



**MINNESOTA**  
**Academic Standards - Science Grade 7**  
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OBJECTIVES	PAGE REFERENCES
<b>I. HISTORY AND NATURE OF SCIENCE</b>	
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.	
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.	SE: 6-7, 9-11, 19 TWE: TF 10 VL 20, 189 CD 42
2. The student will explain natural phenomena by using appropriate physical, conceptual and mathematical models.	SE: 12 <i>Applying Science 11</i> <i>Integrate Earth Science 21</i> <i>Applying Math 44</i> <i>Lab 584-585</i> <i>Launch Lab 621</i> TWE: IM 12 MM 25 CC 99
B. Scientific Inquiry The student will design and conduct scientific investigations.	
1. The student will formulate a testable hypothesis based on prior knowledge.	SE: <i>Design Your Own Lab 28-29, 612-613, 702-703</i> TWE: TPK 6 QD 8 AIL 28
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.	SE: 9 <i>Design Your Own Lab 29, 144-145, 292-293, 558-559, 612-613</i> TWE: T 787
3. The student will write a specific step-by-step procedure for a scientific investigation.	SE: <i>Design Your Own Lab 28-29, 144-145, 350-351, 702-703</i> TWE: AIL 418
4. The student will explain how classroom scientific investigations relate to established scientific principles.	SE: <i>MiniLAB 9</i> <i>Lab 584</i> TWE: LD 8 IM 12 DI 17

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<b>C. Scientific Enterprise</b> The student will know that science and technology are human efforts that both influence, and are influenced by, society.	
1. The student will give examples of the development of technology influencing scientific knowledge, and investigation and scientific knowledge influencing the development of technology.	SE: 47-51 <i>Launch Lab 37</i> TWE: DI 11, 54 D 19 TC 36
<b>D. Historic Perspectives</b> The student will understand how scientific discovery, culture, societal norms and technology have influenced one another in different time periods.	
1. The student will cite examples of individuals throughout history who made discoveries and contributions in science and technology.	SE: 19, 21, 23-24, 47 TWE: CC 9, 113 CD 10, 42 A 21 TF 24 Act 118
2. The student will cite examples of how culture influences scientific and technological advances.	SE: 199 <i>Integrate Environment 44</i> TWE: Act 11 DI 20, 50 CC 597 TF 654
<b>IV. LIFE SCIENCE</b>	
<b>A. Cells</b> The student will understand that all organisms are composed of cells that carry on the many functions needed to sustain life.	
1. The student will know that cells are the fundamental units of life.	SE: 38, 51, 96-97 TWE: FF 39 D 40
2. The student will distinguish between single-cellular and multicellular organisms.	SE: 39, 45, 187 TWE: TPK 186
3. The student will distinguish between plant and animal cells.	SE: 39, 41, 241 <i>Lab 46</i> TWE: VL 41 A 45, 46 DI 45
4. The student will recognize that cells repeatedly divide for growth and repair.	SE: 96-102, 188 <i>Applying Science 11</i> TWE: CC 99 A 102
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.	SE: 15, 42-43, 77-78, 188 TWE: TF 42

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6. The student will recognize that specialized cells in multi-cellular organisms perform specialized functions.	SE: 40-44, 104-107, 114, 241, 551 <i>Launch Lab 95</i> TWE: UA 41 DI 41
<b>B. Diversity of Organisms</b> The student will understand that living systems, at every level of organization, demonstrate the complementary nature of structure and function.	
1. The student will explain that individuals are composed of specialized cells, tissues, organs and organ systems that perform specialized functions.	SE: 45, 114, 215, 370-371, 400-401, 550-551 TWE: CA 18
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.	SE: 54, 312, 332, 337-338, 360 TWE: CC 16 UA 339
3. The student will recognize that behavioral responses of organisms may be determined by heredity and past experience.	SE: 15, 401, 456-461, 464 TWE: TF 460
4. The student will use and create dichotomous keys.	SE: 25-26 <i>Lab 27</i> TWE: MM 25 Act 26 A 27
5. The student will use the characteristics of an organism to identify the kingdom to which it belongs.	SE: 23, 361-362 <i>Launch Lab 5</i> <i>Lab 27</i> TWE: A 5 IL 23
<b>C. Interdependence of Life</b> The student will understand that within ecosystems, complex interactions exist between organisms and the physical environment.	
1. The student will provide examples of the potentially irreversible effects of human activity on ecosystems.	SE: 721, 778-781 <i>Applying Science 248</i> TWE: CB 30 TQA 697 CA 781 TF 785
2. The student will define a population as all individuals of a species that exist together at a given place and time.	SE: 686 TWE: Act 686 DI 686 IM 686 LD 690
3. The student will define an ecosystem as all populations living together and the physical factors with which they interact.	SE: 685, 721 TWE: TF 685 A 687 DI 713

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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.	SE: 688-691, 695, 712-716 TWE: Act 691 A 703, 718
D. Heredity The student will understand that heredity information is contained in genes which are inherited through both sexual and asexual reproduction.	
1. The student will recognize that inherited traits result from information contained in genes, which are located on chromosomes of each cell.	SE: 100, 112, 158 TWE: TC 94, 124 UA 98 CC 105 Act 146
2. The student will recognize that each gene carries a single unit of information and can influence more than one trait.	SE: 112, 126, 128 TWE: QD 131 D 146
3. The student will explain how inherited traits can be determined by one or many genes.	SE: 134-136 <i>MiniLAB</i> 136 TWE: TF 112 USC 136 IM 147
4. The student will comprehend that interactions with the environment affect some inherited traits.	SE: 114-115, 158-159 <i>Lab</i> 133 TWE: D 106 SJ 114
5. The student will comprehend that reproduction is essential for the continuation of a species.	SE: 154, 243 <i>Integrate Earth Science</i> 363 TWE: D 106
6. The student will compare and contrast the advantages and disadvantages of sexual and asexual reproduction.	SE: 101-102, 104, 223 TWE: LD 100 D 275
E. Biological Populations Change Over Time 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.	
1. The student will recognize extinction is a common event.	SE: 167, 363 TWE: AIL 116 Act 166 TF 171 FF 173
2. The student will describe how the fossil record documents the appearance and diversification of many life forms.	SE: 163-169, 241, 397, 435 TWE: TF 164
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.	SE: 158-159, 401 <i>Lab</i> 162 TWE: TF 168 DI 434

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4. The student will recognize that scientific evidence can be used to infer common ancestry among some organisms.	SE: 163-169, 171, 241 <i>Integrate Earth Science</i> 167 TWE: TF 168 TPK 170
5. The student will explain how diversity of species develops through gradual processes over generations.	SE: 159-161, 167, 172-173 TWE: TC 94 DI 173
F. Flow of Matter and Energy The student will understand how the flow of energy and the recycling of matter contribute to a stable ecosystem.	
1. The student will know that plants use the energy in light to make sugars out of carbon dioxide and water.	SE: 15, 242, 302, 305-307, 726 TWE: TF 728
2. The student will explain how energy is transferred through food chains and food webs in an ecosystem.	SE: 15, 696-697, 727-729 TWE: MM 698 A 729
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.	SE: 726, 729 TWE: DI 727 QD 728 UA 728
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.	SE: 726-728 <i>Lab</i> 730-731 TWE: TF 721, 728 DI 730
5. The student will compare and contrast predator/prey, parasite/host and producer/consumer/decomposer relationships.	SE: 15, 52, 696-700 TWE: TF 55 UA 698 DI 727
G. Human Organism The student will understand human body systems and their relationship to disease.	
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.	SE: 657-658, 666-670 <i>Launch Lab</i> 651 <i>Lab</i> 665 TWE: TF 137 DI 138
2. The student will identify risks associated with natural, chemical and biological hazards.	SE: 657-658, 660-661, 663, 668 TWE: VL 653 TF 662
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.	SE: 18, 484-487, 496-497, 525-529, 654-656 <i>Lab</i> 583 <i>MiniLAB</i> 541 TWE: A 582

## Codes Used for TWE Pages

A	Assessment
Act	Activity
AIL	Alternative Inquiry Lab
CA	Caption Answer
CB	Content Background
CC	Curriculum Connection
CD	Cultural Diversity
D	Discussion
DI	Differentiated Instruction
FF	Fun Fact
IL	Inquiry Lab
IM	Identifying Misconceptions
LD	Lab Demonstration
MM	Make a Model
QD	Quick Demo
SJ	Science Journal
T	Troubleshooting
TC	Theme Connection
TF	Teacher FYI
TPK	Tying to Prior Knowledge
TQA	Text Question Answer
UA	Use an Analogy
USC	Use Science Words
VL	Visual Learning