



Life Science

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STANDARDS		PAGE REFERENCES
S8.A The Nature of Science		
ASSESSMENT ANCHOR		
S8.A.1 Reasoning and Analysis		
S8.A.1 1 Explain, interpret and apply scientific, environmental, or technological knowledge presented in a variety of formats (e.g., visuals, scenarios, graphs).		
S8.A.1.1.1 Distinguish between a scientific theory and an opinion, explaining how a theory is supported with evidence, or how new data/information may change existing theories and practice.	Student Edition: 6-11 <i>Lab 27</i> Teacher Wraparound Edition: D 9; IM 7; LD 8; QD 8; SJ 7; TFYI 9	
S8.A.1.1.2 Explain how certain questions can be answered through scientific inquiry and/or technological design.	Student Edition: 6-11 <i>Design Your Own Lab 28-29, 144-145, 174-175, 200-201, 292-293, 350-351, 418-419, 558-559</i> <i>Model and Invent Lab 230-231, 472-473, 584-585, 792-793</i> Teacher Wraparound Edition: A 7; IM 7; SJ 7	
S8.A.1.1.3 Use evidence, such as observations or experimental results, to support inferences about a relationship.	Student Edition: 6-11 <i>Lab 27</i> Teacher Wraparound Edition: D 9; IM 7, 10; LD 8; QD 8	

STANDARDS	PAGE REFERENCES
<p>S8.A.1.1.4 Develop descriptions, explanations, predictions, and models using evidence.</p>	<p>Student Edition: 6-13, 22-23 <i>Design Your Own Lab</i> 28-29, 56-57, 144-145, 174-175, 612-613 <i>Lab</i> 27, 80, 86-87, 103, 133, 162 <i>Launch Lab</i> 5, 95, 185, 632 <i>MiniLab</i> 9, 101, 128, 136, 185 <i>Use the Internet Lab</i> 116-117, 262-263, 502-503</p>
<p>S8.A.1.2 Identify and explain the impacts of applying scientific, environmental, or technological knowledge to address solution to practical problems.</p>	
<p>S8.A.1.2.1 Describe the positive and negative, intended and unintended, effects of specific scientific results or technological developments (e.g., air/space travel, genetic engineering, nuclear fission/fusion, artificial intelligence, lasers, organ transplants).</p>	<p>Student Edition: 47, 50, 141-143, 264, 773-774 <i>Design Your Own Lab</i> 56-57 <i>Integrating Astronomy</i> 606 <i>National Geographic</i> 48-49 <i>TIME Science & History</i> 58, 176, 560, 586 <i>TIME Science & Society</i> 202, 294, 420 Teacher Wraparound Edition: A 48; D 774; MAM 774; SJ 48; TFYI 142, 775</p>
<p>S8.A.1.2.2 Identify environmental issues and explain their potential long-term health effects (e.g., pollution, pest controls, vaccinations).</p>	<p>Student Edition: 768-776, 778-786 <i>Lab</i> 787 <i>MiniLab</i> 779 <i>National Geographic</i> 777 <i>TIME Science & Society</i> 762 Teacher Wraparound Edition: CD 781; D 773, 782; IL 784; IM 781; QD 783, 785; SJ 774; TFYI 781, 782, 783, 785</p>
<p>S8.A.1.2.3 Describe fundamental scientific or technological concepts that could solve practical problems (e.g., Newton’s laws of motion, Mendelian genetics, mechanical advantage).</p>	<p>Student Edition: 54-55, 126-128, 141-143, 670, 771-776 <i>National Geographic</i> 777 <i>TIME Science & History</i> 176 <i>TIME Science & Society</i> 58, 294, 762 Teacher Wraparound Edition: TFYI 127</p>
<p>S8.A.1.2.4 Explain society’s standard of living in terms of technological advancements and their impact on agriculture (e.g., transportation, processing, production, storage).</p>	<p>Student Edition: 688-694, 749, 770-776</p>

STANDARDS		PAGE REFERENCES	
S8.A.1.3 Identify evidence that certain variables may have caused measurable changes in natural or human-made-systems.			
S8.A.1.3.1 Use ratio to describe change (e.g., percents, parts per million, grams per cubic centimeter).	Student Edition: <i>Applying Math</i> 44, 72, 131, 290, 313, 347, 404, 487, 609, 623, 716, 756		
S8.A.1.3.2 Use evidence, observations, or explanations to make inferences about change in systems over time (e.g., carrying capacity, succession, population dynamics, loss of mass in chemical reactions, indicator fossils in geologic time scale) and the variables affecting these changes.	Student Edition: 9, 484-489, 490-495, 496-500, 540-548, 556-557 <i>Design Your Own Lab</i> 28-29, 56-57, 144-145, 174-175, 558-559 <i>Lab</i> 86-87, 318-319, 530-531 <i>MiniLab</i> 9, 75, 101, 111, 552 <i>Model and Invent Lab</i> 472-473 <i>Use the Internet Lab</i> 116-117, 502-503		
S8.A.1.3.3 Examine systems changing over time, identifying the possible variables causing this change, and drawing inferences about how these variables affect this change.	Student Edition: 9 <i>Design Your Own Lab</i> 28-29, 56-57, 174-175, 200-201 <i>Lab</i> 80, 86-87, 318-319 <i>Launch Lab</i> 65, 95, 567 <i>MiniLab</i> 75, 218, 253 Teacher Wraparound Edition: QD 8		
S8.A.1.3.4 Given a scenario, explain how a dynamically changing environment provides for the sustainability of living systems.	Student Edition: 684-693, 696-700, 710-718, 720-723, 725-729, 740-741, 743-751 <i>Lab</i> 730-731, 752 <i>National Geographic</i> 694, 724, 742 Teacher Wraparound Edition: TFYI 728		

STANDARDS		PAGE REFERENCES
ASSESSMENT ANCHOR		
S8.A.2	Processes, Procedures and Tools of Scientific Investigations	
S8.A.2.1	Apply knowledge of scientific investigation or technological design in different contexts to make inferences to solve problems.	
S8.A.2.1.1 Use evidence, observations, or a variety of scales (e.g., time, mass, distance, volume, temperature) to describe relationships.	Student Edition: <i>Applying Science</i> 11 <i>Design Your Own Lab</i> 292-293, 418-419, 672-673 <i>Lab</i> 81, 86-87, 398, 530-531, 603, 665, 730-731, 787 <i>Launch Lab</i> 65, 621 <i>MiniLab</i> 714 <i>Model and Invent Lab</i> 792-793	
S8.A.2.1.2 Use space/time relationships, define concepts operationally, raise testable questions, or formulate hypotheses.	Student Edition: 6-11 <i>Design Your Own Lab</i> 28-29, 56-57, 144-145, 174-175, 200-201, 292-293 <i>Lab</i> 27, 80, 86-87, 103, 133, 162, 192, 221, 261, 318-319, 343 <i>Use the Internet Lab</i> 116-117	
S8.A.2.1.3 Design a controlled experiment by specifying how the independent variables will be manipulated, how the dependent variable will be measured, and which variables will be held constant.	Student Edition: <i>Design Your Own Lab</i> 28-29, 56-57, 144-145, 174-175, 200-201, 292-293, 350-351, 418-419, 558-559, 612-613, 672-673, 702-703 <i>Model and Invent Lab</i> 792	
S8.A.2.1.4 Interpret data/observations; develop relationships among variables based on data/observations to design models as solutions.	Student Edition: <i>Design Your Own Lab</i> 28-29, 56-57, 144-145, 174-175, 200-201, 292-293, 350-351, 418-419, 558-559, 612-613, 672-673, 702-703 <i>Lab</i> 27, 46, 80, 86-87, 343, 379, 530-531, 642-643, 665 <i>MiniLab</i> 430, 552 <i>Model and Invent Lab</i> 230-231, 472-473, 584-585, 792-793	
S8.A.2.1.5 Use evidence from investigations to clearly communicate and support conclusions.	Student Edition: <i>Lab</i> 27, 46, 80, 86-87, 192, 221, 318-319, 398, 471, 549, 552, 603, 632, 642-643, 701, 787 <i>MiniLab</i> 136, 225, 247, 430, 552	
S8.A.2.1.6 Identify a design flaw in a simple technological system and devise possible working solutions.	Student Edition: <i>Model and Invent Lab</i> 792-793	

STANDARDS		PAGE REFERENCES
S8.A.2.2 Apply appropriate instruments for a specific purpose and describe the information the instrument can provide.		
S8.A.2.2.1 Describe the appropriate use of instruments and scales to accurately measure time, mass, distance, volume, or temperature safely under a variety of conditions.	Student Edition: <i>Applying Science</i> 11 <i>Design Your Own Lab</i> 292-293, 418-419, 672-673 <i>Lab</i> 81, 86-87, 398, 530-531, 603, 665, 730-731, 787 <i>Launch Lab</i> 65, 621 <i>MiniLab</i> 714 <i>Model and Invent Lab</i> 792-793	
S8.A.2.2.2 Apply appropriate measurement systems (e.g., time, mass, distance, volume, temperature) to record and interpret observations under varying conditions.	Student Edition: <i>Applying Science</i> 11 <i>Design Your Own Lab</i> 292-293, 418-419, 672-673 <i>Lab</i> 81, 86-87, 398, 530-531, 603, 665, 730-731, 787 <i>Launch Lab</i> 65, 621 <i>MiniLab</i> 714 <i>Model and Invent Lab</i> 792-793	
S8.A.2.2.3 Describe ways technology extends and enhances human abilities for specific purposes (e.g., microscope, telescope, micrometer, hydraulics, barometer).	Student Edition: 47, 50-51, 55, 141-143, 772-776 <i>Integrating Astronomy</i> 606 <i>Model and Invent Lab</i> 792-793 <i>National Geographic</i> 48-49, 777 <i>Oops!</i> 364 <i>TIME Science & History</i> 560 <i>TIME Science & Society</i> 294 Teacher Wraparound Edition: D 773; MAM 774; QD 775; SJ 48, 774; TFYI 773	
ASSESSMENT ANCHOR		
S8.A.3 Systems, Models and Patterns		
S8.A.3.1 Explain the parts of a simple system, their roles, and their relationships to the system as a whole.		
S8.A.3.1.1 Describe a system (e.g., watershed, circulatory system, heating system, agricultural system) as a group of related parts with specific roles that works together to achieve an observed result.	Student Edition: 9, 484-489, 490-495, 496-500, 540-548, 556-557 <i>Design Your Own Lab</i> 28-29, 56-57, 144-145, 174-175, 558-559 <i>Lab</i> 86-87, 318-319, 530-531 <i>MiniLab</i> 9, 75, 101, 111, 552 <i>Model and Invent Lab</i> 472-473 <i>Use the Internet Lab</i> 116-117, 502-503	

STANDARDS	PAGE REFERENCES
<p>S8.A.3.1.2 Explain the concept of order in a system (e.g., first to last—manufacturing steps; trophic levels; simple to complex—cell, tissue, organ, organ system).</p>	<p>Student Edition: 38-45, 51, 252-255, 303, 306, 308, 337-340, 344, 360-361, 365-367, 380-382, 394-395, 399-403, 407-408, 429-432, 436-438, 484-488, 490-494, 496-500, 523-529, 540-545, 550-554, 556-557, 568, 571, 577-580, 594-599, 604-611, 627-629, 652-654 <i>National Geographic</i> 79, 546, 624-625 Teacher Wraparound Edition: IH 255; IM 45; QD 497; TFYI 485</p>
<p>S8.A.3.1.3 Distinguish between system inputs, system processes, system outputs, and feedback (e.g., physical, ecological, biological, informational).</p>	<p>Student Edition: 66-73, 81-85, 304-309, 331, 626, 720-729 <i>Lab</i> 730-731 <i>MiniLab</i> 305 <i>National Geographic</i> 724 Teacher Wraparound Edition: A 70, 727; IM 721; QD 68, 69, 728; S 68; TFYI 67, 69, 71, 721, 728</p>
<p>S8.A.3.1.4 Distinguish between open loop (e.g., energy flow, food web, open-switch) and closed loop (e.g., materials in the nitrogen and carbon cycles, closed-switch) systems.</p>	<p>Student Edition: 712-718, 720-723, 725-729 <i>Lab</i> 719, 730-731 <i>National Geographic</i> 724 Teacher Wraparound Edition: D 717, 727; IL 715; IM 721; LD 714; QD 728; TFYI 721, 728</p>
<p>S8.A.3.1.5 Explain how components of a natural and human-made system play different roles in a working system.</p>	<p>Student Edition: 712-718, 720-723, 725-729, 740-741, 744-751, 770-776 <i>Lab</i> 719, 730-731 <i>National Geographic</i> 724, 742, 777 Teacher Wraparound Edition: D 717, 727; IL 715; IM 721; LD 714; QD 728; TFYI 721, 728; UAA 771</p>
<p>S8.A.3.2 Apply knowledge of models to make predictions, draw inferences, or explain technological concepts.</p>	
<p>S8.A.3.2.1 Describe how scientists use models to explore relationships in natural systems (e.g., an ecosystem, river system, or the solar system).</p>	<p>Student Edition: <i>Launch Lab</i> 185, 551, 621 <i>MiniLab</i> 40, 101, 111, 187, 288, 332, 381, 403, 430, 528, 552, 579, 748, 754 <i>Model and Invent Lab</i> 472-473, 584-585, 792-793</p>

STANDARDS		PAGE REFERENCES
S8.A.3.2.2 Describe how engineers use models to develop new and improved technologies to solve problems.	Student Edition: <i>Model and Invent Lab</i> 792-793 <i>Oops!</i> 118	
S8.A.3.2.3 Given a model showing simple cause and effect relationships in a natural system, predict results that can be used to test the assumptions in the model (e.g., photosynthesis, water cycle, diffusion, infiltration).	Student Edition: <i>Launch Lab</i> 185, 551, 621 <i>MiniLab</i> 40, 101, 111, 187, 288, 332, 381, 403, 430, 528, 552, 579, 748, 754 <i>Model and Invent Lab</i> 472-473, 584-585, 792-793	
S8.A.3.3	Describe repeated processes or recurring elements in scientific and technological patterns.	
S8.A.3.3.1 Identify and describe patterns as repeated processes or recurring elements in human-made systems (e.g., triangles in bridges, hub and spoke system in communications and transportation systems, feedback controls in regulated systems).	The Teacher may expand on the following references to meet this standard. Student Edition: 773 <i>Oops!</i> 118	
S8.A.3.3.2 Describe repeating structure patterns in nature (e.g., veins in a leaf, tree rings, crystals, water waves) or periodic patterns (e.g., daily, monthly, annually).	Student Edition: 43, 110-113, 168-169, 252-258, 334-335, 344, 394-395 <i>MiniLab</i> 111 Teacher Wraparound Edition: TFYI 255	
S8.B Biological Sciences		
ASSESSMENT ANCHOR		
S8.B.1 Structure and Function of Organisms		
S8.B.1.1 Describe and compare structural and functional similarities and differences that characterize diverse living things.		
S8.B.1.1.1 Describe the structures of living things that help them function affectively in specific ways (e.g., adaptations and characteristics).	Student Edition: 38-45, 154-161, 168-169, 170-173, 210-220, 222-224, 242-243, 246-260, 330-342, 344-347, 360-364, 373, 394-395, 399-406, 408-417 Teacher Wraparound Edition: A 156; D 156; IM 155; LD 158; QD 156; UAA 141	
S8.B.1.1.2 Compare similarities or differences in both internal structures (e.g., invertebrate/vertebrate, vascular/nonvascular, single-celled/multi-celled) and external structures (e.g., appendages, body segments, type of covering, size, shape) of organisms.	Student Edition: 38-45, 167-169, 187, 210-211, 245, 247-260, 344, 399, 430, 442-443	

STANDARDS	PAGE REFERENCES
<p>S8.B.1.1.3 Apply knowledge of characteristic structures to identify or categorize organisms (i.e., plants, animals, fungi, bacteria, and protista).</p>	<p>Student Edition: 23-26, 186-191, 210-220, 222-226, 228-229, 240-260, 330-342, 344-349, 376-378, 380-383, 394-397, 399-415, 428-444 <i>Lab 27, 221, 230-231, 261</i> <i>National Geographic 227, 244</i></p> <p>Teacher Wraparound Edition: MAM 211; TFYI 212, 214, 331</p>
<p>S8.B.1.1.4 Identify the levels of organization from cell to organism and describe how specific structures (parts), which underlie larger systems, enable the system to function as a whole.</p>	<p>Student Edition: 38-45, 240-245, 281-288, 302-309, 399-403, 428-432, 484-489, 490-495, 496-500, 523-529, 540-548, 550-555, 556-557, 568-572, 577-582, 594-602, 622-629 <i>Lab 46, 583</i> <i>National Geographic 79</i></p> <p>Teacher Wraparound Edition: IM 486; TFYI 488</p>
<p>ASSESSMENT ANCHOR</p>	
<p>S8.B.2 Continuity of Life</p>	
<p>S8.B.2.1 Explain the basic concepts of natural selection.</p>	
<p>S8.B.2.1.1 Explain how inherited structures or behaviors help organisms survive and reproduce in different environments.</p>	<p>Student Edition: 126-128, 154-159, 330-333 <i>Design Your Own Lab 144-145, 174-175</i> <i>Lab 133</i> <i>MiniLab 128, 159</i> <i>National Geographic 129</i></p> <p>Teacher Wraparound Edition: A 156; D 156; FF 158; IL 127; TFYI 127</p>
<p>S8.B.2.1.2 Explain how different adaptations in individuals of the same species may affect survivability or reproduction success.</p>	<p>Student Edition: 154-159, 167-169, 330-333 <i>Launch Lab 683</i> <i>Use the Internet Lab 116-117</i></p> <p>Teacher Wraparound Edition: A 156; AIL 116; D 156; FF 158; QD 156; TFYI 168</p>
<p>S8.B.2.1.3 Explain that mutations can alter a gene and are the original source of new variations.</p>	<p>Student Edition: 114-115, 137-139 <i>Design Your Own Lab 174-175</i> <i>Use the Internet Lab 116-117</i></p> <p>Teacher Wraparound Edition: LD 137; SJ 114; TFYI 137, 138</p>

STANDARDS	PAGE REFERENCES
<p>S8.B.2.1.4 Describe how selective breeding or biotechnology can change the genetic makeup of organisms.</p>	<p>Student Edition: 126-128, 134-140, 141-143 <i>MiniLab</i> 128 <i>National Geographic</i> 129 Teacher Wraparound Edition: CD 142; IM 128; TFYI 142</p>
<p>S8.B.2.1.5 Explain that adaptations are developed over long periods of time and are passed from one generation to another.</p>	<p>Student Edition: 152-161, 167-173 <i>Design Your Own Lab</i> 174-175 <i>Lab</i> 162 <i>Launch Lab</i> 153 <i>MiniLab</i> 159 <i>National Geographic</i> 166 Teacher Wraparound Edition: D 156; FF 158; IL 160; IM 155, 161; LD 158; TFYI 156</p>
<p>S8.B.2.2 Explain how a set of genetic instructions determines inherited traits of organisms.</p>	
<p>S8.B.2.2.1 Identify and explain differences between inherited and acquired traits.</p>	<p>Student Edition: 126-128, 136, 154-159 <i>MiniLab</i> 128, 159 <i>National Geographic</i> 129 Teacher Wraparound Edition: D 156; IM 128, 152F, 155; LD 158; QD 156; TFYI 156</p>
<p>S8.B.2.2.2 Recognize that the gene is the basic unit of inheritance, that there are dominant and recessive genes, that traits are inherited.</p>	<p>Student Edition: 110-115, 126-128, 130-132 <i>MiniLab</i> 111 <i>National Geographic</i> 129 <i>Use the Internet Lab</i> 116-117 Teacher Wraparound Edition: IM 128; QD 113, 131; TFYI 112; UAA 112</p>

STANDARDS		PAGE REFERENCES
ASSESSMENT ANCHOR		
S8.B.3	Ecological Behavior and Systems	
S8.B.3.1	Explain the relationships among and between organisms in different ecosystems and their abiotic and biotic components.	
S8.B.3.1.1 Explain the flow of energy through an ecosystem (e.g., food chains, food webs).	Student Edition: 81-85, 304-309, 331, 726-729 <i>MiniLab</i> 305 Teacher Wraparound Edition: A 727; QD 728; TFYI 728; UAA 728	
S8.B.3.1.2 Identify major biomes and describe abiotic and biotic components (e.g., abiotic: different soil types, air, water, sunlight).	Student Edition: 712-718, 720-723, 725, 744-751 <i>Lab</i> 719 <i>MiniLab</i> 714, 748 <i>National Geographic</i> 724 Teacher Wraparound Edition: D 717; FF 714, 750; IL 715; IM 746; LD 714, 747, 748; QD 713, 717, 745; TFYI 718, 745, 747; UAA 749	
S8.B.3.1.3 Explain relationships among organisms (e.g., producers/consumers, predator/prey, in an ecosystem).	Student Edition: 82-83, 188-190, 696-698, 726-729 <i>Lab</i> 730-731 Teacher Wraparound Edition: A 698, 727; D 727; MAM 728; QD 728; TFYI 728; UAA 698	
	S8.B.3.2	Identify evidence of change to infer and explain the ways different variables may affect change in natural or human-made systems.
S8.B.3.2.1 Use evidence to explain factors that affect changes in populations (e.g., deforestation, disease, land use, natural disaster, invasive species).	Student Edition: 158-159, 684-693, 740-745 <i>Design Your Own Lab</i> 174-175 <i>MiniLab</i> 689 <i>National Geographic</i> 694 Teacher Wraparound Edition: A 686, 691; D 687, 690; IL 690; IM 686; LD 690	
S8.B.3.2.2 Use evidence to explain how diversity affects the ecological integrity of natural systems.	Student Edition: 158-159, 684-693, 696-700, 740-745 <i>Design Your Own Lab</i> 174-175 <i>MiniLab</i> 689 <i>National Geographic</i> 694 Teacher Wraparound Edition: A 686, 691; D 687, 690; IL 690; IM 686; LD 690	

STANDARDS		PAGE REFERENCES	
S8.B.3.2.3	Describe the response of organisms to environmental changes (e.g., changes in climate, hibernation, migration, coloration) and how those changes affect survival.	Student Edition: 407, 469, 740-743, 744-751, 753-759 <i>National Geographic</i> 742	Teacher Wraparound Edition: IM 746; QD 746
S8.B.3.3	Explain how renewable and nonrenewable resources provide for human needs or how these needs impact the environment.		
S8.B.3.3.1	Explain how human activities may affect local, regional, and global environments.	Student Edition: 749, 753-759, 770-776, 778-786 <i>Lab</i> 787 <i>MiniLab</i> 779	Teacher Wraparound Edition: IL 784; IM 782; QD 783, 785; TFYI 781, 783, 785
S8.B.3.3.2	Explain how renewable and nonrenewable resources provide for human needs (i.e., energy, food, water, clothing, and shelter).	Student Edition: 770-776 <i>MiniLab</i> 772 <i>National Geographic</i> 777	Teacher Wraparound Edition: A 771; CC 772; D 773; IM 771, 774; QD 775; TFYI 773, 774, 775; UAA 771
S8.B.3.3.3	Describe how waste management affects the environment (e.g., recycling, composting, landfills, incineration, sewage treatment).	Student Edition: 770-776, 778-786, 788-791 <i>National Geographic</i> 777	Teacher Wraparound Edition: A 789; D 789; IL 784; IM 782, 790; QD 783, 785; TFYI 790
S8.B.3.3.4	Explain the long-term effects of using integrated pest management (e.g., herbicides, natural predators, biogenetics) on the environment.	Student Edition: 288, 783 <i>Integrate Environment</i> 142	Teacher Wraparound Edition: QD 783

STANDARDS		PAGE REFERENCES
S8.C Physical Sciences		
ASSESSMENT ANCHOR		
S8.C.1 Structure, Properties, and Interaction of Matter and Energy		
S8.C.1.1 Explain concepts about the structure and properties (physical and chemical) of matter.		
S8.C.1.1.1 Explain the differences among elements, compounds, and mixtures.	Student Edition: 66-73 Teacher Wraparound Edition: A 70; IM 70; QD 68, 69; TFYI 67, 69, 71	
S8.C.1.1.2 Use characteristic physical or chemical properties to distinguish one substance from another (e.g., density, thermal expansion/contraction, freezing/melting points, streak test).	Student Edition: 66-73 Teacher Wraparound Edition: A 70; IM 70; QD 68, 69; TFYI 67, 69, 71	
S8.C.1.1.3 Identify and describe reactants and products of simple chemical reactions.	Student Edition: 82-83, 305, 307 <i>Integrate Chemistry</i> 598 Teacher Wraparound Edition: MAM 195; QD 781	
ASSESSMENT ANCHOR		
S8.C.2 Forms, Sources, Conversion, and Transfer of Energy		
S8.C.2.1 Describe energy sources, transfer of energy, or conversion of energy.		
S8.C.2.1.1 Distinguish among forms of energy (e.g., electrical, mechanical, chemical, heat, light, sound, nuclear) and sources of energy (i.e., renewable and nonrenewable energy).	Student Edition: 81-85, 306, 726-729, 773-776 <i>National Geographic</i> 777 Teacher Wraparound Edition: D 774; MAM 774; QD 728, 775; TFYI 728, 773, 775	
S8.C.2.1.2 Explain how heat is transferred from one place to another through convection, conduction, or radiation.	Student Edition: 717-718, 726-729, 781 Teacher Wraparound Edition: QD 728; TFYI 728; UAA 728	
S8.C.2.1.3 Describe how one form of energy (e.g., electrical, mechanical, chemical, heat, light, sound, nuclear) can be converted into a different form of energy.	Student Edition: 81-85, 306, 726-729, 773-776 <i>National Geographic</i> 777 Teacher Wraparound Edition: D 774; MAM 774; QD 728, 775; TFYI 728, 773, 775	

STANDARDS		PAGE REFERENCES
S8.C.2.2 Compare the environmental impact of different energy sources chosen to support human endeavors.		
S8.C.2.2.1 Describe the sun as a major source of energy that impacts on the environment.	Student Edition: 710, 714-715, 780-781 <i>Model and Invent Lab</i> 792-793 <i>National Geographic</i> 777	
S8.C.2.2.2 Compare the time spans of renewability for fossil fuels and alternative fuels.	Student Edition: 770-776 <i>MiniLab</i> 772 <i>National Geographic</i> 777 Teacher Wraparound Edition: A 771; D 774; IM 771; QD 775; TFYI 773, 775; UAA 771	
S8.C.2.2.3 Describe the waste (i.e., quantity, kind, and potential to cause environmental impacts) derived from the use of renewable and nonrenewable energy sources and their potential impact on the environment.	Student Edition: 778-786 <i>Lab</i> 787 <i>MiniLab</i> 779 Teacher Wraparound Edition: A 783; D 779, 782; IM 781, 782; LD 780; QD 783, 785; TFYI 780, 781, 782, 785	
ASSESSMENT ANCHOR		
S8.C.3 Principles of Motion and Force		
S8.C.3.1 Describe the effect of multiple forces on the movement, speed, or direction of an object.		
S8.C.3.1.1 Describe forces acting on objects (e.g., friction, gravity, balanced versus unbalanced, inertia, momentum).	Student Edition: 431 <i>Integrate Physics</i> 73, 312, 363, 545 <i>National Geographic</i> 492	
S8.C.3.1.2 Distinguish between kinetic and potential energy.	Student Edition: 773 <i>Integrate Physics</i> 363	
S8.C.3.1.3 Explain that the mechanical advantages produced by simple machines helps to do work (physics) by either overcoming a force or changing the direction of the applied force.	Student Edition: 773 <i>Integrate Physics</i> 363	

STANDARDS		PAGE REFERENCES
S8.D Earth and Space Sciences		
ASSESSMENT ANCHOR		
S8.D.1 Earth Features and Processes that Change Earth and Its Resources		
S8.D.1.1 Describe constructive and destructive natural processes that form different geologic structures and resources.		
S8.D.1.1.1 Explain the rock cycle as changes in the solid earth and rock types found in Pennsylvania (igneous – granite, basalt, obsidian, pumice; sedimentary – limestone, sandstone, shale, coal; and metamorphic – slate, quartzite, marble, gneiss).	Student Edition: 164-165 <i>National Geographic</i> 166 Teacher Wraparound Edition: A 164; SJ 164	
S8.D.1.1.2 Compare and contrast (i.e., geological processes, length of time over which change occurs, and factors affecting the rate of change) different types of changes in Earth’s surface (e.g., landslides, volcanic eruptions, earthquakes, mountain building, new land being formed, weathering, erosion, sedimentation, soil formation).	Student Edition: 164-165 <i>National Geographic</i> 166 Teacher Wraparound Edition: A 164; SJ 164	
S8.D.1.1.3 Identify soil types (i.e., humus, topsoil, subsoil, loam, loess, and parent material) and their characteristics (i.e., particle size, porosity, and permeability) found in different biomes and in Pennsylvania, and explain how they formed.	Student Edition: 714, 741, 744-751 <i>Lab</i> 719 <i>MiniLab</i> 714 Teacher Wraparound Edition: LD 714	
S8.D.1.1.4 Explain how fossils provide evidence about plants and animals that lived long ago throughout Pennsylvania’s history (e.g., fossils provide evidence of different environments).	The Teacher may expand on the following references to meet this standard. Student Edition: 163-165, 167-169, 171, 406, 435 <i>National Geographic</i> 166 Teacher Wraparound Edition: A 164; FF 164; MAM 165; QD 165; TFYI 164	
S8.D.1.2 Describe the potential impact of human-made processes on changes to Earth’s resources and how they affect everyday life.		
S8.D.1.2.1 Describe a product’s transformation process from production to consumption (e.g., prospecting, propagating, growing, maintaining, adapting, treating, converting, distributing, disposing) and explain the process’s potential impacts on Earth’s resources.	Student Edition: <i>Oops!</i> 264	

STANDARDS	PAGE REFERENCES
<p>S8.D.1.2.2 Describe potential impacts of human-made processes (e.g., manufacturing, agriculture, transportation, mining) on Earth's resources, both nonliving (i.e., air, water, or earth materials) and living (i.e., plants and animals).</p>	<p>Student Edition: 754, 770-776, 778-786</p>
<p>S8.D.1.3 Describe characteristic features of Earth's water systems or their impact on resources.</p>	
<p>S8.D.1.3.1 Describe the water cycle and the physical processes on which it depends (i.e., evaporation, condensation, precipitation, transpiration, runoff, infiltration, energy inputs, and phase changes).</p>	<p>Student Edition: 720, 779, 783</p>
<p>S8.D.1.3.2 Compare and contrast characteristics of freshwater and saltwater systems on the basis of their physical characteristics (i.e., composition, density, and electrical conductivity) and their use as natural resources.</p>	<p>Student Edition: 753-759 <i>Lab</i> 760-761 <i>MiniLab</i> 754 <i>TIME Science & Society</i> 762 Teacher Wraparound Edition: A 756; D 757; IM 755; MAM 756; QD 756; SJ 756; TFYI 755</p>
<p>S8.D.1.3.3 Distinguish among different water systems (e.g., wetland systems, ocean systems, river systems, watersheds) and describe their relationships to each other as well as to landforms.</p>	<p>Student Edition: 753-759 <i>Lab</i> 760-761 <i>MiniLab</i> 754 <i>TIME Science & Society</i> 762 Teacher Wraparound Edition: A 756; D 757; IM 755; MAM 756; QD 756; SJ 756; TFYI 755</p>
<p>S8.D.1.3.4 Identify the physical characteristics of a stream and how these characteristics determine the types of organisms found in an aquatic environment (e.g., biological diversity, water quality, flow rate, tributaries, surrounding watershed).</p>	<p>Student Edition: 753-754</p>

STANDARDS		PAGE REFERENCES
ASSESSMENT ANCHOR		
S8.D.2 Weather, Climate, and Atmospheric Processes		
S8.D.2.1 Explain how pressure, temperature, moisture, and wind are used to describe atmospheric conditions that affect regional weather or climate.		
S8.D.2.1.1 Explain the impact of water systems on the local weather or the climate of a region (e.g., lake effect snow, land/ocean breezes).	Student Edition: 717-718, 720-721 Teacher Wraparound Edition: D 717, IM 721; QD 717, 721; TFYI 718, 721	
S8.D.2.1.2 Identify how global patterns of atmospheric movement influence regional weather and climate.	Student Edition: 717, 744-751, 780-786 <i>Lab 787</i> <i>Science Stats 732</i>	
S8.D.2.1.3 Identify how cloud types, wind directions, and barometric pressure changes are associated with weather patterns in different regions of the country.	Student Edition: 717, 732	
ASSESSMENT ANCHOR		
S8.D.3 Composition and Structure of the Universe		
S8.D.3.1 Explain the relationships between and among the objects of our solar system.		
S8.D.3.1.1 Describe patterns of Earth's movements (i.e., rotation and revolution) in relation to the moon and sun (i.e., phases, eclipses, and tides).	Student Edition: <i>Integrate Astronomy 685</i>	
S8.D.3.1.2 Describe the role of gravity as the force that governs the movement of the solar system and universe.	Student Edition: <i>Integrate Physics 312</i>	
S8.D.3.1.3 Compare and contrast characteristics of celestial bodies found in the solar system (e.g., planets, moons, asteroids, comets, meteors, meteoroids, meteorites, inner and outer planets).	Student Edition: <i>Integrate Astronomy 21, 429, 685</i>	