

Our Lady Queen of Peace Science Standards

The spirit of science education described in this document is based on the premise that science is an evolving, active process within the creation of God. To learn science, students will be actively engaged in posing questions, designing experiments to gain information related to their questions, and communicating their ideas within the classroom's community of scientists. Experiencing science that is inquiry-driven enables students to become immersed in scientific ways of thinking that are both distinct and complimentary to other content areas. The process of inquiry is central to science learning and builds a foundation that will enable students to experience science as a dynamic, human enterprise. It is in this spirit of inquiry that students will experience the simplicity, the great diversity, the interdependence of the physical and biotic aspects of nature and the enormity of God's plan.

Standard A. Science Connections

Students 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 scientific disciplines. These themes relate and interconnect the Diocese of Madison Science Standards to one another.

Standard B. Nature of Science

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

Standard C. Science Inquiry

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

Standard D. Physical Science

Students 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.

Standard E. Earth and Space Science

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

Standard F. Life and Environmental Science

Students 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.

Standard G. Science Applications

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

Standard H. Social and Personal Perspectives

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

Grade level performance standards: Kindergarten

Please refer to the list of Grade 4 Exit Level Performance Standards for numbered competencies listed below.

Within our kindergarten grade science curriculum, students will:

Goal A Science Connections

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 scientific disciplines. These themes are to be used to connect the Wisconsin science content standards as well as other subject areas.

Using topics such as: senses, plants, animals, earth and weather, students will:

A.K.1. Pose and solve problems. MA

A.K.3. Sort, graph, draw pictures, and compare and share information. MA

A.K.4. Explore themes of constancy, change and measurement. MA

A.K.5. Observe changes in environment. Identify that life and all creation are God's gift to us. RE

Goal B Nature of Science

Understand that science is ongoing and inventive, and that scientific understandings have changed over time as new evidence is found.

B.K.1. a. Demonstrate that science is important in our lives.

b. Demonstrate that science is fun and interesting.

Goal C Science Inquiry

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

C.K.8. a. Ask questions about objects, organisms and events in their environment. LA

b. Demonstrate that science involves asking questions and looking for answers. LA

Goal D Physical Science

Students 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.K.2. Identify water and land masses. MA,SS

D.K.3. Identify liquids and solids. MA

D.K.4. Observe changes in the weather.

D.K.5. Make models of earth and simple weather instruments. AR, SS, LA

D.K.6. Observe and experiment with objects in motion. MA

D.K.7. Describe, measure and keep records. MA, LA

Goal E Earth and Space Science

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

E.K.1. Observe sand and earth samples. SS

E.K.3. Describe earth formations. LA, SS

E.K.4. Identify the sun.

E.K.5. Describe weather changes. LA

E.K.6. Observe daily and long term weather patterns. LA, MA, IT

E.K.7. Use simple weather instruments.

E.K.8. Identify the importance of water. SS

Goal F Life and Environmental Science

Students 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.K.2. Experiment using plants. LA, MA

F.K.3. Match adult and baby animals. MA

F.K.4. Sort living and non-living things. MA

Grade level performance standards: Grade One

Within our first grade science curriculum, students will:

Goal A Science Connections

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 scientific disciplines. These themes are to be used to connect the Wisconsin science content standards as well as the other subject areas.

Using topic such as: color, water, air, plants, animals and weather, students will:

A.1.1. Pose and solve problems. MA

A.1.2. Collect and organize data. MA

A.1.4. Explore themes of constancy, change and measurement. MA

A.1.5. a. Observe and explain changes over time. LA

b. See that through caring for the environment, plants and animals, we express our love for God. RE

Goal B Nature of Science

Understand that science is ongoing and inventive, and that scientific understandings have changed over time as new evidence is found.

B.1.2. Understand and demonstrate that people can choose science as a career or hobby. SS

Goal C Science Inquiry

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

C.1.1. Make and share observations to help answer questions.

C.1.4. Measure objects in their environment. MA

C.1.6. Explain that in science, it is helpful to work with a team and share findings. LA

Goal D Physical Science

Students 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.1.1 a. Observe differences in color and water.

b. Observe characteristics of water and air.

D.1.2. a. Classify and sort objects according to color. MA

b. Classify and sort objects according to buoyancy. MA

D.1.3. Observe various states of water.

D.1.4. a. Observe changes in water and air.

b. Observe and record changes in color, and water properties, including absorption and buoyancy. LA

Goal E Earth Science

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

E.1.3. Describe the relationship of oceans and surface of the earth. LA, SS

E.1.5. Observe and describe types of weather types in WI. LA, SS

E.1.6. Observe changes in clouds and the effect that wind has on weather. LA

Goal F Life and Environmental Science

Students 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.1.2. Explain how plants and animals respond to different environments. LA

F.1.3. Observe various stages in life cycles of plants and animals. LA

F.1.4. Observe connections among plants, animals, and non-living things.

Goal G Science Applications

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

G.1.4. Identify weather instruments used in the home.

G.1.5. Identify scientists and their inventions. LA, SS

Goal H Social and Personal Perspectives

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

H.1.3. Have responsibility for their own basic needs and for their communities. SS, RE

Grade Level Performance Standards: Grade Two

Within our second grade curriculum, students will:

Goal A Science Connections

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 scientific disciplines. These themes are to be used to connect the Wisconsin science content standards as well as the other subject areas.

Using topics such as: water surface, minerals, nutrients, simple machines, and solar systems, students will:

A.2.1. Pose and solve problems. MA

A.2.3. a. Collect, organize, and interpret data. MA

b. Understand that the stories of the Bible show us God's creation for our world. RE

Goal B Nature of Science

Understand that science is ongoing and inventive, and that scientific understandings have changed over time as new evidence is found.

B.2.2. a. Understand and demonstrate that people have made many contributions throughout history of science and technology. IT, SS, LA

b. Understand and demonstrate that science and technology have been practiced by people for a long time. IT, SS

B.2.3. Understand and demonstrate that science and technology continue to change over time. IT, SS

Goal C Science Inquiry

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

C.2.2. Compare and contrast objects and events and communicate findings. LA

C.2.4. a. Identify a simple problem, test a possible solution to the problem, and communicate results. LA

C.2.4. b. Demonstrate that instruments can be used to extend the senses. LA

C.2.6. Recognize that instructions that others can follow in carrying out a procedure need to be clearly stated. LA

C.2.7. Explain that learning can come from careful observation and simple experiments. LA

Goal D Physical Science

Students 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.2.2. a. Compare and classify substances. MA

b. Observe and describe changes in natural environments. LA, SS

D.2.8. a. Compare and contrast how magnets attract and repel a variety of objects. LA

b. Create musical instruments and magnetic models. AR, MU

c. Recognize that objects can be moved by magnetic force through a variety of substances.

d. Recognize that sound vibrations travel through different materials. MU

e. Conduct experiments using magnets, sound, light and energy. MU

Goal E Earth and Space Science

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

E.2.1. Observe differences in rocks and soils. LA, SS

E.2.2. Observe properties of soils and rocks.

E.2.4. Identify objects in space. IT, LA

E.2.6. Observe changes in the natural environment. SS

E.2.7. a. Explain how energy affects everyday life. LA, SS

b. Explain how people use resources to improve life. LA, SS

Goal F Life and Environmental Science

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

F.2.1. Discover how the human body is composed of different systems, serving various purposes.

F.2.2. a. Discover how environmental changes such as the weather and seasons influence the life and death of animals and plants. SS

b. Identify how an organism's patterns of behavior are related to its environment. SS

F.2.3. a. Observe that organisms alive today may resemble extinct organisms. SS

F.2.3. b. Identify how life has continued on earth for a very long time. SS

F.2.4. a. Group animals and plants by their characteristics. MA

b. Observe that living things are part of a system and are interdependent with their living and non-living surroundings. SS

c. Discover that natural resources are limited and must be used very carefully. SS

d. Discuss how human influences have initiated change in the earth's environment. SS, RE, LA

Goal G Science Applications

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

G.2.3. a. Explain how technology has helped people. LA, IT

b. Conduct a problem solving investigation. MA

G.2.4. Use scientific tools such as scales, magnifying glasses, magnets, thermometers, and beakers. MA

G.2.5. a. Explain scientific contributions of people. LA, SS

G.2.5. b. Explain the outcomes of their investigations. LA

Goal H Social and Personal Perspectives

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

H.2.1 a. Demonstrate an individual's and population's quality of life and ability to survive are affected by environmental factors. SS

b. Discuss how drugs can have positive or negative effects depending upon how they are used. PE

H.2.3. a. Relate scientific knowledge to safety and health issues.

b. Demonstrate that balanced nutrition, exercise and a healthy lifestyle are essential to good health.

c. Explain how science has contributed to nutrition knowledge. LA

H.2.4. Identify problems caused by noise pollution. SS

Grade Level Performance Standards: Grade Three

Within our third grade science curriculum, students will:

Goal A Science Connections

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 scientific disciplines. These themes are to be used to connect the Wisconsin science content standards as well as the other subject areas.

Using topics such as water surface, minerals, nutrients, simple machines, and solar systems, students will:

A.3.1. a. Pose and solve problems. MA

A.3.1. b. Collect, organize, and interpret data. MA

A.3.2. Draw on prior knowledge in constructing a model of a habitat. LA, AR

Goal B Nature of Science

Understand that science is ongoing and inventive, and that scientific understandings have changed over time as new evidence is found.

B.3.1. a. Understand and demonstrate that scientific understanding is always changing. RE, IT, SS

b. Understand and demonstrate that students can be scientists. SS

B.3.2. Define and use scientific vocabulary. LA

B.3.3. Compare and contrast scientific beliefs about the solar system of the past and in the present. MA, LA

Goal C Science Inquiry

Students in the Diocese of Madison will investigate questions using scientific method and tools, revise their personal understanding to accommodate knowledge, and communicate these understandings to others.

C.3.3 Consult reliable sources for scientific information. LA

C.3.4. a. Choose and operate measuring tools. MA

b. Construct, conduct and experiment to answer scientific questions. AR

C.3.5. Use data to construct explanations. MA

C.3.6. a. Demonstrate alternative ways to display data. MA, AR, IT

b. Demonstrate that explanations are developed from observation and are based on what is already known about the world. SS

Goal D Physical Science

Students 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.3.3. Observe the various states of water.

D.3.4. Construct models of simple machines. AR

D.3.6. Observe and communicate reasons for objects at rest or in motion. LA

Goal E Earth and Space Science

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

E.3.1. Observe that the natural environment is in a constant state of change. SS

E.3.4. a. Identify sun and moon and explain changes in patterns. LA

b. Describe various animal habitats.

E.3.4. c. Describe similarities and differences of the earth and moon. LA

d. Observe and identify changes in the solar system.

E.3.6. Observe shadows and the nature of eclipse

E.3.7. Explain the use of weather balloons, weather vanes, and other weather tools. Identify weather patterns.

Goal F Life and Environmental Science

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

F.3.1. a. Illustrate how living things can be classified.

b. Categorize populations of organisms into groups of producers, consumers and decomposers. MA

F.3.2. a. Observe how internal and external cues influence behavior.

b. Explain how organisms are affected by day/night and seasons. LA

c. Recognize all organisms cause changes in their environments. SS

F.3.3. a. Investigate how some living organisms are so small we can only see them through a microscope.

b. Illustrate that plants and animals have life cycles that include birth, growth, reproduction, and death. LA, AR

c. Identify that some characteristics are inherited in various combinations from parents. SS

F.3.4. a. Observe that a population consists of all organisms living together at a given place and time.

b. Investigate that an ecosystem is composed of all populations of organisms living. SS

c. Observe how humans can pollute ecosystems and ways to prevent this. SS

Goal G Science Applications

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

G.3.1. Discover how machines have brought changes in the work place. SS, IT

G.3.3 Identify how people use technology to solve problems. IT

G.3.5. Explain scientific contributions of people. LA, SS

Goal H Social and Personal Perspectives

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

H.3.1. a. Identify how astronomers use technology. IT

b. Demonstrate that some substances can damage the body and how it functions.

H.3.2. Demonstrate how new ideas and inventions continue to affect people. SS

H.3.3 Demonstrate rest, exercise, and good nutrition are important to the maintenance and improvement of health. PE

H.3.4. Explain how people use technology to solve problems of water pollution and filtration. LA, IT, SS

Grade level performance Standards: Grade Four

Within our fourth grade science curriculum, students will:

Goal A Science Connections

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 scientific disciplines. These themes are to be used to connect the Wisconsin science content standards as well as other subject areas.

Using topics such as: plants, animals, insects, rocks, minerals, air, atmosphere, and matter, students will:

A.4.1. a. Use, pose and solve problems. MA

b. Collect and organize. MA

c. Interpret data. MA

d. Develop an understanding of the main feature of the germ theory and use this understanding to frame questions about disease/health related issues and problems.

e. Develop an understanding of the main features of the heliocentric system and use the features of this system to frame questions about a solar system/galaxy/universe. AR

A.4.5. Explain changes over time in rock cycle, matter, insects, plants and animals. LA

Goal B Nature of Science

Understand that science is ongoing and inventive, and that scientific understandings have changed over time as new evidence is found.

B.4.1. a. Understand and demonstrate knowledge of a variety of resources are available to help answer science related questions and plan investigations. IT

b. Define and use scientific vocabulary. LA

B.4.2. a. Understand and demonstrate that many individuals have contributed to the traditions of science.

b. Understand and demonstrate that science has been practiced by different individuals in different cultures in different ways. SS

B.4.3. Compare and contrast scientific classification systems. MA, LA

Goal C Science Inquiry

Investigate questions using scientific method and tools, revise their personal understanding to accommodate knowledge, and communicate these understandings to others.

C.4.1. Question the reliability of sources for scientific information

C.4.2. a. Conduct a valid experiment

C.4.2. b. Critique explanations of scientific events. LA

C.4.6. Demonstrate that scientists make the results of their investigations public, communicating in ways that enable others to repeat the investigations.

C.4.7. a. Cite evidence to support conclusions. LA, SS

b. Demonstrate that good explanations are based on evidence from systematic scientific investigations.

C.4.8. Demonstrate that scientists review and ask questions about the results of other scientists work.

Goal D Physical Science

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.4.2. a. Observe, describe, and classify diversity and patterns in the earth materials based on properties of matter. LA, MA

b. Describe that all matter is made of atoms and has three states.

c. Measure some physical attributes of matter-mass, volume, and density.

D.4.3. a. Describe how rocks, minerals, matter and elements exist in different states. LA

b. Observe and describe changes in rocks. LA

D.4.4. Describe changes in rocks due to earth's forces. LA

D.4.5. Construct models that demonstrate knowledge about rocks. AR

D.4.7 Explain what happens to earth's energy in a day. LA

Goal E Earth and Space Science

Demonstrate an understanding of the structure and systems of earth and other bodies in the universe and of their interactions.

E.4.1. Use scientific terms for knowledge of rocks, minerals, and the rock cycle.

E.4.2. a. Describe chemical properties of earth's atmosphere and its effect on earth. LA

b. Describe the movement of earth plates. LA, SS

c. Describe how rocks may be brought to the surface by the forces that drive plate motion which continues the rock cycle. LA

E.4.3. a. Identify landforms, rocks, and minerals. SS

b. Communicate knowledge of rocks using correct scientific terms. LA

c. Identify the four distinct layers of the earth.

d. Identify changes to the earth's surface.

e. Describe the relationship of the forces on the ocean, plates and weather. LA, SS

E.4.4. Demonstrate that rocks at the earth's surface weather, forming sediments that are buried, compacted, heated and form new rocks.

E.4.5. a. Identify weather patterns. SS

b. Describe the water cycle and how it affects the weather on earth.

c. Identify changes on earth over time. SS

d. Observe how land forms have resulted from a combination of constructive and destructive forces. SS

e. Show how water, air and land can be polluted by various factors in the environment. SS, AR

E.4.6. a. Identify objects in our solar system such as the sun, planets, stars, and moons.

b. Identify and describe how fossils provide evidence of how life and environmental conditions have changes. LA, SS, RE

E.4.8. Describe the importance of people in industry. LA, SS

Goal F Life and Environmental Science

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

F.4.1. a. Describe how plants and animals meet their basic needs in order to survive. LA, SS

b. Observe that all organisms are composed of cells

c. Discover how human organisms have interacting systems.

d. Identify that the systems of the human body have a variety of structures and functions.

F.4.3. a. Describe life cycles of insects, plants and animals. LA

b. Observe that characteristics of organisms are inherited or environmentally influenced. SS

c. Identify that variations within a species may give individuals an important advantage in surviving and reproducing.

d. Investigate that fossils provide evidence of previous life forms and fossils can be compared to one another and to living organisms to observe their similarities and differences.

F.4.4. a. Explain how plants and animals use living and non-living things to survive. LA

b. Explain how air, water, and land can become polluted and unsuitable for life.

Goal G Science Applications

Demonstrate an understanding of the relationship between science and technology and the ways in which that relationship influences human activities.

G.4.1. Describe technology used by someone employed in science. LA, IT, SS

G.4.2. Relate current technology in the lab and classroom. IT

G.4.3. Identify that scientific discoveries have created new products. SS, RE

G.4.5. Explain scientific contributions of people. LA, SS

Goal H Social and Personal Perspectives

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

H.4.1. Examine how life has changed due to science and technology. IT, SS

H.4.2. a. Identify those resources that are necessary for life.

b. Examine changes in environments that can be natural or influenced by humans. SS

c. Demonstrate that the size of a population can increase or decrease due to changes in the environment. MA

H.4.3. Be aware that science and technology have greatly affected the quality of life for most people. RE

H.4.4. Identify earth's resources that are limited. SS

H.4.5. Identify the importance of rest, exercise, and good nutrition for the maintenance and improvement of human health.

Note: Numeric order for the K-8 grade level goals listed in this document aligns with the WI State Academic Standards. Not all grades include each standard sub-category (as indicated by gaps in the numbering system). However, all K-4 goals and 5-8 goals are appropriately addressed by the end of fourth and eighth grades.

These grade level performance standards are listed developmentally. Therefore, a specific grade level standard may not be addressed at the grade indicated, but will be address within a 4 year time span (K-4, 5-8)

Grade level performance standards: Grade Five

Within our fifth grade science curriculum, students will:

Goal A Science Connections

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 scientific disciplines. These themes are to be used to connect the Wisconsin science content standards as well as the other subject areas.

A.5.2. a. Describe how a science system consists of many parts that usually influence one another. LA

b. Describe how a science system may not work as well (or not at all) if a part of it is missing, broken, worn out, mismatched, or misconnected. LA

A.5.3. Explain that by its nature, a model is different from the real thing but can be used to learn about, explain, critique or make predictions about the real thing. LA

A.5.4. Demonstrate that different models can be used to represent the same physical phenomena, concept, proposition, or theory.

A.5.6. a. Use models to make predictions about actions/events in the natural world. MA, AR

b. Demonstrate that the usefulness of a model to describe/predict may be limited if it is too simple or if it is unnecessarily complicated.

A.5.7. Be able to ask "How do I know?" in appropriate situations and attempt reasonable answers. LA

Goal B Nature of Science

Understand that science is ongoing and inventive, and that scientific understandings have changed over time as new evidence is found.

B.5.1. Describe how scientific knowledge is subject to modification or change. For example, new information challenges existing theories; a new theory leads to looking at old observations in new ways. LA

B.5.2. a. Identify and describe the main changes in scientists' conceptions of the germ theory and the role played by microscopes in making germs in diseased tissue visible. Key scientists: Pasteur. LA

b. Identify and describe the main features of the heliocentric theory, and contrast them with those of the geocentric theory. Key scientists are discussed.

B.5.3. a. Explain that scientific investigations may take many different forms. For example, observing what things are alike, observing what is happening, collecting specimens for analysis, doing experiments. LA

b. Explain that scientific investigations may take many different forms. For example, observing what things are alike, observing what is happening, collecting specimens for analysis, doing experiments. LA

B.5.4. Explain that scientists' explanations about what happens in the world comes partly from what they observe and partly from what they think. LA, SS

B.5.5 Explain that scientific knowledge is shared through a strong commitment to the process of peer review and publication. LA

B.5.6. Explain that the process of science is heavily influenced/dependent on what else is happening in society or history. SS, LA

Goal C Science Inquiry

Investigate questions using scientific method and tools, revise their personal understanding to accommodate knowledge and communicate these understandings to others.

C.5.1. Pose questions that can be answered through scientific investigations. LA

C.5.2., C.5.7., C.5.8. Use tools to gather, analyze and interpret data. MA, IT

C.5.2., C.5.7., C.5.8. Recognize data that does not fit a pattern. MA

C.5.3. Use knowledge of subject matter to conduct investigations and create explanations. LA

C.5.4., C.5.5., C.5.6., C.5.9. Form a logical argument about cause and effect relationships in experiments.

C.5.4., C.5.5., C.5.6., C.5.9. Use mathematics to structure convincing explanations. MA

C.5.10. a. Summarize results of others' investigations. LA

b. Listen to and respect the explanations proposed by other students. RE

Goal D Physical Science

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.5.2. Demonstrate how mixtures can be formed and separated using the characteristic properties of each.

D.5.3. Explain how elements may combine to form compounds. LA

D.5.5 Investigate how simple machines such as levers, pulleys, axels, inclined lanes and screws make work easier. LA, SS, MA

D.5.8. Investigate and categorize the different forms of energy.

D.5.9. a. Use models to explain the behavior of light and sound. MA, MU, AR

b. Demonstrate the relationship between kinetic and potential energy.

Goal E Earth and Space Science

Demonstrate an understanding of the structure and systems of earth and other bodies in the universe and of their interactions.

E.5.1. a. Explain and predict changes in landforms, atmosphere and environment. LA, MA, SS

b. Identify, observe and describe the biomes of the earth. SS, LA

c. Investigate the importance of habitat on an ecosystem. MA, SS

Goal F Life and Environmental Science

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.5.1. a. Discover how living systems at all levels of organization demonstrate the complementary nature of structure and function.

b. Identify and compare parts that make up various living systems. MA

c. Realize that the systems of the human body have a variety of structures and functions.

F.5.2. Discover that groups of cells form tissues, organs, organ systems, and organisms.

F.5.8. a. Identify how various organisms depend on one another for survival. RE

b. Explain the basic components and importance of the food web. LA, AR,

F.5.9. a. Realize that environments support a diversity of plants and animals that share limited natural resources.

b. Describe how life forms are affected by changes in the earth and climate. SS, LA

F.5.10. Describe how human activities affect ecosystems. LA, SS, RE

Goal G Science Applications

Demonstrate an understanding of the relationship between science and technology and the ways in which that relationship influences human activities.

G.5.1. a. Identify and investigate the skills people need for a career in science or technology and the academic courses that a person pursuing such a career would need.

b. Identify the skills needed to pursue careers in science. MA, IT, AR

G.5.2. a. Explain how current scientific and technological discoveries have an influence on the work people do and how some of these discoveries have also lead to new careers.

G.5.2. b. Recognize the importance of new technologies for oceanic or atmospheric careers. IT

G.5.3. a. Illustrate the impact that science and technology have had, both good and bad, on careers, systems, society, environment, and quality of life.

b. Describe the impact of technology on society, environment, and everyday life. SS, RE, IT

G.5.4. 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. AR< MA

Goal H Social and Personal Perspectives

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

H.5.1. a. Evaluate the scientific evidence used in various media.

b. Create working solutions for the problems of alcoholism and drug addiction.

c. Examine how the use of tobacco products increases the risk of illness.

H.5.3. Realize that, tobacco and other drugs are often abused substances.

Grade Level Performance Standards: Grade Six

Within our sixth grade science curriculum, students will:

Goal A Science Connections

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 scientific disciplines. These themes are to be used to connect the Wisconsin science content standards as well as the other subject areas.

A.6.1. a. Develop an understanding of the main components of the earth (atmosphere, hydrosphere, and lithosphere) and use this understanding to frame questions about the shape and location of continents and ocean basins.

b. Develop an understanding of the age of the earth and use this understanding to form questions about the age of things around us. SS

A.6.2. Describe how a science system may include processes as well as physical things.

A.6.3. Explain the difference between a physical model and a conceptual model; and describe how both types of models can be used to compare and contrast how two or more things, events, or concepts are alike or different. LA

A.6.5. Use models to represent processes that happen too slowly/quickly, or on too small/large of a scale to be observed directly. MA, AR

A.6.6. Demonstrate that the usefulness of a model can be tested by comparing its predictions to actual observations in the real world. MA

A.6.7. Ask "How do I know?" questions in appropriate situations and design simple investigations to test the questions posed. LA

A.6.8. a. Utilize models to demonstrate how physical/biological systems tend to change until they become stable (e.g. in equilibrium) and then remain that way unless their surroundings change. MA, AR

b. Investigate the properties of gravity.

c. Investigate the properties of sound. MA

D.6.9. Explain movement of light and sound waves by conducting experiments. MU

D.6.10. Observe how models of the atomic structure have changed over time.

Goal E Earth and Space Science

Demonstrate an understanding of the structure and systems of earth and other bodies in the universe and of their interactions.

E.6.1. a. Explain and predict land changes shaped by rivers, streams, glaciers, rockslides, mudflows and the water cycle. SS

b. Relate how the lithospheric plates move in response to the movement of the mantle.

c. Explain how water moves through the water cycle. AR

E.6.2. a. Demonstrate how rocks are classified into categories by properties. AR, MA

b. Observe and identify that soil is found in layers. LA

c. Describe and construct models of earthquakes and volcanoes. AR, LA

E.6.3. a. Describe and illustrate the process of the water cycle. LA, AR

b. Identify atmospheric contents.

c. Describe the various properties of the atmosphere at different layers. LA, MA

d. Observe how global patterns of atmospheric movements influence local weather.

e. Relate how oceans affect climate. SS

f. Observe the interactions of global weather and climate.

E.6.4. a. Describe how soil is made of weathered rocks and decomposed organic material.

b. Describe how living organisms have played many roles in the earth system. SS

E.6.5 a. Analyze layers of sedimentary rocks to confirm the long history of the earth. MA, SS

b. Analyze locations of igneous, sedimentary, metamorphic rocks to explain geologic history of the earth.

c. Illustrate how earth history and climate are influenced by occasional phenomena. AR, SS

d. Show how glaciers can cause physical changes in landform. AR, SS

E.6.6 Describe through investigation how energy resources are renewable and nonrenewable and list ways that resources have changed over time. SS

E.6.7. a. Discover, describe and show that the solar system contains a variety of bodies. AR

b. Identify the sun as the major source of energy for earth. SS

E.6.8. a. Demonstrate how most objects in the solar system are in regular and predictable motion. AR< MA

b. Show that predictable motions explain days, phases of the moon and eclipses.

- E.6.8. c. Relate the relationship between the earth and everything else in the solar system. RE
- d. Observe how the seasons result from the variations of the amount of the suns' energy. SS
- e. Identify natural hazards and the challenges they present.
- f. Show how historical weather patterns and phenomena can be used to predict future weather. MA

Goal F Life and Environmental Science

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.6.1.

Goal B Nature of Science

Understand that science is ongoing and inventive, and that scientific understandings have changed over time as new evidence is found.

B.6.1. Describe how from time to time, major shifts occur in the scientific view of how the world works (most often, however, the changes that take place in the body of scientific knowledge are small modifications of prior knowledge). LA

B.6.2. a. Identify and describe the main changes in scientists' conceptions of the earth's surface—the shape and location of the continents and ocean basins.

b. Identify and describe the main changes in the scientists' conceptions of the age of the earth—from a few thousand years to many million of years. LA

B.6.3. a. Explain that scientific investigations are conducted for different reasons (for example, to explore new phenomena; to verify previous results; to test personal ideas/ thinking; to test how well an existing theory predicts; or to compare/contrast different theories). LA

b. Explain that scientists differ greatly in the phenomena they study and how they work (although there are no fixed steps that all scientists follow, scientific investigations usually involve: application of imagination in devising a hypothesis to guide investigation, developing a methodology, collecting relevant evidence, using logical reasoning to interpret evidence, and developing persuasive explanations to make sense of collected evidence). LA

B.6.4. Explain there are different traditions in science about what counts as evidence, and how an investigation should be conducted (for example, scientists have a common basic belief about the value of evidence, logic, and good argument). LA

B.6.5. Explain that scientific knowledge is shared through a strong commitment to the process of peer review and publication. This process serves to keep the vast majority of scientists well within the bounds of ethical behavior. LA

B.6.6. Explain that scientists can bring information, insight, and analytical skills to bear on matters of public concern (for example, scientists can help people understand cause and effects of events). Outside their expertise, however, scientists do not possess special credibility. LA

Goal C Science Inquiry

Investigate questions using scientific method and tools, revise their personal understanding to accommodate knowledge, and communicate these understandings to others.

C.6.1. Differentiate those questions which are scientific in nature from those which are not. RE, LA

C.6.2., C.6.7., C.6.8 Choose appropriate tools and techniques to gather data. MA

C.6.3. a. Cite knowledge of subject matter when making judgments. RE

b. Demonstrate the ability to make systematic observations and accurate measurements of variables. MA

C.6.4, C.6.5, C.6.6, C.6.9 a. Differentiate between an explanation, a description, and a theory. LA

b. Demonstrate that mathematics is an important aspect of scientific inquiry. MA

Goal D Physical Science

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.6.1. Observe and describe the physical properties of matter. LA

D.6.2. a. Using the atomic and molecular theory, describe the physical properties of matter. LA

b. Using models, illustrate that matter is made up of atoms. AR, MA

D.6.3. Observe chemical changes as new products are made.

D.6.6 a. Investigate the motion of an object in relation to its position, speed, and direction of motion. MA

D.6.7. Observe that energy can neither be created nor destroyed, yet can be transformed from one form to another.

D.6.8. a. Observe how light interacts with matter by transmission, absorption, or scattering. AR

b. Investigate the properties of magnetism and electricity

c. Investigate the properties of gravity.

d. Investigate the properties of sound.

D.6.9. Explain movement of light and sound waves by conducting experiments. MU, LA

D.6.10 Observe how models of the atomic structure have changed over time.

Goal E Earth and Space Science

Demonstrate an understanding of the structure and systems of earth and other bodies in the universe and of their interactions.

E.6.1. a. Explain and predict land changes shaped by rivers, streams, glaciers, rockslides, mudflows and the water cycle. MA, LA, SS

b. Relate how the lithospheric plates move in response to the movement of the mantle.

c. Relate the relationship between the earth and everything else in the solar system. RE

d. Observe how the seasons result from the variations of the amount of the sun's energy. SS

e. Identify natural hazards and the challenges they present.

f. Show how historical weather patterns and phenomena can be used to predict future weather. MA

Goal F Life and Environment Science

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.6.1. a. Identify that cells carry on many functions needed to sustain life.

b. Discover that disease in organisms results from a failure in structures and functions or damage by infection.

F.6.2. Explain how plant and animal adaptations allow them to survive.

F.6.3. a. Recognize that organisms are grouped into kingdoms and broken down further into classifications based on their characteristics.

b. Observe structure and activities of single-celled and multi-celled animals and classify their physical characteristics.
MA

F.6.6 Observe behavior as one kind of response an organism can make to an internal or environmental condition.

F.6.7. a. Identify that an ecosystem is composed of all populations of organisms living together and physical factors with which they react. SS, MA, RE

b. Describe how plants and animals adapt to their environment.

c. Categorize populations of organisms as producers and consumers by the function they serve in the ecosystem.

F.6.9. Identify changes which cause species to become endangered and/or extinct. SS

Goal G Science Applications

Demonstrate an understanding of the relationship between science and technology and the ways in which that relationship influences human activities.

G.6.1. Identify the skills needed to pursue careers in environmental and medical careers. SS, IT, HE

G.6.2. Recognize and report on the importance of new technologies in the chemical and engineering fields. IT, HE

G.6.3. Describe the impact, both good and bad, of technology on society, the environment, and everyday life. RE, LA, SS, MA

G.6.4. Produce a model or experiment to demonstrate an environmental concern and solution. AR

G.6.6 Report on current trends in the engineering or environmental fields utilizing various sources. SS

Goal H Social and Personal Perspectives

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

H.6.1. Examine the issues of land use and environmental concerns of overpopulation and waste control. SS

H.6.2. a. Research and present solutions for discussion on the topics of recycling and/or land management. SS

Grade Level Performance Standards: Grade Seven

Within our seventh grade science curriculum, students will:

Goal A Science Connections

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 scientific disciplines. These themes are to be used to connect the Wisconsin science content standards as well as the other subject areas.

A.7.1. a. Develop an understanding about the main feature of evolution by natural selection and use this understanding to frame questions about the diversity of life. SS, RE

b. Develop an understanding about the main changes in society that lead to the Industrial Revolution and use this understanding to frame questions about the impact of these changes on people's lives. SS, RE

A.7.2. a. Describe how a system is usually connected to other systems, both internally and externally, for example, a system may be thought of as containing subsystems or as being a subsystem of a larger system. LA, MA, SS

b. Demonstrate an understanding that computers have greatly improved the power of usefulness of modes to summarize, predict or demonstrate how event change in the natural world. IT

Goal C Science Inquiry

Investigate questions using scientific method and tools, revise their personal understanding to accommodate knowledge, and communicate these understandings to others.

C.7.7. Choose appropriate tools and techniques to gather data.

Goal F Life and Environmental Science

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.7.1. Identify, compare, and contrast parts of living things. MA

F.7.2. a. Explain structure and functions of various body systems and how they ensured survival

b. Discuss how malfunctioning could occur within the body systems resulting in change of lifestyle or jeopardizing chance of survival. IT, SS

F.7.3. Explain why different cells have different functions. HE

F.7.4. Investigate the history of genetics and understand the concepts of modern genetics.

F.7.5. a. Observe, and evaluate inheritance patterns in humans and other organisms.

b. Recognize the process of changes in species over time and natural selection.

c. Explain how one-celled and multi-celled organisms reproduce.

F.7.7. Explain how limiting factors affect plant and animal behaviors.

F.7.8. a. Recognize that the number of organisms an ecosystem can support depends on the biotic and abiotic resources available. SS

b. Discover how organisms interact in an ecosystem.

c. Observe that some activities practiced by humans can accelerate changes in the natural environment. SS

F.7.9. Explain how natural changes and diversity affect an ecosystem. SS

F.7.10. Examine the influence that humans have on the natural environment. SS, RE

Goal G Science Applications

Demonstrate an understanding of the relationship between science and technology and the ways in which that relationship influences human activities.

G.7.1. Identify the skills needed to pursue careers in biological or health related fields. MA, LA, IT, HE

G.7.2. Recognize and relate the importance of new technologies in life science and medical fields. IT

G.7.3. Describe the impacts of other technologies on living systems. IT, LA, HE

G.7.4. Demonstrate the interrelationships between science and technologies by creating or designing an object based on the grade level curriculum. AR, MU, LA, IT, MA, RE

G.7.7. Use the internet and other available resources to identify new technologies and predict future possibilities. IT, SS, LA, MA, HE

Goal H Social and Personal Perspectives

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

H.7.1. Demonstrate that the natural environments contain substances harmful to living organisms. SS, HE

H.7.2. Experiment and explain how some activities practiced by humans can accelerate natural changes. SS

H.7.3. Identify the consequences of altering the genetic make-up of naturally occurring systems. SS, LA

Grade Level Performance Standards: Grade Eight

Within our eighth grade science curriculum, students will:

Goal A Science Connections

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 scientific disciplines. These themes are to be used to connect the Wisconsin science content standards as well as the other subject areas.

A.8.1. a. Develop an understanding about the main features of Newton's Laws of Motion and use this to frame questions about Newton's concepts of mass, force, and acceleration. MA

b. Develop an understanding about the main features of the atomic theory and use this understanding to frame questions about the basic structure of the atom, conservation of matter, and its relationship to energy. MA

A.8.2. Describe how thinking about science systems means looking at the relationships of the parts to each other. For example, the output from one part of a system (which can include material, energy, or information) can become the input for another part of a system.

A.8.3., A.8.4., A.8.5. Use geometric figures, number sequence, graphs, diagrams, sketches, number line, maps, stories, or 3-D objects to physically represent objects, events, processes, or conceptions (by their nature, such representations-physical or conceptual- can never be exact in every detail). MA, AR

A.8.6. Use mathematical models to explain/predict natural occurring events. MA

A.8.7. Design investigations to test the limitations or usefulness of a physical or conceptual model. AR, MA

A.8.8 Use physical or conceptual models to show how organisms evolve by natural selection, change in a steady repetitive or irregular ways. AR, MA, SS

Goal B Nature of Science

Understand that science is ongoing and inventive, and that scientific understandings have changed over time as new evidence is found.

B.8.1. Describe how the on-going process of changes in scientific knowledge can lead to a better understanding of how things work in the world but not to absolute truth. LA, SS

B.8.2. a. Identify and describe the main changes in society leading to the Industrial Revolution (for example, the importance of tools/inventions; geographic distribution of materials, energy, and resources). SS, AR

b. Identify and describe the main changes in scientists' conceptions of evolution by natural selection, the evidence and arguments that support it and its importance in biology. SS, RE

B.8.3. a. Explain that when similar investigations give different results, the scientific challenge is to judge whether the differences are trivial or significant. LA, MA

b. Explain the importance of variables in development of scientific investigations (for example, if more than one variable change at the same time in an experiment, the outcomes of the experiment may not be clearly attributed to any one variable; it may not be possible to prevent outside variables from influencing the outcomes of an investigation. MA

Goal C Science Inquiry

Investigate questions using scientific method and tools, revise their personal understanding to accommodate knowledge, and communicate these understandings to others.

C.8.1. Apply scientific ideas, concepts, relationships to their formulations of scientific questions. RE< MA

C.8.2., C.8.7, C.8.8 Explain how different scientific disciplines employ different methods, core theories, and standards to advance scientific knowledge and understanding. GM

C.8.3. a. Identify the assumptions that influence and guide their investigations. GM

b. State explanations in terms of the relationship between two or more variables. MA, LA, SS

c. Propose and critique alternative explanations and procedures. LA, SS, MA

C.8.4., C.8.5., C.8.6., C.8.9. Make connections between the content of science and the contexts within which scientists develop new knowledge. Re, MA

Goal D Physical Science

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. Describe the physical properties of metals, nonmetals and metalloids.

D.8.2. Explain how the ideas of atomic and molecular theory support chemical and physical interactions of solids, liquids, and gases.

D.8.3. a. Describe materials before and after chemical changes. LA, AR

D.8.3. b. Understand and demonstrate that all types of matter are the result of changes in the arrangement, motion, and combination of atoms. AR

D.8.4. Experience and describe how the behavior of gases can be explained. AR, MA

D.8.5. a. Investigate forces in relationship to Newtonian Laws of Motion. MA

b. Demonstrate, using equations, how simple machines make work easier. MA, AR

c. Understand and apply the concept of work and power to simple machines. MA, SS

D.8.6. Observe the relationship of how force, mass, and acceleration can be represented mathematically. MA, IT

D.8.9. a. Experience examples of heat transfer by conduction, radiation, and convection.

b. Describe the form of nuclear energy and how this energy is transformed. LA, AR

c. Discover through experiments that in most chemical and nuclear reactions, energy is transferred into or out of the system.

d. Experience how electrical circuits provide a means of transferring electrical energy, when heat, light, sound, and chemical changes are produced.

e. Discover that energy comes to the earth in the form of electromagnetic radiation. MA

Goal G Science Applications

Demonstrate an understanding of the relationship between science and technology and the ways in which that relationship influences human activities.

G.8.1. Identify the skills needed to pursue careers in science. HE, SS

G.8.2. Relate the importance of new technologies in careers connected with chemistry or physics. IT, MA

G.8.3. Describe the impact of technology on new theories toward exploration of space and the complexity of the universe. IT, RE

G.8.4. Demonstrate the interrelationship of science and technology by creating or designing a project or experimtn related to the curriculum. LA, MA, Ar

G.8.5. Investigate, demonstrate, and report on a local problem or technology that will enable newer technologies or broaden the field of science. MA

G.8.7. Utilize and experiment with new technologies to allow observations otherwise limited due to quantity, distance, location, size and speed. MA, IT

Goal H Social and Personal Perspectives

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

H.8.1. Evaluate the risk analysis of various hazards, such as radiation, or chemical contaminations, and estimate the number of people that may be exposed and the number likely to suffer consequences. MA, SS

H.8.2. Research and present solutions for societal challenges that include both positive and negatives in the area of physics and chemistry. MA, SS, IT, HE, RE

Note: Numeric order for the K-8 grade level goals listed in this document aligns with the WI State Academic Standards. Not all grades include each standard sub-category (as indicated by gaps in the numbering system). However, all K-4 goals and 5-8 goals are appropriately addressed by the end of fourth and eighth grades.

These grade level performance standards are listed developmentally. However, each school is uniquely organized. Therefore, a specific grade level standard may not be addressed at the grade indicated, but will be addressed within a 4 year time span (K-4, 5-8).