



OHIO
Academic Content Standards – Science Grade 8
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OBJECTIVES	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.	SE: 307, 309-311, 313-316 <i>Integrate Earth Science</i> 168 <i>Lab</i> 321 <i>Launch Lab</i> 305 TWE: D 310 FF 166 FYI 309 TC 304
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.	SE: 337, 338, 350, 358-359 <i>MiniLAB</i> 345 <i>National Geographic</i> 339
3. Compare the orbits and composition of comets and asteroids with that of Earth.	SE: 309, 311, 356-359 <i>Integrate Physics</i> 308 <i>Launch Lab</i> 305 TWE: AS 359 D 357 TC 304
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).	SE: 357-359 <i>Accidents in Science</i> 362 TWE: A 357 FYI 358 TPK 356
5. Explain that the universe consists of billions of galaxies that are classified by shape.	SE: 386-387, 391 <i>National Geographic</i> 390 TWE: CU 391 DIN 389 FYI 387
6. Explain interstellar distances are measured in light years (e.g., the nearest star beyond the sun is 4.3 light years away).	SE: 373 <i>Design Your Own Lab</i> 392-393 TWE: AS 374 CC 373 D 394 IM 371
7. Examine the life cycle of a star and predict the next likely stage of a star.	SE: 383-385 <i>Integrate Physics</i> 382 TWE: FF 384 RT 385 VL 383

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8. Name and describe tools used to study the universe (e.g., telescopes, probes, satellites and spacecraft).	SE: 324-325, 342-346, 348, 350-351, 359 <i>Lab 379</i> <i>National Geographic 318</i> TWE: D 377 FYI 355, 383
<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.	SE: 186-187, 190-192, 195, 196-197, 226-227, 229-231 <i>National Geographic 193</i> TWE: IM 194 RT 231 TC 180
10. Explain that most major geological events (e.g., earthquakes, volcanic eruptions, hot spots and mountain building) result from plate motion.	SE: 196-197, 210-213, 219-224, 226-229, 285, 292 <i>Use the Internet Lab 200-201</i> TWE: D 285 FYI 197 TPK 190
11. Use models to analyze the size and shape of Earth, its surface and its interior (e.g., globes, topographic maps, satellite images).	SE: 195, 214, 230-231, 306-307, 344, 354 <i>National Geographic 193</i> TWE: LD 354 MM 230
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.	SE: 186-187, 195, 221-223, 227-228, 231 <i>MiniLAB 220</i> TWE: FYI 221, 223, 227 IC 228
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).	SE: 186-187, 196-197, 219-223, 227-228, 285, 292 <i>Lab 189</i> <i>National Geographic 193</i> TWE: D 285 FYI 197
14. Explain that folding, faulting and uplifting can rearrange the rock layers so the youngest is not always found on top.	SE: 250-252 <i>Lab 256</i> <i>National Geographic 253</i> TWE: D 252
15. Illustrate how the three primary types of plate boundaries (transform, divergent and convergent) cause different landforms (e.g., mountains, volcanoes and ocean trenches).	SE: 191-194, 196-198 TWE: AS 199 MM 196 USW 192
Life Sciences	
<i>Heredity</i>	
1. Describe that asexual reproduction limits the spread of detrimental characteristics through a species and allows for genetic continuity.	SE: 42 TWE: D 42
2. Recognize that in sexual reproduction new combinations of traits are produced which may increase or decrease an organism's chances for survival.	SE: 46-48 TWE: SJ 46

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<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.	SE: 50, 52 <i>Integrate Environment</i> 49 <i>Lab</i> 54-55 <i>National Geographic</i> 51 TWE: AS 53 TPK 49
4. Explain that diversity of species is developed through gradual processes over many generations (e.g., fossil record).	SE: 274-276, 288-290, 293 TWE: RT 279 SJ 275 TC 270 VL 277, 289
5. Investigate how an organism adapted to a particular environment may become extinct if the environment, as shown by the fossil record, changes.	SE: 278, 279, 282, 286, 291 <i>National Geographic</i> 283 TWE: D 296 FYI 282 SJ 284 TPK 288
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.	SE: 522-523, 527, 528-529, 567-568 <i>Accidents in Science</i> 542 <i>Design Your Own Lab</i> 570-571 TWE: A 523 AS 532 FF 525 RT 527
2. Explain that motion describes the change in the position of an object (characterized by a speed and direction) as time changes.	SE: 524-526, 528-529, 552, 556-559, 567-568 <i>Design Your Own Lab</i> 570-571 TWE: AS 527, 532 DIN 526 VL 525
3. Explain that an unbalanced force acting on an object changes that object's speed and/or direction.	SE: 550-551, 552-555 <i>Science and Society</i> 572 TWE: A 552 DIN 554 TPK 550 USW 551
<i>Nature of Energy</i>	
4. Demonstrate that waves transfer energy.	SE: 212-213, 694, 697, 701-703, 708-710 <i>National Geographic</i> 216 <i>Science and History</i> 234 <i>Use the Internet Lab</i> 200-201 TWE: FF 698 UA 697

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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).	SE: 212-213, 694, 701-703 <i>Integrate Earth Science</i> 696 <i>Lab</i> 706 <i>Launch Lab</i> 693 <i>National Geographic</i> 216 TWE: FF 698 FYI 212
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.	SE: 26, 182-183, 434-435 <i>Accidents in Science</i> 716 <i>Integrate Career</i> 127, 467 <i>Integrate History</i> 681 <i>Integrate Physics</i> 340 <i>Science and History</i> 426 TWE: FF 25
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).	SE: 27 <i>Accidents in Science</i> 716 <i>Integrate History</i> 681 <i>Integrate Life Science</i> 617 <i>Science and Society</i> 658 TWE: D 325
<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).	SE: <i>Design Your Own Lab</i> 540-541, 598-599 <i>National Geographic</i> 90-91, 632-633 <i>Science and History</i> 114, 234, 512 <i>Science and Society</i> 172, 572, 600
4. Evaluate the overall effectiveness of a product design or solution.	SE: <i>Accidents in Science</i> 716 <i>Design Your Own Lab</i> 540-541 <i>Integrate Health</i> 682 <i>MiniLAB</i> 18 <i>National Geographic</i> 712 <i>Science and History</i> 512 <i>Science and Society</i> 572, 600
Scientific Inquiry	
<i>Doing Scientific Inquiry</i>	
1. Choose the appropriate tools or instruments and use relevant safety procedures to complete scientific investigations.	SE: 17 <i>Lab</i> 326-327, 510-511, 618 <i>Science Skill Handbook</i> 729-731, 733-735 <i>Use the Internet Lab</i> 28-29 TWE: SJ 9 USW 10
2. Describe the concepts of sample size and control and explain how these affect scientific investigations.	SE: 22 <i>Science and History</i> 114 <i>Science Skill Handbook</i> 728-729 TWE: DIN 20 LD 19, 100

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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).	SE: <i>Design Your Own Lab</i> 598-599, 624-625 <i>Lab</i> 189, 326-327, 341, 379 <i>Math Skill Handbook</i> 765-766 <i>Use the Internet Lab</i> 200-201 TWE: CC 22
4. Apply appropriate math skills to interpret quantitative data (e.g., mean, median and mode).	SE: <i>Applying Math</i> 47, 291, 419, 582, 583 <i>Design Your Own Lab</i> 424-425 <i>Math Skill Handbook</i> 758, 762-766
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).	SE: 14-19, 21-23, 47-48, 391, 410-413 <i>MiniLAB</i> 243, 345 <i>National Geographic</i> 20 <i>Science and Society</i> 658 TWE: FYI 47
<i>Ethical Practices</i>	
2. Explain why it is important to examine data objectively and not let bias affect observations.	SE: 15 <i>Science Skill Handbook</i> 732 TWE: A 15

Codes Used for TWE Pages

A	Activity
AS	Assessment
CC	Curriculum Connection
CU	Check for Understanding
D	Discussion
DIN	Differentiated Instruction
FF	Fun Fact
FYI	Teacher FYI
IC	Integrate Chemistry
IM	Identifying Misconceptions
LD	Lab Demonstration
MM	Make a Model
RT	Reteach
SJ	Science Journal
TC	Theme Connection
TPK	Tie to Prior Knowledge
UA	Use an Analogy
USW	Use Science Words
VL	Visual Learning