



**SOUTH DAKOTA**  
**Science Standards Eighth Grade**  
**Science Level Blue © 2005**

STANDARDS	PAGE REFERENCES
<b>EIGHTH GRADE NATURE OF SCIENCE STANDARDS</b>	
<b>STUDENTS WILL:</b>	
1. explain how scientific theory, hypothesis generation, and experimentation are interrelated.	SE: 13-19, 21-23, 408-413, 435 <i>Lab</i> 392-393, 510-511, 540-541 <i>National Geographic</i> 20 <i>Science and Society</i> 172 <i>Science Skill Handbook</i> 727-732
2. analyze the scientific contributions of various men and women within specific fields of science.	SE: 50-51, 182-185, 389, 405-413, 552, 649 <i>Accidents in Science</i> 716 <i>Science and History</i> 426
3. describe how scientific knowledge and processes have evolved and will continue to evolve over time.	SE: 44-48, 52-53, 274-276, 306-307, 319, 336-338, 404-413 <i>Accidents in Science</i> 716 <i>Integrate Physics</i> 340 <i>Science and History</i> 328
4. analyze the limitations of scientific study.	SE: 27, 391, 707 <i>Science and Society</i> 56 TWE: A 412
5. analyze uses of hypotheses in scientific investigations. (example: evaluating relevance of data, determining data to be obtained, and interpreting old and new data, identifying the need for further information)	SE: 21, 50, 408-409, 434 <i>Lab</i> 360-361, 392-393, 510-511, 540-541 <i>National Geographic</i> 51 <i>Science Skill Handbook</i> 727-728
6. understand the limits of accuracy inherent in a particular measuring device or procedure.	SE: <i>Integrate Earth Science</i> 420 <i>Lab</i> 392-393 <i>National Geographic</i> 675 <i>Science and History</i> 114, 328 <i>Science Skill Handbook</i> 729-730 TWE: A 412
7. control variables to test hypotheses by repeated trials, and by identifying sources of experimental error.	SE: 21-23 <i>Lab</i> 82-83, 112-113, 424-425, 570-571 <i>Science Skill Handbook</i> 728-729 TWE: LD 19
8. interpret data to justify predictions or conclusions.	SE: 18-19, 50 <i>Applying Science</i> 101, 192, 372 <i>Lab</i> 454-455, 510-511 <i>National Geographic</i> 51 <i>Science Skill Handbook</i> 732
9. use research methods to investigate practical and/or personal scientific problems and questions.	SE: 9-10 <i>Lab</i> 28-29, 82-83, 454-455, 540-541 <i>Science Skill Handbook</i> 727-732 TWE: A 8 RE 11

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10. select appropriate scientific equipment and technologies for investigations and experiments.	SE: 16-17, 421 <i>Accidents in Science</i> 716 <i>Lab</i> 200-201, 326-327, 379, 392-393, 510-511 <i>National Geographic</i> 675 <i>Science Skill Handbook</i> 729-731
11. use proper safety procedures in all investigations.	SE: 22, 653-654 <i>Integrate Health</i> 703 <i>Lab</i> 379, 454-455, 510-511, 655 <i>Science Skill Handbook</i> 734-735
<b>EIGHTH GRADE PHYSICAL SCIENCE STANDARDS</b>	
1. analyze the characteristics of types of matter based on physical and chemical properties. (example: elements, compounds, mixtures, acids, bases, salts, organic, inorganic, solids, liquids, and gases)	SE: 434-437, 441-446, 448-450 <i>Applying Science</i> 439, 469 <i>Lab</i> 453, 454-455, 481 <i>National Geographic</i> 478 <i>Science and History</i> 512
2. describe the relationship between the organization and the predictive nature of the periodic table.	SE: 434-438, 441-452, 466-469, 472-480 <i>Applying Science</i> 439 <i>Lab</i> 481, 482-483 TWE: TC 432
3. investigate various models of atomic structure including Lewis, Bohr and electron-cloud (quantum) models.	SE: 404-413, 464-467, 470-471 <i>Lab</i> 481, 482-483
4. classify types of elements using atomic electron configuration.	SE: 438, 441-446, 448-450, 464-469, 472-475 TWE: SJ 437
5. create equations which describe chemical reactions.	SE: 472-476, 479-480, 494-497, 501 <i>Applying Math</i> 498 TWE: DI 500
6. observe and describe factors that affect the rates of reactions. (example: temperature, nature of reactants, catalysts, and surface area)	SE: 504-508 <i>Lab</i> 510-511 TWE: DI 500 TPK 502
7. relate the Law of Conservation of Matter and Energy to atomic theory.	SE: 496-497 <i>Applying Math</i> 498 TWE: FYI 138, 535
8. explain how Newton's laws of motion apply to the way the world works. (example: inertia, acceleration, gravitation, and action/reaction)	SE: 533-538, 550-553, 556-560, 563-568 <i>Lab</i> 539, 540-541, 569, 570-571 <i>Science and Society</i> 572 TWE: CU 562
9. relate change of speed and direction to unbalanced forces acting on an object.	SE: 550-552, 556-562, 568 <i>Integrate Life Science</i> 564 <i>Lab</i> 569, 570-571 <i>National Geographic</i> 565
10. relate force to pressure in fluids.	SE: <i>National Geographic</i> 621 TWE: DIF 620
11. relate variables to the speed of sound waves. (example: wavelength, frequency, density and state of medium)	SE: 702 <i>Lab</i> 706 TWE: DI 704

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12. investigate and understand states and forms of energy using temperature scales and heat transfer.	SE: 609-610, 612-616, 619 <i>Integrate Life Science</i> 617 <i>Lab</i> 326-327, 510-511, 618, 624-625 TWE: TC 606
13. describe states and forms of energy. (example: mechanical, chemical, electrical)	SE: 76, 375, 381-382, 465-466, 498-501, 611, 619, 652-653 <i>Lab</i> 510-511
14. describe ways energy is transferred by means of heat flow, light, and sound.	SE: 612-616, 622-623, 652-653, 701-702, 707-710 TWE: TC 606
15. differentiate among reflection, refraction, and diffraction of water, light, and sound waves.	SE: 699-700, 705 <i>Lab</i> 714-715
<b>EIGHTH GRADE LIFE SCIENCE STANDARDS</b>	
1. relate structures and functions of cells, tissues, organs, and body systems to each other.	SE: 64-67, 70-71, 73-81 <i>Lab</i> 72, 82-83 <i>Launch Lab</i> 63 <i>National Geographic</i> 69 <i>Science Stats</i> 84 TWE: TC 62
2. model the process of cell division and reproduction. (example: mitosis and meiosis)	SE: 39, 46
3. analyze the workings of the immune system as it protects the human body from foreign organisms. (example: viruses, bacteria, fungi)	See Glencoe's <i>Science Level Green</i> © 2005 SE: 377-380
4. compare the complexity of human systems to those of other organisms. (example: frogs, earthworms)	SE: <i>Lab</i> 72 TWE: CB 84 QD 78 VL 70
5. describe structure and function of the human immune system.	See Glencoe's <i>Science Level Green</i> © 2005 SE: 377-380
6. investigate the lineage of organisms for traits and features. (example: family genealogy, bloodline of a registered pet)	SE: 38-39, 45-46 <i>Applying Math</i> 47 <i>Launch Lab</i> 37 <i>National Geographic</i> 51 TWE: AS 48 TPK 44 UW 41
7. investigate the role of probability in the study of heredity.	SE: 45, 47-48
8. investigate the role of DNA in the transmission of traits and characteristics in organisms.	SE: 38-39, 67 TWE: DI 40
9. recognize the impact of selective breeding, natural selection, genetic defects, and environmental adaptations on the development and survival of species.	SE: 40-42, 49-52 <i>Lab</i> 43, 54-55 TWE: AS 48 FYI 53 IL 47 TPK 38

<b>STANDARDS</b>	<b>PAGE REFERENCES</b>
10. investigate how organisms adapt to biotic and abiotic factors in a biome.	SE: 40-42, 49-50, 109, 125, 160-161 <i>Lab</i> 43, 54-55 <i>National Geographic</i> 51 TWE: DI 167 VL 168
11. describe the physical and chemical processes of photosynthesis and its importance to plant and animal life.	SE: 106, 124, 135, 136 TWE: DI 500
12. describe interactions that exist among members of a biological population. (example: competition, cooperation, social hierarchy, territorial imperative)	SE: 98-101, 106-110, 137-139 <i>Applying Science</i> 101 <i>Lab</i> 112-113
13. describe ways in which organisms within an ecosystem are dependent on one another and on nonliving components of the environment. (example: energy flow in food chains, food webs, and food pyramids)	SE: 136-139, 150-153, 155-158, 160-161, 163-165, 168-169 <i>Lab</i> 162
14. analyze the relationships among ecosystem dynamics and human activity. (example: change in habitat size, quality, structure)	SE: 135, 159, 164-165, 167 <i>Integrate Life Science</i> 617 <i>National Geographic</i> 134 <i>Science and Society</i> 172, 658 TWE: CC 151 FF 160 FYI 157
15. investigate the complex relationships in terrestrial and freshwater ecosystems to predict changes within the systems.	SE: 122-128, 138-139, 150-153, 158-159, 161, 163-165 <i>Lab</i> 162, 170-171 TWE: TC 148 TPK 154
<b>EIGHTH GRADE EARTH/SPACE SCIENCE STANDARDS</b>	
1. analyze the role of plate tectonics in shaping Earth.	SE: 182-185, 190-192, 194-197, 226-231 <i>Lab</i> 200-201, 232-233 <i>National Geographic</i> 193 TWE: TC 180
2. investigate and understand that many aspects of Earth's history can be inferred by studying rocks and fossils.	SE: 242-249, 250-255, 257-261, 277-279, 280-286, 288-293 <i>Lab</i> 256, 262-263, 294-295 TWE: TC 240
3. analyze the effects of density differences and energy transfer on the activities of the atmosphere, oceans, and Earth's interior.	SE: 125-127, 186-188, 195, 212-214, 226-231 <i>Lab</i> 189 <i>National Geographic</i> 216 TWE: TC 180
4. analyze how energy transfer between the sun, Earth, and Earth's atmosphere drives weather and climate on Earth.	SE: 125-127, 309-310 <i>Lab</i> 326-327 TWE: DI 376
5. predict the potential impact of human activities on long-range changes in surface and climate of Earth. (example: rain forest, clear cutting, El Nino)	SE: 135, 159, 165 <i>Integrate Life Science</i> 617 <i>National Geographic</i> 134 <i>Science and Society</i> 172 TWE: CC 151

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6. investigate theories related to the origin and evolution of the solar system, a galaxy, and the universe.	SE: 338, 380-384, 388, 391 <i>National Geographic</i> 339, 390 TWE: RE 340
7. describe the origin of stars and of stellar systems.	SE: 380-384, 386-389, 391 TWE: RE 385
8. describe the components of the universe.	SE: 370-374, 378, 380-384, 386-389, 391 <i>Science Stats</i> 394-395 TWE: TC 368
9. relate the discovery of the speed of light to how distance is measured in the universe.	SE: 373, 707 <i>Lab</i> 392-393 <i>MiniLab</i> 388
10. investigate apparent relationships among various components of the universe.	SE: 306-311, 312-319, 322-325, 336-337, 370-371, 386-391 <i>Integrate Physics</i> 340 <i>Lab</i> 321, 326-327, 341
<b>EIGHTH GRADE SCIENCE, TECHNOLOGY, ENVIRONMENT, AND SOCIETY STANDARDS</b>	
1. analyze science issues. (example: cloning, aging, farming, mining, timber)	SE: 345-346 <i>Lab</i> 540-541 <i>National Geographic</i> 51, 390, 518-519 <i>Science and History</i> 234 <i>Science and Society</i> 172, 658 TWE: DI 352 FYI 354
2. explain how science helps drive research and provides knowledge for better understanding.	SE: 21-23, 25-27, 198-199 <i>Lab</i> 200-201, 454-455 <i>National Geographic</i> 51, 451, 712 <i>Science and History</i> 512 <i>Science and Society</i> 572
3. determine how cultural backgrounds and beliefs of different groups can affect scientific thinking.	SE: 26, 50-51, 182-185 <i>Integrate Physics</i> 340 <i>Science and History</i> 426 <i>Science and Society</i> 56 TWE: CD 10 FYI 7
4. analyze how society and need can affect the direction taken by science.	SE: 24-25, 217-218 <i>Accidents in Science</i> 716 <i>Integrate History</i> 681 <i>Lab</i> 200-201, 454-455 <i>Science and History</i> 512 <i>Science and Society</i> 172, 572 TWE: CD 644 SJ 680
5. analyze scientific advancements that have had an impact on the environment.	SE: 135, 423, 507 <i>Integrate Career</i> 165 <i>Integrate Environment</i> 420 <i>Integrate Life Science</i> 617 <i>Lab</i> 454-455 <i>National Geographic</i> 90-91 <i>Science and Society</i> 172

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6. analyze the importance of public access to scientific discoveries.	SE: 159, 358-359, 420 <i>Integrate History</i> 75 <i>National Geographic</i> 422 <i>Science and History</i> 234 <i>Science and Society</i> 572 TWE: FYI 78
7. explain the importance of testing technology and products of technology in a controlled setting before submission to the general public.	SE: <i>Integrate Environment</i> 15, 420 <i>Integrate Health</i> 703 <i>Integrate Life Science</i> 423, 617 <i>Integrate Social Studies</i> 7 <i>Lab</i> 12 <i>Science and Society</i> 572 TWE: DI 25
8. analyze the possible consequences of various alternative decisions for technological-related issues.	SE: <i>Lab</i> 454-455 <i>National Geographic</i> 712 <i>Science and History</i> 114 <i>Science and Society</i> 572, 658 TWE: DI 198, 217
9. investigate and discuss public policy decisions relating to the environment.	SE: 420, 423 <i>Integrate Life Science</i> 617 <i>Lab</i> 454-455 <i>National Geographic</i> 90-91, 518-519 <i>Science and Society</i> 172, 658 TWE: DI 151 DI 152 FYI 157

### Codes Used for TWE Pages

A	Activity
AS	Assessment
CB	Content Background
CC	Curriculum Connection
CD	Cultural Diversity
CU	Check for Understanding
DI	Discussion
DIF	Differentiated Instruction
EX	Extension
FF	Fun Fact
FYI	Teacher FYI
IL	Inquiry Lab
LD	Lab Demonstration
QD	Quick Demo
RE	Reteach
SJ	Science Journal
TC	Theme Connection
TPK	Tie to Prior Knowledge
UW	Use Science Words
VL	Visual Learning