



**KANSAS**  
**Science Education Standards Eighth Grade**  
**Earth Science © 2005**

OBJECTIVES	PAGE REFERENCES
<b>STANDARD 1: SCIENCE AS INQUIRY</b> 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.	
<b>Benchmark 1: The students will demonstrate abilities necessary to do the processes of scientific inquiry.</b> <b>Indicators: The students will:</b>	
<b>1.</b> Identify questions that can be answered through scientific investigations.	SE: LAB 444-445 TWE: R 14 ACT 20 IL 64, 337, 464, 551 AIL 562, 616
<b>2.</b> Design and conduct a scientific investigation.	SE: MiniLAB 11 LAB 52-53, 200-201, 228-229, 350-351, 444-445, 532-533 TWE: A 19, 221 IL 551
<b>3.</b> Use appropriate tools, mathematics, technology, and techniques to gather, analyze, and interpret data.	SE: LAB 24-25, 45, 52-53, 66, 136, 228-229, 260-261, 414-415, 504-505 TWE: IL 41
<b>4.</b> Think critically to identify the relationship between evidence and logical conclusions.	SE: 6-14 Applying Science 21 LAB 98, 136, 260-261, 414-415 Launch Lab 209 MiniLAB 402 TWE: CC 21 D 69
<b>5.</b> Apply mathematical reasoning to scientific inquiry.	SE: LAB 45, 279, 650-651 Applying Math 47, 85, 251, 544 MiniLAB 412 Launch Lab 541 TWE: ACT 243
<b>6.</b> Communicate scientific procedures and explanations.	SE: LAB 23, 52-53, 142-143, 228-229, 290-291, 376, 382-383, 444-445, 504-505 TWE: A 33
<b>Benchmark 2: The students will apply different kinds of investigations to different kinds of questions.</b> <b>Indicators: The students will:</b>	
<b>1.</b> Differentiate between a qualitative and a quantitative investigation.	SE: Science Skill Handbook 760

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2. Develop questions and adapt the inquiry process to guide an investigation.	TWE: ACT 37 D 49 A 53 IL 64, 337, 464, 515, 551 AIL 229 QD 310
<b>Benchmark 3: The students will analyze how science advances through new ideas, scientific investigations, skepticism, and examining evidence of varied explanations.</b> <b>Indicators: The students will:</b>	
1. After doing an investigation, generate alternative methods of investigation and/or further questions for inquiry.	SE: 295#22 <i>Communicating Your Data</i> 53 TWE: AIL 24, 110, 172, 229, 260 A 136, 376 IL 253
2. Determine evidence which supports or contradicts a scientific breakthrough.	SE: 18-19, 272-275, 276-278, 280-289, 297#28, 690-694 <i>Section Review</i> 275 TWE: SCB 4E QD 19 D 409
3. Identify faulty reasoning or conclusions that go beyond evidence and/or are not supported by data.	SE: 20-22, 272-275 <i>Applying Science</i> 21 TWE: LD 8 SJ 20 CC 21 D 69, 273 TPK 690
<b>STANDARD 4: EARTH and SPACE SCIENCE</b> <b>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.</b>	
<b>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.</b> <b>Indicators: The students will:</b>	
1. Predict patterns from data collected.	SE: LAB 200-201, 260-261, 290-291, 320-321, 407, 444-445, 590-591 TWE: DI 19 R 199 T 423
2. Identify properties of the solid earth, the oceans and fresh water, and the atmosphere.	SE: 66, 242-246, 249-254, 309-311, 426-433, 514-517 <i>Science Online</i> 428 TWE: DI 42, 310 UAA 310

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3. Model earth's cycles.	SE: <i>MiniLAB</i> 91, 493 <i>Section Review</i> 502 <i>LAB</i> 503 <i>Launch Lab</i> 659 TWE: MAM 109 IM 482F QD 664 R 665
4. Model earth's plate movements that result in major geologic events and landform development.	SE: 154-159 <i>MiniLAB</i> 274 <i>Applying Science</i> 282 <i>Integrate Physics</i> 288 TWE: DI 273 QD 273, 281 LD 282 MAM 286, 287
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.	SE: 238-248, 253-254, 485-486 <i>Integrate Physics</i> 213 <i>LAB</i> 221 <i>Launch Lab</i> 236 TWE: IM 208F LD 216 SCB 236E-F DI 242
<b>Benchmark 2: The students will understand that past and present earth processes are similar. Indicators: The students will:</b>	
1. Understand the dynamics of earth's constructive and destructive forces over time.	SE: 182-187, 188-194, 210-214, 215-220, 238-248 <i>LAB</i> 200-201 <i>Launch Lab</i> 209 TWE: SJ 183 DI 189 IM 193
2. Model geologic time to scale.	SE: <i>Applying Math</i> 419 TWE: IM 390F DI 397 CC 398
3. Relate geologic evidence to a record of earth's history.	SE: 272-275, 362-369, 370-375, 377-381 <i>MiniLAB</i> 274 <i>Science Online</i> 371 <i>LAB</i> 376, 382-383 TWE: SJ 367 DI 368

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<p>4. Compare the current arrangement of the continents with the arrangement of continents throughout the earth's history.</p>	<p>SE: 272-275  <i>Launch Lab</i> 271  <i>Science Online</i> 273  <i>Applying Science</i> 282  TWE: TPK 272  DI 273, 274  UAA 273  CFU 275</p>
<p><b>Benchmark 3: The students will identify and classify planets and other solar system components.  Indicators: The students will:</b></p>	
<p>1. Compare and contrast the characteristics of the planets.</p>	<p>SE: 438, 660-662, 696-701, 702-709  <i>Integrate Career</i> 332  <i>Science Online</i> 691  TWE: TFYI 499  IM 670  SCB 688E  ACT 708</p>
<p>2. Develop understanding of spatial relationships via models of the earth/moon/planets/sun system to scale.</p>	<p>SE: 690-691  <i>MiniLAB</i> 667, 704  <i>Applying Math</i> 685, 701  <i>LAB</i> 714-715  TWE: A 667  VL 691  QD 698  CC 705</p>
<p>3. Research smaller components of the solar system such as asteroids and comets.</p>	<p>SE: 710-713  <i>Accidents in Science</i> 716  TWE: SJ 711  DI 712</p>
<p>4. Identify the sun as a star and compare its characteristics to those of other stars.</p>	<p>SE: 724-728, 729-732, 734-739, 751#19  <i>Section Review</i> 739  TWE: IM 688F  SCB 722E  FF 738  D 748  ACT 748</p>
<p>5. Trace cultural as well as scientific influences on the study of astronomy.</p>	<p>SE: 628-633, 635-642, 643-649  <i>MiniLAB</i> 632  <i>Science and Society</i> 652  TWE: SCB 626E-F  DI 631  CD 636, 640  CC 638</p>

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<b>Benchmark 4: The students will model motions and identify forces that explain earth phenomena. Indicators: The students will:</b>	
1. Demonstrate object/space/time relationships that explain phenomena such as the day, the month, the year, and the seasons.	SE: 492-493, 660-665, 685#18 <i>Launch Lab</i> 659 <i>Science Online</i> 665 TWE: IM 482F ACT 663 DI 663 QD 664 R 665
2. Model earth/moon positions that create phases of the moon and eclipses.	SE: <i>LAB</i> 675 TWE: IM 658F QD 669 ACT 670 LD 670 A 675
3. Apply principles of force and motion to understand the solar system.	SE: 527-530, 692-694 <i>MiniLAB</i> 641, 699 <i>Science Online</i> 663 <i>Integrate Physics</i> 693 <i>LAB</i> 695 TWE: TFYI 529
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.	SE: 484, 663-665 <i>MiniLAB</i> 485 <i>LAB</i> 680-681 TWE: SCB 482E IM 482F QD 484, 664 DI 485 A 485
<b>STANDARD 5: SCIENCE AND TECHNOLOGY</b> <b>As a result of activities in grades 5-8, all students will demonstrate abilities of technological design and understandings about science and technology.</b>	
<b>Benchmark 1: The students will demonstrate abilities of technological design. Indicators: The students will:</b>	
1. Identify appropriate problems for technological design.	SE: <i>LAB</i> 142-143, 474-475 <i>MiniLAB</i> 318 TWE: IL 101 QD 125 MAM 132 ACT 133 M 269 A 318 R 319

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2. Design a solution or product, implement the proposed design, evaluate the product.	SE: LAB 142-143, 474-475 <i>MiniLAB</i> 318 TWE: IL 101 MAM 132, 645 ACT 133 A 318 R 319 DI 516
3. Communicate the process of technological design.	SE: LAB 142-143, 474-475 TWE: DI 37, 49, 75 IL 101 MAM 132, 645 ACT 133 M 269
<b>Benchmark 2: The students will develop understandings of the similarities, differences, and relationships in science and technology.</b> <b>Indicators: The students will:</b>	
1. Compare the work of scientists with that of applied scientists and technologists.	SE: 12-14 TWE: UAA 12
2. Evaluate limitations and trade-offs of technological solutions.	SE: 125-129, 130-135 <i>Science and Society</i> 476, 652 <i>Science and History</i> 618 TWE: V 126 DI 638
3. Identify contributions to science and technology by many people and many cultures.	SE: 395-396 <i>Integrate Social Studies</i> 77 <i>Science and History</i> 82, 618, 682 TWE: ACT 13 CD 106, 198, 332 SJ 281
<b>STANDARD 6: SCIENCE IN PERSONAL AND ENVIRONMENTAL PERSPECTIVES</b> <b>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.</b>	
<b>Benchmark 1: The students will make decisions based on scientific understanding of personal health.</b> <b>Indicators: The students will:</b>	
1. Identify individual nutrition, exercise, and rest needs based on science.	TWE: QD 140
2. Use a systemic approach to thinking critically about personal health risks and benefits.	SE: 612-613 <i>Integrate Health</i> 339 <i>Science and Society</i> 592 TWE: RES 339 CFU 615

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<b>Benchmark 2: The students will understand the impact of human activity on resources and environment.</b>	
<b>Indicators: The students will:</b>	
1. Investigate the effects of human activities on the environment.	SE: 196-199, 500-502, 557-561, 578-584, 600-607, 609-615 <i>Science and Society</i> 112 <i>Integrate Health</i> 223 TWE: SJ 251 LD 500
2. Base decisions on perceptions of benefits and risks.	SE: <i>Science and Society</i> 262, 476, 592, 652 TWE: D 128, 134
<b>Benchmark 3: The students will understand that natural hazards are dynamic examples of earth processes which cause us to evaluate risks.</b>	
<b>Indicators: The students will:</b>	
1. Evaluate risks and define appropriate actions associated with natural hazards.	SE: 210-214, 246-247, 313-319, 465-469 <i>Integrate Health</i> 339 TWE: LD 246 CC 318, 494 CFU 319 D 331
2. Recognize patterns of internal and external earth processes that may result in natural hazards.	SE: 210-214, 246-247, 280-289, 300-303, 330-335, 465-469, 493-495 TWE: SCB 208E CC 287 QD 466
3. Communicate human activities that can cause/contribute to natural hazards.	SE: 213-214 TWE: TFYI 211 D 212
<b>STANDARD 7: HISTORY AND NATURE OF SCIENCE</b>	
<b>As a result of activities in grades 5-8, all students will examine and develop an understanding of science as a historical human endeavor.</b>	
<b>Benchmark 1: The students will develop scientific habits of mind.</b>	
<b>Indicators: The students will:</b>	
1. Practice intellectual honesty.	SE: <i>LAB</i> 228-229, 350-351, 382-383, 414-415, 444-445, 474-475, 531, 532-533, 714-715
2. Demonstrate skepticism appropriately.	SE: <i>LAB</i> 434 TWE: LD 8 D 16, 69 A 275, 434
3. Display open-mindedness to new ideas.	TWE: DI 143 IM 152F, 180F, 298F, 360F, 390F, 424F, 576, 598F
4. Base decisions on evidence.	SE: <i>Science and Society</i> 262, 476, 592, 652 <i>Science Online</i> 409 TWE: D 128, 134 DI 409, 706

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<b>Benchmark 2: The students will research contributions to science throughout history.</b>	
<b>Indicators: The students will:</b>	
1. Recognize that new knowledge leads to new questions and new discoveries.	SE: 36, 272-275, 276-278, 280-289, 690-694, 696-701, 702-707, 742-745 TWE: SCB 4E DI 277
2. Replicate historic experiments to understand principles of science.	This objective can be met with teacher guidance in replicating historic experiments.
3. Relate contributions of men and women to the fields of science.	SE: 272-275, 381, 421#12 <i>Science and History</i> 82, 618 <i>Integrate Career</i> 197 <i>Accidents in Science</i> 384 TWE: SJ 281, 380 CC 466

### Codes Used for TWE Pages

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