School District of La Crosse

Grade 7 Science Curriculum

2003-2004

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Table of Contents

7th Grade
Major Topics

- Exploring Science
- Cells
- Heredity/Genetics
- Adaptations/Diversity/Classification
- Simple Organisms
- Plants
- Animals
- Ecology/Environment

LA CROSSE SCHOOL DISTRICT SCIENCE

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Subject/Course: Middle School Science **Grade:** 7

Topics/Skills: Exploring the Sciences **Time:** 3-4 weeks

Subtopics: Studying Science
The Earth and Living Things
The Chemistry of Living Things

District Benchmarks/Students Will Learn:

- To use the tools of science to do investigations. Standards A, C and G.
- To use the scientific method to solve problems. Standards, A, B and C.
- To describe matter in terms of atoms, molecules, elements and compounds. Standard B.
- To explain the importance of the relationship between living and non-living things on earth. Standard D.
- To list and define the characteristics of living things. Standards A and F.

State Content Standard: A – Science Connections
State Performance Standards: A8.1, A8.2, A8.3, A8.4, A8.5, A8.6, A8.7

State Content Standard: B – Nature of Science
State Performance Standards: B8.1, B8.2, B8.3, B8.4

State Content Standard: C – Science Inquiry
State Performance Standards: C8.1, C8.2, C8.4, C8.11

State Content Standard: D – Physical Science
State Performance Standards: D8.2, D8.3

State Content Standard: F – Life and Environmental Science
State Performance Standards: F8.2, F8.6

State Content Standard: G – Science Applications
State Performance Standards: G 8.1, G8.3, G8.6

Curriculum

Assessment/Proficiency
Chapter/unit tests, projects, science notebooks (journals), performance assessment on using the microscope, quizzes, oral and written reports, metric labs, research papers

State/WSAS Test Concept_____ District Assessment_____ Classroom Assessments__x____

Assessment

Instruction

Teaching/Learning Strategies:

- Metric Measurement Lab
- Metric Ladder
- Microscope Labs
- Venn Diagrams
- Science Inquiry
- KWL
- Concept Webx

Resources:

- Textbook: "Living Things" – Addison Wesley Textbook
- Microscopes
- Videoflex

LA CROSSE SCHOOL DISTRICT SCIENCE

Subject/Course: Middle School Science **Grade:** 7

Topics/Skills: Cells **Time:** 3-4 weeks

Subtopics: Cells and Organization of Living Things
Cell Processes

District Benchmarks/Students Will Learn:

- To use the tools of science to gather, analyze and interpret data. Standards A, C, and G.
- To state the cell theory and discuss its development. Standards B, F, and G.
- To explain the functions of cell organelle. Standard F.
- To explain how the levels of organization work together. Standard F.
- To describe how materials move into and out of a cell. Standard A and F.

Curriculum

State Content Standard: A – Science Connections
State Performance Standards: A8.1, A8.3, A8.4, A8.6, A8.7

State Content Standard: B – Nature of Science
State Performance Standards: B8.1, B8.2, B8.3, B8.5

State Content Standard: C – Science Inquiry
State Performance Standards: C8.1, C8.2, C8.4, C8.6, C8.9

State Content Standard: F – Life and Environmental Science
State Performance Standards: F8.1, F8.3

State Content Standard: G – Science Applications
State Performance Standards: G8.1

Assessment

Assessment/Proficiency
Chapter/unit tests, projects, science notebooks (journals), quizzes, oral and written reports, research papers.

State/WSAS Test Concept_____ District Assessment_____ Classroom Assessments__x____

Instruction

Teaching/Learning Strategies:

- Lab – Observation of living cells (cheek epithelial & onion)
- Lab – Observation of living cells and tissue (prepared slides)
- Demonstration/Labs of diffusion osmosis (food color/hot water, egg and vinegar, effect of temperature on diffusion)
- Levels of organization – discussion groups

Resources:

- Textbook: Living Things – Addison Wesley Textbook
- Microscopes
- Videoflex
- Prepared Slides
- Videos from DMC

LA CROSSE SCHOOL DISTRICT SCIENCE

Subject/Course: Middle School Science **Grade:** 7

Topics/Skills: Heredity/Genetics **Time:** 3-4 weeks

Subtopics: Mendel's Principle of Heredity
DNA, Genes, Chromosomes
Meiosis
Applied Genetics

District Benchmarks/Students Will Learn:

- To describe how Mendel used scientific method to discover the principles of dominant and recessive genes. Standards A, B, F, and G.
- To explain how meiosis contributes to variety in species and individuals. Standard F.
- To use punnet squares to predict possible characteristics of offspring. Standard F.
- The basic concept of theoretical probability (pennies, dice). Standards A and C.
- How genetic technology is affecting society. Standards B, G, and H.

Curriculum

State Content Standard: A – Science Connections
State Performance Standards: A8.1, A8.2, A8.4, A8.5, A8.6, A8.8

State Content Standard: B – Nature of Science
State Performance Standards: B8.1, B8.2, B8.3, B8.5, B8.6

State Content Standard: C – Science Inquiry
State Performance Standards: C8.1, C8.4, C8.5

State Content Standard: F – Life and Environmental Science
State Performance Standards: F8.1, F8.2, F8.4, F8.5, F8.9

State Content Standard: G – Science Applications
State Performance Standards: G8.1, G8.2, G8.3, G8.6

State Content Standard: H – Science in Social and Personal Perspectives
State Performance Standards: H8.1, H8.2, H8.3

Assessment

Assessment/Proficiency
Chapter/unit tests, projects, science notebooks (journals), quizzes, oral and written reports, research papers, lab reports

State/WSAS Test Concept_____ District Assessment_____ Classroom Assessments__x____

Instruction

Teaching/Learning Strategies:

- Large Group Discussions
- Current Events
- Concept Maps
- Venn Diagrams
- KWL
- Probability Lab
- Punnet Squares

Resources:

- Textbook: "Living Things" – Addison Wesley Textbook
- Microscopes
- Meter Sticks
- Triple Beam Balances
- Labs

LA CROSSE SCHOOL DISTRICT SCIENCE

Subject/Course: Middle School Science **Grade:** 7

Topics/Skills: Adaptation-Diversity-Classification **Time:** 4 Weeks

Subtopics: Physical and Behavioral Adaptations to the Environment
Darwin's Theory of Natural Selection
History of Life
Classification of Living Things

District Benchmarks/Students Will Learn:

- To explain how environment influences adaptation. Standards E and F.
- To explain how sexual reproduction contributes to variety of life. Standard F.
- That the scientific method led Darwin to his theory of natural selection. Standards F, B, and A.
- To list the major points of natural selection. Standards F, A, and B.
- About the historical impact of Darwin's Theory of Evolution. Standards B, A, H, and F.
- The 5 kingdoms, their similarities and differences. Standards F and A.
- The major classification groups. Standards F, A, and B.
- The classification system to explore the history of life. Standards A, F, B, G, and E.
- Basic scientific names. Standards F and G.

Curriculum

State Content Standard: A – Science Connections
State Performance Standards: A8.1, A8.2, A8.3, A8.4, A8.5, A8.6, A8.7, A8.8

State Content Standard: B – Nature of Science
State Performance Standards: B81., B8.2, B8.3, B8.4, B8.5, B8.6

State Content Standard: E – Earth and Space Science
State Performance Standards: E8.5

State Content Standard: F – Life and Environmental Science
State Performance Standards: F8.1, F8.2, F8.3, F8.5, F8.7

State Content Standard: G – Science Applications
State Performance Standards: G8.1, G8.2, G8.3

State Content Standard: H – Science in Social and Personal Perspectives
State Performance Standards: H8.2

Assessment

Assessment/Proficiency
Chapter/unit tests, quizzes, lab reports, projects, oral and written reports, performance assessment, science notebooks (journals) and research papers

State/WSAS Test Concept_____ District Assessment_____ Classroom Assessments__x____

Instruction

Teaching/Learning Strategies:
- Group Discussions
- Current Events
- Concept Maps
- Venn Diagrams
- KWL
- Classification/Collection/Identification Activities
- Taxonomic Key Activities

Resources:
- Textbook: "Living Things" – Addison Wesley Textbook
- Microscopes
- David Attenborough's "Life on Earth" Video Series

LA CROSSE SCHOOL DISTRICT SCIENCE

Subject/Course: Middle School Science **Grade:** 7

Topics/Skills: Simple Organisms **Time:** 6 Weeks

Subtopics:

Viruses	Protists
Monerans	Algae (can be taught with plants)
Diseases	Fungi

District Benchmarks/Students Will Learn:

- To use the tools of science to gather, analyze and draw conclusions about investigations. Standards A and C.
- To draw and describe the basic structure of a virus and a bacterium. Standard F.
- To draw the steps of viral replication and bacterial fission. Standard F.
- To support an argument of whether a virus is alive or note. Standard E, A and F.
- To list ways that bacteria are helpful and harmful. Standards F, G, and H.
- To explain the connection between viruses, bacteria and disease. Standards F. H. and G.
- The historic and social perspective of disease. Standards B, H. A, and G.
- To observe and make models of the structure, function, and movement of protist. Standards A, F, and C.
- The characteristics of fungi. Standards F and A.
- The importance of simple organisms to the biosphere. Standards A, E, F, and H.

Curriculum

State Content Standard: A – Science Connections
State Performance Standards: A8.1, A8.2, A8.3, A8.4, A8.5, A8.6

State Content Standard: B – Nature of Science
State Performance Standards: B8.1, B8.2, B8.3, B8.5, B8.6

State Content Standard: C – Science Inquiry
State Performance Standards: C8.1, C8.2, C8.3, C8.4, C8.5, C8.6, C8.7, C8.9, C8.10, C8.11

State Content Standard: E – Earth and Space Science
State Performance Standards: E8.4

State Content Standard: F – Life and Environmental Science
State Performance Standards: F8.1, F8.2, F8.3, F8.4, F8.5, F8.6, F8.7, F8.8

State Content Standard: G – Science Applications
State Performance Standards: G8.2, G8.3, G8.6

State Content Standard: H – Science in Social and Personal Perspectives
State Performance Standards: H8.1, H8.2, H8.3

Assessment

Assessment/Proficiency
Chapter/unit tests, quizzes, lab reports, projects, oral and written reports, performance assessment, science notebooks (journals) and research papers.

State/WSAS Test Concept_____ District Assessment_____ Classroom Assessments__x____

Instruction

Teaching/Learning Strategies:
- Group Discussions
- Current Events
- Concept Maps
- Venn Diagrams
- KWL
- Classification/Collection/Identification Activities

Resources:
- Textbook: "Living Things" – Addison Wesley Textbook
- Microscopes
- Prepared Slides

LA CROSSE SCHOOL DISTRICT SCIENCE

Subject/Course: Middle School Science **Grade:** 7

Topics/Skills: Plants **Time:** 5 Weeks

Subtopics: Plant Adaptations, Diversity and Classification
Non-flowering Plants
Flowering Plants
Algae (can be taught as part of Simple Organisms unit)

Curriculum

District Benchmarks/Students Will Learn:

- To use the tools of science to observe and record information about plants. Standards A and C.
- To compare and contrast the process of photosynthesis and respiration. Standards A, B, F, D, E, and C.
- The importance of plants as primary producers. Standards F, D, and E.
- To identify the main structure of plants. Standard F.
- How plants reproduce. Standard F.
- To compare and contrast major groups of plants. Standard F.
- The various roles of plants in our environment. Standards F and E.

State Content Standard: A – Science Connections
State Performance Standards: A8.1, A8.2

State Content Standard: B – Nature of Science
State Performance Standards: B8.3

State Content Standard: C – Science Inquiry
State Performance Standards: C8.1, C8.2, C8.3, C8.4, C8.5, C8.6, C8.7, C8.8

State Content Standard: D – Physical Science
State Performance Standards: D8.2, D8.3, D8.4

State Content Standard: F – Life and Environmental Science
State Performance Standards: F8.1, F8.2, F8.4, F8.5, F8.6

Assessment

Assessment/Proficiency
Chapter/unit tests, projects, science notebooks (journals), performance assessment on using the microscope, quizzes, oral and written reports, metric labs, research papers.

State/WSAS Test Concept_____ District Assessment_____ Classroom Assessments__x____

Instruction

Teaching/Learning Strategies:

- Group Discussions
- Current Events
- Concept Maps
- Venn Diagrams
- KWL
- Determine the age of trees by their annual rings
- Identification of plants by leaves and flowers
- Microscope tissue study of plants\Design and build a model plant and explain its lifestyle
- Make a model of photosynthesis and respiration
- Balance the chemical equation of photosynthesis and respiration
- Lab experiments

Resources:

- Textbook: "Living Things" – Addison Wesley Textbook
- Microscopes
- DMC Videos

LA CROSSE SCHOOL DISTRICT SCIENCE

Subject/Course: Middle School Science **Grade:** 7

Topics/Skills: The Animal Kingdom **Time:** 9 Weeks

Subtopics: Invertebrates
Vertebrates (cold blooded) Fish, Amphibians, and Reptiles
Vertebrates (warm blooded) Birds, Mammals

Curriculum

District Benchmarks/Students Will Learn:

- To use the tools of science to investigate the structure and function of representative animals. Standards A, C, and B.
- To distinguish between vertebrate and invertebrate animals. Standard F.
- To compare and contrast warm and cold blooded animals. Standards F and A.
- The structure, function, and reproduction of various animal phyla. Standard F.
- The increasing complexity of the structure of animals. Standards F, E, and B.
- Identify various relationships between animals and human beings. Standard F.

State Content Standard: A – Science Connections
State Performance Standards: A8.1, A8.2, A8.3, A8.4, A8.5

State Content Standard: B – Nature of Science
State Performance Standards: B8.1, B8.3

State Content Standard: C – Science Inquiry
State Performance Standards: C8.1, C8.2, C8.5, C8.6, C8.7

State Content Standard: E – Earth and Space Science
State Performance Standards: E8.5

State Content Standard: F – Life and Environmental Science
State Performance Standards: F8.1, F8.2, F8.3, F8.6, F8.7

Assessment

Assessment/Proficiency
Chapter/unit tests, projects, science notebooks (journals), performance assessment using the microscope, quizzes, oral and written reports, metric labs, research papers

State/WSAS Test Concept_____ District Assessment_____ Classroom Assessments__x____

Instruction

Teaching/Learning Strategies:

- Concept Maps
- Venn Diagrams
- KWL
- Compare digestive systems from simple to complex
- Dissection of annelid and frog (other options available)
- Design and build a bird model
- Classification lab using preserved specimen samples

Resources:

- Textbook: "Living Things" – Addison Wesley Textbook
- Microscopes

LA CROSSE SCHOOL DISTRICT SCIENCE

Subject/Course: Middle School Science **Grade:** 7

Topics/Skills: Ecology/Environment Science **Time:** 1-2 Weeks or Integrated throughout the year

Subtopics:
Ecosystems
Interactions Among Organisms
Cycle of Nature
Humans and the Environment

District Benchmarks/Students Will Learn:

- That organisms compete for finite resources. Standards A, E, and F.
- That conditions of the physical environment determine the variety and distribution of populations. Standards F and D.
- How organisms interact with one another in an ecosystem (food webs, predator/prey, symbiosis). Standards A, E, and F.
- How resources are cycled through an ecosystem over time (water, carbon and nitrogen). Standards B, E, and F.
- How humans impact the world. Standards B, G, and H.

Curriculum

State Content Standard: A – Science Connections
State Performance Standards: A8.1, A8.5, A8.6, A8.8

State Content Standard: B – Nature of Science
State Performance Standards: B8.1, B8.2, B8.3, B8.5, B8.6

State Content Standard: D – Physical Science
State Performance Standards: D8.4

State Content Standard: E – Earth and Environmental Science
State Performance Standards: E8.1, E8.4, E8.5

State Content Standard: F – Life and Environmental Science
State Performance Standards: F8.2, F8.6, F8.7, F8.8, F8.9, F8.10

State Content Standard: G – Science Applications
State Performance Standards: G8.3, G8.5

State Content Standard: H – Science in Social and Personal Perspectives
State Performance Standards: H8.1, H8.3

Assessment

Assessment/Proficiency
Chapter/unit tests, projects, science notebook (journal), quizzes, oral and written reports, lab reports, research papers

State/WSAS Test Concept_____ District Assessment_____ Classroom Assessments__x____

Instruction

Teaching/Learning Strategies:
- Large Group Discussions
- Current Events
- Concept Maps
- Venn Diagrams
- KWL

Resources:
- Textbook: "Living Things" – Addison Wesley Textbook
- Field Trips: Marsh
- Hixon
- Goose Island
- Trempealeau
- Guest Speakers: DNR
- Newspapers and Magazines – Current Events

Wisconsin Model Academic Standards **7th Grade Standards Analysis**		6th	7th	8th
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.	✓	✓	

Wisconsin Model Academic Standards 7th Grade Standards Analysis		6th	7th	8th
C.8.4	Use inferences to help decide possible results of their investigations, use observations to check their inferences.	✓	✓	

Wisconsin Model Academic Standards **7th Grade Standards Analysis**		6th	7th	8th
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 investigation 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.	✓		
D.8.10	Explain how models of the atomic structure of matter have changed over time, including historical models and modern atomic theory.	✓		

Wisconsin Model Academic Standards **7th Grade Standards Analysis**		6th	7th	8th
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.		✓	
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.	✓	✓	

Wisconsin Model Academic Standards **7th Grade Standards Analysis**		6th	7th	8th
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.	✓	✓	

LA CROSSE SCHOOL DISTRICT SCIENCE

7th Grade Explanatory Notes on
WI Science Standards in Relation to School Curriculum
1999 – 2000

Exploring the Sciences

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.

A8.1 Systems, atoms, measurement

A8.2 Are viruses alive?

A8.3 Viruses, stimulus/response

A8.4 Atom Model, Deep Sea Vents

A8.5 Deep Sea Vents, Viruses

A8.6 Photosynthesis/Respiration

A8.7 What is alive? Viruses and flame

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.

B8.1 Where does life come from – Redi experiments, Pasteur

B8.2 Redi, Pasteur

B8.3 Scientific Method

B8.4 Alchemy – life from non-living things – spontaneous generation

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.

C8.1, C8.2, C8.3, and C8.12 – 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 interat.

D8.2 and D8.3 – 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.

F8.2 and F8.3 – 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 relationships influences human activities.

G8.1 Metric Measurement, Microscope, Bio Science (e.g., Biology, Zoology, Botany, etc.)

G8.3 Microscopes

G8.4 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.

Not covered in this unit.

Cells

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.

A8.1 Cell Models, Cell Theory, Equilibrium (Homeostatis)

A8.3 Active Transport/Diffusion, Osmosis

A8.4 Cell Theory

A8.6 Diffusion, Osmosis, Active Transport

A8.7 Microscope – cell lab (Onion lab – adding salt water to onion cell)

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.

B8.1 Cell Theory

B8.2 Van Leeuwanhoek, Hooke, Schwan, Virchow, Schleiden

B8.3 Diffusion, Osmosis (cell lab – onion lab – adding salt water to onion cell)

B8.5 Cell Theory, worked together Virchow, Schleiden, Schwan

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.

C8.1, C8.2, C8.4, C8.6 and C8.9 – 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.

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 characteristics and structures of living things, the processes of life, and how living things interact with one another and their environment.

F8.1 and F8.3 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.

G8.1 Microscope Skills

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.

Not covered in this unit.

Heredity/Genetics

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.

A8.1 Models of Genetics (dominant/recessive)

A8.2 Punnet Aquare is not totally accurate

A8.4 Mendel

A8.5 Watson and Crick DNA Double helix

A8.6 Punnet Square oversimplification

A8.8 Genetics is driving force of evlution

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.

B8.1 Changes in understanding of Genetics

B8.2 Mendel – Watson/Crick

B8.3 Probability Theory, Punnet Square

B8.5 Advances in Genetics (Cloning, Genetic Engineering)

B8.6 Bioethics

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.

C8.1, C8.4, and C8.5 – 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.

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 characteristics and structures of living things, the processes of life, and how living things interact with one another and their environment.

F8.1, F8.2, F8.4, F8.5, and F8.9 – 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.

G8.1 Genetic Counseling, Genetic Engineering

G8.2 Advances in Genetics

G8.3 Medical Advances, food production

G8.6 Current advances – Genetic Engineering

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.

H8.1 Cloning, Genetic Testing, Gene Therapy

H8.2 Food – Genetic Engineering, Defects – Genetic Engineering

H8.3 – cloning, Genetic Engineering

Adaptation/Diversity/Classification

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.

A8.1 Evolution, Order (Classification System)

A8.2 Some don't fit (Euglena, Viruses, Bacteria)

A8.3 Classification System (Taxonomic Key)

A8.4 Insect Collection, Leaf Collection – Make a Taxonomic Key

A8.5 Change from visual classification to genetic classification

A8.6 Evolution/Adaptation to environment

A8.7 Adaptation Model Investigation

A8.8 Natural Selection

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.

B8.1 Evolutin – Taxonomy

B8.2 Linneaus, Darwin

B8.3 Natural Selection

B8.4 Creationism

B8.5 Evolution Theory Changing – Classification System Changing

B8.6 Social Darwinism, Scopes Monkey Trial

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.

E8.5 Fossil record, evolution

F. Life and Environment 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.

F8.1, F8.2, F8.3, F8.5, and F8.7 – 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.

G8.1 Taxonomists

G8.2 Technology to find new life/change technology

G8.3 Scopes Trial, Darwinism

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.

H8.1 Darwin – Evolution

Simple Organisms

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 functin) among the scientific disciplines.

A8.1 Models – Form & Function

A8.2 Virus alive or not

A8.3 Virus alive or not

A8.4 Germ Theory – disease- vaccines

A8.5 Fungi has its own kingdom

A8.6 Bacteria Growth

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.

B8.1 Pasteurization, Vaccines

B8.2 Jenner, Pasteur, Flemming

B8.3 Jenner – Vaccines, Flemming – penicillin experiments

B8.5 Bacteriology, Microbiology

B8.6 Overuse of antibiotics

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.

C8.1 through C8.11 – 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.

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.

E8.4 Algae contributes to atmosphere

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.

F8.1 through F8.8 – 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.

G8.2 Medical discoveries

G8.3 Antibiotics

G8.6 Flu Shots, Lyme Disease, etc.

H. Science in Social and Personal Perspectives

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

H8.1, H8.2, H8.3 – Medicines

Plants

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.

A8.1 Form and Function – Plant Adaptations/Structures

A8.2 Plant Adaptations, Transpiration

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.

B8.3 Balanced Equations

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.

C8.1 through C8.8 – 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.

D8.2, D8.3, and D8.4 – 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.

E8.4 Plants product 0_2, anti-erosion

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 their environment.

F8.1, F8.2, F8.4, F8.5, and F8.6 – Self explanatory

G. Science Applications

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

Not covered in this unit.

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.

Animals

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.

A8.1 Form and Function – Animal Adaptations/Structures

A8.2 Sponges – Porifea

A8.3 Sponges

A8.4 Sponges

A8.5 Sponges

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.

B8.1 Classification of animals – sponges

B8.3 Bird Model, etc.

C. Science inquiry

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

C8.1, C8.2, C8.5, C8.6, and C8.7 – 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.

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.

E8.5 Evolution of animals

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.

F8.1, F8.2, F8.3, F8.6 and F8.7 – Self explanatory

G. Science Applications

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

Not covered in this unit.

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.

Ecology

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.

A8.1 Equilibrium in Ecosystems

A8.5 Pesticides, Resilience

A8.6 Food Webs

A8.8 Equilibrium in food web, limiting factors

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.

B8.1 Humans and Environment

B8.2 Leopold, Muir, Carson

B8.3 DDT

B8.5 Understanding problems with pesticides

B8.6 Overuse of Pesticides

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.

D8.4 How chemicals move through the system

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.

E8.1 Self explanatory

E8.4 Self explanatory

E8.5 Evolution of animals

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.

F8.2, F8.6, F8.7, F8.8, F8.9, and F8.10 – 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.

G8.3 Pesticides, Harvests, Pollution

G8.5 Land use issues

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.

H8.1, H8.2, H8.3 Ecology affects versus environmental issues/affects

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.