explanations); (constancy, change, and measurement); (evolution, equilibrium, and energy); (form and function) among the scientific disciplines.

- A.8.1 Systems, order, organization and interactions – Earth’s structure
Evidence, models, and explanations – plate tectonics theory
- A.8.2 Limitations – our inability to accurately predict earthquakes and/or volcanoes
- A.8.4 Plate Tectonics Theory
- A.8.5 Plate Tectonics Theory
- A.8.6 Mapping earthquakes and volcanoes and plate boundaries
- A.8.6 Why earthquakes happen in Wisconsin?
- A.8.8 Future changes...plate positions

B. Nature of Science

Students in Wisconsin will understand that science is ongoing and inventive, and that scientific understandings have changed over time as new evidence is found.

- B.8.1 Plate tectonics
- B.8.2 Alfred Wagner and Harold Hess and their contributions to Earth Science
- B.8.3 Density, pressure, temperature and convection currents cause Earth’s internal processes.
- B.8.4 Alfred Wagner and Harold Hess – Theory of plate tectonics developed over time.

C. Science Inquiry

Students in Wisconsin will investigate questions using scientific methods and tools, revise their personal understanding to accommodate knowledge, and communicate these understandings to others.

Not covered in this unit.

D. Physical Science

Students in Wisconsin will demonstrate an understanding of the physical and chemical properties of matter, the forms and properties of energy, and the ways in which matter and energy interact.

- D.8.1 Magnetism – Rationale for sea floor spreading
- D.8.5 Forces acting on the plates
- D.8.6 Slinky wave – illustration of seismic waves

D.8.8 The effects of gravity and magnetic fields

E. Earth and Space Science

Students in Wisconsin will demonstrate an understanding of the structure and systems of the earth and other bodies in the universe and their interactions.

E.8.1, E.8.2, E.8.5 – Self-explanatory

F. Science Applications

Students in Wisconsin will demonstrate an understanding of the characteristics and structures of living things, the processes of life, and how living things interact with one another and their environment.

Not covered in this unit.

G. Science Applications

Students in Wisconsin will demonstrate an understanding of the relationship between science and technology and ways in which that relationship influences human activities.

G.8.1 and G.8.2 Forecasting of earthquakes, tornadoes, hurricanes, etc. has improved over the years.

G.8.3 Structures being built today are designed to be more earthquake resistant. Better overall prediction of natural disasters.

H. Science and Social and Personal Perspectives

Students in Wisconsin will use scientific information and skills to make decisions about themselves, Wisconsin, and the world in which they live.

H.8.1 Movies and their lack of accuracy.

H.8.12 Building on fault lines and near volcanoes despite our understanding of the potential dangers involved in our actions.

Astronomy

A. Science Connections

Students in Wisconsin will understand that there are unifying themes: (systems, order, organization, and interactions); (evidence, models, and explanations); (constancy, change, and measurement); (evolution, equilibrium, and energy); (form and function) among the scientific disciplines.

A.8.1 Solar System – Organization – moon and stars

A.8.2 Star distances, the size of the system is a limitation...we have no idea of its size

A.8.4 Theories over time have changed, Copernicus...

A.8.5 Theories over time have changed

A.8.6 Moon phases, seasons, tides

A.8.7 Colonization Study

A.8.8 Solar Eclipse, Haley's Comet

B. Nature of Science

Students in Wisconsin will understand that science is ongoing and inventive, and that scientific understandings have changed over time as new evidence is found.

B.8.1 Theories of Geocentric versus Heliocentric

B.8.2 Galileo, Copernicus, Hubbell, etc.

B.8.3 Gravity helps keep planets in order

B.8.4 Big Bang Theory

B.8.5 Communication between Astronomers

B.8.6 Astrology – Constellations and Myths

C. Science Inquiry

Students in Wisconsin will investigate questions using scientific methods and tools, revise their personal understanding to accommodate knowledge, and communicate these understandings to others.

Not covered in this unit.

D. Physical Science

Students in Wisconsin will demonstrate an understanding of the physical and chemical properties of matter, the forms and properties of energy, and the ways in which matter and energy interact.

D.8.1 Magnetic attraction, identify stars based on their color

D.8.8 Gravity, light travel

E. Earth and Space Science

Students in Wisconsin will demonstrate an understanding of the structure and systems of the earth and other bodies in the universe and their interactions.

E.8.7 and E.8.8 Self-Explanatory

F. Life and Environmental Science

Students in Wisconsin will demonstrate an understanding of the characteristics and structures of living things, the processes of life, and how living things interact with one another and their environment.

Not covered in this unit.

G. Science Applications

Students in Wisconsin will demonstrate an understanding of the relationship between science and technology and the ways in which that relationship influences human activities.

G.8.1 – G.8.3 Self-Explanatory

H. Science in Social and Personal Perspectives

Students in Wisconsin will use scientific information and skills to make decisions about themselves, Wisconsin and the world in which they live.

H.8.1 Movies, UFOs, Astrology, Horoscopes

H.8.2 Overpopulation and colonization

Meteorology

A. Science Connections

Students in Wisconsin will understand that there are unifying themes: (systems, order, organization, and interactions); (evidence, models, and explanations); (constancy, change and measurement); (evolution, equilibrium, and energy); (form and function) among the scientific disciplines.

A.8.1 Systems, order, organization and interactions – wind, energy transfer, equilibrium, constancy, change, measurement – barometer

A.8.2 Weather prediction limitations

A.8.3 Global temperature change – debatable

A.8.4 Ozone hole evidence

A.8.5 Ozone hole evidence

A.8.6 Weather prediction

A.8.7 Usefulness and accuracy of weather prediction

A.8.8 Global warming

B. Nature of Science

Students in Wisconsin will understand that science is ongoing and inventive, and that scientific understandings have changed over time as new evidence is found.

B.8.1 Tornado or Hurricane formation

B.8.3 Air Pressure, Sun Energy, Coriolis's effect

B.8.4 Weather Lore, Cows in a circular arrangement

B.8.5 Weather forecasting, Satellites, Doppler Radar

B.8.6 Weather forecasting and accuracy

C. Science Inquiry

Students in Wisconsin will investigate questions using scientific methods and tools, revise their personal understanding to accommodate knowledge, and communicate these understandings to others.

Not covered in this unit.

D. Physical Science

Students in Wisconsin will demonstrate an understanding of the physical and chemical properties of matter, the forms and properties of energy, and the ways in which matter and energy interact.

D.8.1 Air pressure change – density

D.8.3 Ozone and CFC interactions

D.8.8 Transfer of energy – sunlight

E. Earth and Space Science

Students in Wisconsin will demonstrate an understanding of the structure and systems of the earth and other bodies in the universe and their interactions.

E.8.1 Self-explanatory

E.8.3 Climate zones and weather

E.8.4 Composition of atmosphere – Ozone layer

F. Life and Environmental Science

Students in Wisconsin will demonstrate an understanding of the characteristics and structures of living things, the processes of life, and how living things interact with one another and their environment.

F.8.9 UV adaptations, redesign of coolants.

G. Science Applications

Students in Wisconsin will demonstrate an understanding of the relationship between science and technology and the ways in which that relationship influences human activities.

G.8.1 – G.8.3 Self-Explanatory

H. Science in Social and Personal Perspectives

Students in Wisconsin will use scientific information and skills to make decisions about themselves, Wisconsin, and the world in which they live.

H.8.1 Twisters, sunscreens

H.8.2 Warming effects

H.8.3 Self-explanatory

Hydrology**A. Science Connections**

Students in Wisconsin will understand that there are unifying themes: (systems, order, organization, and interactions); (evidence, models, and explanations); (constancy, change, and measurement); (evolution, equilibrium, and energy); (form and function) among the scientific disciplines.

A.8.1 Systems – water cycle

A.8.7 Water table and wells for home use

B. Nature of Science

Students in Wisconsin will understand that science is ongoing and inventive, and that scientific understandings have changed over time as new evidence is found.

B.8.6 Water quality – factory use – human aspects.

C. Science Inquiry

Students in Wisconsin will investigate questions using scientific methods and tools, revise their personal understanding to accommodate knowledge, and communicate these understandings to others.

Not covered in this unit.

D. Physical Science

Students in Wisconsin will demonstrate an understanding of the physical and chemical properties of matter, the forms and properties of energy, and the ways in which matter and energy interact.

D.8.1 Solubility – caves – limestone

D.8.6 Value of wet lands

E. Earth and Space Science

Students in Wisconsin will demonstrate an understanding of the structure and systems of the earth and other bodies in the universe and their interactions.

E.8.1 – E.8.6 Self-explanatory

F. Life and Environmental Science

Students in Wisconsin will demonstrate an understanding of the characteristics and structures of living things, the processes of life, and how living things interact with one another and their environment.

F.8.10 Water use and contamination

G. Science Applications

Students in Wisconsin will demonstrate an understanding of the relationship between science and technology and the ways in which that relationship influences human activities.

G.8.1 Self-explanatory

G.8.3 Self-explanatory

G.8.5 Water contamination (fish in river can only eat a limited amount due to lead content).

H. Science in Social and Personal Perspectives

Students in Wisconsin will use scientific information and skills to make decisions about themselves, Wisconsin, and the world in which they live.

H.8.1 Army Corps of Engineers proposal for increasing the size of dams in the Mississippi River

H.8.2 The value of dams in general

H.8.3 Self-explanatory

Environmental**A. Science Connections**

Students in Wisconsin will understand that there are unifying themes: (systems, order, organization, and interactions); (evidence, models, and explanations); (constancy, change, and measurement); (evolution, equilibrium, and energy); (form and function) among the scientific disciplines.

A.8.1 Energy, interactions
Constancy, change – populations
Models – fossil fuels

A.8.2 We aren't sure of the impact of our actions.

A.8.3 Land use issues – conflicting thoughts on Global warming

A.8.4 and A.8.5 – Models to predict water pollution issues – changes

A.8.6 Population growth predictions

A.8.7 Population growth predictions

A.8.8 Overuse of non-renewable resources

B. Nature of Science

Students in Wisconsin will understand that science is ongoing and inventive, and that scientific understandings have changed over time as new evidence is found.

B.8.1 Recycling now, non-renewable resources are becoming an issue.

B.8.6 Self-explanatory

C. Science Inquiry

Students in Wisconsin will investigate questions using scientific methods and tools, revise their personal understanding to accommodate knowledge, and communicate these understandings to others.

C.8.1 through C.8.11 – Science Expo Project

D. Physical Science

Students in Wisconsin will demonstrate an understanding of the physical and chemical properties of matter, the forms and properties of energy, and the ways in which matter and energy interact.

Not covered in this unit.

E. Earth and Space Science

Students in Wisconsin will demonstrate an understanding of the structure and systems of the earth and other bodies in the universe and their interactions.

E.8.4, E.8.6 Self-explanatory

F. Life and Environmental Science

Students in Wisconsin will demonstrate an understanding of the characteristics and structures of living things, the processes of life, and how living things interact with one another and their environment.

F.8.9, F.8.10 – Self-explanatory

G. Science Applications

Students in Wisconsin will demonstrate an understanding of the relationship between science and technology and the ways in which that relationship influences human activities.

G.8.1 through G.8.5 - Self-explanatory

H. Science in Social and Personal Perspectives

Students in Wisconsin will use scientific information and skills to make decisions about themselves, Wisconsin, and the world in which they live.

H.8.1 through H.8.3 – Self-explanatory

GLOSSARY OF TERMS

SCIENCE THEMES

Each of the following terms refers to a theme that connects and unifies the many disciplines of science. The themes are found particularly in Standard A and are mentioned consistently throughout the science standards. They are identified with an asterisk (*) each time they appear.

Change. A variance in the rate, scale, and pattern, including trends and cycles.

Constancy. The stability of a property, such as the speed of light.

Equilibrium. The physical state in which forces and changes occur in opposite and offsetting directions.

Evidence. Data and documentation that support inferences or conclusions.

Evolution. A series of changes, some gradual and some sporadic, that accounts for the present form and function* of objects.

Explanation. The skill of communication in which an interpretation of information is given and stated to others.

Form and Function. Complimentary aspects of objects, organisms, and systems in the natural world.

Measurement. The quantification of changes in systems, including mathematics.

Models. Tentative schemes or structures that correspond to real objects, events, or classes of events, and that have explanatory power.

Order. The behavior of units of matter, objects, organisms, or events in the universe.

Organization. Descriptions of systems based on complexity and/or order.

Systems. An organized group of related objects or components that form a whole.

TERMS UNIQUE TO SCIENCE

The following terms are used uniquely in science. They are used consistently throughout the standards and are identified by an asterisk (*) each time they appear. They represent the range of rigorous science skills and knowledge found in the standards.

Analyze. The skill of recognizing the underlying details of important facts or patterns that are not always readily visible.

Apply. The skill of selecting and using information in other situations or problems.

Construct. The skill of developing or creating.

Describe. The skill of developing a detailed picture or image.

Discover. The skill of learning through study or investigation.

Energy. The work that a physical system is capable of completing or doing.

Evaluate. The skill of collecting and examining data to make judgments and appraisals.

Group. The skill of identifying objects according to characteristics.

Identify. The skill of recognizing patterns, facts, or details.

Inference. The skill of using the results of an investigation based on a premise.

Illustrate. The skill of giving examples to describe something.

Interaction. The influence of objects, materials, or events on one another.

Investigate. Scientific methodology that systematically employs many inquiry skills.

Observation. The skill of describing scientific events.

Predict. The skill of explaining new events based on observations or information.

Relate. The skill of association.

Show. The skill of illustration.

Understand. The skill of having and applying well-organized bodies of knowledge.