



OHIO

Academic Content Standards – Science Grade 8
Earth Materials and Processes F,
The Changing Surface of Earth G, Astronomy J,
Chemistry L, Waves, Sound, and Light O

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STANDARDS	PAGE REFERENCES
Earth and Space Sciences	
<i>The Universe</i>	
1. Describe how objects in the solar system are in regular and predictable motions that explain such phenomena as days, years, seasons, eclipses, tides and moon cycles.	(J) 40-45, 46-50 <i>Launch Lab</i> 39 <i>Science Online</i> 45 <i>Lab</i> 55 ACT 43, 50 A 45 QD 49 LD 50
2. Explain that gravitational force is the dominant force determining motions in the solar system and in particular keeps the planets in orbit around the sun.	(J) 17, 70-74, 82-84, 92 <i>MiniLAB</i> 21 V 73 (O) 67
3. Compare the orbits and composition of comets and asteroids with that of Earth.	(J) 43, 74, 90-91 <i>Science Online</i> 43 <i>Lab</i> 75 SCB 68E D 91 A 93
4. Describe the effect that asteroids or meteoroids have when moving through space and sometimes entering planetary atmospheres (e.g., meteor-"shooting star" and meteorite).	(J) 51, 91-93 <i>Launch Lab</i> 69 <i>Accidents in Science</i> 96 TPK 90 ACT 91 IM 91 DI 92 TFYI 92 VL 92
5. Explain that the universe consists of billions of galaxies that are classified by shape.	(J) 120-121 SCB 102F VL 121 A 125
6. Explain interstellar distances are measured in light years (e.g., the nearest star beyond the sun is 4.3 light years away).	(J) 107 <i>Applying Skills</i> 108 <i>MiniLAB</i> 122 CC 107

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7. Examine the life cycle of a star and predict the next likely stage of a star.	(J) 114-119 <i>Science Online</i> 116 DI 115 TFYI 116 VL 117 R 119
8. Name and describe tools used to study the universe (e.g., telescopes, probes, satellites and spacecraft).	(J) 8-13, 15-22, 23-29, 56-59 <i>Science Online</i> 20, 25 SJ 11 R 22 DI 27 (O) 77-78
<i>Earth Systems</i>	
9. Describe the interior structure of Earth and Earth's crust as divided into tectonic plates riding on top of the slow moving currents of magma in the mantle.	(F) 106-115, 135-137 <i>MiniLAB</i> 111, 160 R 115
10. Explain that most major geological events (e.g., earthquakes, volcanic eruptions, hot spots and mountain building) result from plate motion.	(F) 106-115, 126-129, 156-161 <i>Science Online</i> 108 <i>Use the Internet Lab</i> 116-117 LD 108 CD 111 CC 113 DI 114
11. Use models to analyze the size and shape of Earth, its surface and its interior (e.g., globes, topographic maps, satellite images).	(F) 135-137 QD 136 UAA 136 CFU 137 (G) 18-24 <i>Lab</i> 25 <i>Model and Invent Lab</i> 26-27 (J) <i>MiniLAB</i> 84 QD 41 A 47
12. Explain that some processes involved in the rock cycle are directly related to thermal energy and forces in the mantle that drive plate motions.	(F) 36-39, 40-43 <i>Science Online</i> 42 <i>Lab</i> 44 LD 166
13. Describe how landforms are created through a combination of destructive (e.g., weathering and erosion) and constructive processes (e.g., crustal deformation, volcanic eruptions and deposition of sediment).	(F) 106-115, 156-161 A 115 (G) 8-13, 36-41, 42-48, 64-68, 69-74, 101-102 R 74

STANDARDS	PAGE REFERENCES
14. Explain that folding, faulting and uplifting can rearrange the rock layers so the youngest is not always found on top.	(G) 132-137 <i>Lab</i> 138 D 134 DI 134 V 135 IL 136 CFU 137 R 137
15. Illustrate how the three primary types of plate boundaries (transform, divergent and convergent) cause different landforms (e.g., mountains, volcanoes and ocean trenches).	(F) 106-115, 159-161 V 109 MM 112, 113 A 115, 161 R 161
Life Sciences	
<i>Heredity</i>	
1. Describe that asexual reproduction limits the spread of detrimental characteristics through a species and allows for genetic continuity.	Asexual reproduction and genetic continuity is discussed in Glencoe's <i>From Bacteria to Plants</i> (B) © 2005 (B) 23, 46, 94-95, 100-101
2. Recognize that in sexual reproduction new combinations of traits are produced which may increase or decrease an organism's chances for survival.	(G) 156-161 <i>Lab</i> 169
<i>Evolutionary Theory</i>	
3. Explain how variations in structure, behavior or physiology allow some organisms to enhance their reproductive success and survival in a particular environment.	(G) 156-161 <i>Launch Lab</i> 153 A 153 D 157 ACT 158
4. Explain that diversity of species is developed through gradual processes over many generations (e.g., fossil record).	(G) 156-161, 164-166, 172-175
5. Investigate how an organism adapted to a particular environment may become extinct if the environment, as shown by the fossil record, changes.	(G) 156-161, 168, 170-173
Physical Sciences	
<i>Forces and Motion</i>	
1. Describe how the change in the position (motion) of an object is always judged and described in comparison to a reference point.	(F) 130-134* *These pages discuss changes in the motion of earthquake waves, with the epicenter as the reference point.
2. Explain that motion describes the change in the position of an object (characterized by a speed and direction) as time changes.	(J) 74* *discusses planetary motion

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3. Explain that an unbalanced force acting on an object changes that object's speed and/or direction.	See Glencoe's <i>Motion, Forces, and Energy M</i> © 2005 (M) 36-38, 49 <i>Design Your Own Lab</i> 56-57 <i>National Geographic</i> 51 <i>Section Review</i> 41 #5 ACT 38 CFU 41 SJ 47
<i>Nature of Energy</i>	
4. Demonstrate that waves transfer energy.	(F) 130-137 (J) 8-9 (O) 8-12, 13-17 <i>Launch Lab</i> 7 D 9 MM 9 CFU 12 QD 37
5. Demonstrate that vibrations in materials may produce waves that spread away from the source in all directions (e.g., earthquake waves and sound waves).	(F) 130-137 USW 131 (O) 8-12, 13-17, 36-45 FF 14 TPK 36
Science and Technology	
<i>Understanding Technology</i>	
1. Examine how science and technology have advanced through the contributions of many different people, cultures and times in history.	(F) <i>Science and History</i> 28 SJ 107 (J) 70-74 <i>Science and History</i> 62 CD 16 DI 80, 115 (L) <i>The Nature of Science</i> 2-3 (O) <i>The Nature of Science</i> 2-3 <i>Science and History</i> 88 SJ 115
2. Examine how choices regarding the use of technology are influenced by constraints caused by various unavoidable factors (e.g., geographic location, limited resources, social, political and economic considerations).	(F) 66-75 (G) <i>The Nature of Science</i> 2-5 (J) 23 <i>Science and Society</i> 32 SJ 21 D 24 ACT 27 (L) <i>The Nature of Science</i> 2-5 D 3 CC 4

STANDARDS	PAGE REFERENCES
<i>Abilities To Do Technological Design</i>	
3. Design and build a product or create a solution to a problem given more than two constraints (e.g., limits of cost and time for design and production, supply of materials and environmental effects).	(F) <i>Model and Invent Lab</i> 88-89 <i>MiniLAB</i> 144 R 145
4. Evaluate the overall effectiveness of a product design or solution.	(F) <i>Model and Invent Lab</i> 88-89 <i>MiniLAB</i> 144 (J) <i>Use the Internet Lab</i> 30-31
Scientific Inquiry	
<i>Doing Scientific Inquiry</i>	
1. Choose the appropriate tools or instruments and use relevant safety procedures to complete scientific investigations.	(F) <i>Lab</i> 26-27, 82 (G) <i>Design Your Own Lab</i> 54-55, 82-83 (J) <i>Lab</i> 14, 60-61 (L) <i>Lab</i> 52 <i>Design Your Own Lab</i> 54-55 (O) <i>Design Your Own Lab</i> 86-87 <i>Lab</i> 107
2. Describe the concepts of sample size and control and explain how these affect scientific investigations.	(F) <i>Science Skill Handbook</i> 190-191 (G) <i>Science Skill Handbook</i> 190-191 (J) <i>Science Skill Handbook</i> 140-141 (L) <i>Design Your Own Lab</i> 54-55 <i>Science Skill Handbook</i> 130-131 (O) <i>The Nature of Science</i> 4-5 <i>Design Your Own Lab</i> 26-27, 56-57 <i>Science Skill Handbook</i> 132-133
3. Read, construct and interpret data in various forms produced by self and others in both written and oral form (e.g., tables, charts, maps, graphs, diagrams and symbols).	(F) <i>Communicating Your Data</i> 89, 117 (G) <i>Communicating Your Data</i> 83 (J) <i>Communicating Your Data</i> 127 CYD 113 (L) CYD 52, 55 (O) <i>Communicating Your Data</i> 27, 46, 107
4. Apply appropriate math skills to interpret quantitative data (e.g., mean, median and mode).	(F) <i>Lab</i> 105 <i>MiniLAB</i> 135 (G) <i>Applying Math</i> 105 <i>Lab</i> 169 (J) <i>Use the Internet Lab</i> 30-31 <i>Applying Math</i> 81 (L) <i>Math Skill Handbook</i> 144-158 (O) <i>Design Your Own Lab</i> 26-27 <i>Lab</i> 107
Scientific Ways of Knowing	
<i>Nature of Science</i>	
1. Identify the difference between description (e.g., observation and summary) and explanation (e.g., inference, prediction, significance and importance).	(F) <i>Science Skill Handbook</i> 189-194 (G) <i>Science Skill Handbook</i> 189-194 (J) <i>Science Skill Handbook</i> 139-144 (L) <i>Science Skill Handbook</i> 129-134 (O) <i>Science Skill Handbook</i> 131-136

STANDARDS	PAGE REFERENCES
<i>Ethical Practices</i>	
2. Explain why it is important to examine data objectively and not let bias affect observations.	(F) <i>Science Skill Handbook</i> 194 (G) <i>Science Skill Handbook</i> 194 (J) <i>Science Skill Handbook</i> 144 (L) <i>Science Skill Handbook</i> 134 (O) <i>Design Your Own Lab</i> 56-57 <i>Science Skill Handbook</i> 136

Codes Used for TWE Pages

A	Assessment
ACT	Activity
CC	Curriculum Connection
CD	Cultural Diversity
CFU	Check for Understanding
CYD	Communicating Your Data
D	Discussion
DI	Differentiated Instruction
FF	Fun Fact
LD	Lab Demonstration
IL	Inquiry Lab
IM	Identifying Misconceptions
MM	Make a Model
QD	Quick Demo
R	Reteach
SCB	Science Content Background
SJ	Science Journal
TFYI	Teacher FYI
TPK	Tie to Previous Knowledge
UAA	Use an Analogy
USW	Use Science Words
V	Visualizing
VL	Visual Learning