



Introduction to
**Physical
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: 7, 27-30, 74-79 LAB 31 Science Skill Handbook 670, 678 Teacher Wraparound Edition: CC 15; CD 18; D 7, 29; IM 15; TPK 27; VL 7, 77

STANDARDS	PAGE REFERENCES
<p>S8.A.1.1.2 Explain how certain questions can be answered through scientific inquiry and/or technological design.</p>	<p>Student Edition: 6, 9-11, 12-17, 27-29 <i>Applying Science</i> 89, 111, 266, 496 <i>Design Your Own LAB</i> 124-125, 150-151, 208-209, 300-301, 330-331, 424-425, 450-451 <i>LAB</i> 32-33, 92-93, 149, 207, 240-241, 299, 411, 632-633 <i>Use the Internet LAB</i> 362-363, 396-397 Teacher Wraparound Edition: AIL 32, 124, 362; IL 17; VL 13</p>
<p>S8.A.1.1.3 Use evidence, such as observations or experimental results, to support inferences about a relationship.</p>	<p>Student Edition: 16 <i>Design Your Own LAB</i> 60-61, 150-151, 424-425, 480-481, 540-541 <i>LAB</i> 32-33, 231, 270-271, 329, 411, 444, 523, 603, 604-605 <i>MiniLAB</i> 23 <i>Science Skill Handbook</i> 678 <i>Use the Internet LAB</i> 362-363 Teacher Wraparound Edition: DI 16</p>
<p>S8.A.1.1.4 Develop descriptions, explanations, predictions, and models using evidence.</p>	<p>Student Edition: 12-17, 21-23, 25-26, 27-29 <i>Design Your Own LAB</i> 124-125, 300-301, 330-331 <i>LAB</i> 31, 32-33, 604-605, 632-633 <i>LaunchLAB</i> 161, 249 <i>MiniLAB</i> 173, 254, 291 <i>Model and Invent LAB</i> 180-181 Teacher Wraparound Edition: A 24; CC 22; D 29; DI 24; LD 14; MM 25; QD 23; VL 25</p>

STANDARDS	PAGE REFERENCES
<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: 326, 356-357, 360, 384-385, 389-395, 445-446, 448-449, 535-539, 567-571, 622, 624, 626-627, 630-631, 642-647, 649-656, 658 <i>Applying Science</i> 390, 496 <i>Integrate Astronomy</i> 533 <i>LAB</i> 632-633 <i>National Geographic</i> 234, 447, 623, 657 <i>Oops! Accidents in Science</i> 126, 574 <i>Time Science and History</i> 152, 210, 542 <i>Time Science and Society</i> 272, 332, 426, 452, 662 <i>Use the Internet LAB</i> 396-397 Teacher Wraparound Edition: AIL 396; CC 97, 384; CD 390, 448, 629; D 332, 384; DI 446; SJ 446; VL 360</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: 388, 443 <i>National Geographic</i> 234</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: 312, 316, 323, 356-360, 412-416, 417-420 <i>Applying Science</i> 89, 111 <i>Design Your Own LAB</i> 330-331, 424-425 <i>LAB</i> 329, 411 <i>MiniLAB</i> 422 <i>National Geographic</i> 325, 421 <i>Time Science and Society</i> 323 Teacher Wraparound Edition: AIL 424; CC 414; CD 326, 419; D 326; DI 314; IL 418; LD 420; MM 321; VL 414</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>Teacher Wraparound Edition: CC 253</p>

STANDARDS	PAGE REFERENCES
<p>S8.A.1.3 Identify evidence that certain variables may have caused measurable changes in natural or human-made-systems.</p>	
<p>S8.A.1.3.1 Use ratio to describe change (e.g., percents, parts per million, grams per cubic centimeter).</p>	<p>Student Edition: 284-285, 290-291, 294, 319, 408-409 <i>Applying Math</i> 121, 135, 284, 290, 294, 319, 408, 409, 436 <i>Applying Science</i> 229 <i>Math Skill Handbook</i> 700-702 Teacher Wraparound Edition: A 284; DI 290</p>
<p>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.</p>	<p>Student Edition: 109, 111-114, 119-120, 143-148, 192-194 <i>Design Your Own LAB</i> 208-209 <i>LAB</i> 115, 149 <i>MiniLAB</i> 112, 194 <i>National Geographic</i> 110 <i>Time Science and History</i> 152 Teacher Wraparound Edition: A 147; CC 113; D 111; MM 147</p>
<p>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.</p>	<p>Student Edition: 109, 111-114, 119-120, 200-206 <i>Integrate Life Science</i> 193 <i>LAB</i> 115 <i>MiniLAB</i> 112, 145, 204 <i>National Geographic</i> 110 <i>Time Science and History</i> 152 Teacher Wraparound Edition: A 202; D 111, 202; DI 110, 146; IL 203; LD 205; QD 203</p>
<p>S8.A.1.3.4 Given a scenario, explain how a dynamically changing environment provides for the sustainability of living systems.</p>	<p>See Glencoe's <i>Life Science</i> © 2008. 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</p>

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: 467-471 <i>Applying Math</i> 290 <i>Design Your Own LAB</i> 60-61, 124-125, 150-151, 208-209, 330-331 <i>LAB</i> 240-241, 355, 444, 472 <i>MiniLAB</i> 284, 291 <i>Use the Internet LAB</i> 362-363 Teacher Wraparound Edition: A 284; CC 284; D 287; IL 286; IM 294; LD 296	
S8.A.2.1.2 Use space/time relationships, define concepts operationally, raise testable questions, or formulate hypotheses.	Student Edition: 282-287, 288-292 <i>Applying Math</i> 284, 290 <i>LAB</i> 299 <i>MiniLAB</i> 285, 291 Teacher Wraparound Edition: CU 287; D 290; DI 286; TPK 288	
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: 18 <i>Design Your Own LAB</i> 208-209, 450-451, 480-481, 510-511, 540-541 <i>LAB</i> 32-33, 604-605 <i>Science Skill Handbook</i> 674 Teacher Wraparound Edition: CU 20; IM 18; QD 18	
S8.A.2.1.4 Interpret data/observations; develop relationships among variables based on data/observations to design models as solutions.	Student Edition: 21-23, 25-26 <i>Design Your Own LAB</i> 124-125, 300-301, 330-331 <i>LAB</i> 31, 604-605 <i>LaunchLAB</i> 161, 249 <i>MiniLAB</i> 173, 254, 291 <i>Model and Invent LAB</i> 180-181 Teacher Wraparound Edition: A 24; CC 22; D 22; DI 24; QD 23; TPK 21; UA 22; VL 25	

STANDARDS	PAGE REFERENCES
<p>S8.A.2.1.5 Use evidence from investigations to clearly communicate and support conclusions.</p>	<p>Student Edition: 17, 56-59 <i>Communicating Your Data</i> 55, 61, 115, 181, 299, 355, 500, 511, 561, 573, 661 <i>Math Skill Handbook</i> 710-711 <i>Science Skill Handbook</i> 678 <i>Technology Skill Handbook</i> 695-696 Teacher Wraparound Edition: CYD 33, 86, 209, 411</p>
<p>S8.A.2.1.6 Identify a design flaw in a simple technological system and devise possible working solutions.</p>	<p>Student Edition: <i>Design Your Own LAB</i> 300-301, 424-425, 450-451 <i>LAB</i> 632-633</p>
<p>S8.A.2.2 Apply appropriate instruments for a specific purpose and describe the information the instrument can provide.</p>	
<p>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.</p>	<p>Student Edition: 42-45, 47-49, 50-54 <i>Design Your Own LAB</i> 60-61 <i>LaunchLAB</i> 41 <i>MiniLAB</i> 44 <i>National Geographic</i> 46 <i>Science Skill Handbook</i> 675-676 Teacher Wraparound Edition: A 43; D 45; IL 48; SJ 45; VL 45</p>
<p>S8.A.2.2.2 Apply appropriate measurement systems (e.g., time, mass, distance, volume, temperature) to record and interpret observations under varying conditions.</p>	<p>Student Edition: 50-54 <i>Design Your Own LAB</i> 60-61, 208-209, 330-331, 450-451, 480-481 <i>LAB</i> 55, 115, 207, 355, 444 <i>MiniLAB</i> 44, 52 <i>Science Skill Handbook</i> 675-676 Teacher Wraparound Edition: A 53; CU 54; IL 48</p>

STANDARDS		PAGE REFERENCES
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: 356-361, 389-395, 417-420, 422-423, 445-446, 448-449, 567-571, 626-631, 642-647, 649-659 <i>Design Your Own LAB</i> 424-425 <i>Integrate History</i> 569 <i>MiniLAB</i> 391, 422, 568 <i>National Geographic</i> 421, 447 <i>Oops! Accidents in Science</i> 574 <i>Time Science and Society</i> 426 <i>Use the Internet LAB</i> 362-363 Teacher Wraparound Edition: A 393; AIL 362, 424; CD 390, 392, 419; D 357, 569; DI 390; LD 420, 626; TFYI 357
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: 8-9, 122, 357-358, 384-385, 389-395, 417-423, 445-446, 448-449, 621-622, 624 <i>Design Your Own LAB</i> 330-331, 424-425 <i>Integrate Health</i> 9 <i>MiniLAB</i> 8 <i>National Geographic</i> 382, 447, 623 Teacher Wraparound Edition: AIL 424; CD 122; D 357; QD 8; R 11; SJ 8; TFYI 357
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).		Student Edition: 122, 357-358, 384-385, 389-395, 445-446, 448-449, 622 <i>National Geographic</i> 382, 447 Teacher Wraparound Edition: DI 393; VL 448
S8.A.3.1.3 Distinguish between system inputs, system processes, system outputs, and feedback (e.g., physical, ecological, biological, informational).		Student Edition: 384, 389-395, 406-407, 412, 415, 420, 422-423, 621, 624, 626-628 <i>Applying Math</i> 413 <i>Design Your Own LAB</i> 424-425 <i>LAB</i> 386, 411 Teacher Wraparound Edition: D 394; LD 420, 626; TFYI 392

STANDARDS	PAGE REFERENCES
<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: 591-592, 596-599 <i>LAB</i> 603, 604-605 <i>MiniLAB</i> 598 Teacher Wraparound Edition: D 597; IM 599; MM 597; QD 599; VL 598</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: 389-395 <i>MiniLAB</i> 391 Teacher Wraparound Edition: D 394; DI 390, 392; MM 390, 394; TFYI 392</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: 162-169, 170-175, 177 <i>LAB</i> 179 <i>MiniLAB</i> 173 <i>Model and Invent LAB</i> 180-181 <i>National Geographic</i> 176 Teacher Wraparound Edition: D 163</p>
<p>S8.A.3.2.2 Describe how engineers use models to develop new and improved technologies to solve problems.</p>	<p>Student Edition: <i>Design Your Own LAB</i> 124-125, 300-301, 424-425, 450-451 <i>LAB</i> 632-633</p>
<p>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).</p>	<p>Student Edition: 438-442 <i>LAB</i> 444 <i>MiniLAB</i> 440, 441 Teacher Wraparound Edition: IL 439; LD 442</p>
<p>S8.A.3.3 Describe repeated processes or recurring elements in scientific and technological patterns.</p>	
<p>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).</p>	<p>See Glencoe's <i>Physical Science</i> © 2008. Student Edition: 267-269, 364, 648</p>

STANDARDS		PAGE REFERENCES	
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: 103, 175 <i>National Geographic</i> 176, 478 Teacher Wraparound Edition: DI 176; MM 103, 176; TFYI 103	
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: 80-85, 87-91 <i>Applying Science</i> 89 <i>Integrate Earth Science</i> 91 <i>LAB</i> 86, 92-93 <i>MiniLAB</i> 88 Teacher Wraparound Edition: A 82, 84, 90; AIL 92; CC 90; D 89; DI 89, 90; IM 81; MM 88; QD 90; TPK 87; USW 86	
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: 134-138, 139-142 <i>Design Your Own LAB</i> 150-151 <i>MiniLAB</i> 135 <i>Self-Check</i> (4) 138 Teacher Wraparound Edition: A 140; IL 141; TFYI 137	
S8.C.1.1.3	Identify and describe reactants and products of simple chemical reactions.	Student Edition: 192-199 <i>Applying Math</i> 196 <i>LaunchLAB</i> 189 <i>MiniLAB</i> 194 Teacher Wraparound Edition: A 195; D 198; DI 193, 195; MM 194	

STANDARDS		PAGE REFERENCES
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: 374-378, 387-395 <i>MiniLAB</i> 391 Teacher Wraparound Edition: A 376; CC 375; D 391; DI 377; IL 375; IM 327F; QD 389; SJ 377	
S8.C.2.1.2 Explain how heat is transferred from one place to another through convection, conduction, or radiation.	Student Edition: 438-443 <i>LAB</i> 444 <i>MiniLAB</i> 440, 441 Teacher Wraparound Edition: A 439; IL 439; LD 442; VL 441	
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: 379-381, 383-385, 389-395 <i>LAB</i> 386 <i>MiniLAB</i> 381, 391 <i>National Geographic</i> 382 <i>Science Online</i> 380 Teacher Wraparound Edition: D 383, 394; DI 377; LD 380; QD 381; SJ 377; VL 381	
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: 387 (Figure 16)	
S8.C.2.2.2 Compare the time spans of renewability for fossil fuels and alternative fuels.	Student Edition: 388-395 <i>Use the Internet LAB</i> 396-397 Teacher Wraparound Edition: SJ 388; UA 388	
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: 388-389, 443	

STANDARDS		PAGE REFERENCES
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: 293-296, 310-315, 316-321 <i>Applying Math</i> 294 <i>Design Your Own LAB</i> 330-331 <i>LAB</i> 329 <i>MiniLAB</i> 314 <i>National Geographic</i> 297 Teacher Wraparound Edition: A 312; CC 294; D 296; DI 297, 314, 321; IM 308F, 318; LD 296; MM 295; QD 296, 312; TFYI 294; VL 318, 320
S8.C.3.1.2 Distinguish between kinetic and potential energy.		Student Edition: 375-376, 380 <i>MiniLAB</i> 381 Teacher Wraparound Edition: IL 375; USW 376
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: 412-416, 417-423 <i>Applying Math</i> 413 <i>Design Your Own LAB</i> 424-425 <i>MiniLAB</i> 422 <i>National Geographic</i> 421 Teacher Wraparound Edition: A 419; LD 420; TPK 417; UA 414; VL 422