



OHIO

Academic Content Standards – Science Grade 7
Animal Diversity C, Human Body Systems D, Ecology E,
The Water Planet H, The Air Around You I,
Motion, Forces, and Energy M,
Electricity and Magnetism N

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STANDARDS	PAGE REFERENCES
Earth and Space Sciences	
<i>Earth Systems</i>	
1. Explain the biogeochemical cycles which move materials between the lithosphere (land), hydrosphere (water) and atmosphere (air).	(E) 44-49 TPK 44 DI 46 ACT 18 R 49 A 49 (H) 24-25 IL 24 (I) 19 <i>Section Review 20 #3</i>
2. Explain that Earth's capacity to absorb and recycle materials naturally (e.g., smoke, smog and sewage) can change the environmental quality depending on the length of time involved (e.g. global warming).	(E) 104-105 (I) 14-15, 82-84, 97 D 109 CU 84
3. Describe the water cycle and explain the transfer of energy between the atmosphere and hydrosphere.	(E) 44-45 <i>Chapter Review 59 #26</i> SJ 45 TPK 44 (H) 24-25 IL 24 VL 25 (I) 17-20 <i>MiniLab 19</i> A 20
4. Analyze data on the availability of fresh water that is essential for life and for most industrial and agricultural processes. Describe how rivers, lakes and groundwater can be depleted or polluted becoming less hospitable to life and even becoming unavailable or unsuitable for life.	(H) 16-25, 76-84 <i>Lab 58-59, 90-91</i> <i>Science and Society 28</i> IL 56 AIL 58 ACT 20, 24 CC 83

STANDARDS	PAGE REFERENCES
5. Make simple weather predictions based on the changing cloud types associated with frontal systems.	(I) 40-42, 45-46 <i>Chapter Review 61 #27</i> IL 46 VL 40 TFYI 42 DI 42
6. Determine how weather observations and measurements are combined to produce weather maps and that data for a specific location at one point in time can be displayed in a station model.	(I) 52-54 <i>Section Review 54 #2 & #3</i> DI 53 R 54
7. Read a weather map to interpret local, regional and national weather.	(I) 54 <i>Lab 55</i> CU 54 A 54, 55
8. Describe how temperature and precipitation determine climatic zones (biomes) (e.g., desert, grasslands, forests, tundra and alpine).	(E) 41-42, 68-75 <i>Integrate Earth Science 74</i> R 75 QD 70 GI 56 DI 71 (I) 66-69 <i>Launch Lab 65</i> A 69
9. Describe the connection between the water cycle and weather-related phenomenon (e.g., tornadoes, floods, droughts and hurricanes).	(I) 40-43, 47-50 <i>Launch Lab 35</i> <i>Section Review 20 #4</i> <i>Chapter Review 31 #25</i> A 43 DI 42
Life Sciences	
<i>Characteristics and Structure of Life</i>	
1. Investigate the great variety of body plans and internal structures found in multicellular organisms.	(C) 15-18, 77-78, 90-93, 106-110, 114-121 <i>Design Your Own Lab 28-29</i> SJ 46 R 75 IL 49 QD 83
<i>Diversity and Interdependence of Life</i>	
2. Investigate how organisms or populations may interact with one another through symbiotic relationships and how some species have become so adapted to each other that neither could survive without the other (e.g., predator-prey, parasitism, mutualism and commensalism).	(C) 22-27 <i>Design Your Own Lab 28-29</i> D 25 DI 19 (E) 20-24, 51-53 ACT 22 CU 24, 53 MM 22

STANDARDS	PAGE REFERENCES
3. Explain how the number of organisms an ecosystem can support depends on adequate biotic (living) resources (e.g., plants, animals) and abiotic (non-living) resources (e.g., light, water and soil).	(E) 12-19, 36-42, 50-53 <i>Design Your Own Lab</i> 26-27 <i>Lab</i> 76 TPK 36 A 53 SJ 80 IL 82 (M) 167
4. Investigate how overpopulation impacts an ecosystem.	(E) 15, 19 <i>Applying Science</i> 15 <i>Chapter Review</i> 31 #29 VPG 18
5. Explain that some environmental changes occur slowly while others occur rapidly (e.g., forest and pond succession, fires and decomposition).	(E) 64-67 CU 67 TPK 64 (I) 14-15, 78-84 <i>Science Online</i> 81, 83 <i>Science and History</i> 88 IM 78 (N) <i>Science and Society</i> 30
6. Summarize the ways that natural occurrences and human activity affect the transfer of energy in Earth's ecosystems (e.g., fire, hurricanes, roads and oil spills).	(E) 130-136 <i>Lab</i> 137 <i>Science and Society</i> 146 <i>Chapter Review</i> 149 #27 CU 136 MM 134 (I) 107-109 VL 109 IL 108 (N) <i>Science and Society</i> 30
7. Explain that photosynthetic cells convert solar energy into chemical energy that is used to carry on life functions or is transferred to consumers and used to carry on their life functions.	(E) 20-21, 38, 50-51 <i>Integrate Chemistry</i> 21 TFYI 52 (H) 135
<i>Evolutionary Theory</i>	
8. Investigate the great diversity among organisms.	(C) 14-27, 38-61, 77-95, 106-122 <i>Use the Internet Lab</i> 124-125 ACT 78 CU 42 SJ 46 LD 116 (E) 126-129

STANDARDS	PAGE REFERENCES
Physical Sciences	
<i>Nature of Matter</i>	
1. Investigate how matter can change forms but the total amount of matter remains constant.	The instructor can discuss this point in connection with the material on flow of matter through an ecosystem: (E) 50-51 DI 51
<i>Nature of Energy</i>	
2. Describe how an object can have potential energy due to its position or chemical composition and can have kinetic energy due to its motion.	(M) 127-129, 132, 161 <i>MiniLab</i> 133 <i>Science Online</i> 132 IL 127 DI 129 LD 132
3. Identify different forms of energy (e.g., electrical, mechanical, chemical, thermal, nuclear, radiant and acoustic).	(E) <i>Model and Invent Lab</i> 116-117 (M) 126-130 <i>Lab</i> 138 IL 127 SJ 129 ACT 128 R 130 QD 133 (N) 15-17 <i>Lab</i> 27
4. Explain how energy can change forms but the total amount of energy remains constant.	(E) TFYI 52 (M) 131-137, 139, 169 <i>Lab</i> 138 <i>Integrate History</i> 100 IM 124F
5. Trace energy transformation in a simple closed system (e.g., a flashlight).	(M) 133-137 <i>MiniLab</i> 133 <i>Lab</i> 138 D 135 CU 137 A 137 (N) 15-16 <i>MiniLab</i> 22 <i>Lab</i> 56-57 MM 24

STANDARDS	PAGE REFERENCES
Science and Technology	
<i>Understanding Technology</i>	
1. Explain how needs, attitudes and values influence the direction of technological development in various cultures.	(D) <i>Oops! Accidents in Science</i> 28 <i>Science and Society</i> 56 <i>Science and History</i> 110 (E) <i>The Nature of Science</i> 2-5 <i>Science and Society</i> 86 D 86 (I) <i>Science and Society</i> 58 (M) <i>Science and Society</i> 118 DI 134 (N) <i>Science and Society</i> 86
2. Describe how decisions to develop and use technologies often put environmental and economic concerns in direct competition with each other.	(E) 97, 104-105 <i>Science and Society</i> 146 ACT 107 (H) AIL 148 (I) 99-102 <i>Science and Society</i> 58 D 14 (M) 141-142 CD 142
3. Recognize that science can only answer some questions and technology can only solve some human problems.	(D) <i>The Nature of Science</i> 4-5 (I) <i>Science and Society</i> 58
<i>Abilities To Do Technological Design</i>	
4. Design and build a product or create a solution to a problem given two constraints (e.g., limits of cost and time for design and production or supply of materials and environmental effects).	(C) IL 111 (D) <i>Invent</i> 28 (E) <i>Model and Invent Lab</i> 116-117 (H) IL 101 ACT 140 (I) <i>Model and Invent Lab</i> 56-57 (M) <i>Design Your Own Lab</i> 26-27, 116-117 DI 142 MM 166
Scientific Inquiry	
<i>Doing Scientific Inquiry</i>	
1. Explain that variables and controls can affect the results of an investigation and that ideally one variable should be tested at a time; however it is not always possible to control all variables.	(C) <i>Science Skill Handbook</i> 164 ACT 4 (E) <i>Design Your Own Lab</i> 27 (I) <i>The Nature of Science</i> 4 D 3
2. Identify simple independent and dependent variables.	(C) <i>Science Skill Handbook</i> 164 EX 4 (D) <i>Design Your Own Lab</i> 83 (E) <i>Design Your Own Lab</i> 27 (H) <i>Design Your Own Lab</i> 26-27 (I) <i>Chapter Review</i> 31 #23 (M) <i>Design Your Own Lab</i> 57, 175 (N) <i>Lab</i> 29

STANDARDS	PAGE REFERENCES
3. Formulate and identify questions to guide scientific investigations that connect to science concepts and can be answered through scientific investigations.	(C) <i>Design Your Own Lab</i> 96-97 IL 141 (D) AIL 54 (E) <i>Design Your Own Lab</i> 26-27 (H) <i>Design Your Own Lab</i> 118-119 (I) <i>Use the Internet Lab</i> 116-117 IL 79 (M) <i>You Do It</i> 5 SJ 4 (N) ACT 40
4. Choose the appropriate tools and instruments and use relevant safety procedures to complete scientific investigations.	(C) <i>Design Your Own Lab</i> 28-29 R 27 IL 86 (D) <i>Design Your Own Lab</i> 196-197 (E) <i>Model and Invent Lab</i> 116-117 IL 82 (H) <i>Lab</i> 58-59 (I) <i>Model and Invent Lab</i> 56-57 IL 46 (M) <i>Design Your Own Lab</i> 174-175
5. Analyze alternative scientific explanations and predictions and recognize that there may be more than one good way to interpret a given set of data.	(C) YDI 5 (E) <i>Science Online</i> 104 <i>Model and Invent Lab</i> 116-117 (I) <i>Model and Invent Lab</i> 56-57 AIL 116 (M) <i>Design Your Own Lab</i> 26-27, 116-117 AIL 148
6. Identify faulty reasoning and statements that go beyond the evidence or misinterpret the evidence.	(H) ACT 72 (I) <i>Lab</i> 16
7. Use graphs, tables and charts to study physical phenomena and infer mathematical relationships between variables (e.g., speed and density).	(C) <i>Use the Internet Lab</i> 124-125 (D) EX 4 (E) <i>Design Your Own Lab</i> 26-27 ACT 18 (H) <i>Lab</i> 15 (I) <i>Design Your Own Lab</i> 26-27 AIL 116 (M) <i>Design Your Own Lab</i> 174-175 ACT 128 (N) <i>Lab</i> 28-29
Scientific Ways of Knowing	
<i>Ethical Practices</i>	
1. Show that the reproducibility of results is essential to reduce bias in scientific investigations.	(C) <i>Science Skill Handbook</i> 160 (D) <i>The Nature of Science</i> 3 VL 3 (H) EA 59

STANDARDS	PAGE REFERENCES
2. Describe how repetition of an experiment may reduce bias.	(D) <i>The Nature of Science</i> 3 Lab 46 VL 3 (H) <i>Lab</i> 59 (I) <i>MiniLab</i> 38
<i>Science and Society</i>	
3. Describe how the work of science requires a variety of human abilities and qualities that are helpful in daily life (e.g., reasoning, creativity, skepticism and openness).	(C) <i>Science Skill Handbook</i> 163-168 (D) <i>Applying Science</i> 40 SJ 42 (H) <i>MiniLab</i> 18 <i>Applying Science</i> 81 ACT 72 (I) <i>Lab</i> 16, 55 (N) <i>Use the Internet Lab</i> 84-85 R 26

Codes Used for TWE Pages

A	Assessment
ACT	Activity
AIL	Alternative Inquiry Lab
CC	Curriculum Connection
CD	Cultural Diversity
CU	Check for Understanding
D	Discussion
DI	Differentiated Instruction
EA	Error Analysis
EX	Extension
GI	Graph It
IL	Inquiry Lab
IM	Identifying Misconceptions
LD	Lab Demonstration
MM	Make a Model
QD	Quick Demo
R	Reteach
SJ	Science Journal
TFYI	Teacher FYI
TPK	Tie to Prior Knowledge
VL	Visual Learning
VPG	Visualizing Population Growth
YDI	You Do It