



# Physical Science

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STANDARDS		PAGE REFERENCES
<b>PHYSICAL SCIENCE</b>		
<b>Standard 1: Nature of Science</b>		
Students exercise the basic tenets of scientific investigation, make accurate observations, exercise critical thinking skills, apply proper scientific instruments of investigation and measurement tools, and communicate results in problem solving. Students evaluate the validity of information by utilizing the tools of scientific thinking and investigation. Students summarize their findings by creating lab reports using technical writing including graphs, charts, and diagrams to communicate the results of investigations.		
<b>Goal 1.1: Understand Systems, Order, and Organization</b>		
<b>Objective(s): By the end of Physical Science, the student will be able to:</b>		
8-9.PS.1.1.1	Explain the scientific meaning of system, order, and organization. (648.01a)	<b>Student Edition:</b> 14-16, 22-26, 82, 107-108, 111-113, 146, 175, 201, 267, 373 <i>Integrate Earth Science</i> 45-46, 162 <i>Integrate Environment</i> 111 <i>National Geographic</i> 166 <i>Science and History</i> 118 <i>Science and Society</i> 150 <i>Science Skill Handbook</i> 788-791 <b>Teacher Wraparound Edition:</b> CU 146; IM 15

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8-9.PS.1.1.2	Apply the concepts of order and organization to a given system. (648.01a)	<p><b>Student Edition:</b>  22-26, 163  <i>Applying Math</i> 211, 212, 548  <i>Applying Science</i> 426, 514, 744, 766  <i>Design Your Own LAB</i> 116-117, 214-215  LAB 27  <i>Model and Invent LAB</i> 148-149, 438-439  <i>Use the Internet LAB</i> 278-279, 652-653</p> <p><b>Teacher Wraparound Edition:</b>  A 45; CC 160; QD 201</p>
<p><b>Goal 1.2: Understand Concepts and Processes of Evidence, Models, and Explanation</b></p> <p><b>Objective(s): By the end of Physical Science, the student will be able to:</b></p>		
8-9.PS.1.2.1	Use observations and data as evidence on which to base scientific explanations. (648.02a)	<p><b>Student Edition:</b>  7-10, 18-21, 163, 167  <i>Design Your Own LAB</i> 116-117, 214-215  LAB 57, 466-467  <i>Model and Invent LAB</i> 148-149  <i>Science and History</i> 92  <i>Science Skill Handbook</i> 795-796</p> <p><b>Teacher Wraparound Edition:</b>  A 78; QD 10; R 163</p>
8-9.PS.1.2.2	Develop models to explain concepts or systems. (648.02b)	<p><b>Student Edition:</b>  11, 138-139, 201  <i>Design Your Own LAB</i> 592-593  <i>Integrate Astronomy</i> 76  <i>Integrate Earth Science</i> 45-46  <i>Integrate Physics</i> 30  LAB 438-439  <i>Model and Invent LAB</i> 148-149  <i>National Geographic</i> 258</p> <p><b>Teacher Wraparound Edition:</b>  A 11, 45; IP 30; QD 78</p>

STANDARDS		PAGE REFERENCES
8-9.PS.1.2.3	Develop scientific explanations based on knowledge, logic, and analysis. (648.02c)	<p><b>Student Edition:</b>  7-12, 22-26, 271-276, 416-422, 465, 492-495  <i>LAB 57</i>, 90-91  <i>National Geographic</i> 166  <i>Science Skill Handbook</i> 796  <i>Use the Internet LAB</i> 278-279</p> <p><b>Teacher Wraparound Edition:</b>  IL 12</p>
<b>Goal 1.3: Understand Constancy, Change, and Measurement</b>		
<b>Objective(s): By the end of Physical Science, the student will be able to:</b>		
8-9.PS.1.3.1	Measure changes that can occur in and among systems. (648.03b)	<p><b>Student Edition:</b>  14-16, 22-26, 82, 114-115, 204-205  <i>Design Your Own LAB</i> 116-117  <i>Integrate Astronomy</i> 76  <i>Integrate Earth Science</i> 45-46, 162  <i>Integrate Environment</i> 111  <i>LAB 27</i>, 147  <i>Model and Invent LAB</i> 148-149  <i>Science Skill Handbook</i> 788-791</p> <p><b>Teacher Wraparound Edition:</b>  IL 113; IM 15</p>
8-9.PS.1.3.2	Analyze changes that can occur in and among systems. (648.03b)	<p><b>Student Edition:</b>  14-16, 22-24, 78-79, 80-82, 107-108, 111-113, 146, 175, 201, 267-268, 373  <i>Integrate Earth Science</i> 45-46, 162  <i>Integrate Environment</i> 111  <i>MiniLAB</i> 25, 112  <i>Model and Invent LAB</i> 148-149  <i>National Geographic</i> 166  <i>Science and History</i> 118  <i>Science and Society</i> 150  <i>Science Skill Handbook</i> 788-791</p> <p><b>Teacher Wraparound Edition:</b>  AIL 116; FYI 16, 78; IM 15, 114</p>

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8-9.PS.1.3.3	Measure and calculate using the metric system. (648.03c)	<b>Student Edition:</b> 14-21, 48-50 <i>Applying Math</i> 69, 86, 104 <i>Design Your Own LAB</i> 58-59 <i>Integrate Astronomy</i> 39 <i>LAB</i> 27 <i>Math Skill Handbook</i> 827-828 <i>Model and Invent LAB</i> 148-149 <i>National Geographic</i> 20 <i>Use the Internet LAB</i> 278-279, 652-653 <b>Teacher Wraparound Edition:</b> CC 19; D 16; IM 15
<b>Goal 1.4: Understand the Theory that Evolution is a Process that Relates to the Gradual Changes in the Universe and of Equilibrium as a Physical State</b>		
No objectives in Physical Science.		
<b>Goal 1.5: Understand Concepts of Form and Function</b>		
No objectives in Physical Science.		
<b>Goal 1.6: Understand Scientific Inquiry and Develop Critical Thinking Skills</b>		
<b>Objective(s): By the end of Physical Science, the student will be able to:</b>		
8-9.PS.1.6.1	Identify questions and concepts that guide scientific investigations. (649.01a)	<b>Student Edition:</b> 6-8 <i>Design Your Own LAB</i> 58-59, 116-117, 214-215, 406-407, 716-717 <i>LAB</i> 89, 245, 466-467, 680, 778-779 <i>Science Skill Handbook</i> 788-791 <i>Use the Internet LAB</i> 278-279, 652-653 <b>Teacher Wraparound Edition:</b> A 9; FF 8; IL 12; SJ 11

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<p>8-9.PS.1.6.2 Utilize the components of scientific problem solving to design, conduct, and communicate results of investigations. (649.01b)</p>	<p><b>Student Edition:</b>  7-10, 22-26  <i>Applying Science</i> 228, 426, 514, 766  <i>Design Your Own LAB</i> 58-59, 116-117, 214-215, 406-407, 716-717  <i>LAB</i> 466-467, 778-779  <i>Model and Invent LAB</i> 148-149  <i>Science Skill Handbook</i> 788-796  <i>Technology Skill Handbook</i> 813-816  <i>Use the Internet LAB</i> 278-279, 652-653</p> <p><b>Teacher Wraparound Edition:</b>  A 9; D 8</p>
<p>8-9.PS.1.6.3 Use appropriate technology and mathematics to make investigations. (649.01c)</p>	<p><b>Student Edition:</b>  48-50, 76-77  <i>Applying Math</i> 40, 69, 162, 211, 212, 357, 669  <i>Applying Science</i> 514  <i>Integrate Astronomy</i> 39  <i>LAB</i> 778-779  <i>Math Skill Handbook</i> 827-831  <i>Model and Invent LAB</i> 148-149  <i>Technology Skill Handbook</i> 813-816  <i>Use the Internet LAB</i> 278-279, 652-653</p> <p><b>Teacher Wraparound Edition:</b>  A 769; D 41; FYI 78</p>
<p>8-9.PS.1.6.4 Formulate scientific explanations and models using logic and evidence. (649.01d)</p>	<p><b>Student Edition:</b>  7-11, 22-26  <i>Applying Math</i> 463, 548  <i>LAB</i> 366, 778-779  <i>Model and Invent LAB</i> 148-149  <i>Science and History</i> 118, 376, 560  <i>Science Skill Handbook</i> 796  <i>Use the Internet LAB</i> 278-279, 652-653</p> <p><b>Teacher Wraparound Edition:</b>  IL 12; QD 10; SJ 11</p>

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8-9.PS.1.6.5 Analyze alternative explanations and models. (649.01e)	<p><b>Student Edition:</b>  10, 82, 267-269, 271-276, 358-359, 509-511  <i>Integrate Earth Science</i> 45-46  <i>National Geographic</i> 510  <i>Science and History</i> 92, 118, 376  <i>Science and Society</i> 280  <i>Use the Internet LAB</i> 652-653</p> <p><b>Teacher Wraparound Edition:</b>  D 8; FYI 53, 69, 242; IL 12; IM 70, 201, 273; SJ 11</p>
8-9.PS.1.6.6 Communicate and defend a scientific argument. (649.01f)	<p><b>Student Edition:</b>  22-26  <i>Applying Science</i> 269, 514, 766  <i>Integrate Earth Science</i> 45-46  <i>LAB</i> 778-779  <i>Science and History</i> 376  <i>Science and Society</i> 280, 346, 718  <i>Science Skill Handbook</i> 796  <i>Technology Skill Handbook</i> 816  <i>Use the Internet LAB</i> 278-279, 652-653</p> <p><b>Teacher Wraparound Edition:</b>  A 45; CYD 117, 215, 407; IL 12; SJ 11</p>
8-9.PS.1.6.7 Explain the differences among observations, hypotheses, and theories. (649.01g)	<p><b>Student Edition:</b>  8, 10, 12, 14-21  <i>Design Your Own LAB</i> 116-117, 214-215, 344-345, 716-717  <i>Science and History</i> 118, 376, 560  <i>Science Skill Handbook</i> 791-796</p> <p><b>Teacher Wraparound Edition:</b>  A 9; IL 12; SJ 11</p>
<p><b>Goal 1.7: Understand That Interpersonal Relationships Are Important in Scientific Endeavors</b></p>	
<p>No objectives in Physical Science.</p>	

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<b>Goal 1.8: Understand Technical Communication</b>	
<b>Objective(s): By the end of Physical Science, the student will be able to:</b>	
8-9.PS.1.8.1 Analyze technical writing, graphs, charts, and diagrams. (658.02a)	<b>Student Edition:</b> 22-26 <i>Applying Math</i> 24 <i>Integrate Earth Science</i> 11 LAB 466-467, 622-623 <i>Math Skill Handbook</i> 830-831 <i>Science and History</i> 118 <i>Science and Language Arts</i> 30, 216 <i>Technology Skill Handbook</i> 813-816 <i>Use the Internet LAB</i> 526-527 <b>Teacher Wraparound Edition:</b> CC 10; CYD 59, 117, 215, 467; DI 23; LD 25; SJ 24
<b>Standard 2: Physical Science</b>	
<p>Students explain the structure and properties of atoms, including isotopes. Students explain how chemical reactions, while requiring or releasing energy, can neither destroy nor create energy or matter. Students explain the differences between fission and fusion. Students explain the interactions of force and mass in describing motion using Newton's Laws. Students explain how energy can be transformed from one form to another while the total amount of energy remains constant. Students classify energy as potential and/or kinetic, and as energy contained in a field.</p>	
<b>Goal 2.1: Understand the Structure and Function of Matter and Molecules and Their Interactions</b>	
No objectives in Physical Science.	
<b>Goal 2.2: Understand Concepts of Motion and Forces</b>	
<b>Objective(s): By the end of Physical Science, the student will be able to:</b>	
8-9.PS.2.2.1 Explain motion using Newton's Laws of Motion. (650.04b)	<b>Student Edition:</b> 54-56, 68-70, 76-82, 83-84 <i>Design Your Own LAB</i> 58-59 LAB 57, 90-91 <i>National Geographic</i> 85 <i>Science and History</i> 92 <b>Teacher Wraparound Edition:</b> DI 76, 86; FF 55; FYI 69; SJ 84; TPK 83

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<b>Goal 2.3: Understand the Total Energy in the Universe is Constant</b>		
<b>Objective(s): By the end of Physical Science, the student will be able to:</b>		
8-9.PS.2.3.1	Explain that energy can be transformed but cannot be created nor destroyed. (650.05a)	<b>Student Edition:</b> 107-112, 135, 256, 260-261, 290, 300-301 <i>Design Your Own LAB</i> 116-117 <i>LAB</i> 106 <i>Science and History</i> 118 <b>Teacher Wraparound Edition:</b> D 262; FF 112; FYI 328; LD 110; TPK 290; USW 111
8-9.PS.2.3.2	Classify energy as potential and/or kinetic and as energy contained in a field. (650.05b)	<b>Student Edition:</b> 102-105, 108-111, 115, 211-212, 238, 477, 646 <i>Design Your Own LAB</i> 116-117 <i>LAB</i> 106 <i>National Geographic</i> 110, 647 <b>Teacher Wraparound Edition:</b> CU 105; QD 104; USW 102
<b>Goal 2.4: Understand the Structure of Atoms</b>		
<b>Objective(s): By the end of Physical Science, the student will be able to:</b>		
8-9.PS.2.4.1	Describe the properties, function, and location of protons, neutrons, and electrons. (650.01a)	<b>Student Edition:</b> 507, 511, 520, 536, 541-543, 551-552, 608-612 <i>National Geographic</i> 510 <b>Teacher Wraparound Edition:</b> A 537; D 609; FF 521, 523; TPK 536
8-9.PS.2.4.2	Explain the processes of fission and fusion. (650.01b)	<b>Student Edition:</b> 113, 266, 270, 551-553 <i>Science and History</i> 560 <b>Teacher Wraparound Edition:</b> FF 270; FYI 113, 553; VL 266
8-9.PS.2.4.3	Describe the characteristics of isotopes. (650.01c)	<b>Student Edition:</b> 514-515, 538-539, 554, 556 <b>Teacher Wraparound Edition:</b> DI 554; R 540; VL 514

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8-9.PS.2.4.4	State the basic electrical properties of matter. (650.01d)	<b>Student Edition:</b> 195, 203-205, 523 <i>LAB 206</i> <b>Teacher Wraparound Edition:</b> D 194; DI 195; FYI 204, 209; UA 203
8-9.PS.2.4.5	Describe the relationships between magnetism and electricity.	<b>Student Edition:</b> 231-237, 238-244 <i>Design Your Own LAB 246-247</i> <i>LAB 245</i> <i>National Geographic 241</i> <b>Teacher Wraparound Edition:</b> CU 237, 244; IL 234; VL 233
<b>Goal 2.5: Understand Chemical Reactions</b>		
<b>Objective(s): By the end of Physical Science, the student will be able to:</b>		
8-9.PS.2.5.1	Explain how chemical reactions may release or consume energy while the quantity of matter remains constant. (650.03a)	<b>Student Edition:</b> 465, 632-634, 638-640, 646-649 <i>Applying Math 463</i> <i>National Geographic 647</i> <b>Teacher Wraparound Edition:</b> QD 633; R 465
<b>Standard 5: Personal and Social Perspectives; Technology</b>		
Students understand that science and technology interact and impact both society and the environment.		
<b>Goal 5.1: Understand Common Environmental Quality Issues, Both Natural and Human Induced</b>		
No objectives in Physical Science.		
<b>Goal 5.2: Understand the Relationship between Science and Technology</b>		
<b>Objective(s): By the end of Physical Science, the student will be able to:</b>		
8-9.PS.5.2.1	Explain how science advances technology. (655.01a)	<b>Student Edition:</b> 13, 367-373 <i>Applying Science 228, 269, 766</i> <i>LAB 366, 778-779</i> <i>National Geographic 241, 369, 397, 430, 769</i> <i>Science and History 248, 314, 528, 594</i> <i>Science and Society 780</i> <b>Teacher Wraparound Edition:</b> FYI 12; SJ 371

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8-9.PS.5.2.2	Explain how technology advances science. (655.01a)	<b>Student Edition:</b> 13, 256-263, 396-399, 432-437 <i>Accidents in Science</i> 624, 654, 750 <i>Integrate Astronomy</i> 331 <i>Integrate History</i> 429 <i>National Geographic</i> 2-3, 397, 430, 567 <b>Teacher Wraparound Edition:</b> D 434; FYI 433
8-9.PS.5.2.3	Explain how science and technology are pursued for different purposes. (656.01b)	<b>Student Edition:</b> 13, 264-269, 271-276 <i>Accidents in Science</i> 624, 654, 750 <i>Science and History</i> 248, 376, 560, 594 <i>Science and Society</i> 150, 780 <b>Teacher Wraparound Edition:</b> FYI 274
<b>Goal 5.3: Understand the Importance of Natural Resources and the Need to Manage and Conserve Them</b>		
No objectives in Physical Science.		