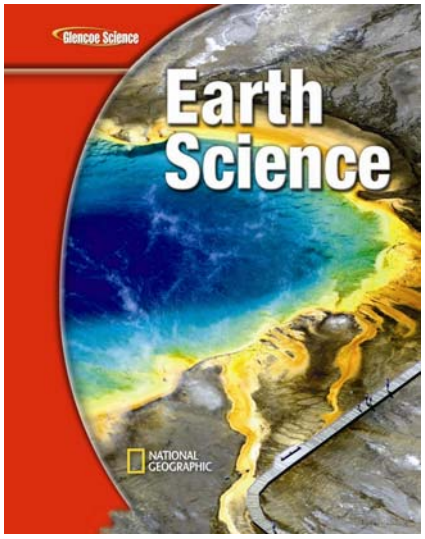
Science Grade-Level Expectations
Grades 6, 7, and 8

Missouri



Earth Science

STANDARDS	PAGE REFERENCES
Grade 6	
Strand 4: Changes in Ecosystems and Interactions of Organisms with their Environments	
1. Organisms are interdependent with one another and with their environment	
A. All populations living together within a community interact with one another and with their environment in order to survive and maintain a balanced ecosystem	
Scope and Sequence – Ecosystems and Populations a. Identify the biotic factors (populations of organisms) and abiotic factors (e.g., quantity of light and water, range of temperatures, soil composition) that make up an ecosystem	**Student Edition:** 549-556 *National Geographic* 555
B. Living organisms have the capacity to produce populations of infinite size, but environments and resources are finite	
Scope and Sequence – Ecosystems and Populations a. Identify populations within a community that are in competition with one another for resources	**Student Edition:** 551-553 *National Geographic* 555 *Get Ready to Read* 574A **Teacher Wraparound Edition:** DI 554 **Teacher Resources:** *Fast File: Volcanoes* 30

Codes used for Teacher Wraparound Edition pages are the initial caps of headings on that page.

STANDARDS	PAGE REFERENCES
b. Recognize the factors that affect the number and types of organisms an ecosystem can support (e.g., food availability, abiotic factors such as quantity of light and water, temperature and temperature range, soil composition, disease, competitions from other organisms, predation)	**Student Edition:** 551-556, 574-577 *National Geographic* 555 *Get Ready to Read* 574A **Teacher Wraparound Edition:** A 556; DIS 564, 575; V 555 **Teacher Resources:** *Critical Thinking/Problem Solving* 1 *Fast File: Volcanoes* 30
c. Predict the possible effects of changes in the number and types of organisms in an ecosystem on the populations of other organisms within that ecosystem	**Student Edition:** 557-560 **Teacher Wraparound Edition:** DIS 560; TFYI 560
D. The diversity of species within an ecosystem is affected by changes in the environment, which can be caused by other organisms or outside processes	
Scope and Sequence – Ecosystems and Populations a. Describe beneficial and harmful activities of organisms, including humans (e.g., deforestation, overpopulation, water and air pollution, global warming, restoration of natural environments, river bank/coastal stabilization, recycling, channelization, reintroduction of species, depletion of resources), and explain how these activities affect organisms within an ecosystem	**Student Edition:** 432-433, 499-502, 557-561, 578-584, 600-607, 609-615 *Science Online* 501 *Get Ready to Read* 600A **Teacher Wraparound Edition:** A 433; CFU 615; IL 605; IM 604; LD 500; R 607; SJ 611 **Teacher Resources:** *Fast File: Volcanoes* 30 *Fast File: Our Impact On Land* 9-12, 13-14, 17-20, 31-34
b. Predict the impact (beneficial or harmful) of a natural environmental change (e.g., forest fire, flood, volcanic eruption, avalanche) on the organisms in an ecosystem	**Student Edition:** 246-247, 331, 342-343, 406 *Get Ready to Read* 238A *Accidents in Science* 352 *Science and History* 506 **Teacher Wraparound Edition:** CC 494; DI 494; DIS 506

STANDARDS	PAGE REFERENCES
c. Describe possible solutions to potentially harmful environmental changes within an ecosystem	**Student Edition:** 198-199, 561, 586-589, 605-607, 613-615 *Science Online* 197, 554 *Applying Science* 581 **Teacher Wraparound Edition:** A 199; CD 558, 580; CFU 584; R 199 **Teacher Resources:** *Fast File: Our Impact On Land* 11-12, 19, 27
2. Matter and energy flow through an ecosystem	
A. As energy flows through the ecosystem, all organisms capture a portion of that energy and transform it to a form they can use	
Scope and Sequence – Ecosystems and Populations a. Diagram and describe the transfer of energy in an aquatic food web and a land food web with reference to producers, consumers, decomposers, scavengers, and predator/prey relationships	**Student Edition:** 549-551 *Integrate Career* 550 *Applying Skills* 556 **Teacher Wraparound Edition:** CB 564; DI 554; MM 550; TFYI 551; VL 550
b. Classify populations of unicellular and multicellular organisms as producers, consumers, and decomposers by the role they serve in the ecosystem	**Student Edition:** 549 **Teacher Wraparound Edition:** DIS 550; R 556; TFYI 551 **Teacher Resources:** *Fast File: Oceanography* 33-34
3. Genetic variation sorted by the natural selection process explains evidence of biological evolution	
A. Evidence for the nature and rates of evolution can be found in anatomical and molecular characteristics of organisms and in the fossil record	
Scope and Sequence – Ecosystems and Populations a. Identify fossils as evidence some types of organisms (e.g., dinosaurs, trilobites, mammoths, giant tree ferns) that once lived in the past, and have since become extinct, have similarities with and differences from organisms living today	**Student Edition:** 362-369, 397-399 *Launch Lab* 361 *Integrate Life Science* 368 *Model and Invent Lab* 382-383 *National Geographic* 403 *Use the Internet Lab* 414-415 **Teacher Wraparound Edition:** DI 363, 368; DIS 366; SJ 367 **Teacher Resources:** *Fast File: Clues to Earth's Past* 7-8, 13-15, 30

STANDARDS	PAGE REFERENCES
C. Natural selection is the process of sorting individuals based on their ability to survive and reproduce within their ecosystem	
Scope and Sequence – Ecosystems and Populations a. Relate examples of adaptations (specialized structures or behaviors) within a species to its ability to survive in a specific environment (e.g., hollow bones/flight, hollow hair/insulation, dense root structure/compact soil, seeds/food, protection for plant embryo vs. spores, fins/movement in water)	**Student Edition:** 394-398, 404, 488-491 *Lab* 407 **Teacher Wraparound Edition:** A 399; ACT 396, 555; DI 410, 489; DIS 396; VL 404, 490 **Teacher Resources:** *Fast File: Climate* 28
b. Predict how certain adaptations, such as behavior, body structure, or coloration, may offer a survival advantage to an organism in a particular environment	**Student Edition:** 488-491 *Launch Lab* 391 *Integrate Chemistry* 552 **Teacher Wraparound Edition:** CFU 491; DIS 395; FF 489; IL 551; MM 490 **Teacher Resources:** *Fast File: Climate* 28
Strand 5: Processes and Interactions of the Earth's Systems (Geosphere, Atmosphere, and Hydrosphere)	
1. Earth's Systems (geosphere, atmosphere, and hydrosphere) have common components and unique structures	
A. The Earth's crust is composed of various materials, including soil, minerals, and rocks, with characteristic properties	
Scope and Sequence – Earth's Resources a. Describe the components of soil and other factors that influence soil texture, fertility, and resistance to erosion (e.g., plant roots and debris, bacteria, fungi, worms, rodents)	**Student Edition:** 188-194, 196-199 *Get Ready to Read* 182A *National Geographic* 189 *MiniLAB* 190 *Integrate Chemistry* 191 *Applying Math* 192 *Lab* 195 **Teacher Wraparound Edition:** ACT 189; CFU 194; DI 189; IL 193; QD 191; V 189; VL 197 **Teacher Resources:** *Fast File: Weathering and Soil* 5-6, 28

STANDARDS	PAGE REFERENCES
B. The hydrosphere is composed of water (a material with unique properties), gases, and other materials	
Scope and Sequence – Earth's Resources a. Recognize the properties of water that make it an essential component of the Earth system (e.g., its ability to act as a solvent, its ability to remain as a liquid at most Earth temperatures)	**Student Edition:** 40-42, 600 *Launch Lab* 33 *Integrate Physics* 436 **Teacher Wraparound Edition:** A 44; DIS 601; SCB 512E; TFYI 42; VL 42
2. Earth's Systems (geosphere, atmosphere, and hydrosphere) interact with one another as they undergo change by common processes	
A. The Earth's materials and surface features are changed through a variety of external processes	
Scope and Sequence – Internal Processes and External Events a. Make inferences about the formation of sedimentary rocks from their physical properties (e.g., layering and the presence of fossils indicate sedimentation)	**Student Edition:** 103-109, 370-375 *Lab* 110-111 *National Geographic* 373 **Teacher Wraparound Edition:** A 111; ACT 373; DIS 372; IL 374; IM 360F; R 375; V 373; VL 372 **Teacher Resources:** *Fast File: Rocks* 9-10, 30
b. Explain how the formation of sedimentary rocks depends on weathering and erosion	**Student Edition:** 90-93, 103-109, 117 #20 **Teacher Wraparound Edition:** A 109; DIS 105; SJ 105 **Teacher Resources:** *Fast File: Rocks* 32
c. Describe how weathering agents and erosional processes (i.e., force of water as it freezes or flows, expansion/contraction due to temperature, force of wind, force of plant roots, action of gravity, chemical decomposition) slowly cause surface changes that create and/or change landforms	**Student Edition:** 182-187, 210-214, 215-220, 222-227, 238-248 *Design Your Own Lab* 200-201 *MiniLAB* 211 **Teacher Wraparound Edition:** R 187; SJ 183, 212; VL 184 **Teacher Resources:** *Fast File: Weathering and Soil* 7-8, 9-10 *Fast File: Erosional Forces* 7-8, 23-25 *Fast File: Water Erosion and Deposition* 29-31

STANDARDS	PAGE REFERENCES
d. Describe how the Earth's surface and surface materials can change abruptly through the activity of floods, rock/mudslides, or volcanoes	**Student Edition:** 210-214, 246-247, 300-303, 304-311, 313-319, 336-343 *Get Ready to Read* 210A *National Geographic* 306 *Science Stats* 322 **Teacher Wraparound Edition:** QD 316; TFYI 331 **Teacher Resources:** *Fast File: Erosional Forces* 26
B. There are internal processes and sources of energy within the geosphere that cause changes in Earth's crustal plates	
Scope and Sequence – Internal Processes and External Events a. Identify events (earthquakes, volcanic eruptions) and the landforms created by them on the Earth's surface that occur at different plate boundaries	**Student Edition:** 280-289, 333-335, 340-343 *Science Online* 282 *National Geographic* 283 *Use the Internet Lab* 290-291 **Teacher Wraparound Edition:** A 335; CC 287; DI 286, 302; R 335; VL 284 **Teacher Resources:** *Fast File: Earthquakes* 21 *Fast File: Volcanoes* 25
D. Changes in the Earth over time can be inferred through rock and fossil evidence	
Scope and Sequence – Internal Processes and External Events a. Explain the types of fossils and the processes by which they are formed (i.e., replacement, mold and cast, preservation, trace)	**Student Edition:** 362-369 *MiniLAB* 363 *Model and Invent Lab* 382-383 **Teacher Wraparound Edition:** A 363; AR 364; IM 364; MM 367; QD 364; R 369 **Teacher Resources:** *Fast File: Clues to Earth's Past* 20

STANDARDS	PAGE REFERENCES
b. Use fossil evidence to make inferences about changes on Earth and in its environment (i.e., superposition of rock layers, similarities between fossils in different geographical locations, fossils of seashells indicate the area was once underwater)	**Student Edition:** 272-275, 362-369, 392-399 *Get Ready to Read* 272A *MiniLAB* 274 *Launch Lab* 361 *Integrate Life Science* 368 **Teacher Wraparound Edition:** DI 368; VL 368 **Teacher Resources:** *Fast File: Clues to Earth's Past* 28
3. Human activity is dependent upon and affects Earth's resources and systems	
A. Earth's materials are limited natural resources affected by human activity	
Scope and Sequence – Earth's Resources a. Relate the comparative amounts of fresh water and salt water on the Earth to the availability of water as a resource for living organisms and human activity	**Student Edition:** 249-254, 516-517 **Teacher Wraparound Edition:** CC 605; DI 250; DIS 516; SCB 512E, 598E; TFYI 246, 251
b. Describe the affect of human activities (e.g., landfills, use of fertilizers and herbicides, farming, septic systems) on the quality of water	**Student Edition:** 557-561, 600-607 *Get Ready to Read* 600A **Teacher Wraparound Edition:** CD 604; CFU 607; IL 253, 605; QD 558; R 607; SJ 251; TFYI 604 **Teacher Resources:** *Fast File: Oceanography* 29
Scope and Sequence – Internal Processes and External Events c. Analyze the ways humans affect the erosion and deposition of soil and rock materials (e.g., clearing of land, planting vegetation, paving land, construction of new buildings, building or removal of dams)	**Student Edition:** 196-199, 213-214, 578-584 *Applying Science* 581 **Teacher Wraparound Edition:** ACT 197; CFU 199; DI 198; DIS 212; QD 581; R 199; TFYI 211 **Teacher Resources:** *Critical Thinking/Problem Solving* 6, 7 *Fast File: Weathering and Soil* 15, 25, 28

STANDARDS	PAGE REFERENCES
Grade 7	
Strand 5: Processes and Interactions of the Earth's Systems (Geosphere, Atmosphere, and Hydrosphere)	
1. Earth's Systems (geosphere, atmosphere, and hydrosphere) have common components and unique structures	
C. The atmosphere (air) is composed of a mixture of gases, including water vapor, and minute particles	
Scope and Sequence – Weather and Climate a. Describe the composition of the Earth's atmosphere (i.e., mixture of gases, water and minute particles) and how it circulates as air masses	**Student Edition:** 426-433, 462-463 *Get Ready to Read* 426A, 454A *Science Online* 428 **Teacher Wraparound Edition:** CFU 433; DI 432; IM 428; ITC 424; MM 423; TFYI 429; VL 427 **Teacher Resources:** *Fast File: Atmosphere* 16, 23
b. Describe the role atmosphere (e.g., clouds, ozone) plays in precipitation, reflecting and filtering light from the Sun, and trapping heat energy emitted from the Earth's surface	**Student Edition:** 435-438, 454-461, 499, 511 #8-#10 *Launch Lab* 453 *Science Online* 499 *Lab* 503 **Teacher Wraparound Edition:** A 438, 461; DI 457 **Teacher Resources:** *Fast File: Climate* 5-6
D. Climate is a description of average weather conditions in a given area over time	
Scope and Sequence – Weather and Climate a. Differentiate between weather and climate	**Student Edition:** 454, 484 **Teacher Resources:** *Fast File: Weather* 17 *Fast File: Climate* 33

STANDARDS	PAGE REFERENCES
b. Identify factors that affect climate (e.g., latitude, altitude, prevailing wind currents, amount of solar radiation)	**Student Edition:** 484-487 *Launch Lab* 483 *MiniLAB* 485 *Applying Science* 486 **Teacher Wraparound Edition:** A 487; CC 485; CFU 487, 500; FF 486; QD 484; R 487; SCB 482E **Teacher Resources:** *Fast File: Climate* 9-11, 30
2. Earth's Systems (geosphere, atmosphere, and hydrosphere) interact with one another s they undergo change by common processes	
E. Changes in the form of water as it moves through Earth's systems are described as the water cycle	
Scope and Sequence – Weather and Climate a. Explain and trace the possible paths of water through the hydrosphere, geosphere, and atmosphere (i.e., the water cycle: evaporation, condensation, precipitation, surface run-off/ groundwater flow)	**Student Edition:** 238-248, 249-254, 437-438, 458-461 *Applying Math* 252, 265 **Teacher Wraparound Edition:** A 437; CFU 461; QD 240; R 438; SCB 236F; VL 437
b. Relate the different forms water can take (i.e., snow, rain, sleet, fog, clouds, dew, humidity) as it moves through the water cycle to atmospheric conditions (i.e., temperature, pressure, wind direction and speed, humidity) at a given geographic location	**Student Edition:** 456-461 *MiniLAB* 456 **Teacher Wraparound Edition:** A 437, 461; CFU 461; DI 457, 460; DIS 460; R 461; TFYI 460 **Teacher Resources:** *Fast File: Weather* 9-11, 20, 27
c. Explain how thermal energy is transferred throughout the water cycle by the processes of convection, conduction, and radiation	**Student Edition:** 435-438 *MiniLAB* 437 **Teacher Wraparound Edition:** CFU 438; DI 436; DIS 437; TPK 435; UAA 436 **Teacher Resources:** *Fast File: Atmosphere* 17, 24, 28

STANDARDS	PAGE REFERENCES
F. Constantly changing properties of the atmosphere occur in patterns which are described as weather	
Scope and Sequence – Weather and Climate a. Explain how the differences in surface temperature, due to the different heating and cooling rates of water and soil, affect the temperature and movement of the air above	**Student Edition:** 449 #26 *Integrate Physics* 436 *Design Your Own Lab* 444-445 **Teacher Wraparound Edition:** A 445 **Teacher Resources:** *Fast File: Atmosphere* 7-8, 37
b. Recognize the characteristics of air masses (i.e., high/low barometric pressure, temperature) and predict their effect on the weather in a given location	**Student Edition:** 462-463 *Get Ready to Read* 454A *Science Online* 469 **Teacher Wraparound Edition:** A 469 **Teacher Resources:** *Fast File: Weather* 19
c. Identify weather conditions associated with cold fronts and warm fronts	**Student Edition:** 463-466 *Lab* 473 **Teacher Wraparound Edition:** A 469; CC 464; CFU 469; DI 464; VL 464 **Teacher Resources:** *Fast File: Weather* 21, 34
d. Identify factors that affect weather patterns in a particular region (e.g., proximity to large bodies of water, latitude, altitude, prevailing wind currents, amount of solar radiation, location with respect to mountain ranges)	**Student Edition:** 462, 484-487 *Get Ready to Read* 484B *MiniLAB* 485 *Applying Science* 486 **Teacher Wraparound Edition:** CC 485; DIS 487; FF 486

STANDARDS	PAGE REFERENCES
e. Collect and interpret weather data (e.g., cloud cover, precipitation, wind speed and direction) from weather instruments and maps to explain present day weather and to predict the next day's weather	**Student Edition:** 470-472, 474-475, 479 #32 *Unit Projects* 423 *MiniLAB* 471 *Lab* 473 *Model and Invent Lab* 474-475 **Teacher Wraparound Edition:** A 473; DI 19, 471; IL 464 **Teacher Resources:** *Fast File: Atmosphere* 11-12 *Fast File: Weather* 7-8, 29-32
f. Recognize significant changes in temperature and barometric pressure may cause dramatic weather phenomena (i.e., severe thunderstorms, tornadoes, hurricanes)	**Student Edition:** 465-469 *National Geographic* 467 *Integrate Environment* 468 **Teacher Wraparound Edition:** ACT 467; TFYI 465, 468 **Teacher Resources:** *Fast File: Weather* 28, 34-35
3. Human activity is dependent upon and affects Earth's resources and systems	
A. Earth's materials are limited natural resources affected by human activity	
Scope and Sequence – Energy Transformations a. Distinguish between renewable (e.g., geothermal, hydroelectric) and nonrenewable (e.g., fossil fuel) energy sources	**Student Edition:** 120-129, 130-135 *Get Ready to Read* 120B **Teacher Wraparound Edition:** A 129, 135; ACT 133; DIS 134; R 135; USW 121 **Teacher Resources:** *Critical Thinking/Problem Solving* 10, 17 *Fast File: Earth's Energy and Mineral Resources* 17, 19, 28
Scope and Sequence – Weather and Climate b. Provide examples of how the availability of fresh water for humans and other living organisms is dependent upon the water cycle	**Student Edition:** 249-253, 437-438, 451 #15-#17 *Science and Society* 476 **Teacher Wraparound Edition:** A 437

STANDARDS	PAGE REFERENCES
Strand 6: Composition and Structure of the Universe and the Motion of the Objects Within It	
1. The universe has observable properties and structure	
A. The Earth, Sun, and moon are part of a larger system that includes other planets and smaller celestial bodies	
Scope and Sequence – Objects and Their Motion in the Solar System a. Classify celestial bodies in the solar system into categories: Sun, moon, planets, and other small bodies (i.e., asteroids, comets, meteors), based on physical properties	**Student Edition:** 690-691, 696-701, 702-709, 710-713 *Get Ready to Read* 690B *Science Online* 691 **Teacher Wraparound Edition:** CFU 713; IM 711; R 713; TC 688; TPK 710 **Teacher Resources:** *Fast File: The Solar System* 13-15, 19, 27
b. Compare and contrast the size, composition, atmosphere, and surface of the planets (inner vs. outer) in our solar system and Earth's moon	**Student Edition:** 690-691, 696-701, 702-709 *Get Ready to Read* 690A *Applying Math* 700 *MiniLAB* 704 **Teacher Wraparound Edition:** A 694; ACT 703, 708; CC 705; DI 692; QD 698; TFYI 697 **Teacher Resources:** *Fast File: The Solar System* 4, 17, 20, 28-29
c. Identify the relative proximity of common celestial bodies (i.e., Sun, moon, planets, smaller celestial bodies such as comets and meteors, other stars) in the sky to the Earth	**Student Edition:** 690-694, 708-709 *Model and Invent Lab* 714-715 **Teacher Wraparound Edition:** A 715; ACT 708; DI 692; QD 706; TBI 722 **Teacher Resources:** *Fast File: The Solar System* 7-8
B. The Earth has a composition and location suitable to sustain life	
Scope and Sequence – Objects and Their Motion in the Solar System a. Describe how the Earth's placement in the solar system is favorable to sustain life (i.e., distance from the Sun, temperature, atmosphere)	**Student Edition:** 438, 698

STANDARDS	PAGE REFERENCES
b. Compare and contrast the characteristics of Earth that support life with the characteristics of other planets that are considered favorable or unfavorable to life (e.g., atmospheric gases, extremely high/low temperatures)	**Student Edition:** 438, 703 *Apply It* 690A **Teacher Wraparound Edition:** SJ 709; TFYI 708 **Teacher Resources:** *Critical Thinking/Problem Solving* 8 *Fast File: The Solar System* 7-8, 9-12, 33
C. Most of the information we know about the universe comes from the electromagnetic spectrum	
Scope and Sequence – Objects and Their Motion in the Solar System a. Recognize stars are separated from one another by vast and different distances, which causes stars to appear smaller than the Sun	**Student Edition:** 724-728 **Teacher Wraparound Edition:** CC 727; DIS 748; IM 725 **Teacher Resources:** *Fast File: Stars and Galaxies* 4, 9-12, 31
b. Compare the distance light travels from the Sun to Earth to the distance light travels from other stars to Earth using light years	**Student Edition:** 727 *Get Ready to Read* 724B *Applying Skills* 728 *MiniLAB* 742 **Teacher Wraparound Edition:** A 742
2. Regular and predictable motions of objects in the universe can be described and explained as the result of gravitational forces	
A. The apparent position of the Sun and other stars, as seen from Earth, change in observable patterns	
Scope and Sequence – Objects and Their Motion in the Solar System a. Relate the apparent east-to-west changes in the positions of the Sun, other stars, and planets in the sky over the course of a day to Earth's counterclockwise rotation about its axis	**Student Edition:** 660-661
b. Describe the pattern that can be observed in the changes in number of hours of visible sunlight, and the time and location of sunrise and sunset, throughout the year	**Student Edition:** 663-665 *Get Ready to Read* 660A-B **Teacher Wraparound Edition:** R 665; TFYI 663; VL 663 **Teacher Resources:** *Fast File: The Sun-Earth-Moon System* 28

STANDARDS	PAGE REFERENCES
c. Recognize, in the Northern Hemisphere, the Sun appears lower in the sky during the winter and higher in the sky during the summer	**Student Edition:** 663-665 **Teacher Wraparound Edition:** QD 664
d. Recognize, in winter, the Sun appears to rise in the Southeast and set in the Southwest, accounting for a relatively short day length, and, in summer, the Sun appears to rise in the Northeast and set in the Northwest, accounting for a relatively long day length	**Student Edition:** 663-665
e. Recognize the Sun is never directly overhead when observed from North America	**Student Edition:** 663-665 **Teacher Wraparound Edition:** R 665
B. The apparent position of the moon, as seen from Earth, and its actual position relative to Earth change in observable patterns	
Scope and Sequence – Objects and Their Motion in the Solar System a. Observe the change in time and location of moon rise, moon set, and the moon's appearance relative to time of day and month over several months, and note the pattern in this change	**Student Edition:** 666-670 *Science Online* 669 *Lab* 675 **Teacher Wraparound Edition:** A 675; IM 658F, 683; VL 668
b. Recognize the moon rises later each day due to its revolution around the Earth in a counterclockwise direction	**Student Edition:** 666-667 **Teacher Wraparound Edition:** TBI 658
c. Recognize the Moon is in the sky for roughly 12 hours in a 24-hour period (i.e., if the Moon rises at about 6 P.M., it will set at about 6 A.M.)	**Student Edition:** 666-667
d. Recognize that one half of the Moon is always facing the Sun and, therefore, one half of the Moon is always lit	**Student Edition:** 666-670 **Teacher Wraparound Edition:** IM 658F **Teacher Resources:** *Fast File: The Sun-Earth-Moon System* 32
e. Relate the apparent change in the moon's position in the sky as it appears to move east-to-west over the course of a day to Earth's counterclockwise rotation about its axis	**Teacher Wraparound Edition:** IM 658F; TBI 658

STANDARDS	PAGE REFERENCES
f. Describe how the appearance of the moon that can be seen from Earth changes approximately every 28 days in an observable pattern (moon phases)	**Student Edition:** 666-670 *Get Ready to Read* 660B *Lab* 675 **Teacher Wraparound Edition:** A 675; IM 658F **Teacher Resources:** *Fast File: The Sun-Earth-Moon System* 7-8
C. The regular and predictable motions of a planet and moon relative to the Sun explain natural phenomena on a planet, such as day, month, year, shadows, moon phases, eclipses, tides, and seasons	
Scope and Sequence – Objects and Their Motion in the Solar System a. Illustrate and explain a day as the time it takes a planet to make a full rotation about its axis	**Student Edition:** 661, 665 **Teacher Wraparound Edition:** TBI 658 **Teacher Resources:** *Fast File: The Sun-Earth-Moon System* 17, 20
b. Diagram the path (orbital ellipse) the Earth travels as it revolves around the Sun	**Student Edition:** 663-665 *Science Online* 663 *Lab* 695 **Teacher Resources:** *Fast File: The Solar System* 5-6
c. Illustrate and explain a year as the time it takes a planet to revolve around the Sun	**Student Edition:** 663-665 **Teacher Resources:** *Fast File: The Sun-Earth-Moon System* 17
d. Explain the relationships between a planet's length of year (period of revolution) and its position in the solar system	**Student Edition:** 694 *Get Ready to Read* 690A *Section Review* 694
e. Describe how the moon's relative position changes as it revolves around the Earth	**Student Edition:** 666-670 *Lab* 675 **Teacher Wraparound Edition:** ACT 670; DIS 670; R 674 **Teacher Resources:** *Fast File: The Sun-Earth-Moon System* 26

STANDARDS	PAGE REFERENCES
f. Recognize the phases of the moon are due to the relative positions of the Moon with respect to the Earth and Sun	**Student Edition:** 666-668 *Lab* 675 **Teacher Wraparound Edition:** IM 658F **Teacher Resources:** *Fast File: The Sun-Earth-Moon System* 7-8
g. Relate the axial tilt and orbital position of the Earth as it revolves around the Sun to the intensity of sunlight falling on different parts of the Earth during different seasons	**Student Edition:** 663-665 *Get Ready to Read* 660A-B *Lab* 680-681 **Teacher Wraparound Edition:** ACT 663; AIL 680; QD 664; R 665 **Teacher Resources:** *Fast File: The Sun-Earth-Moon System* 9-10, 38
D. Gravity is a force of attraction between objects in the solar system that governs their motion	
Scope and Sequence –- Objects and Their Motion in the Solar System a. Describe how the Earth's gravity pulls any object on or near the Earth toward it (including natural and artificial satellites)	**Student Edition:** 210, 637, 721 #26
b. Describe how the planets' gravitational pull keeps satellites and moons in orbit around them	**Student Edition:** 637, 673, 703-704
c. Describe how the Sun's gravitational pull holds the Earth and other planets in their orbits	**Student Edition:** 690-694
Grade 8	
Strand 4: Changes in Ecosystems and Interactions of Organisms with their Environments	
1. Organisms are interdependent with one another and with their environment	
D. The diversity of species within an ecosystem is affected by changes in the environment, which can be caused by other organisms or outside processes	
Scope and Sequence – Disease a. Explain the beneficial or detrimental impact that some organisms (i.e., viruses, bacteria, protists, fungi) may have on other organisms (e.g., diseases, antibiotics, breakdown of waste, fermentation)	**Student Edition:** 190, 401, 551 **Teacher Wraparound Edition:** DIS 401 **Teacher Resources:** *Critical Thinking/Problem Solving* 1

STANDARDS	PAGE REFERENCES
2. Matter and energy flow through an ecosystem	
B. Matter is recycled through an ecosystem	
Scope and Sequence – Cells and Body Systems a. Illustrate the oxygen/carbon dioxide cycles	**Student Edition:** 502, 511 #13-#15 **Teacher Wraparound Edition:** CFU 502
b. Describe the processes involved in the recycling of matter in the oxygen/carbon dioxide cycles	**Student Edition:** 502, 511 #13-#15, 549 *Section Review* 556 **Teacher Wraparound Edition:** IM 550; TFYI 551 **Teacher Resources:** *Fast File: Oceanography* 13-16
Strand 5: Processes and Interactions of the Earth's Systems (Geosphere, Atmosphere, and Hydrosphere)	
1. Earth's Systems (geosphere, atmosphere, and hydrosphere) have common components and unique structures	
A. The Earth's crust is composed of various materials, including soil, minerals, and rocks, with characteristic properties	
Scope and Sequence – Rock Cycle and Plate Tectonics a. Differentiate between minerals and rocks (which are composed of different kinds of minerals)	**Student Edition:** 62-66, 90 *Get Ready to Read* 62A-B, 90A-B *National Geographic* 64 *Launch Lab* 89 *Science Online* 100 **Teacher Wraparound Edition:** R 93 **Teacher Resources:** *Fast File: Minerals* 23 *Fast File: Rocks* 28

STANDARDS	PAGE REFERENCES
b. Describe the distinguishing properties that can be used to classify minerals (i.e., texture, smell, luster, hardness, crystal shape, streak, reaction to magnets and acids)	**Student Edition:** 68-72 *Get Ready to Read* 62B *Applying Science* 70 *MiniLAB* 72 *Lab* 80-81 **Teacher Wraparound Edition:** A 72; LD 70; QD 71; R 72; VL 70 **Teacher Resources:** *Fast File: Minerals* 7-8, 15, 24
c. Describe the methods used to identify the distinguishing properties of minerals	**Student Edition:** 68-72 *Applying Science* 70 *MiniLAB* 72 *Lab* 80-81 **Teacher Wraparound Edition:** A 81; AIL 81; DIS 69; LD 70; QD 71; UAA 71; VL 70 **Teacher Resources:** *Fast File: Minerals* 7-8, 17
d. Classify rocks as sedimentary, igneous, or metamorphic	**Student Edition:** 90-93, 94-97, 99-102, 103-109 *Get Ready to Read* 90A-B *Lab* 98, 110-111 **Teacher Wraparound Edition:** ACT 106; CFU 97; DI 91; R 102, 109; SCB 88E-F **Teacher Resources:** *Fast File: Rocks* 17, 18, 27
2. Earth's Systems (geosphere, atmosphere, and hydrosphere) interact with one another as they undergo change by common processes	
B. There are internal processes and sources of energy within the geosphere that cause changes in Earth's crustal plates	
Scope and Sequence – Rock Cycle and Plate Tectonics a. Explain convection currents are the result of uneven heating inside the mantle resulting in the melting of rock materials, convection of magma, eruption/flow of magma, and movement of crustal plates	**Student Edition:** 285-289, 295 #22, 297 #20 *MiniLAB* 285 **Teacher Wraparound Edition:** R 289; TBI 270 **Teacher Resources:** *Fast File: Plate Tectonics* 13-15, 29

STANDARDS	PAGE REFERENCES
b. Explain how rock layers are affected by the folding, breaking, and uplifting of rock layers due to plate motion	**Student Edition:** 157-159, 286-289, 300-303 **Teacher Wraparound Edition:** ACT 302; DIS 158; MM 287; QD 157; TFYI 287 **Teacher Resources:** *Fast File: Earthquakes* 22, 29
c. Describe how the movement of crustal plates can cause earthquakes and volcanic eruptions that can result in mountain building and trench formation	**Student Edition:** 159, 280-289, 340-343 **Teacher Wraparound Edition:** A 159, 289; MM 286; TBI 298 **Teacher Resources:** *Fast File: Plate Tectonics* 21
C. Continual changes in the Earth's materials and surface that result from internal and external processes is described by the rock cycle	
Scope and Sequence – Rock Cycle and Plate Tectonics a. Explain how heating and cooling in the mantle layer leads to the formation of metamorphic rocks and some igneous rocks	**Student Edition:** 94-97, 99-102 *Science Online* 96 **Teacher Wraparound Edition:** DIS 100; R 97; UAA 100 **Teacher Resources:** *Fast File: Rocks* 28
b. Make inferences about the formation of igneous and metamorphic rocks from their physical properties (e.g., crystal size indicates rate of cooling, air pockets or glassy texture indicate volcanic activity)	**Student Edition:** 94-97, 99-102 *Lab* 98 **Teacher Wraparound Edition:** ACT 101; QD 95; R 102 **Teacher Resources:** *Fast File: Rocks* 5-6, 11-12
c. Explain and diagram the external and internal processes of the rock cycle (e.g., weathering and erosion, sedimentation, compaction, heating, recrystallization, resurfacing due to forces that drive plate motion)	**Student Edition:** 90-93, 109 *Get Ready to Read* 90A-B *MiniLAB* 91 *National Geographic* 92 **Teacher Wraparound Edition:** A 109; CFU 93; DIS 92; MM 109; TBI 88; VL 91 **Teacher Resources:** *Fast File: Rocks* 15, 16, 23

STANDARDS	PAGE REFERENCES
D. Changes in the Earth over time can be inferred through rock and fossil evidence	
Scope and Sequence – Rock Cycle and Plate Tectonics a. Describe the methods used to estimate geologic time and the age of the Earth (e.g., techniques used to date rocks and rock layers, presence of fossils)	**Student Edition:** 362-369, 370-375, 377-381 *Unit Projects* 359 *Get Ready to Read* 362B **Teacher Wraparound Edition:** ACT 367; FF 365; IL 374; LD 378; SCB 360E; TBI 360; TFYI 374; VL 379 **Teacher Resources:** *Fast File: Clues to Earth's Past* 21-22, 27-29, 31
b. Use rock and fossil evidence to make inferences about the age, history, and changing life forms and environment of the Earth (i.e., changes in successive layers of sedimentary rock and the fossils contained within them, similarities between fossils in different geographic locations, similarities between fossils and organisms present today, fossils of organisms indicating changes in climate, fossils of extinct organisms)	**Student Edition:** 362-369, 370-375, 377-381 *Launch Lab* 361 *Integrate Life Science* 368 *Science Online* 371 *Lab* 376 *Applying Science* 380 *Model and Invent Lab* 382-383 **Teacher Wraparound Edition:** DI 368; DIS 372; R 375, 381; SJ 367; V 373 **Teacher Resources:** *Critical Thinking/Problem Solving* 11 *Fast File: Clues to Earth's Past* 5-6, 13-15

STANDARDS	PAGE REFERENCES
Grade 8	
Strand 7: Scientific Inquiry	
1. Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking	
A. Scientific inquiry includes the ability of students to formulate a testable question and explanation, and to select appropriate investigative methods in order to obtain evidence relevant to the explanation	
Scope and Sequence: All Units a. Formulate testable questions and hypotheses	**Student Edition:** *Design Your Own Lab* 52-53, 200-201, 228-229, 350-351, 444-445 *Lab* 260-261, 376 **Teacher Wraparound Edition:** IL 9, 193; R 14 **Teacher Resources:** *Fast File: Earth's Energy and Mineral Resources* 9-11 *Fast File: Erosional Forces* 7-8 *Fast File: Oceanography* 13-16
b. Recognize the importance of the independent variable, dependent variables, control of constants, and multiple trials to the design of a valid experiment	**Student Edition:** 9-11 *MiniLAB* 11 *Lab* 24-25, 260-261, 503 *Design Your Own Lab* 52-53, 200-201, 228-229 **Teacher Wraparound Edition:** QD 10; R 14; SCB 4E; SJ 20; VL 10 **Teacher Resources:** *Fast File: Erosional Forces* 7-8 *Fast File: The Nature of Science* 25
c. Design and conduct a valid experiment	**Student Edition:** 233 #28 *MiniLAB* 11 *Design Your Own Lab* 52-53, 200-201, 228-229, 350-351, 444-445 *Lab* 260-261 **Teacher Wraparound Edition:** A 186, 221, 261; IL 193 **Teacher Resources:** *Fast File: Earth's Energy and Mineral Resources* 9-11 *Fast File: Erosional Forces* 7-8 *Fast File: Oceanography* 13-16

STANDARDS	PAGE REFERENCES
d. Evaluate the design of an experiment and make suggestions for reasonable improvements or extensions of an experiment	**Student Edition:** *Model and Invent Lab* 172-173, 474-475, 714-715 *Use the Internet Lab* 650-651 **Teacher Wraparound Edition:** A 23, 229, 352, 533
e. Recognize that different kinds of questions suggest different kinds of scientific investigations (e.g., some involve observing and describing objects, organisms, or events; some involve collecting specimens; some involve experiments; some involve making observations in nature; some involve discovery of new objects and phenomena; and some involve making models)	**Student Edition:** 15-22 *Science Skill Handbook* 756-764 **Teacher Wraparound Edition:** TBI 4
f. Acknowledge that there is no fixed procedure called "the scientific method," but that some investigations involve systematic observations, carefully collected and relevant evidence, logical reasoning, and some imagination in developing hypotheses and other explanations	**Student Edition:** 6-14 *Science Skill Handbook* 756-764 **Teacher Wraparound Edition:** IM 8; TBI 4 **Teacher Resources:** *Fast File: The Nature of Science* 9-10, 17
B. Scientific inquiry relies upon gathering evidence from qualitative and quantitative observations	
Scope and Sequence: All Units a. Make qualitative observations using the five senses	**Student Edition:** *Unit Projects* 3 *Lab* 67, 98, 110-111 *MiniLAB* 72 *Launch Lab* 89, 209 **Teacher Wraparound Edition:** IL 41; MM 287, 363 **Teacher Resources:** *Fast File: Exploring Space* 5-6
b. Determine the appropriate tools and techniques to collect data	**Student Edition:** *Lab* 45, 67, 80-81, 136, 504-505, 680-681, 733 *Design Your Own Lab* 52-53, 200-201, 444-445 **Teacher Resources:** *Fast File: Earth's Energy and Mineral Resources* 9-11 *Fast File: Oceanography* 13-16

STANDARDS	PAGE REFERENCES
c. Use a variety of tools and equipment to gather data (e.g., microscopes, thermometers, analog and digital meters, computers, spring scales, balances, metric rulers, graduated cylinders, stopwatches)	**Student Edition:** *Lab* 45, 67, 504-505, 680-681, 733 *Design Your Own Lab* 52-53, 200-201, 444-445 **Teacher Resources:** *Fast File: Earth's Energy and Mineral Resources* 9-11 *Fast File: Ocean Motion* 11-12 *Fast File: Oceanography* 13-16
d. Measure length to the nearest millimeter, mass to the nearest gram, volume to the nearest milliliter, force (weight) to the nearest Newton, temperature to the nearest degree Celsius, time to the nearest second	**Student Edition:** *Launch Lab* 33 *Lab* 45, 136, 260-261, 504-505, 680-681 *Design Your Own Lab* 52-53, 200-201, 444-445 *MiniLAB* 456 **Teacher Resources:** *Fast File: Ocean Motion* 7-8
e. Compare amounts/measurements	**Student Edition:** *Communicating Your Data* 25, 259, 376 *Lab* 45, 504-505, 590-591 *Design Your Own Lab* 228-229, 444-445 *Model and Invent Lab* 474-475 **Teacher Wraparound Edition:** EA 261 **Teacher Resources:** *Fast File: Earth's Energy and Mineral Resources* 9-11 *Fast File: Erosional Forces* 7-8 *Fast File: Oceanography* 13-16
f. Judge whether measurements and computation of quantities are reasonable	**Student Edition:** *Lab* 45 *Model and Invent Lab* 474-475 *Communicating Your Data* 608 **Teacher Wraparound Edition:** A 533; EA 261

STANDARDS	PAGE REFERENCES
g. Calculate the range and average/mean of a set of data	**Student Edition:** *Lab* 24-25, 279 *Applying Math* 295, 487, 537, 567 *MiniLAB* 412, 456, 471 *Applying Science* 486 **Teacher Resources:** *Fast File: Ocean Motion* 45 *Fast File: Plate Tectonics* 5-6
C. Evidence is used to formulate explanations	
Scope and Sequence: All Units a. Use quantitative and qualitative data as support for reasonable explanations (conclusions)	**Student Edition:** *Lab* 24-25, 67, 80-81, 136, 260-261, 320-321, 504-505, 733 *Design Your Own Lab* 52-53, 228-229, 444-445, 616-617 **Teacher Resources:** *Fast File: Earth's Energy and Mineral Resources* 9-11 *Fast File: Oceanography* 13-16
b. Use data as support for observed patterns and relationships, and to make predictions to be tested	**Student Edition:** *Lab* 24-25, 136, 260-261, 320-321, 376, 407, 504-505 *Design Your Own Lab* 52-53, 200-201, 444-445 *Use the Internet Lab* 290-291 **Teacher Resources:** *Fast File: Earth's Energy and Mineral Resources* 9-11
c. Recognize the possible effects of errors in observations, measurements, and calculations on the formulation of explanations (conclusions)	**Student Edition:** *Lab* 45 *Design Your Own Lab* 52-53 *Use the Internet Lab* 650-651 **Teacher Wraparound Edition:** CYD 45; EA 25, 261, 321, 617 **Teacher Resources:** *Fast File: Exploring Space* 7-8

STANDARDS	PAGE REFERENCES
D. Scientific inquiry includes evaluation of explanations (hypotheses, laws, theories) in light of scientific principles (understandings)	
Scope and Sequence: All Units a. Evaluate the reasonableness of an explanation (conclusion)	**Student Edition:** *Lab* 23 *Communicating Your Data* 98 **Teacher Wraparound Edition:** A 23; LD 8 **Teacher Resources:** *Fast File: Plate Tectonics* 9-12
b. Analyze whether evidence (data) and scientific principles support proposed explanations (hypotheses, laws, theories)	**Student Edition:** *Design Your Own Lab* 200-201, 350-351, 444-445, 532-533, 616-617 *Use the Internet Lab* 414-415 **Teacher Resources:** *Fast File: Atmosphere* 7-8 *Fast File: Ocean Motion* 7-8 *Fast File: Weathering and Soil* 7-8
E. The nature of science relies upon communication of results and justification of explanations	
Scope and Sequence: All Units a. Communicate the procedures and results of investigations and explanations through: • oral presentations • drawings and maps • data tables (allowing for the recording and analysis of data relevant to the experiment, such as independent and dependent variables, multiple trials, beginning and ending times or temperatures, derived quantities) • graphs (bar, single line, pictographs) • equations and writings	**Student Edition:** *Communicating Your Data* 23, 53, 143, 291, 351, 434, 445, 533, 617, 747 *Design Your Own Lab* 200-201 **Teacher Wraparound Edition:** UP 3, 151, 625 **Teacher Resources:** *Fast File: Earth's Energy and Mineral* Resources 9-11 *Fast File: Plate Tectonics* 7-8

STANDARDS	PAGE REFERENCES
Grades 6, 7, 8	
Strand 8: Impact of Science, Technology and Human Activity	
1. The nature of technology can advance, and is advanced by, science as it seeks to apply scientific knowledge in ways that meet human needs	
A. Designed objects are used to do things better or more easily and to do some things that could not otherwise be done at all	
Scope and Sequence: All Units a. Explain how technological improvements, such as those developed for use in space exploration, the military, or medicine, have led to the invention of new products that may improve lives here on Earth (e.g., new materials, freeze-dried foods, infrared goggles, Velcro, satellite imagery, robotics, lasers)	**Student Edition:** 13-14, 170, 649 *Get Ready to Read* 628A **Teacher Wraparound Edition:** CC 645; CFU 14 **Teacher Resources:** *Fast File: Stars and Galaxies* 32
B. Advances in technology often result in improved data collection and an increase in scientific information	
Scope and Sequence: All Units a. Identify the link between technological developments and the scientific discoveries made possible through their development (e.g., Hubble telescope and stellar evolution, composition and structure of the universe; the electron microscope and cell organelles; sonar and the composition of the Earth; manned and unmanned space missions and space exploration; Doppler radar and weather conditions; MRI and CAT-scans and brain activity)	**Student Edition:** 14, 15-19, 288-289, 309-311, 628-633, 635-642, 643-649 *National Geographic* 13 *Integrate Earth Science* 26 *Accidents in Science* 564 **Teacher Wraparound Edition:** DI 277; DIS 12; IES 26; V 13 **Teacher Resources:** Critical Thinking/Problem Solving 5 Fast File Stars and Galaxies 33-34
C. Technological solutions to problems often have drawbacks as well as benefits	
Scope and Sequence: All Units a. Describe how technological solutions to problems (e.g., storm water runoff, fiber optics, windmills, efficient car design, electronic trains without conductors, sonar, robotics, Hubble telescope) can have both benefits and drawbacks (e.g., design constraints, unintended consequences, risks) (Asess Locally)	**Student Edition:** 127-129, 130-135, 196-199, 432-433, 557-561, 631 *Science and Society* 262, 476 *Get Ready to Read* 600A-B **Teacher Wraparound Edition:** CC 257; SJ 251 **Teacher Resources:** *Critical Thinking/Problem Solving* 2, 3, 13, 15 *Fast File: Views of Earth* 28

STANDARDS	PAGE REFERENCES
2. Historical and cultural perspectives of scientific explanations helps to improve understanding of the nature of science and how science knowledge and technology evolve over time	
A. People of different gender and ethnicity have contributed to scientific discoveries and the invention of technological innovations	
Scope and Sequence: All Units a. Describe how the contributions of scientists and inventors, representing different cultures, races, and gender, have contributed to science, technology and human activity (e.g., George Washington Carver, Thomas Edison, Thomas Jefferson, Isaac Newton, Marie Curie, Galileo, Albert Einstein, Mae Jemison, Edwin Hubble, Charles Darwin, Jonas Salk, Louis Pasteur, Jane Goodall, Tom Akers, John Wesley Powell, Rachel Carson) (Assess Locally)	**Student Edition:** 381, 395-396, 488-489, 570-571, 690-694 *Unit Project* 3 *Integrate Social Studies* 77 *Science and History* 82, 618 **Teacher Wraparound Edition:** CC 466; CD 332, 636, 661; SJ 281 **Teacher Resources:** *Critical Thinking/Problem Solving* 23
B. Scientific theories are developed based on the body of knowledge that exists at any particular time and must be rigorously questioned and tested for validity	
Scope and Sequence: All Units a. Recognize the difficulty science innovators experience as they attempt to break through accepted ideas (hypotheses, laws, theories) of their time to reach conclusions that may lead to changes in those ideas and serve to advance scientific understanding (e.g., Darwin, Copernicus, Newton)	**Student Edition:** 272-275 **Teacher Wraparound Edition:** A 275 **Teacher Resources:** *Fast File: Plate Tectonics* 27
b. Recognize explanations have changed over time as a result of new evidence	**Student Edition:** 36, 272-275, 276-278, 280-289, 660-661, 690-694 **Teacher Wraparound Edition:** TBI 270 **Teacher Resources:** *Fast File: Plate Tectonics* 20

STANDARDS	PAGE REFERENCES
3. Science and technology affect, and are affected by, society	
B. Social, political, economic, ethical, and environmental factors strongly influence, and are influenced by, the direction of progress of science and technology	
Scope and Sequence: All Units a. Describe ways in which science and society influence one another (e.g., scientific knowledge and the procedures used by scientists influence the way many individuals in society think about themselves, others, and the environment; societal challenges often inspire questions for scientific research; social priorities often influence research priorities through the availability of funding for research)	**Student Edition:** 313-319 *Science and Society* 112, 476, 652 **Teacher Wraparound Edition:** DIS 646 **Teacher Resources:** *Critical Thinking/Problem Solving* 9, 19
b. Identify and evaluate the physical, social, economic, and/or environmental problems that may be overcome using science and technology (e.g., the need for alternative fuels, human travel in space, AIDS)	**Student Edition:** 130-135, 141, 432-433, 516-517, 578-584, 586-589, 609-615 *Model and Invent Lab* 142-143 *Science and Society* 592 **Teacher Wraparound Edition:** ACT 133 **Teacher Resources:** *Critical Thinking/Problem Solving* 18, 20 *Fast File: Oceanography* 32