



KANSAS
Science Education Standards Eighth Grade
Earth Materials and Processes F
The Changing Surface of Earth G
The Water Planet H
The Air Around You I
***Astronomy J* © 2005**

OBJECTIVES	PAGE REFERENCES
STANDARD 1: SCIENCE AS INQUIRY As a result of activities in grades 5-8, all students will develop the abilities to do scientific inquiry, be able to demonstrate how scientific inquiry is applied, and develop understandings about scientific inquiry.	
Benchmark 1: The students will demonstrate abilities necessary to do the processes of scientific inquiry. Indicators: The students will:	
1. Identify questions that can be answered through scientific investigations.	(F) <i>Lab 146-147</i> (G) <i>Lab 114-115</i> (H) <i>Lab 58-59</i> (I) <i>Lab 103</i> (J) <i>Lab 55</i>
2. Design and conduct a scientific investigation.	(F) <i>Design Your Own Lab 176-177</i> (G) <i>Design Your Own Lab 54-55</i> (H) <i>Design Your Own Lab 118-119</i> (I) <i>Design Your Own Lab 26-27</i> (J) <i>Design Your Own Lab 126-127</i>
3. Use appropriate tools, mathematics, technology, and techniques to gather, analyze, and interpret data.	(F) <i>Lab 105</i> <i>Use the Internet 116-117</i> (G) <i>Lab 114-115</i> (H) <i>Science Online 105</i> <i>Use the Internet 148-149</i> (I) <i>Use the Internet 116-117</i> <i>AC 49</i> (J) <i>DI 115</i>
4. Think critically to identify the relationship between evidence and logical conclusions.	(F) <i>Section Review 18 #5</i> (G) <i>Section Review 53 #5</i> (H) <i>Section Review 14 #5</i> (I) <i>Section Review 102 #5</i> (J) <i>Section Review 93 #5</i>
5. Apply mathematical reasoning to scientific inquiry.	(F) <i>Lab 105, 138</i> (G) <i>Lab 169</i> (H) <i>Section Review 89 #6</i> <i>Applying Math 130</i> (J) <i>Lab 75</i>

OBJECTIVES	PAGE REFERENCES
6. Communicate scientific procedures and explanations.	(F) CYD 89 (G) CYD 83 (H) CYD 15 (I) CYD 117 (J) AIL 126
Benchmark 2: The students will apply different kinds of investigations to different kinds of questions. Indicators: The students will:	
1. Differentiate between a qualitative and a quantitative investigation.	Qualitative: (F) <i>Lab 26-27, 56-57</i> (G) <i>Use the Internet 176-177</i> Quantitative: (I) <i>Lab 86-87</i> (J) <i>Use the Internet 30-31</i>
2. Develop questions and adapt the inquiry process to guide an investigation.	(F) AIL 26, 146 (G) AIL 26 (H) AIL 26 (I) AIL 26 (J) AIL 126
Benchmark 3: The students will analyze how science advances through new ideas, scientific investigations, skepticism, and examining evidence of varied explanations. Indicators: The students will:	
1. After doing an investigation, generate alternative methods of investigation and/or further questions for inquiry.	(F) AS 27 AIL 56 (G) AIL 114 (H) AIL 58 (I) AIL 86
2. Determine evidence which supports or contradicts a scientific breakthrough.	(F) 98-101, 103-104 <i>Science Online 99</i> <i>Section Review 101 #1-4, 104 #1-3</i> (J) 74 SJ 72, 107
3. Identify faulty reasoning or conclusions that go beyond evidence and/or are not supported by data.	(F) D 99 (G) <i>Oops, Accidents in Science 146</i> EA 83 DI 156 (H) EA 59 (J) 70-71 SJ 72

OBJECTIVES	PAGE REFERENCES
STANDARD 4: EARTH and SPACE SCIENCE As a result of activities in grades 5-8, all students will apply process skills to explore and develop an understanding of the structure of the earth system, earth's history, and earth in the solar system.	
Benchmark 1: The students will understand that the structure of the earth system is constantly changing due to the earth's physical and chemical processes.	
Indicators: The students will:	
1. Predict patterns from data collected.	(F) <i>Section Review 115 #5</i> <i>Use the Internet 116-117</i> (I) <i>You Do It 5</i> CC 46 IL 49 CU 54
2. Identify properties of the solid earth, the oceans and fresh water, and the atmosphere.	(F) 106 <i>Science Online 108</i> (H) <i>Science and History 60</i> <i>Science Online 105</i> AC 38, 46 SJ 73 (I) VL 9 CC 23
3. Model earth's cycles.	(F) <i>MiniLab 111</i> MA 112 QD 159 DI 174 (H) IL 24 (I) <i>Section Review 84 #6</i> (J) <i>Lab 55</i>
4. Model earth's plate movements that result in major geologic events and landform development.	(F) <i>Applying Science 108</i> <i>Integrate Physics 114</i> QD 107 LD 108 MA 112, 113
5. Understand water's major role in changing the solid surface of the earth, such as the effect of oceans on climates and water as an erosion force.	(H) 36-42, 53, 69-74, 86-89, 113-116 <i>Section Review 43 #2-4</i> MA 37
Benchmark 2: The students will understand that past and present earth processes are similar.	
Indicators: The students will:	
1. Understand the dynamics of earth's constructive and destructive forces over time.	(F) 112-115 MA 112 CC 113 AS 115 CD 158 (G) 64-68, 69-70, 73, 110 AR 78 AC 95

OBJECTIVES	PAGE REFERENCES
2. Model geologic time to scale.	(G) DI 159 CC 160 R 175
3. Relate geologic evidence to a record of earth's history.	(G) <i>Section Review</i> 131 #5 <i>Use the Internet</i> 176-177 AC 129 SJ 129 DI 130, 169 AIL 176
4. Compare the current arrangement of the continents with the arrangement of continents throughout the earth's history.	(F) 98-101 DI 100 (G) 161, 170, 174 VL 130 CU 161
Benchmark 3: The students will identify and classify planets and other solar system components. Indicators: The students will:	
1. Compare and contrast the characteristics of the planets.	(J) <i>Science Online</i> 71 <i>Section Review</i> 74 #3,4, 87 #1,3-5 <i>MiniLab</i> 79, 84 QD 86
2. Develop understanding of spatial relationships via models of the earth/moon/planets/sun system to scale.	(J) <i>MiniLab</i> 84 <i>Model and Invent</i> 94-95 VL 71 CC 85 DI 94 AS 95 CYD 95
3. Research smaller components of the solar system such as asteroids and comets.	(J) <i>Oops, Accidents in Science</i> 96 <i>Science Online</i> 96 AC 91 SJ 91 DI 92
4. Identify the sun as a star and compare its characteristics to those of other stars.	(J) 109-112 <i>Section Review</i> 108 #4, 112 #4-6 <i>Lab</i> 113 VL 111
5. Trace cultural as well as scientific influences on the study of astronomy.	(J) 24-25 <i>Integrate Career</i> 18 <i>Science and History</i> 62 CC 16, 18 CD 16, 20 D 17 SJ 21

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Benchmark 4: The students will model motions and identify forces that explain earth phenomena. Indicators: The students will:	
1. Demonstrate object/space/time relationships that explain phenomena such as the day, the month, the year, and the seasons.	(J) <i>Integrate Life Science</i> 41 <i>Science Online</i> 45 <i>Section Review</i> 45 #2 AC 43 D 44 QD 44 R 45
2. Model earth/moon positions that create phases of the moon and eclipses.	(J) <i>Lab</i> 55 QD 49 UA 49 AC 50 LD 50 AS 55
3. Apply principles of force and motion to understand the solar system.	(J) <i>Figure</i> 8 17 <i>MiniLab</i> 21, 79 <i>Section Review</i> 54 #6 <i>Lab</i> 75 AIL 30
4. Understand the effect of the angle of incidence of solar energy striking the earth's surface on the amount of heat energy absorbed at the earth's surface.	(J) <i>Section Review</i> 45 #4 <i>Science Online</i> 45 <i>Lab</i> 60-61 R 45 AIL 60 AS 61
STANDARD 5: SCIENCE AND TECHNOLOGY As a result of activities in grades 5-8, all students will demonstrate abilities of technological design and understandings about science and technology.	
Benchmark 1: The students will demonstrate abilities of technological design. Indicators: The students will:	
1. Identify appropriate problems for technological design.	(F) <i>Model and Invent</i> 88-89 (G) <i>Science Online</i> 22 AIL 26 (H) IL 101 (I) <i>Model and Invent</i> 56-57 (J) <i>Use the Internet</i> 30-31
2. Design a solution or product, implement the proposed design, evaluate the product.	(F) <i>Model and Invent</i> 88-89 AS 89 DI 89 (G) <i>Science Online</i> 22 (I) <i>Model and Invent</i> 56-57 (J) <i>Lab</i> 14 AS 14
3. Communicate the process of technological design.	(F) CYD 89 (G) CYD 27 (I) CYD 57 (J) CYD 14 AC 32

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Benchmark 2: The students will develop understandings of the similarities, differences, and relationships in science and technology.	
Indicators: The students will:	
1. Compare the work of scientists with that of applied scientists and technologists.	Scientists: (F) <i>Integrate Career</i> 52, 77, 113 Technologists/Applied Scientists: (H) <i>Integrate Career</i> 79 (I) <i>Integrate Career</i> 79
2. Evaluate limitations and trade-offs of technological solutions.	(F) <i>National Geographic Society Visualizing</i> 72 <i>Section Review</i> 75 #3, 81 #1,4 AS 89 (I) <i>Science and Society</i> 58 (J) <i>Science and Society</i> 32
3. Identify contributions to science and technology by many people and many cultures.	(F) <i>Science and History</i> 28 SJ 107 (G) 157 DI 156 (H) <i>Integrate History</i> 56 (J) 21-22 CC 16 CD 16
STANDARD 6: SCIENCE IN PERSONAL AND ENVIRONMENTAL PERSPECTIVES	
As a result of activities in grades 5-8, all students will apply process skills to explore and develop an understanding of issues of personal health, population, resources and environment, and natural hazards.	
Benchmark 1: The students will make decisions based on scientific understanding of personal health.	
Indicators: The students will:	
1. Identify individual nutrition, exercise, and rest needs based on science.	See Glencoe's <i>Human Body Systems (D)</i> © 2005 (D) 18-19, 36-39 <i>MiniLab</i> 39 <i>Applying Science</i> 40 <i>National Geographic</i> 41 <i>Lab</i> 46 <i>Time: Science and Society</i> 56 SJ 40 AC 45 ITI 56
2. Use a systemic approach to thinking critically about personal health risks and benefits.	(F) <i>Integrate Health</i> 165 (H) AIL 90 CC 146 (I) <i>Integrate Health</i> 105 TP 104 CC 106 VL 107 (J) <i>Integrate Health</i> 9

OBJECTIVES	PAGE REFERENCES
Benchmark 2: The students will understand the impact of human activity on resources and environment.	
Indicators: The students will:	
1. Investigate the effects of human activities on the environment.	(H) Lab 90-91 D 78, 82 CC 83 (I) IL 108 CC 109 VL 109 D 109
2. Base decisions on perceptions of benefits and risks.	(F) AR 73 D 74 AS 117 (I) <i>Science and Society</i> 58 (J) <i>Science and Society</i> 32
Benchmark 3: The students will understand that natural hazards are dynamic examples of earth processes which cause us to evaluate risks.	
Indicators: The students will:	
1. Evaluate risks and define appropriate actions associated with natural hazards.	(F) <i>Nature of Science</i> 2-5 <i>Integrate Career</i> 113 CD 158 VL 158 AC 160 (G) <i>Section Review</i> 68 #4,5 AC 67 (I) <i>Section Review</i> 51 #4
2. Recognize patterns of internal and external earth processes that may result in natural hazards.	(F) <i>Science Online</i> 108 <i>Use the Internet</i> 116-117 CD 111 DI 112 AIL 116 (G) 64-68, 92-95, 100-101
3. Communicate human activities that can cause/contribute to natural hazards.	(G) 51 <i>Science Online</i> 51 <i>Section Review</i> 68 #5 <i>Integrate History</i> 77 TF 100
STANDARD 7: HISTORY AND NATURE OF SCIENCE	
As a result of activities in grades 5-8, all students will examine and develop an understanding of science as a historical human endeavor.	
Benchmark 1: The students will develop scientific habits of mind.	
Indicators: The students will:	
1. Practice intellectual honesty.	The labs listed below can be used to emphasize and develop intellectual honest when designing and analyzing the results of an experiment. (F) Lab 26-27, 56-57, 116-117 (H) Lab 26-27, 90-91

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2. Demonstrate skepticism appropriately.	(F) through (J) See the <i>Science Skill Handbook/Scientific Methods/Evaluate Sources of Information</i> .
3. Display open-mindedness to new ideas.	(F) through (J) Any of the labs can be used to emphasize open-mindedness to new ideas when gathering data, drawing conclusions, and avoiding bias.
4. Base decisions on evidence.	(G) <i>You Do It</i> 5 (H) <i>Use the Internet</i> 148-149 (I) AS 117
Benchmark 2: The students will research contributions to science throughout history. Indicators: The students will:	
1. Recognize that new knowledge leads to new questions and new discoveries.	(F) 102-103 <i>Oops, Accidents in Science</i> 90 <i>Figure 6</i> 103 (H) <i>Oops, Accidents in Science</i> 150 (I) <i>Oops, Accidents in Science</i> 118
2. Replicate historic experiments to understand principles of science.	This objective can be met during teacher/class discussion. See Glencoe's <i>Human Body Systems (D)</i> © 2005 (D) <i>National Geographic</i> 183
3. Relate contributions of men and women to the fields of science.	(F) <i>Science and History</i> 28 SJ 107 (G) 157 DI 156 (H) <i>Integrate History</i> 56 (J) 21-22 CC 16 CD 16

Codes Used for TWE Pages

AC	Activity
AIL	Alternative Inquiry Lab
AR	Active Reading
AS	Assessment
CC	Curriculum Connection
CD	Cultural Diversity
CU	Check for Understanding
CYD	Communicating Your Data
D	Discussion
DI	Differentiated Instruction
EA	Error Analysis
IC	Integrate Career
IL	Inquiry Lab
LD	Lab Demonstration
MA	Make A Model
QD	Quick Demo
R	Reteach
SJ	Science Journal
TF	Teacher FYI
TP	Tie to Prior Knowledge
UA	Use an Analogy
VL	Visual Learning