

Glencoe/McGraw-Hill

Earth Science: Geology, the Environment, and the Universe

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correlated to

Alabama

Course of Study for Earth and Space Science

Grades 9-12

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GRADES 9-12

OBJECTIVES	PAGE REFERENCES
1. Describe sources of energy, including solar, gravitational, geothermal, and nuclear.	SE: 682–689, 690–692, 693–694, 695–697, 707, 709, 741, 743, 810–811 TWE: 682C–682D, 682–689, 690–692, 693–694, 695–697, 707, 709, 741, 743, 810–811
2. Describe effects on weather of energy transfer within and among the atmosphere, hydrosphere, biosphere, and lithosphere.	
<ul style="list-style-type: none"> • Describing the energy transfer related to condensation in clouds, precipitation, winds, and ocean currents 	SE: 69, 146, 212, 275–277, 282, 289–295, 296, 297, 305–307, 336–337, 403–405, 408, 411, 436 TWE: 69, 146, 212, 270C–270D, 275–277, 282, 289–295, 296, 297, 305–307, 336–337, 403–405, 408, 411, 436
<ul style="list-style-type: none"> • Describing the characteristics of the El Niño and La Niña phenomena 	SE: 321, 370–371, 374, 381, 382, 411 TWE: 321, 370–371, 374, 381, 382, 411
<ul style="list-style-type: none"> • Using data to analyze global weather patterns 	The opportunity to address this objective is available. See the following: SE: 317–321 TWE: 312, 317–321
3. Explain how weather patterns affect climate.	
<ul style="list-style-type: none"> • Explaining characteristics of various weather systems, including high and low pressure areas or fronts 	SE: 305–311, 325, 326, 436 TWE: 298C, 305–311, 325, 326, 436
<ul style="list-style-type: none"> • Interpreting weather maps and symbols to predict changing weather conditions 	SE: 317–318, 319, 322–323 TWE: 317–318, 319, 322–323

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OBJECTIVES	PAGE REFERENCES
<ul style="list-style-type: none"> Identifying technologies used to obtain meteorological data 	SE: 312–316, 324, 325, 326, 327, 436, 439 TWE: 298C, 312–316, 321, 324, 325, 326, 327, 436, 439
4. Describe the production and transfer of stellar energies. (AHSGE Standard VII: 2)	
<ul style="list-style-type: none"> Describing the relationship between the life cycles and nuclear reactions of stars 	SE: 821–825, 831, 859, 861 TWE: 804D, 821–825, 831, 859, 861
<ul style="list-style-type: none"> Describing how the reception of solar radiation is affected by atmospheric and lithospheric conditions 	SE: 300–301, 362, 375–376 TWE: 300–301, 362, 375–376
5. Discuss various theories for the origin, formation, and changing nature of the universe and our solar system.	
<ul style="list-style-type: none"> Explaining the nebular hypothesis for formation of planets, the big bang theory, and the steady state theory 	SE: 793–795, 801, 847–851, 854, 855, 856, 857, 858–859, 860, 861 TWE: 793–795, 801, 847–851, 854, 855, 856, 857, 858–859, 860, 861
<ul style="list-style-type: none"> Relating Hubble’s law to the concept of an ever-expanding universe 	SE: 842–843, 856, 857 TWE: 842–843, 856, 857
<ul style="list-style-type: none"> Describing the impact of meteor, asteroid, and comet bombardment on planetary and lunar development 	SE: 438, 648, 754, 755, 768, 794–797, 803 TWE: 438, 648, 754, 755, 768, 794–797, 803
6. Explain the length of a day and of a year in terms of the motion of Earth.	
<ul style="list-style-type: none"> Explaining the relationship of the seasons to the tilt of Earth’s axis and its revolution about the sun 	SE: 370, 373, 374, 759–762, 783 TWE: 370, 373, 374, 759–762, 783

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7. Explain techniques for determining the age and composition of Earth and the universe. (AHSGE Standard I: 1)	
<ul style="list-style-type: none"> • Using radiometric age methods to compute the age of Earth 	<p>The opportunity to address this objective is available. See the following: SE: 562–563, 648</p> <p>TWE: 562–563, 648</p>
<ul style="list-style-type: none"> • Using expanding universe measurements to determine the age of the universe 	<p>SE: 850–851</p> <p>TWE: 850–851</p>
<ul style="list-style-type: none"> • Identifying techniques for evaluating the composition of objects in space 	<p>SE: 504, 747–752, 753–755, 780, 781, 782, 783, 784, 785, 786, 788, 789, 790</p> <p>TWE: 504, 747–752, 753–755, 774C–774D, 780, 781, 782, 783, 784, 785, 786, 788, 789, 790</p>
8. Explain the terms <i>astronomical unit</i> and <i>light year</i> .	
	<p>SE: 777, 801, 815</p> <p>TWE: 777, 801, 815</p>
9. Relate the life cycle of stars to the H-R diagram.	
<ul style="list-style-type: none"> • Explaining indicators of motion by the stars and sun in terms of Doppler effect and red and blue shifts 	<p>SE: 818–819, 830, 859</p> <p>TWE: 818–819, 830, 859</p>
<ul style="list-style-type: none"> • Describing the relationship of star color, brightness, and evolution to the balance between gravitational collapse and nuclear fusion 	<p>SE: 821, 822, 831, 859</p> <p>TWE: 821, 822, 831, 859</p>

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OBJECTIVES	PAGE REFERENCES
10. Identify scientists and their findings relative to Earth and space, including Copernicus, Galileo, Kepler, Newton, and Einstein. (AHSGE Standard VIII: 1)	
<ul style="list-style-type: none"> • Identifying classical instruments used to extend the senses and increase knowledge of the universe, including optical telescopes, radio telescopes, spectroscopes, and cameras 	SE: 748–750, 771, 858 TWE: 746C, 748–750, 771, 858
11. Describe pulsars, quasars, black holes, and galaxies.	SE: 825, 828, 829, 839–846, 852–853, 855, 857 TWE: 825, 828, 829, 839–846, 852–853, 855, 857
12. Describe the challenges and required technologies of space exploration.	
<ul style="list-style-type: none"> • Identifying long-term human space travel needs, including life support 	The opportunity to address this objective is available. See the following: SE: 752 TWE: 752, 753
<ul style="list-style-type: none"> • Identifying applications of propulsion technologies for space travel 	This objective falls outside the scope of Glencoe/McGraw-Hill <i>Earth Science: Geology, the Environment, and the Universe</i> .
<ul style="list-style-type: none"> • Identifying new instrumentation and communication technologies needed for space information gathering 	SE: 800 TWE: 800
<ul style="list-style-type: none"> • Identifying benefits to the quality of life that have been achieved through space advances 	SE: 752 TWE: 752

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OBJECTIVES	PAGE REFERENCES
<ul style="list-style-type: none"> • Identifying new technology used to gather information, including spacecraft, observatories, space-based telescopes, and probes 	<p>SE: 750, 751, 752, 771, 775, 780, 781, 782, 784, 786, 787, 788, 789, 790, 803, 828, 858, 903–907</p> <p>TWE: 750, 751, 752, 771, 775, 780, 781, 782, 784, 786, 787, 788, 789, 790, 803, 828, 858, 903–907</p>

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