

## Content Standard Science Standard A (Science Connections)

**Content Standard:** 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 scientific disciplines.

These themes relate and interconnect the Wisconsin science standards to one another. Each theme is further defined in the [Science Glossary](#).

### Rationale

These unifying themes are ways of thinking rather than theories or discoveries. Students should know about these themes and realize that the more they learn about science the better they will understand how the themes organize and enlarge their knowledge. Science is a system and should be seen as a single discipline rather than a set of separate disciplines. Students will also understand science better when they connect and integrate these unifying themes into what they know about themselves and the world around them.

	Performance Standards	Grade	Learning Targets	Assessments
A.4.1	When conducting science investigations, ask and answer questions that will help decide the general areas of science being addressed	K  1  2  3	Students will be introduced to basic question formation  Students will be introduced to Inquiry Activity where they classify and compare. They will develop their basic questioning skills  Students will be introduced to the Scientific Method. They will develop their inquiry skills  Students will further develop Scientific Method: Inquiry is purpose, procedure draw conclusions	

		4	and explore.  Students will master Scientific Method: Inquiry is purpose, procedure draw conclusions, observe, infer, communicate, classify, use variables, experiment, interpret data, make a model/ table, measure, use numbers and explore.	
A.4.2	When faced with a science-related problem, decide what evidence, models, or explanations previously studied can be used to better understand what is happening now	K  1  2  3  4	Students will be introduced to basic question formation  Students will be introduced to Inquiry Activity where they classify and compare. They will develop their basic questioning skills  Students will be introduced to the Scientific Method. They will develop their inquiry skills  Students will further develop Scientific Method: Inquiry is purpose, procedure draw conclusions and explore.  Students will master Scientific Method: Inquiry is purpose, procedure draw conclusions, observe, infer, communicate, classify, use variables, experiment, interpret data, make a model/ table, measure, use numbers and explore.	
A.4.3	When investigating a science-related problem, decide what data can be collected to determine the most	K  1	Students will be introduced to observing, predicting, inferring and classifying.  Students are introduced to observing, comparing, recording data, and drawing a conclusion based	

	useful explanations	2	on data Students will master observing, comparing recording, and concluding data	
		3	Students will further develop Scientific Method: Inquiry is purpose, procedure draw conclusions, quick lab/ quick check and explore.	
		4	Students will master Scientific Method: Inquiry is purpose, procedure draw conclusions, observe, infer, communicate, classify, use variables, experiment, interpret data, make a model/ table, measure, use numbers, quick lab/ quick check and explore.	
A.4.4	When studying science-related problems, decide which of the science themes are important	3	Students will develop science themes by utilizing inquiry, investigation through structured, guided and independent inquiry	
		4	Students will master science themes by utilizing inquiry, investigation through structured, guided and independent inquiry	
A.4.5	When studying a science-related problem, decide what changes over time are occurring or have occurred	1	Students will be introduced to observing changes during an experiment	
		2	Students will develop observing changes during an experiment	
		3	Students will record change observations during experiments	

		4	Students will master recording of change observations	
<p><b>Content Standard Science Standard B (Nature of Science)</b></p> <p><b>Content Standard:</b> Students in Wisconsin will understand that science is ongoing and inventive, and that scientific understandings have changed over time as new evidence is found.</p> <p><b>Rationale</b>  Students will realize that scientific knowledge is developed from the activities of scientists and others who work to find the best possible explanations of the natural world. Researchers and those who are involved in science follow a generally accepted set of rules to produce scientific knowledge that others can confirm with experimental evidence. This knowledge is public, replicable, and undergoing revision and refinement based on new experiments and data.</p>				
B.4.1	Use encyclopedias, source books, texts, computers, teachers, parents, other adults, journals, popular press, and various other sources, to help answer science-related questions and plan investigations	K  1  2  3	<p>Students will (in large group) use trade books and guest speakers</p> <p>Students will (in large group) use trade books, internet resources (ex: Discovery Learning), student encyclopedia set, guest speakers, Scholastic News to acquire information</p> <p>Students will (independently) use trade books, internet resources, encyclopedia set, guest speakers, Scholastic News, guest speakers, Discovery Works and computers to acquire information</p> <p>Students will (independently) demonstrate the use of trade books, internet resources, encyclopedia set, guest speakers, Time for Kids, guest speakers, Discovery Works, newspapers and</p>	

		4	<p>computers to acquire information</p> <p>Students will (independently) master the use of trade books, internet resources, encyclopedia set, guest speakers, Time for Kids, guest speakers, Discovery Works, newspapers and computers to acquire information</p>	
B.4.2	<p>Acquire information about people who have contributed to the development of major ideas in the sciences and learn about the cultures in which these people lived and worked</p>	1	<p>Students will (in large group) use trade books, internet resources (ex: Discovery Learning), student encyclopedia set, guest speakers, Scholastic News to acquire information about scientific contributions</p>	
		2	<p>Students will (independently) use trade books, internet resources, encyclopedia set, guest speakers, Scholastic News, guest speakers, Discovery Works and computers to acquire information about scientific contributions</p>	
		3	<p>Students will (independently) demonstrate the use of trade books, internet resources, encyclopedia set, guest speakers, Time for Kids, guest speakers, Discovery Works, newspapers and computers to acquire information about scientific contributions</p>	
		4	<p>Students will (independently) master the use of trade books, internet resources, encyclopedia set, guest speakers, Time for Kids, guest speakers, Discovery Works, newspapers and computers to acquire information about scientific contributions</p>	

B.4.3	Show* how the major developments of scientific knowledge in the earth and space, life and environmental, and physical sciences have changed over time	1	Students will (in large group) use trade books, internet resources (ex: Discovery Learning), student encyclopedia set, guest speakers, Scholastic News to acquire information about scientific changes over time	
		2	Students will (independently) use trade books, internet resources, encyclopedia set, guest speakers, Scholastic News, guest speakers, Discovery Works and computers to acquire information about scientific changes over time	
		3	Students will (independently) demonstrate the use of trade books, internet resources, encyclopedia set, guest speakers, Time for Kids, guest speakers, Discovery Works, newspapers and computers to acquire information about scientific changes over time	
		4	Students will (independently) master the use of trade books, internet resources, encyclopedia set, guest speakers, Time for Kids, guest speakers, Discovery Works, newspapers and computers to acquire information about scientific changes over time	

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

**Rationale**

Students should experience science in a form that engages them in actively constructing ideas and explanations and enhances their opportunities to develop the skills of doing science. Such inquiry (problem solving) should include questioning, forming hypotheses, collecting and analyzing data, reaching conclusions and evaluating results, and communicating procedures and findings to others.

C.4.1	Use the vocabulary of the unifying themes to ask questions about objects, organisms, and events being studied	K  1  2  3  4	<p>Students will (as a class) discuss vocabulary words (ex: word wall)</p> <p>Students will (as a class) keep track of science vocabulary words (ex: word wall)</p> <p>Students will (as a class) keep track of, discuss and use science vocabulary words (ex: science journal)</p> <p>Students will (independently) keep track of, discuss and use science vocabulary words (ex: vocabulary cards)</p> <p>Students will (independently) keep track of, discuss and use science vocabulary words (ex: graphic organizers)</p>	
C.4.2	Use the science content being learned to ask questions, plan investigations, make observations, make	K	<p>Students will (in large group) use trade books and guest speakers</p> <p>Students will (in large group) use trade books, internet resources (ex: Discovery Learning),</p>	

	predictions, and offer explanations	1	student encyclopedia set, guest speakers, Scholastic News to acquire information	
		2	Students will (independently) use trade books, internet resources, encyclopedia set, guest speakers, Scholastic News, guest speakers, Discovery Works and computers to acquire information	
		3	Students will (independently) demonstrate the use of trade books, internet resources, encyclopedia set, guest speakers, Time for Kids, guest speakers, Discovery Works, newspapers and computers to acquire information	
		4	Students will (independently) master the use of trade books, internet resources, encyclopedia set, guest speakers, Time for Kids, guest speakers, Discovery Works, newspapers and computers to acquire information	
C.4.3	Select multiple sources of information to help answer questions selected for classroom investigations	1	Students will (in large group) use trade books, internet resources (ex: Discovery Learning), student encyclopedia set, guest speakers, Scholastic News to acquire information about scientific investigations	
		2	Students will (independently) use trade books, internet resources, encyclopedia set, guest speakers, Scholastic News, guest speakers, Discovery Works and computers to acquire	

		3	information about scientific investigations  Students will (independently) demonstrate the use of trade books, internet resources, encyclopedia set, guest speakers, Time for Kids, guest speakers, Discovery Works, DVD's, newspapers and computers to acquire information about scientific investigations	
		4	Students will (independently) master the use of trade books, internet resources, encyclopedia set, guest speakers, Time for Kids, guest speakers, DVD's, Discovery Works, newspapers and computers to acquire information about scientific investigations	
C.4.4	Use simple science equipment safely and effectively, including rulers, balances, graduated cylinders, hand lenses, thermometers, and computers, to collect data relevant to questions and investigations	K	Students will use hand lenses and magnets and thermometers to aid in investigations.	
		1	Students will use magnifying glasses, thermometers, flashlight, magnets, and safety goggles to aid in investigations.	
		2	Students will use scale, tuning fork, watch, meter stick, ruler, prism, magnifying glasses, thermometers, flashlight, magnets, and safety goggles to aid in investigations.	
		3	Students will use scale, microscope, measuring cups, tuning fork, watch, meter stick, ruler, prism, magnifying glasses, thermometers, flashlight, magnets, and safety goggles to aid in	

		4	<p>investigations.</p> <p>Students will use gram masses, balance, beaker, graduated cylinder, scale, microscope, measuring cups, tuning fork, watch, meter stick, ruler, prism, magnifying glasses, thermometers, flashlight, magnets, and safety goggles to aid in investigations.</p>	
C.4.5	Use data they have collected to develop explanations and answer questions generated by investigations	3	Students will develop science themes by utilizing inquiry, investigation through structured, guided and independent inquiry	
		4	Students will master science themes by utilizing inquiry, investigation through structured, guided and independent inquiry	
C.4.6	Communicate the results of their investigations in ways their audiences will understand by using charts, graphs, drawings, written descriptions, and various other means, to display their answers	2	Students will share their observations with an audience by way of: use of technology (ex: Smart Board, Power Point or Excel) and written descriptions	
		3	Students will record their observations and share with an audience by way of: charts, graphic organizers, drawings, use of technology (ex: Smart Board, Power Point or Excel) and written descriptions	
		4	Students will record their observations and share with an audience by way of: charts, graphic organizers, drawings, use of technology (ex: Smart Board, Power Point or Excel) and written	

			descriptions	
C.4.7	Support their conclusions with logical arguments	1	Students can verbally explain conclusions to demonstrate understanding	
		2	Students will share their observations with an audience by way of: use of technology (ex: Smart Board, Power Point or Excel) and written descriptions	
		3	Students will record their observations and share with an audience by way of: charts, graphic organizers, drawings, use of technology (ex: Smart Board, Power Point or Excel) and written descriptions	
		4	Students will record their observations and share with an audience by way of: charts, graphic organizers, drawings, use of technology (ex: Smart Board, Power Point or Excel) and written descriptions	
C.4.8	Ask additional questions that might help focus or further an investigation	K	Teacher-led	
		1	Teacher-led	
		2	Students will access their schema to ask additional questions to help focus their investigation	
		3	Students will independently come up with additional questions to help focus their investigation	

		4	Students will focus their investigations by asking higher level thinking questions	
<p><b>Content Standard Science Standard D - Physical Science</b></p> <p><b>Content Standard:</b> 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.</p> <p><i>Note: For more details of the content of physical sciences, see National Science Education Standards* (1996, p. 115 - 201).</i></p> <p><b>Rationale</b>  Knowledge of the physical and chemical properties of matter and energy is basic to an understanding of the earth and space, life and environmental and physical sciences. The properties of matter can be explained in terms of the atomic structure of matter. Chemical reactions can be explained and predicted in terms of the atomic structure of matter. Natural events are the result of interactions of matter and energy. When students understand how matter and energy interact, they can explain and predict chemical and physical changes that occur around them.</p>				
D.4.1	Understand that objects are made of more than one substance, by observing, describing and measuring the properties of earth materials, including properties of size, weight, shape, color, temperature, and the ability to react with other substances	K 1 2 3 4	Students will be introduced to various materials  Students will be introduced to strengths of various materials  Students will develop knowledge of various materials and whether they are natural or man made  Students will develop knowledge of various materials and whether they are metal or non-metal  Students will master knowledge of various materials and whether they are metal or non-	

			metal, and what element they are	
D.4.2	Group and/or classify objects and substances based on the properties of earth materials	K 1 2 3 4	Students will be introduced to various materials  Students will group and classify various materials  Students classify objects as living or non living after collecting samples from school surroundings.    Students will demonstrate classification of mixtures and compounds	
D.4.3.	Understand that substances can exist in different states-solid, liquid, gas	K 1 2 3 4	Students will be introduced to water in its 3 states of matter (solid, liquid, gas)  Students are introduced to the 3 states of matter (solid, liquid, gas)  Students will develop their knowledge of the 3 states of matter (solid, liquid, gas) and do various experiments with each stage.  Students will review and classify 3 states of matter (solid, liquid, gas)  Students' knowledge of the states of matter is reinforced for mastery	
D.4.4	Observe and describe changes in form, temperature, color,	K	Students will be introduced to water in its 3 states of matter (solid, liquid, gas)	

	speed, and direction of objects and construct explanations for the changes	1 2 3 4	Students will be introduced to mixtures  Students are introduced to basic experiments to detect form and color of objects and basic changes to states of matter  Students will develop their knowledge of the changes between states of matter  Students will master changes of state and be introduced to physical and chemical change	
D.4.5	Construct simple models of what is happening to materials and substances undergoing change, using simple instruments or tools to aid observations and collect data	K 1 2 3 4	Students will be introduced to basic states of substances  Students will be introduced to change  Students are introduced to basic experiments to observe changes in matter  Students will develop their knowledge of the changes between states of matter  Students will master changes of state and be introduced to physical and chemical change	
D.4.6	Observe and describe physical events in objects at rest or in motion	1 2	Students will be introduced to position, motion and speed  Students will develop their knowledge of position, motion and speed	

		3	Students will be introduced to distance and review position, motion and speed	
		4	Students will be introduced to velocity and master distance, position, motion and speed	
D.4.7	<p>Observe and describe physical events involving objects and develop record-keeping systems to follow these events by measuring and describing changes in their properties, including:</p> <ul style="list-style-type: none"> <li>• position relative to another object</li> <li>• motion over time</li> <li>• and position due to forces</li> </ul>	1	Students will be introduced to force, gravity, friction, push and pull	
		2	Students will develop their knowledge of force, gravity, friction	
		3	Students will develop their knowledge of magnetism, gravity, friction and force	
		4	Students will master acceleration, inertia, friction and gravity	
D.4.8	Ask questions and make observations to discover the differences between substances that can be touched (matter) and substances that cannot	2	Introduce difference between touchable matter and non-touchable matter	
		3	Develop difference between touchable matter and non-touchable matter	
		4	Master difference between touchable matter and	

	be touched (forms of energy, light, heat, electricity, sound, and magnetism)		non-touchable matter	
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**Content Standard Science Standard E - Earth and Space Science**

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

*Note: For more details of the content of earth and space sciences, see National Science Education Standards\* (1996, p. 115 - 201).*

**Rationale**

By studying earth, its composition, history, and the processes that shape it, students gain a better understanding of the planet on which they live. In addition, all bodies in space, including earth, are influenced by forces acting throughout the solar system and the universe. Studying the universe enhances students' understanding of earth's origins, its place in the universe, and its future. Understanding these geologic, meteorological, astronomical, and oceanographic processes allows students to make responsible choices and to evaluate the consequences of their choices.

E.4.1	Investigate that earth materials are composed of rocks and soils and correctly use the vocabulary for rocks, minerals, and soils during these investigations	K-4	Differentiated vocabulary for each grade level will be introduced and developed	
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E.4.2	Show that earth materials have different physical and chemical properties, including the properties of soils found in Wisconsin	K 1 2 3 4	Introduce Earth materials  Develop knowledge of Earth materials such as soil  Develop soil knowledge and introduce various other Earth materials  Develop knowledge of properties of minerals  Introduce WI State minerals and various soils Master knowledge of soil properties	
E.4.3	Develop descriptions of the land and water masses of the earth and of Wisconsin's rocks and minerals, using the common vocabulary of earth and space science	K-4	Differentiated vocabulary for each grade level will be introduced and developed	
E.4.4	Identify celestial objects (stars, sun, moon, planets) in the sky, noting changes in patterns of those objects over time	K 1 2 3	Introduce the sky, moon and sun  Develop knowledge of Earth, moon, sun and solar system  Introduce the planets and galaxy and master knowledge of Earth, moon and sun  Master solar system knowledge	

E.4.5	Describe the weather commonly found in Wisconsin in terms of clouds, temperature, humidity, and forms of precipitation, and the changes that occur over time, including seasonal changes	K 1 2 3 4	Daily weather observations during calendar time Daily weather observations during calendar time Daily weather observations during calendar time Develop weather vocabulary and weather changes Introduce clouds and reasons for weather	
E.4.6	Using the science themes, find patterns and cycles in the earth's daily, yearly, and long-term changes	K 1 2 3 4	Introduce months and years Develop knowledge of months and years and the cycle of the moon Master moon cycles Introduce cycles of the day, year, and what long term changes are effected by that Develop cycles of the day, year, and what long term changes are effected by that	
E.4.7	Using the science themes, describe resources used in the home, community, and nation as a whole	K-4	Utilizing current events, local news and text to increase awareness of consumption of renewable and non-renewable resources	

E.4.8	Illustrate human resources use in mining, forestry, farming, and manufacturing in Wisconsin and elsewhere in the world	1	Introduce jobs in WI	
		2	Develop jobs and sources of jobs in WI	
		3	Introduce mining and forestry and how they provide jobs	
		4	Alice in Dairyland farming unit	

**Content Standard Science Standard F - Life and Environmental Science**

**Content Standard:** 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.

*Note: For more details of the content of life and environmental sciences, see National Science Education Standards\* (1996, p. 115 - 201).*

**Rationale**

Students will enhance their natural curiosity about living things and their environment through study of the structure and function of living things, ecosystems, life cycles, energy movement (transfer), energy change (transformation), and changes in populations of organisms through time. Knowledge of these concepts and processes of life and environmental science will assist students in making informed choices regarding their lifestyles and the impact they have on communities of living things in their environment.

F.4.1	Discover* how each organism meets its basic needs for water, nutrients, protection, and energy* in order to survive	K	Introduce the basic needs of humans: food, shelter, air	
		1	Introduce the basic needs of plants: sun, water, light	
			Develop basic needs of plants and their growth	

		2	cycle	
			Introduce organisms and cells	
		3	Develop cells, photosynthesis and reproduce	
		4		
F.4.2	Investigate* how organisms, especially plants, respond to both internal cues (the need for water) and external cues (changes in the environment)	1	Introduce the basic needs of plants: sun, water, light	
		2	Develop basic needs of plants and their growth cycle	
		3	Introduce organisms and cells	
		4	Develop cells, photosynthesis and reproduce	
F.4.3	Illustrate* the different ways that organisms grow through life stages and survive to produce new members of their type	1	Introduce plants and seeds and lifecycles of frogs	
		2	Develop lifecycles through butterflies	
		3	What animals and plants need to survive (expanding their lifecycles)	
		4	Exploring ecosystems and animal lifecycles	
F.4.4	Using the science themes*, develop explanations* for the connections among living and non-living things in various	K-4	All grades develop various levels of food chains, organisms and their behaviors in relationship to the environment	

environments

## Content Standard Science Standard G - Science Applications

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

### Rationale

Science and technology compliment each other. Science helps drive technology and technology provides science with tools for investigation, inquiry, and analysis. Together, science and technology applications provide solutions to human problems, needs, and aspirations. Students should understand that advances in science and technology affect the earth's systems.

G.4.1	Identify* the technology used by someone employed in a job or position in Wisconsin and explain* how the technology helps	1-4	Grade levels will discuss various careers in science and the technologies they use in each	
G.4.2	Discover* what changes in technology have occurred in a career chosen by a parent, grandparent, or an adult friend over a long period of time	2-4	Students will interview family members and each grade levels will discuss various careers in science and the technologies they use in each	
G.4.3	Determine what science discoveries have led to changes in technologies that are being used in the workplace by someone	3-4	Students will interview community members and each grade levels will discuss various careers in science and the technologies they use in each (job fair)	

	employed locally			
G.4.4	Identify* the combinations of simple machines in a device used in the home, the workplace, or elsewhere in the community, to make or repair things, or to move goods or people	3 4	Introduce simple machines  Develop simple machine knowledge and introduce complex machines	
G.4.5	Ask questions to find answers about how devices and machines were invented and produced	3	In collaborative groups, research inventors and inventions throughout history	
<p><b>Content Standard Science Standard H (Science in Personal and Social Perspectives)</b></p> <p><b>Content Standard:</b> Students in Wisconsin will use scientific information and skills to make decisions about themselves, Wisconsin, and the world in which they live.</p> <p><b>Rationale</b> An important purpose of science education is to give students a means to understand and act on personal, economic, social, political, and international issues. Knowledge and methodology of the earth and space, life and environmental, and physical sciences facilitate analysis of topics related to personal health, environment, and management of resources, and help evaluate the merits of alternative courses of action.</p>				
H.4.1	Describe* how science and technology have helped, and in some cases hindered, progress in providing	2-4	Exposure to real world reading materials that connect science technology and society at various grade levels	

	better food, more rapid information, quicker and safer transportation, and more effective health care			
H.4.2	Using the science themes*, identify* local and state issues that are helped by science and technology and explain* how science and technology can also cause a problem	1-4	Grade levels will use Scholastic News, Time for Kids or various other current event periodicals to gain exposure to science technology issues	
H.4.3	Show* how science has contributed to meeting personal needs, including hygiene, nutrition, exercise, safety, and health care	1 2 3	Introduce the food pyramid  Develop healthy eating and lifestyles  Master healthy living through scientific inventions	
H.4.4	Develop* a list of issues that citizens must make decisions about and describe* a strategy for becoming informed about the science behind these issues	4	Introduce citizen decision making strategies in science	