



MINNESOTA
Academic Standards – Science Grade 8
Earth Science © 2005

OBJECTIVES	PAGE REFERENCES
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.	
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.	SE: 20-22 <i>Integrate Career</i> 20 <i>Applying Science</i> 21 <i>Science and Society</i> 112, 476, 592 TWE: TFYI 20 SJ 20
2. The student will explain the development, usefulness and limitations of scientific models in the explanation and prediction of natural phenomena.	SE: 15-22, 36 <i>Launch Lab</i> 209 <i>MiniLAB</i> 318 <i>Lab</i> 382-383, 474-475, 548 TWE: ACT 244 QD 348
B. Scientific Inquiry The student will understand that scientific inquiry is used by scientists to investigate the natural world in systematic ways.	
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.	SE: 6-14, 15-22, 272-275, 276-278, 280-289, 394-399 TWE: VL 8 IM 8 CC 21 D 273
2. The student will describe how scientists can conduct investigations in a simple system and make generalizations to more complex systems.	SE: 6-7, 15-22, 93, 272-275, 310-311, 380, 394-396 TWE: LD 8
The student will use multiple skills to design and conduct scientific investigations.	
1. The student will specify variables to be changed, controlled and measured.	SE: 10, 29 #24 <i>Integrate Life Science</i> 10 <i>MiniLAB</i> 11 <i>Lab</i> 52-53, 200-201, 228-229, 260-261, 350-351 TWE: QD 10
2. The student will use sufficient trials and adequate sample size to ensure reliable data.	SE: 11 <i>Lab</i> 24-25, 52-53, 350-351 TWE: CC 11
3. The student will use appropriate technology and mathematics skills to access, gather, store, retrieve and organize data.	SE: <i>Lab</i> 24-25, 45, 67, 136, 200-201, 350-351, 414-415, 444-445, 504-505, 562-563

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C. Scientific Enterprise The student will know that science and technology are human efforts that both influence and are influenced by civilizations and cultures worldwide.	
1. The student will evaluate the credibility and validity of scientific and technological information from various sources.	SE: <i>Lab</i> 23, 434 <i>Science Skill Handbook</i> 756 TWE: SCB 4E D 16, 69 DI 19, 409 A 23
D. Historic Perspectives The student will understand how scientific discovery, culture, societal norms and technology have influenced one another in different time periods.	
1. The student will relate personal experiences in scientific investigation to the experiences of scientists throughout history.	SE: <i>Launch Lab</i> 5, 391 <i>Lab</i> 136, 142-143, 200-201, 228-229, 344 <i>MiniLAB</i> 247 TWE: QD 131 LD 132
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.	SE: 12-14, 170, 470, 516-517, 603, 649 TWE: CFU 14 DI 37 SCB 626F D 637
III. EARTH AND SPACE SCIENCE	
A. Earth Structure and Processes The student will identify Earth's composition, structure and processes.	
1. The student will explain how earthquakes, volcanoes, sea-floor spreading and mountain building are evidence of the movement of crustal plates.	SE: 272-275, 276-278, 280-289, 300-303, 330-335 <i>Lab</i> 279, 290-291 <i>Applying Science</i> 282 TWE: SCB 270E A 335
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.	SE: 182-187, 196-199, 210-214, 215-220, 222-227, 238-248 <i>Lab</i> 200-201 TWE: SCB 180E, 208E IM 208F
3. The student will describe the various processes and interactions of the rock cycle.	SE: 90-93, 94-97, 99-102, 103-109 <i>MiniLAB</i> 91 <i>Lab</i> 98, 110-111 TWE: SCB 88E-F CFU 93 A 93

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4. The student will interpret successive layers of sedimentary rocks and their fossils to document the age and history of the Earth.	SE: 370-375 <i>Science Online</i> 374, 376 <i>Lab</i> 376 TWE: CFU 369 QD 371 DI 372 IL 374 R 375 A 375
5. The student will recognize that constructive and destructive Earth processes can affect the evidence of Earth's history.	SE: 362-369, 370-375, 387 #19 <i>Launch Lab</i> 361 <i>MiniLAB</i> 363 <i>Lab</i> 376 TWE: IM 361F QD 366 D 372 V 373
6. The student will classify and identify rocks and minerals using characteristics including but not limited to density, hardness and streak.	SE: 62-66, 68-72 <i>Launch Lab</i> 61 <i>MiniLAB</i> 63, 72 <i>Applying Science</i> 70 <i>Lab</i> 80-81 TWE: SCB 60E LD 70 A 81
The student will investigate the impact humans have on the environment.	
1. The student will identify and research an environmental issue and evaluate its impact.	SE: 196-199, 574-577, 578-584, 600-607, 609-615 <i>Lab</i> 616-617 TWE: DI 198, 583 R 199 IL 605
B. The Water Cycle, Weather and Climate The student will investigate how the atmosphere interacts with the Earth system.	
1. The student will define radiation, conduction and convection and explain their effects on weather and climate.	SE: 435-438, 451 #23 <i>MiniLAB</i> 437 TWE: SCB 424E TPK 435 D 436 USW 436 UAA 436 CFU 438
2. The student will identify the forces that create currents and layers in the Earth's atmosphere and water systems.	SE: 426-433, 439-443, 518-523 <i>Science Online</i> 428, 519 <i>Launch Lab</i> 513 <i>MiniLAB</i> 521 TWE: IM 428 TFYI 429 R 523

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3. The student will describe the effect of Earth's rotation on the winds and ocean currents.	SE: 439-443, 518-523, 539 #18 TWE: QD 440 ACT 441 DI 519
4. The student will collect and use data to predict the weather.	SE: 470-472 <i>MiniLAB</i> 456 <i>Lab</i> 473 TWE: T 423 IL 464 A 469 VL 471 DI 471 CFU 472
5. The student will identify the composition and structures of the atmosphere.	SE: 426-433 <i>Science Online</i> 428 <i>Section Review</i> 433 TWE: VL 427 IM 428 TFYI 431 MAM 432 CFU 433
6. The student will describe climate changes that have occurred over time.	SE: 492-502 <i>MiniLAB</i> 493 <i>Science Online</i> 499 TWE: SCB 482E V 494 CB 495 IM 496 TFYI 498 D 499, 501
C. The Universe The student will compare objects in the solar system and explain their interactions with the Earth.	
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.	SE: 435-438, 497, 628-629 TWE: SCB 424E TFYI 436 A 438 TPK 628
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.	SE: 492, 663-665 <i>Science Online</i> 665 <i>Lab</i> 680-681 TWE: IM 482F QD 664 R 665
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.	SE: 690-694, 696-701, 702-709, 719 #19 <i>Science Online</i> 691 <i>Lab</i> 695, 714-715 TWE: SCB 688E QD 698 ACT 703

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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.	SE: 660-665, 666-670 <i>Launch Lab</i> 659 <i>Science Online</i> 669 <i>Lab</i> 675 TWE: SCB 658E IM 658F R 665 QD 669 LD 670
The student will describe the composition and structure of the universe.	
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.	SE: 724-728, 740-745 <i>MiniLAB</i> 742 <i>Science Stats</i> 748 TWE: CC 727 D 727 A 728, 742
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.	SE: 724-728, 729-732, 734-739, 740-745, 751 #19 <i>Section Review</i> 739

Codes Used for TWE Pages

A	Assessment
ACT	Activity
CB	Content Background
CC	Curriculum Connection
CFU	Check for Understanding
D	Discussion
DI	Differentiated Instruction
IL	Inquiry Lab
IM	Identifying Misconceptions
LD	Lab Demonstration
MAM	Make a Model
QD	Quick Demo
R	Reteach
SCB	Science Content Background
SJ	Science Journal
T	Technology
TFYI	Teacher FYI
TPK	Tie to Prior Knowledge
UAA	Use an Analogy
USW	Use Science Words
V	Visualizing
VL	Visual Learning