



# Introduction to Physical Science

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STANDARDS		PAGE REFERENCES
<b>S8.A The Nature of Science</b>		
<b>ASSESSMENT ANCHOR</b>		
<b>S8.A.1 Reasoning and Analysis</b>		
<b>S8.A.1.1</b> Explain, interpret and apply scientific, environmental, or technological knowledge presented in a variety of formats (e.g., visuals, scenarios, graphs).		
<b>S8.A.1.1.1</b> 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.	<b>Student Edition:</b> 7, 27-30, 74-79 <i>LAB 31</i> <i>Science Skill Handbook</i> 670, 678	<b>Teacher Wraparound Edition:</b> CC 15; CD 18; D 7, 29; IM 15; TPK 27; VL 7, 77
<b>S8.A.1.1.2</b> Explain how certain questions can be answered through scientific inquiry and/or technological design.	<b>Student Edition:</b> 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	<b>Teacher Wraparound Edition:</b> AIL 32, 124, 362; IL 17; VL 13

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<p><b>S8.A.1.1.3</b> Use evidence, such as observations or experimental results, to support inferences about a relationship.</p>	<p><b>Student Edition:</b> 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 <b>Teacher Wraparound Edition:</b> DI 16</p>
<p><b>S8.A.1.1.4</b> Develop descriptions, explanations, predictions, and models using evidence.</p>	<p><b>Student Edition:</b> 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 <b>Teacher Wraparound Edition:</b> A 24; CC 22; D 29; DI 24; LD 14; MM 25; QD 23; VL 25</p>
<p><b>S8.A.1.2</b> Identify and explain the impacts of applying scientific, environmental, or technological knowledge to address solution to practical problems.</p>	
<p><b>S8.A.1.2.1</b> 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><b>Student Edition:</b> 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 <b>Teacher Wraparound Edition:</b> AIL 396; CC 97, 384; CD 390, 448, 629; D 332, 384; DI 446; SJ 446; VL 360</p>

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<p><b>S8.A.1.2.2</b> Identify environmental issues and explain their potential long-term health effects (e.g., pollution, pest controls, vaccinations).</p>	<p><b>Student Edition:</b> 388, 443 <i>National Geographic</i> 234</p>
<p><b>S8.A.1.2.3</b> Describe fundamental scientific or technological concepts that could solve practical problems (e.g., Newton’s laws of motion, Mendelian genetics, mechanical advantage).</p>	<p><b>Student Edition:</b> 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 <b>Teacher Wraparound Edition:</b> AIL 424; CC 414; CD 326, 419; D 326; DI 314; IL 418; LD 420; MM 321; VL 414</p>
<p><b>S8.A.1.2.4</b> Explain society’s standard of living in terms of technological advancements and their impact on agriculture (e.g., transportation, processing, production, storage).</p>	<p><b>Teacher Wraparound Edition:</b> CC 253</p>
<p><b>S8.A.1.3</b> Identify evidence that certain variables may have caused measurable changes in natural or human-made-systems.</p>	
<p><b>S8.A.1.3.1</b> Use ratio to describe change (e.g., percents, parts per million, grams per cubic centimeter).</p>	<p><b>Student Edition:</b> 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 <b>Teacher Wraparound Edition:</b> A 284; DI 290</p>
<p><b>S8.A.1.3.2</b> 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><b>Student Edition:</b> 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 <b>Teacher Wraparound Edition:</b> A 147; CC 113; D 111; MM 147</p>

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<p><b>S8.A.1.3.3</b> Examine systems changing over time, identifying the possible variables causing this change, and drawing inferences about how these variables affect this change.</p>	<p><b>Student Edition:</b> 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 <b>Teacher Wraparound Edition:</b> A 202; D 111, 202; DI 110, 146; IL 203; LD 205; QD 203</p>
<p><b>S8.A.1.3.4</b> 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> © 2005. <b>Student Edition:</b> 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>
<p><b>ASSESSMENT ANCHOR</b></p>	
<p><b>S8.A.2 Processes, Procedures and Tools of Scientific Investigations</b></p>	
<p><b>S8.A.2.1</b> Apply knowledge of scientific investigation or technological design in different contexts to make inferences to solve problems.</p>	
<p><b>S8.A.2.1.1</b> Use evidence, observations, or a variety of scales (e.g., time, mass, distance, volume, temperature) to describe relationships.</p>	<p><b>Student Edition:</b> 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 <b>Teacher Wraparound Edition:</b> A 284; CC 284; D 287; IL 286; IM 294; LD 296</p>
<p><b>S8.A.2.1.2</b> Use space/time relationships, define concepts operationally, raise testable questions, or formulate hypotheses.</p>	<p><b>Student Edition:</b> 282-287, 288-292 <i>Applying Math</i> 284, 290 <i>LAB</i> 299 <i>MiniLAB</i> 285, 291 <b>Teacher Wraparound Edition:</b> CU 287; D 290; DI 286; TPK 288</p>

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<p><b>S8.A.2.1.3</b> 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.</p>	<p><b>Student Edition:</b> 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 <b>Teacher Wraparound Edition:</b> CU 20; IM 18; QD 18</p>
<p><b>S8.A.2.1.4</b> Interpret data/observations; develop relationships among variables based on data/observations to design models as solutions.</p>	<p><b>Student Edition:</b> 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 <b>Teacher Wraparound Edition:</b> A 24; CC 22; D 22; DI 24; QD 23; TPK 21; UA 22; VL 25</p>
<p><b>S8.A.2.1.5</b> Use evidence from investigations to clearly communicate and support conclusions.</p>	<p><b>Student Edition:</b> 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 <b>Teacher Wraparound Edition:</b> CYD 33, 86, 209, 411</p>
<p><b>S8.A.2.1.6</b> Identify a design flaw in a simple technological system and devise possible working solutions.</p>	<p><b>Student Edition:</b> <i>Design Your Own LAB</i> 300-301, 424-425, 450-451 <i>LAB</i> 632-633</p>

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<p><b>S8.A.2.2</b> Apply appropriate instruments for a specific purpose and describe the information the instrument can provide.</p>	
<p><b>S8.A.2.2.1</b> 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><b>Student Edition:</b> 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 <b>Teacher Wraparound Edition:</b> A 43; D 45; IL 48; SJ 45; VL 45</p>
<p><b>S8.A.2.2.2</b> Apply appropriate measurement systems (e.g., time, mass, distance, volume, temperature) to record and interpret observations under varying conditions.</p>	<p><b>Student Edition:</b> 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 <b>Teacher Wraparound Edition:</b> A 53; CU 54; IL 48</p>
<p><b>S8.A.2.2.3</b> Describe ways technology extends and enhances human abilities for specific purposes (e.g., microscope, telescope, micrometer, hydraulics, barometer).</p>	<p><b>Student Edition:</b> 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 <b>Teacher Wraparound Edition:</b> A 393; AIL 362, 424; CD 390, 392, 419; D 357, 569; DI 390; LD 420, 626; TFYI 357</p>

STANDARDS		PAGE REFERENCES
<b>ASSESSMENT ANCHOR</b>		
<b>S8.A.3</b>	<b>Systems, Models and Patterns</b>	
<b>S8.A.3.1</b>	Explain the parts of a simple system, their roles, and their relationships to the system as a whole.	
<b>S8.A.3.1.1</b> 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.	<b>Student Edition:</b> 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 <b>Teacher Wraparound Edition:</b> AIL 424; CD 122; D 357; QD 8; R 11; SJ 8; TFYI 357	
<b>S8.A.3.1.2</b> 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).	<b>Student Edition:</b> 122, 357-358, 384-385, 389-395, 445-446, 448-449, 622 <i>National Geographic</i> 382, 447 <b>Teacher Wraparound Edition:</b> DI 393; VL 448	
<b>S8.A.3.1.3</b> Distinguish between system inputs, system processes, system outputs, and feedback (e.g., physical, ecological, biological, informational).	<b>Student Edition:</b> 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 <b>Teacher Wraparound Edition:</b> D 394; LD 420, 626; TFYI 392	
<b>S8.A.3.1.4</b> 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.	<b>Student Edition:</b> 591-592, 596-599 <i>LAB</i> 603, 604-605 <i>MiniLAB</i> 598 <b>Teacher Wraparound Edition:</b> D 597; IM 599; MM 597; QD 599; VL 598	
<b>S8.A.3.1.5</b> Explain how components of a natural and human-made system play different roles in a working system.	<b>Student Edition:</b> 389-395 <i>MiniLAB</i> 391 <b>Teacher Wraparound Edition:</b> D 394; DI 390, 392; MM 390, 394; TFYI 392	

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<p><b>S8.A.3.2</b> Apply knowledge of models to make predictions, draw inferences, or explain technological concepts.</p>	
<p><b>S8.A.3.2.1</b> Describe how scientists use models to explore relationships in natural systems (e.g., an ecosystem, river system, or the solar system).</p>	<p><b>Student Edition:</b> 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 <b>Teacher Wraparound Edition:</b> D 163</p>
<p><b>S8.A.3.2.2</b> Describe how engineers use models to develop new and improved technologies to solve problems.</p>	<p><b>Student Edition:</b> <i>Design Your Own LAB</i> 124-125, 300-301, 424-425, 450-451 <i>LAB</i> 632-633</p>
<p><b>S8.A.3.2.3</b> 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><b>Student Edition:</b> 438-442 <i>LAB</i> 444 <i>MiniLAB</i> 440, 441 <b>Teacher Wraparound Edition:</b> IL 439; LD 442</p>
<p><b>S8.A.3.3</b> Describe repeated processes or recurring elements in scientific and technological patterns.</p>	
<p><b>S8.A.3.3.1</b> 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> © 2005. <b>Student Edition:</b> 267-269, 364, 648</p>
<p><b>S8.A.3.3.2</b> 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).</p>	<p><b>Student Edition:</b> 103, 175 <i>National Geographic</i> 176, 478 <b>Teacher Wraparound Edition:</b> DI 176; MM 103, 176; TFYI 103</p>

STANDARDS		PAGE REFERENCES
<b>S8.C Physical Sciences</b>		
<b>ASSESSMENT ANCHOR</b>		
<b>S8.C.1 Structure, Properties, and Interaction of Matter and Energy</b>		
<b>S8.C.1.1 Explain concepts about the structure and properties (physical and chemical) of matter.</b>		
<b>S8.C.1.1.1</b> Explain the differences among elements, compounds, and mixtures.	<b>Student Edition:</b> 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 <b>Teacher Wraparound Edition:</b> A 82, 84, 90; AIL 92; CC 90; D 89; DI 89, 90; IM 81; MM 88; QD 90; TPK 87; USW 86	
<b>S8.C.1.1.2</b> Use characteristic physical or chemical properties to distinguish one substance from another (e.g., density, thermal expansion/contraction, freezing/melting points, streak test).	<b>Student Edition:</b> 134-138, 139-142 <i>Design Your Own LAB</i> 150-151 <i>MiniLAB</i> 135 <i>Self-Check</i> (4) 138 <b>Teacher Wraparound Edition:</b> A 140; IL 141; TFYI 137	
<b>S8.C.1.1.3</b> Identify and describe reactants and products of simple chemical reactions.	<b>Student Edition:</b> 192-199 <i>Applying Math</i> 196 <i>LaunchLAB</i> 189 <i>MiniLAB</i> 194 <b>Teacher Wraparound Edition:</b> A 195; D 198; DI 193, 195; MM 194	
<b>ASSESSMENT ANCHOR</b>		
<b>S8.C.2 Forms, Sources, Conversion, and Transfer of Energy</b>		
<b>S8.C.2.1 Describe energy sources, transfer of energy, or conversion of energy.</b>		
<b>S8.C.2.1.1</b> Distinguish among forms of energy (e.g., electrical, mechanical, chemical, heat, light, sound, nuclear) and sources of energy (i.e., renewable and nonrenewable energy).	<b>Student Edition:</b> 374-378, 387-395 <i>MiniLAB</i> 391 <b>Teacher Wraparound Edition:</b> A 376; CC 375; D 391; DI 377; IL 375; IM 327F; QD 389; SJ 377	

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<p><b>S8.C.2.1.2</b> Explain how heat is transferred from one place to another through convection, conduction, or radiation.</p>	<p><b>Student Edition:</b> 438-443 <i>LAB</i> 444 <i>MiniLAB</i> 440, 441 <b>Teacher Wraparound Edition:</b> A 439; IL 439; LD 442; VL 441</p>
<p><b>S8.C.2.1.3</b> Describe how one form of energy (e.g., electrical, mechanical, chemical, heat, light, sound, nuclear) can be converted into a different form of energy.</p>	<p><b>Student Edition:</b> 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 <b>Teacher Wraparound Edition:</b> D 383, 394; DI 377; LD 380; QD 381; SJ 377; VL 381</p>
<p><b>S8.C.2.2</b> Compare the environmental impact of different energy sources chosen to support human endeavors.</p>	
<p><b>S8.C.2.2.1</b> Describe the sun as a major source of energy that impacts on the environment.</p>	<p><b>Student Edition:</b> 387 (Figure 16)</p>
<p><b>S8.C.2.2.2</b> Compare the time spans of renewability for fossil fuels and alternative fuels.</p>	<p><b>Student Edition:</b> 388-395 <i>Use the Internet LAB</i> 396-397 <b>Teacher Wraparound Edition:</b> SJ 388; UA 388</p>
<p><b>S8.C.2.2.3</b> 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.</p>	<p><b>Student Edition:</b> 388-389, 443</p>

STANDARDS		PAGE REFERENCES
<b>ASSESSMENT ANCHOR</b>		
<b>S8.C.3</b>	<b>Principles of Motion and Force</b>	
<b>S8.C.3.1</b>	Describe the effect of multiple forces on the movement, speed, or direction of an object.	
<b>S8.C.3.1.1</b> Describe forces acting on objects (e.g., friction, gravity, balanced versus unbalanced, inertia, momentum).		<b>Student Edition:</b> 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 <b>Teacher Wraparound Edition:</b> 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
<b>S8.C.3.1.2</b> Distinguish between kinetic and potential energy.		<b>Student Edition:</b> 375-376, 380 <i>MiniLAB</i> 381 <b>Teacher Wraparound Edition:</b> IL 375; USW 376
<b>S8.C.3.1.3</b> 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.		<b>Student Edition:</b> 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 <b>Teacher Wraparound Edition:</b> A 419; LD 420; TPK 417; UA 414; VL 422