

SCIENCE DAYBOOKS © 2004

Grades 4-8

correlated to

Minnesota

**Academic Standards for
Science**

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EDUCATION GROUP



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 correlated to
Minnesota Academic Standards for Science
Grade 4

I. HISTORY AND NATURE OF SCIENCE

A. Scientific World View

The student will understand how science is used to investigate interactions between people and the natural world.

Benchmarks, Grade 4	Science Daybook, Grade 4
1. The student will explore the uses and effects of science in our interaction with the natural world.	Student Book: 133-138, 143, 147-158
2. The student will discuss the responsible use of science.	Student Book: 133-138, 143, 144, 147-152
3. The student will recognize the impact of scientific and technological activities on the natural world.	Student Book: 51, 133-138, 143, 144, 147-164

B. Scientific Inquiry

The student will participate in a controlled scientific investigation.

Benchmarks, Grade 4	Science Daybook, Grade 4
1. The student will recognize when comparisons might not be fair because some conditions are not kept the same.	Student Book: 48, 93, 94
2. The student will collect, organize, analyze and present data from a controlled experiment.	Student Book: 26-28, 35, 55-56, 61-62, 66-67, 86, 91, 94, 106, 109, 111, 124, 132
3. The student will recognize that evidence and logic are necessary to support scientific understandings.	Student Book: 17-18, 23-24, 29, 30, 34, 39, 41-42, 46-47, 48, 54, 56, 60, 68, 71, 73-74, 78-79, 80, 84-85, 93, 98, 99, 104, 105, 112, 115, 116, 122, 123, 124, 130, 131, 136, 137, 142, 143, 150, 151, 155, 157-158, 162, 163, 164

II. PHYSICAL SCIENCE

A. Structure of Matter

The student will know that heating and cooling may cause changes to the properties of a substance.

Benchmarks, Grade 4	Science Daybook, Grade 4
1. The student will observe that heating and cooling can cause changes in state.	Student Book: 95-100
2. The student will describe the changes in the properties of a substance when it is heated or cooled.	Student Book: 95-100
3. The student will compare and contrast the mass, shape and volume of solids, liquids and gases	Student Book: 98

C. Energy Transformations

The student will understand basic electricity and its application in everyday life.

Benchmarks, Grade 4	Science Daybook, Grade 4
1. The student will explore simple electrical circuits using components such as wires, batteries and bulbs.	Student Book: 117
2. The student will investigate static electricity.	Student Book: 115
3. The student will identify objects and materials that conduct electricity and those that are insulators.	Student Book: 113-118

E. Forces of Nature

The student will understand that a relationship exists between electricity and magnetism.

Benchmarks, Grade 4	Science Daybook, Grade 4
1. The student will demonstrate how a wire and magnet can be used to generate an electric current.	Student Book: 107-112, 115, 117
2. The student will demonstrate how an electric current can make an iron object magnetic.	Student Book: 117-118

III. EARTH AND SPACE SCIENCE

A. Earth Structure and Processes

The student will investigate the impact humans have on the environment.

Benchmarks, Grade 4	Science Daybook, Grade 4
1. The student will identify and investigate environmental issues and potential solutions.	Student Book: 51-56

B. The Water Cycle, Weather and Climate

The student will recognize that water on Earth cycles and exists in many forms.

Benchmarks, Grade 4	Science Daybook, Grade 4
1. The student will describe the water cycle involving the processes of evaporation, condensation, precipitation and collection.	No specific chapter addresses this benchmark. (See <i>Earth Science Daybook</i> .)
2. The student will identify where water exists on Earth.	No specific chapter addresses this benchmark. (See <i>Earth Science Daybook</i> .)

C. The Universe

The student will identify the patterns and movements of celestial objects.

Benchmarks, Grade 4	Science Daybook, Grade 4
1. The student will recognize that the stars in the sky appear to slowly move from east to west.	No specific chapter addresses this benchmark.

Benchmarks, Grade 4	Science Daybook, Grade 4
2. The student will identify the sun as an average-sized star and that the other stars are so far away that they look like points of light.	No specific chapter addresses this benchmark. (See <i>Earth Science Daybook</i> .)
3. The student will know that telescopes magnify distant objects in the sky and dramatically increase the number of stars we can see.	No specific chapter addresses this benchmark. (See <i>Earth Science Daybook</i> .)

IV. LIFE SCIENCE

A. Cells

The student will know that all organisms are composed of cells, which are the fundamental units of life.

Benchmarks, Grade 4	Science Daybook, Grade 4
1. The student will recognize that cells are very small, and that all living things consist of one or more cells.	No specific chapter addresses this benchmark. (See <i>Life Science Daybook</i> .)
2. The student will recognize that cells need: food, water and air, a way to dispose of waste, and an environment in which they can live.	Student Book: 13 Also see <i>Life Science Daybook</i> .

B. Diversity of Organisms

The student will know that living things can be sorted into groups in many ways according to their varied characteristics, structures and behaviors.

Benchmarks, Grade 4	Science Daybook, Grade 4
1. The student will classify plants and animals according to their physical characteristics.	Student Book: 14-18, 31-36 Also see <i>Life Science Daybook</i> .
2. The student will learn that the characteristics used for grouping depend on the purpose of the grouping.	Student Book: 37-42 Also see <i>Life Science Daybook</i> .

G . H u m a n O r g a n i s m

The student will know the structures that serve various functions in the human body, including protection from disease.

Benchmarks, Grade 4	Science Daybook, Grade 4
1. The student will understand that humans have structures that serve functions in growth, survival and reproduction.	Student Book: 20-24 Also see <i>Life Science Daybook</i> .
2. The student will know that germs entering the body can cause disease, and that the body has defenses against these germs.	No specific chapter addresses this benchmark. (See <i>Life Science Daybook</i> .)
3. The student will know that there are many diseases that can be prevented by vaccination.	No specific chapter addresses this benchmark. (See <i>Life Science Daybook</i> .)



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 correlated to
Minnesota Academic Standards for Science
Grade 5

I. HISTORY AND NATURE OF SCIENCE

A. Scientific World View

The student will understand that communication is essential to science.

Benchmarks, Grade 5	Science Daybook, Grade 5
1. The student will know that current scientific knowledge and understanding guide scientific investigation.	Student Book: 71, 74
2. The student will recognize that clear communication of methods, findings and critical review is an essential part of doing science.	Student Book: 69-74

B. Scientific Inquiry

The student will understand the process of scientific investigations.

Benchmarks, Grade 5	Science Daybook, Grade 5
1. The student will perform a controlled experiment using a specific step-by-step procedure and present conclusions supported by the evidence.	Student Book: 60-61, 78-79, 93-94, 99, 100, 106, 117, 123, 151-152
2. The student will observe that when a science investigation or experiment is repeated, a similar result is expected.	Student Book: 69-74

C . S c i e n t i f i c E n t e r p r i s e

The student will recognize that science and technology involve different kinds of work and engages men and women of all backgrounds.

Benchmarks, Grade 5	Science Daybook, Grade 5
1. The student will describe different kinds of work done in science and technology.	Student Book: 20-21, 32, 34, 69-74, 89-91, 102-103, 105, 108-109, 118, 128-130, 133-137, 147-164
2. The student will identify men and women of various backgrounds and ages who have been involved in science and technology, both past and present.	Student Book: 32, 70, 72, 102-103, 105, 108-112, 114-116, 128-130, 148-150, 154-156, 158

I I . P H Y S I C A L S C I E N C E

D . M o t i o n

The student will understand that changes in speed or direction of motion are caused by forces.

Benchmarks, Grade 5	Science Daybook, Grade 5
1. The student will investigate the use of a lever, inclined plane and wheel and axle to move objects.	No specific chapter addresses this benchmark. (See <i>Physical Science Daybook</i> .)
2. The student will demonstrate that the greater the force applied, the greater the change in motion.	No specific chapter addresses this benchmark. (See <i>Physical Science Daybook</i> .)

I I I . E A R T H A N D S P A C E S C I E N C E

A . E a r t h S t r u c t u r e a n d P r o c e s s e s

The student will explore the structures and functions of Earth systems.

Benchmarks, Grade 5	Science Daybook, Grade 5
1. The student will recognize the natural processes that cause rocks to break down into smaller pieces and eventually into soil.	Student Book: 62 Also see <i>Earth Science Daybook</i> .
2. The student will investigate the formation, composition and properties of soil.	No specific chapter addresses this benchmark. (See <i>Earth Science Daybook</i> .)
3. The student will describe how waves, wind, water and ice shape and reshape the Earth's surface.	Student Book: 57-62, 66

Benchmarks, Grade 5	Science Daybook, Grade 5
4. The student will describe the impact of floods, tornadoes, earthquakes and volcanoes on the Earth.	Student Book: 51-56, 57, 75-80
5. The student will explore the interaction of the lithosphere, atmosphere, biosphere, hydrosphere and space.	Student Book: 57-62, 66

IV. LIFE SCIENCE

E. Biological Populations Change Over Time

The student will know that biological populations change over time.

Benchmarks, Grade 5	Science Daybook, Grade 5
1. The student will recognize that individuals of the same species differ in their characteristics and that sometimes the differences give individuals an advantage in surviving and reproducing.	Student Book: 13-43, 47
2. The student will recognize that extinction of a species occurs when the environment changes and the adaptive characteristics of a species are insufficient to allow its survival.	Student Book: 44, 45, 46-47, 48
3. The student will compare the structure of fossils to one another and to living organisms.	Student Book: 69-74

F. Flow of Matter and Energy

The student will know that matter and energy flow into, out of, and within a biological system.

Benchmarks, Grade 5	Science Daybook, Grade 5
1. The student will recognize that organisms need energy to stay alive and grow, and that this energy originates from the sun.	Student Book: 131 <i>Also see Life Science Daybook.</i>
2. The student will use food webs to describe the relationships among producers, consumers, and decomposers in an ecosystem in Minnesota.	No specific chapter addresses this benchmark. <i>(See Life Science Daybook.)</i>
3. The student will recognize that organisms are growing, dying and decaying, and that their matter is recycled.	No specific chapter addresses this benchmark. <i>(See Earth Science Daybook.)</i>



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correlated to
Minnesota Academic Standards for Science
Grade 6**

I. HISTORY AND NATURE OF SCIENCE

A. Scientific World View

The student will understand that science is a way of knowing about the world that is characterized by empirical criteria, logical argument and skeptical review.

Benchmarks, Grade 6	Science Daybooks, Grades 6-8
<p>1. The student will distinguish between scientific evidence and personal opinion.</p>	<p>Earth Science Student Book: 15, 19, 23, 27, 33, 37, 47, 55, 59, 61, 65, 75, 78-79, 85, 99, 103, 105, 109, 120-121, 123, 129, 132-133, 140-141, 145, 149, 153, 163, 165, 174-175, 181, 183, 187, 191, 195, 197, 201, 207</p> <p>Life Science Student Book: 12-13, 22-23, 26-27, 32, 36-37, 39, 43, 47, 49, 57, 60-61, 63, 67, 71, 75, 78-79, 85, 96-97, 101, 103, 106-107, 109, 117, 121, 123, 132-133, 139, 141, 144-145, 148-149, 153, 155, 161, 169, 181, 185, 187, 191, 194-195, 197, 204-205, 211, 216-217</p> <p>Physical Science Student Book: 16-17, 18-19, 23, 29, 35, 49, 55, 59, 61, 65, 71, 77, 81, 91, 97, 101, 107, 111, 113, 119, 123, 127, 133, 137, 141, 148-149, 150-151, 156-157, 161, 165, 167, 171, 175, 181, 184-185, 190-191, 195, 197, 206-207, 211, 215, 217</p>
<p>2. The student will explain why scientists often repeat investigations to be sure of the results.</p>	<p>Earth Science Student Book: 23, 26-27, 46, 88, 129, 174-175</p> <p>Life Science Student Book: 78-79, 136-139, 190-191</p> <p>Physical Science Student Book: 49, 141, 208, 209, 210, 211</p>

Benchmarks, Grade 6	Science Daybooks, Grades 6-8
<p>3. The student will recognize that scientists assume that the laws of nature are the same everywhere and that they are understandable and predictable.</p>	<p>Earth Science Student Book: 20-29, 62-65, 70-71, 72-79, 82-91, 94-95, 104-105, 136-137, 146-149</p> <p>Life Science Student Book: 10-49, 52-81, 94-133, 136-175, 178-207</p> <p>Physical Science Student Book: 10-29, 52-61, 72-77, 94-133, 136-175, 178-217</p>
<p>4. The student will define scientific facts, laws and theories.</p>	<p>Earth Science Student Book: 20-29, 62-65, 70-71, 72-79, 82-91, 94-95, 104-105, 136-137, 146-149</p> <p>Life Science Student Book: 10-49, 52-81, 94-133, 136-175, 178-207</p> <p>Physical Science Student Book: 10-49, 52-61, 72-77, 94-133, 136-175, 178-217, 224</p>

B . S c i e n t i f i c I n q u i r y

The student will understand that scientific inquiry is used in systematic ways to investigate the natural world.

Benchmarks, Grade 6	Science Daybooks, Grades 6-8
<p>1. The student will identify questions that can be answered through scientific investigation and those that cannot.</p>	<p>Earth Science Student Book: 27, 175</p> <p>Life Science Student Book: 139</p> <p>Physical Science Student Book: 49, 138, 141, 187, 198-199</p>
<p>2. The student will distinguish among observation, prediction and inference.</p>	<p>Earth Science Student Book: 15, 19, 23, 27, 29, 33, 37, 39, 47, 55, 59, 61, 65, 75, 78-79, 85, 95, 99, 103, 105, 109, 120-121, 123, 129, 132-133, 140-141, 145, 149, 153, 163, 165, 174-175, 181, 183, 187, 191, 195, 197, 201, 207</p> <p>Life Science Student Book: 12-13, 22-23, 26-27, 32, 36-37, 39, 43, 47, 49, 57, 60-61, 63, 67, 71, 75, 78-79, 85, 96-97, 101, 103, 106-107, 109, 117, 121, 123, 132-133, 139, 141, 144-145, 148-149, 153, 155, 161, 169, 181, 185, 187, 191, 194-195, 197, 204-205, 211, 216-217</p> <p>Physical Science Student Book: 17, 18-19, 23, 29, 35, 49, 55, 59, 61, 65, 71, 77, 81, 91, 97, 101, 107, 111, 113, 119, 123, 127, 133, 137, 141, 148-149, 150-151, 156-157, 161, 165, 167, 171, 175, 181, 184-185, 190-191, 195, 197, 206-207, 211, 215, 217</p>

Benchmarks, Grade 6	Science Daybooks, Grades 6-8
3. The student will use appropriate tools and Système International (SI) units for measuring length, time, mass, volume and temperature with suitable precision and accuracy.	<p>Earth Science Student Book: 29, 120-121</p> <p>Life Science Student Book: 144-145, 216-217</p> <p>Physical Science Student Book: 18-19, 81, 119, 133, 148, 150-151, 156-157, 184, 190, 197, 206, 207</p>
4. The student will present and explain data and findings from controlled experiments using multiple representations including tables, graphs, physical models and demonstrations.	<p>Earth Science Student Book: 27, 29, 84, 95, 103, 105, 120-121, 127, 175</p> <p>Life Science Student Book: 12-13, 36-37, 78-79, 141, 144-145, 148-149</p> <p>Physical Science Student Book: 18-19, 29, 55, 81, 107, 119, 133, 136-137, 148-149, 150-151, 156-157, 161, 184-185, 190-191, 197, 206-207, 217</p>

C . S c i e n t i f i c E n t e r p r i s e

The student will know that science and technology are human efforts that both influence and are influenced by society.

Benchmarks, Grade 6	Science Daybooks, Grades 6-8
1. The student will describe the types of questions asked, the products, and the methods of investigation used to distinguish science from technology.	<p>Earth Science Student Book: 16, 77, 80, 110-113, 184-187, 202-211, 214-217</p> <p>Life Science Student Book: 18-19, 44-47, 76-79, 166-169, 172-175, 212-213</p> <p>Physical Science Student Book: 30-49, 68-71, 82-91, 223</p>
2. The student will explain why scientists may work in teams or work alone, can collaborate and, at times, compete.	<p>Earth Science Student Book: 13, 40-49, 72-81, 96-99, 101, 122-123, 128-129, 136-141, 146-149, 188-191, 202-203, 205</p> <p>Life Science Student Book: 8, 54-57, 83-84, 137, 138, 166-169, 186-199, 202-205</p> <p>Physical Science Student Book: 30-33, 34, 36-38, 46, 63-71, 211</p>

II. PHYSICAL SCIENCE

A. Structure of Matter

The student will understand that matter is made of small particles and this explains the properties of matter.

Benchmarks, Grade 6	Science Daybooks, Grades 6-8
1. The student will know that there are more than 100 different elements with unique properties.	Physical Science Student Book: 166-175
2. The student will use evidence to explain that matter is made of small particles called atoms or molecules which are too small to see.	Physical Science Student Book: 136-145
3. The student will know that the mass of a substance remains constant whether it is together, in parts or in a different state.	Physical Science Student Book: 174 Also see <i>ScienceSaurus</i> .
4. The student will describe the states of matter in terms of the space between particles.	Physical Science Student Book: 146-155
5. The student will distinguish between volume, mass and density.	Earth Science Student Book: 87, 118, 196-197, 219, 224 Life Science Student Book: 106, 222 Physical Science Student Book: 24-26, 124-125, 140, 174, 221, 224
6. The student will use the characteristic properties of density, melting point, boiling point and solubility to identify and distinguish mixtures and pure substances.	Physical Science Student Book: 128-129, 146-165
7. The student will know that atoms are the smallest unit of an element that maintains the characteristics of the element.	Physical Science Student Book: 136-145

B . C h e m i c a l R e a c t i o n s

The student will differentiate between chemical and physical changes.

Benchmarks, Grade 6	Science Daybooks, Grades 6-8
1. The student will define chemical and physical changes.	Physical Science Student Book: 146-165, 178-217
2. The student will observe that substances react chemically with other substances to form new substances with different characteristic properties.	Physical Science Student Book: 156-165, 176, 178-217
3. The student will give examples and classify substances as mixtures or pure substances.	Physical Science Student Book: 156-165

C . E n e r g y T r a n s f o r m a t i o n s

The student will understand that energy exists in many forms and can be transferred in many ways.

Benchmarks, Grade 6	Science Daybooks, Grades 6-8
1. The student will compare and contrast heat, chemical, mechanical and electrical energy and identify transformations of energy from one form to another in everyday situations.	Earth Science Student Book: 34-37, 206-207, 219 Life Science Student Book: 22, 25 Physical Science Student Book: 50-133, 146-155, 198-207
2. The student will recognize that heat is transferred by convection, conduction and radiation from warmer objects to cooler ones until both reach the same temperature.	Earth Science Student Book: 34 Physical Science Student Book: 124-133
3. The student will demonstrate that visible light from the sun or reflected by objects may be made up of a mixture of many different colors of light.	Physical Science Student Book: 116-119
4. The student will recognize the relationship between light and heat.	Physical Science Student Book: 98-101
5. The student will describe waves in terms of speed, frequency and wave length.	Earth Science Student Book: 13, 224 Physical Science Student Book: 97, 100, 103, 108, 110, 113

Benchmarks, Grade 6	Science Daybooks, Grades 6-8
6. The student will recognize that vibrations such as sound and earthquakes move in waves and that waves move at different speeds in different materials.	Earth Science Student Book: 219 Physical Science Student Book: 104-113

D . M o t i o n

The student will describe the motion of objects.

Benchmarks, Grade 6	Science Daybooks, Grades 6-8
1. The student will use a frame of reference to describe the position, speed, and acceleration of an object.	Physical Science Student Book: 10-27
2. The student will measure and graph the positions and speed of an object.	No specific lesson addresses this benchmark.
3. The student will recognize that unbalanced forces acting on an object change the object's speed and/or direction.	Physical Science Student Book: 12-13, 20-27

E . F o r c e s o f N a t u r e

The student will understand that a variety of forces govern the structure and motion of objects in the universe.

Benchmarks, Grade 6	Science Daybooks, Grades 6-8
1. The student will know that electric currents and magnets can exert a force on certain objects and each other.	Physical Science Student Book: 52-59, 72-81
2. The student will know that there are positive and negative charges and that like charges repel one another and opposite charges attract.	Life Science Student Book: 42 Physical Science Student Book: 52-59



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Minnesota Academic Standards for Science
Grade 7**

I. HISTORY AND NATURE OF SCIENCE

A. Scientific World View

The student will understand that science is a way of knowing about the world that is characterized by empirical criteria, logical argument and skeptical review.

Benchmarks, Grade 7	Science Daybooks, Grades 6-8
<p>1. The student will recognize how scientific knowledge is subject to change as new evidence becomes available, or as new theories cause scientists to look at old observations differently.</p>	<p>Earth Science Student Book: 24-27, 72-81, 129, 172-175, 188-191</p> <p>Life Science Student Book: 86-89, 136-139</p> <p>Physical Science Student Book: 68-71</p>
<p>2. The student will explain natural phenomena by using appropriate physical, conceptual and mathematical models.</p>	<p>Earth Science Student Book: 20-29, 62-65, 70-71, 72-79, 82-91, 94-95, 104-105, 136-137, 146-149</p> <p>Life Science Student Book: 10-49, 52-81, 94-133, 136-175, 178-207</p> <p>Physical Science Student Book: 10-29, 52-61, 72-77, 94-133, 136-175, 178-217</p>

B . S c i e n t i f i c I n q u i r y

The student will design and conduct scientific investigations.

Benchmarks, Grade 7	Science Daybooks, Grades 6-8
1. The student will formulate a testable hypothesis based on prior knowledge.	<p>Earth Science Student Book: 27, 72-73, 91, 113, 127, 153, 163, 175, 205</p> <p>Life Science Student Book: 24, 26, 94, 95, 96, 102, 103, 124, 126, 127, 129, 144, 145, 173, 188, 190, 191</p> <p>Physical Science Student Book: 18-19, 76-77, 119, 124, 150-151</p>
2. The student will recognize that a variable is a condition that may influence the outcome of an investigation and know the importance of manipulating one variable at a time.	<p>Earth Science Student Book: 174</p> <p>Life Science Student Book: 132, 133, 138, 158, 188, 191</p>
3. The student will write a specific step-by-step procedure for a scientific investigation.	<p>Earth Science Student Book: 156, 192</p> <p>Life Science Student Book: 104, 158, 202, 208</p> <p>Physical Science Student Book: 84, 136, 142, 182</p>
4. The student will explain how classroom scientific investigations relate to established scientific principles.	<p>Earth Science Student Book: 15, 19, 23, 27, 29, 33, 37, 39, 47, 55, 59, 61, 65, 75, 78-79, 85, 95, 99, 103, 105, 109, 120-121, 123, 129, 132-133, 140-141, 145, 149, 153, 163, 165, 174-175, 181, 183, 187, 191, 195, 197, 201, 207</p> <p>Life Science Student Book: 12-13, 22-23, 26-27, 32, 36-37, 39, 43, 47, 49, 57, 60-61, 63, 67, 71, 75, 78-79, 85, 96-97, 101, 103, 106-107, 109, 117, 121, 123, 132-133, 139, 141, 144-145, 148-149, 153, 155, 161, 169, 181, 185, 187, 191, 194-195, 197, 204-205, 211, 216-217</p> <p>Physical Science Student Book: 17, 18-19, 23, 29, 35, 49, 55, 59, 61, 65, 71, 77, 81, 91, 97, 101, 107, 111, 113, 119, 123, 127, 133, 137, 141, 148-149, 150-151, 156-157, 161, 165, 167, 171, 175, 181, 184-185, 190-191, 195, 197, 206-207, 211, 215, 217</p>

C . S c i e n t i f i c E n t e r p r i s e

The student will know that science and technology are human efforts that both influence, and are influenced by, society.

Benchmarks, Grade 7	Science Daybooks, Grades 6-8
<p>1. The student will give examples of the development of technology influencing scientific knowledge, and investigation and scientific knowledge influencing the development of technology.</p>	<p>Earth Science Student Book: 12-15, 16-19, 34-37, 38-39, 60-61, 66-69, 70-71, 80-81, 96-99, 100-103, 106-109, 110-113, 118-121, 122-123, 130-133, 138-141, 142-145, 146-149, 150-153, 164-165, 184-187, 202-205, 206-207, 208-211, 214-217</p> <p>Life Science Student Book: 18-19, 76-79, 160-169, 172-175, 212-213</p> <p>Physical Science Student Book: 30-33, 36-39, 40-41, 42-45, 46-49, 62-65, 66-67, 68-71, 78-81, 88-91, 102-103, 124, 125, 142-145, 152-155, 158-161, 162-165, 192-195, 200-203, 204-207</p>

D . H i s t o r i c P e r s p e c t i v e s

The student will understand how scientific discovery, culture, societal norms and technology have influenced one another in different time periods.

Benchmarks, Grade 7	Science Daybooks, Grades 6-8
<p>1. The student will cite examples of individuals throughout history who made discoveries and contributions in science and technology.</p>	<p>Earth Science Student Book: 40-43, 44-47, 48-49, 171, 202-205</p> <p>Life Science Student Book: 54-57, 59, 83, 166-169</p> <p>Physical Science Student Book: 88-91, 138-141, 196-197, 209, 212-215</p>
<p>2. The student will cite examples of how culture influences scientific and technological advances.</p>	<p>Earth Science Student Book: 106-109, 110-113, 212-215, 216-217</p> <p>Life Science Student Book: 196-197</p> <p>Physical Science Student Book: 42-45, 46-49, 62-65, 68-71</p>

IV. LIFE SCIENCE

A. Cells

The student will understand that all organisms are composed of cells that carry on the many functions needed to sustain life.

Benchmarks, Grade 7	Science Daybooks, Grades 6-8
1. The student will know that cells are the fundamental units of life.	Life Science Student Book: 10-29
2. The student will distinguish between single-cellular and multi-cellular organisms.	Life Science Student Book: 10, 14-17, 24-27
3. The student will distinguish between plant and animal cells.	Life Science Student Book: 17, 24-27
4. The student will recognize that cells repeatedly divide for growth and repair.	Life Science Student Book: 18-19, 30-37, 218
5. The student will recognize that cells convert energy from food for the production of molecules necessary for life, and for life processes including cell growth and cell division.	Life Science Student Book: 20-23, 28-29, 218
6. The student will recognize that specialized cells in multi-cellular organisms perform specialized functions.	Life Science Student Book: 14-17, 24-27

B. Diversity of Organisms

The student will understand that living systems, at every level of organization, demonstrate the complementary nature of structure and function.

Benchmarks, Grade 7	Science Daybooks, Grades 6-8
1. The student will explain that individuals are composed of specialized cells, tissues, organs and organ systems that perform specialized functions.	Life Science Student Book: 14-17, 24-27, 40-49, 136-165
2. The student will recognize that an organism's body plan and its ability to regulate its internal environment enable it to make or find food, grow and reproduce in a constantly changing environment.	Life Science Student Book: 20-23, 28-35, 54-71, 146-149, 182-205

Benchmarks, Grade 7	Science Daybooks, Grades 6-8
3. The student will recognize that behavioral responses of organisms may be determined by heredity and past experience.	Life Science Student Book: 68-81, 104-133, 182-185, 198-205
4. The student will use and create dichotomous keys.	Life Science Student Book: 90-91
5. The student will use the characteristics of an organism to identify the kingdom to which it belongs.	Life Science Student Book: 82-85

C . I n t e r d e p e n d e n c e o f L i f e

The student will understand that within ecosystems, complex interactions exist between organisms and the physical environment.

Benchmarks, Grade 7	Science Daybooks, Grades 6-8
1. The student will provide examples of the potentially irreversible effects of human activity on ecosystems.	Earth Science Student Book: 112-115, 170-175 Life Science Student Book: 196-197, 206-217
2. The student will define a population as all individuals of a species that exist together at a given place and time.	Life Science Student Book: 178, 180-181, 182, 184, 185, 223
3. The student will define an ecosystem as all populations living together and the physical factors with which they interact.	Life Science Student Book: 176-207
4. The student will explain the factors that affect the number and types of organisms an ecosystem can support, including available resources, abiotic and biotic factors and disease.	Life Science Student Book: 186-197

D . H e r e d i t y

The student will understand that heredity information is contained in genes which are inherited through both sexual and asexual reproduction.

Benchmarks, Grade 7	Science Daybooks, Grades 6-8
1. The student will recognize that inherited traits result from information contained in genes, which are located on chromosomes of each cell.	Life Science Student Book: 54-71 Physical Science Student Book: 181
2. The student will recognize that each gene carries a single unit of information and can influence more than one trait.	Life Science Student Book: 52-63
3. The student will explain how inherited traits can be determined by one or many genes.	Life Science Student Book: 62-63 Physical Science Student Book: 181
4. The student will comprehend that interactions with the environment affect some inherited traits.	Life Science Student Book: 68-81
5. The student will comprehend that reproduction is essential for the continuation of a species.	Life Science Student Book: 30-33, 35
6. The student will compare and contrast the advantages and disadvantages of sexual and asexual reproduction.	Life Science Student Book: 18-19, 35

E . B i o l o g i c a l P o p u l a t i o n s C h a n g e O v e r T i m e

The student will understand how biological evolution provides a scientific explanation for the fossil record of ancient life forms, as well as for the striking similarities observed among the diverse species of living organisms.

Benchmarks, Grade 7	Science Daybooks, Grades 6-8
1. The student will recognize extinction is a common event.	Earth Science Student Book: 24-25, 112, 219 Life Science Student Book: 202-205, 214-217
2. The student will describe how the fossil record documents the appearance and diversification of many life forms.	Earth Science Student Book: 40-42, 44-45, 47, 48-49, 220 Life Science Student Book: 200, 220

Benchmarks, Grade 7	Science Daybooks, Grades 6-8
3. The student will explain how biological adaptations in structure, function and behavior enhance the reproductive success and survival of a species in a particular environment.	Life Science Student Book: 68-81, 104-133, 182-185, 198-205
4. The student will recognize that scientific evidence can be used to infer common ancestry among some organisms.	Earth Science Student Book: 47 Physical Science Student Book: 198-199
5. The student will explain how diversity of species develops through gradual processes over generations.	Life Science Student Book: 54-61, 72-91, 94-102, 104-113, 124-133, 178, 181-185, 192-195, 198-205, 214-218

F . F l o w o f M a t t e r a n d E n e r g y

The student will understand how the flow of energy and the recycling of matter contribute to a stable ecosystem.

Benchmarks, Grade 7	Science Daybooks, Grades 6-8
1. The student will know that plants use the energy in light to make sugars out of carbon dioxide and water.	Life Science Student Book: 24-29
2. The student will explain how energy is transferred through food chains and food webs in an ecosystem.	Life Science Student Book: 182, 188-191, 192, 196, 220
3. The student will explain how the amount of useable energy available to organisms decreases as it passes through a food chain and/or food web.	Life Science Student Book: 188-191, 192, 196
4. The student will know that the total amount of matter in a closed system remains the same as it is transferred between organisms and the physical environment even though its location or form changes.	Life Science Student Book: 182, 188-191, 192, 196, 220
5. The student will compare and contrast predator/prey, parasite/host and producer/consumer/decomposer relationships.	Life Science Student Book: 98-101, 118-121, 188-191, 223

G . H u m a n O r g a n i s m

The student will understand human body systems and their relationship to disease.

Benchmarks, Grade 7	Science Daybooks, Grades 6-8
1. The student will recognize that disease can be caused by genetics, infection by other organisms, exposure to environmental factors or a combination of these.	Earth Science Student Book: 113, 114-115, 170-175 Life Science Student Book: 38-39, 94-101, 166-175
2. The student will identify risks associated with natural, chemical and biological hazards.	Earth Science Student Book: 170-175 Life Science Student Book: 94-101, 166-175, 208-211
3. The student will describe the structure and function of systems for digestion, respiration, reproduction, circulation, excretion, movement, control and coordination and for protection from disease, in the human organism.	Life Science Student Book: 30-33, 35, 44-49, 94-97, 136-175



**Earth Science Daybook © 2002,
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correlated to
Minnesota Academic Standards for Science
Grade 8**

I. HISTORY AND NATURE OF SCIENCE

A. Scientific World View

The student will understand that science is a way of knowing about the world that is characterized by empirical criteria, logical argument and skeptical review.

Benchmarks, Grade 8	Science Daybooks, Grades 6-8
1. The student will explain and give examples of how science can be used to make informed ethical decisions by identifying likely consequences of particular actions.	<p>Earth Science Student Book: 129, 174-175</p> <p>Life Science Student Book: 136-139, 190-191</p> <p>Physical Science Student Book: 49, 141, 208-211</p>
2. The student will explain the development, usefulness and limitations of scientific models in the explanation and prediction of natural phenomena.	<p>Earth Science Student Book: 10, 11, 12, 84-85, 95, 103, 105, 120, 137</p> <p>Life Science Student Book: 13, 32, 36-37, 78-79, 100, 104-107, 148-149, 188</p> <p>Physical Science Student Book: 18-19, 29, 34, 35, 107, 136-137, 138-141, 150-151</p>

B . S c i e n t i f i c I n q u i r y

The student will understand that scientific inquiry is used by scientists to investigate the natural world in systematic ways.

Benchmarks, Grade 8	Science Daybooks, Grades 6-8
1. The student will know that scientific investigations involve the common elements of systematic observations, the careful collection of relevant evidence, logical reasoning and innovation in developing hypotheses and explanations.	<p>Earth Science Student Book: 116-117, 139, 140-141, 149, 152, 162, 168, 181, 196-197, 200</p> <p>Life Science Student Book: 167</p> <p>Physical Science Student Book: 18-19, 150-151, 206-207</p>
2. The student will describe how scientists can conduct investigations in a simple system and make generalizations to more complex systems.	<p>Earth Science Student Book: 84-85, 103, 120-121</p> <p>Life Science Student Book: 36-37, 42, 46, 193-195</p> <p>Physical Science Student Book: 18-19, 29, 30-39, 42-45, 55, 63, 64, 68-71, 77, 81, 84, 88-91, 112-113, 136-137, 140-141, 148-149, 208-217</p>

B . S c i e n t i f i c I n q u i r y

The student will use multiple skills to design and conduct scientific investigations.

Benchmarks, Grade 8	Science Daybooks, Grades 6-8
1. The student will specify variables to be changed, controlled and measured.	<p>Earth Science Student Book: 174</p> <p>Life Science Student Book: 132, 133, 138, 158, 188, 191</p>
2. The student will use sufficient trials and adequate sample size to ensure reliable data.	<p>Earth Science Student Book: 174</p> <p>Life Science Student Book: 193-195 Also see <i>ScienceSaurus</i>.</p>
3. The student will use appropriate technology and mathematics skills to access, gather, store, retrieve and organize data.	<p>Earth Science Student Book: 10, 11, 12, 84-85, 95, 103, 105, 116-117, 120, 137, 139, 140-141, 149, 152, 162, 168, 181, 196-197, 200</p> <p>Life Science Student Book: 13, 32, 36-37, 78-79, 100, 104-107, 148-149, 167, 188</p> <p>Physical Science Student Book: 18-19, 29, 34, 35, 107, 136-137, 138-141, 150-151, 206-207</p>

C . S c i e n t i f i c E n t e r p r i s e

The student will know that science and technology are human efforts that both influence and are influenced by civilizations and cultures worldwide.

Benchmarks, Grade 8	Science Daybooks, Grades 6-8
1. The student will evaluate the credibility and validity of scientific and technological information from various sources.	<p>Earth Science Student Book: 12, 20-21, 59, 101, 133, 193</p> <p>Life Science Student Book: 21, 110, 113</p> <p>Physical Science Student Book: 33, 38, 62-71, 138-141, 146-149</p>

D . H i s t o r i c P e r s p e c t i v e

The student will understand how scientific discovery, culture, societal norms and technology have influenced one another in different time periods.

Benchmarks, Grade 8	Science Daybooks, Grades 6-8
1. The student will relate personal experiences in scientific investigation to the experiences of scientists throughout history.	<p>Earth Science Student Book: 12, 16, 29, 44, 84-85, 100, 102, 103, 120-121, 128, 130, 145, 149, 150, 192, 196-197, 202, 217</p> <p>Life Science Student Book: 82, 104, 148-149</p> <p>Physical Science Student Book: 10, 13, 35, 65, 68, 74, 78, 81, 85, 94, 104, 107, 124, 133, 137, 138, 142, 161, 165, 197, 206-207</p>
2. The student will cite examples of how science and technology contributed to changes in agriculture, manufacturing, sanitation, medicine, warfare, transportation, information processing or communication.	<p>Earth Science Student Book: 106-113</p> <p>Life Science Student Book: 196-197</p> <p>Physical Science Student Book: 46-49, 62-65</p>

III. EARTH AND SPACE SCIENCE

A. Earth Structure and Processes

The student will identify Earth's composition, structure and processes.

Benchmarks, Grade 8	Science Daybooks, Grades 6-8
1. The student will explain how earthquakes, volcanoes, sea-floor spreading and mountain building are evidence of the movement of crustal plates.	Earth Science Student Book: 76-79, 82-89
2. The student will describe how features on the Earth's surface are created and constantly changing through a combination of slow and rapid processes of weathering, erosion, sediment deposition, landslides, volcanic eruptions and earthquakes.	Earth Science Student Book: 20-23, 62-65, 70-71, 82-89, 219, 224
3. The student will describe the various processes and interactions of the rock cycle.	Earth Science Student Book: 20-29
4. The student will interpret successive layers of sedimentary rocks and their fossils to document the age and history of the Earth.	Earth Science Student Book: 24-27, 40-49, 72-74
5. The student will recognize that constructive and destructive Earth processes can affect the evidence of Earth's history.	Earth Science Student Book: 20-29, 40-47, 72-74, 89-81
6. The student will classify and identify rocks and minerals using characteristics including but not limited to density, hardness and streak.	Earth Science Student Book: 20-29, 220, 221, 223

A. Earth Structure and Processes

The student will investigate the impact humans have on the environment.

Benchmarks, Grade 8	Science Daybooks, Grades 6-8
1. The student will identify and research an environmental issue and evaluate its impact.	Earth Science Student Book: 112-115, 170-175 Life Science Student Book: 196-197, 206-217

B. The Water Cycle, Weather and Climate

The student will investigate how the atmosphere interacts with the Earth system.

Benchmarks, Grade 8	Science Daybooks, Grades 6-8
1. The student will define radiation, conduction and convection and explain their effects on weather and climate.	Earth Science Student Book: 142-145, 170-175
2. The student will identify the forces that create currents and layers in the Earth's atmosphere and water systems.	Earth Science Student Book: 94-95, 104-113, 122-133, 136-165
3. The student will describe the effect of Earth's rotation on the winds and ocean currents.	No specific lesson addresses this benchmark. (See <i>ScienceSaurus</i> .)
4. The student will collect and use data to predict the weather.	Earth Science Student Book: 146-149, 156-159
5. The student will identify the composition and structures of the atmosphere.	Earth Science Student Book: 136-145
6. The student will describe climate changes that have occurred over time.	Earth Science Student Book: 166-175

C. The Universe

The student will compare objects in the solar system and explain their interactions with the Earth.

Benchmarks, Grade 8	Science Daybooks, Grades 6-8
1. The student will recognize that the sun is the principal energy source for the solar system and that this energy is transferred in the form of radiation.	Earth Science Student Book: 208-211 Life Science Student Book: 24, 28
2. The student will explain how the combination of the Earth's tilted axis and revolution around the sun causes the progression of seasons and weather patterns.	No specific lesson addresses this benchmark. (See <i>ScienceSaurus</i> .)
3. The student will compare and contrast the planets, taking into account their composition, mass and distance from the sun and recognize the conditions that have allowed life to flourish on Earth.	Earth Science Student Book: 188-197

Benchmarks, Grade 8	Science Daybooks, Grades 6-8
4. The student will use the predictability of the motions of the Earth, and sun to explain the length of day, length of year, phases of the moon, eclipses, tides and shadows.	No specific lesson addresses this benchmark. (See <i>ScienceSaurus</i> .)

C . T h e U n i v e r s e

The student will describe the composition and structure of the universe.

Benchmarks, Grade 8	Science Daybooks, Grades 6-8
1. The student will recognize that the universe consists of many billions of galaxies, each containing many billions of stars and that there are vast distances that separate these galaxies and stars from one another.	Earth Science Student Book: 176, 198-211
2. The student will recognize that the sun is a medium-sized star and is the closest star to Earth. It is the central and largest body in the solar system and is one of billions of stars in the Milky Way Galaxy.	Earth Science Student Book: 177 Also see <i>ScienceSaurus</i> .



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