



Physical Science

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STANDARDS	PAGE REFERENCES
Standard A: Science Connections	
By the end of grade twelve, students will:	
<p>A.12.1 Apply the underlying themes of science to develop defensible visions of the future</p>	<p>Student Edition: 270-276 <i>Science and History</i> 528 <i>Science and Society</i> 150 <i>Science Online</i> 113 <i>Use the Internet LAB</i> 278-279 Teacher Wraparound Edition: A 404; SJ 371, 398</p>
<p>A.12.2 Show how conflicting assumptions about science themes lead to different opinions and decisions about evolution, health, population, longevity, education, and use of resources, and show how these opinions and decisions have diverse effects on an individual, a community, and a country, both now and in the future</p>	<p>Student Edition: 271-276 <i>Science and Society</i> 280 <i>Science Online</i> 434 <i>Use the Internet LAB</i> 278-279 Teacher Wraparound Edition: CC 265; D 376; SJ 552</p>

STANDARDS	PAGE REFERENCES
A.12.3 Give examples that show how partial systems, models, and explanations are used to give quick and reasonable solutions that are accurate enough for basic needs	Student Edition: <i>Design Your Own LAB</i> 592-593 <i>Launch LAB</i> 415 <i>MiniLAB</i> 509 <i>Traditional LAB</i> 366, 557 Teacher Wraparound Edition: A 294; DI 509; MM 145, 644; R 511
A.12.4 Construct arguments that show how conflicting models and explanations of events can start with similar evidence	Student Edition: <i>Science and Society</i> 280 Teacher Wraparound Edition: A 556; AIL 652; D 376, 580; TFYI 242
A.12.5 Show how the ideas and themes of science can be used to make real-life decisions about careers, work places, life-styles, and use of resources	Student Edition: <i>Communicating Your Data</i> 345 <i>Integrate Health</i> 115 <i>Science Online</i> 69, 174 <i>Use the Internet LAB</i> 278-279 Teacher Wraparound Edition: AIL 58; CC 48; D 86; IL 12; SJ 175
A.12.6 Identify and, using evidence learned or discovered, replace inaccurate personal models and explanations of science-related events	Student Edition: <i>Science and History</i> 118 <i>Science and Society</i> 280 Teacher Wraparound Edition: A 55, 527; CC 385; IL 12; IM 204, 299, 390
A.12.7 Re-examine the evidence and reasoning that led to conclusions drawn from investigations, using the science themes	Student Edition: <i>Communicating Your Data</i> 29, 59, 91, 106, 181, 717 <i>Use the Internet LAB</i> 374-375 Teacher Wraparound Edition: CYD 57, 171, 457
Standard B: Nature of Science	
By the end of grade twelve, students will:	
B.12.1 Show how cultures and individuals have contributed to the development of major ideas in the earth and space, life and environmental, and physical sciences	Student Edition: 633-634 <i>National Geographic</i> 510 <i>Science and History</i> 92, 376, 560 Teacher Wraparound Edition: CC 160; CD 84, 104, 538; SJ 242

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<p>B.12.2 Identify the cultural conditions that are usually present during great periods of discovery, scientific development, and invention</p>	<p>Student Edition: 632 <i>Integrate History</i> 429 <i>Science and History</i> 376 Teacher Wraparound Edition: CC 633</p>
<p>B.12.3 Relate the major themes of science to human progress in understanding science and the world</p>	<p>Student Edition: 6-13 <i>Integrate Astronomy</i> 331 <i>Integrate Earth Science</i> 79 <i>Integrate History</i> 9 <i>Science and History</i> 92, 376 Teacher Wraparound Edition: A 45; CD 8; USW 114</p>
<p>B.12.4 Show how basic research and applied research contribute to new discoveries, inventions, and applications</p>	<p>Student Edition: 264-267, 434 <i>National Geographic</i> 287, 567 <i>Science and History</i> 248 <i>Science Online</i> 507, 523 Teacher Wraparound Edition: A 510; CC 134; DI 355</p>
<p>B.12.5 Explain how science is based on assumptions about the natural world and themes that describe the natural world</p>	<p>Student Edition: 6-7, 158-160, 290-295 <i>Integrate Life Science</i> 392 <i>National Geographic</i> 491 <i>Science and History</i> 376 <i>Traditional LAB</i> 496-497 Teacher Wraparound Edition: A 45, 294; SJ 11</p>
<p>Standard C: Science Inquiry</p>	
<p>By the end of grade twelve, students will:</p>	
<p>C.12.1 When studying science content, ask questions suggested by current social issues, scientific literature, and observations* of phenomena, build hypotheses that might answer some of these questions, design possible investigations*, and describe results that might emerge from such investigations</p>	<p>Student Edition: <i>Design Your Own LAB</i> 58-59, 116-117, 214-215, 344-345 <i>Launch LAB</i> 569 Teacher Wraparound Edition: A 9, 302, 330; IL 80, 174</p>

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<p>C.12.2 Identify* issues from an area of science study, write questions that could be investigated*, review previous research on these questions, and design and conduct responsible and safe investigations to help answer the questions</p>	<p>Student Edition: <i>Design Your Own LAB</i> 58-59, 214-215, 406-407, 716-717 <i>Traditional LAB</i> 622-623 Teacher Wraparound Edition: A 13; AIL 246, 466; IL 113, 710</p>
<p>C.12.3 Evaluate* the data collected during an investigation*, critique the data-collection procedures and results, and suggest ways to make any needed improvements</p>	<p>Student Edition: <i>Design Your Own LAB</i> 28-29, 58-59, 246-247 <i>Launch LAB</i> 5 <i>Model and Invent LAB</i> 558-559 Teacher Wraparound Edition: AIL 716, 748; QD 17</p>
<p>C.12.4 During investigations*, choose the best data-collection procedures and materials available, use them competently, and calculate the degree of precision of the resulting data</p>	<p>Student Edition: <i>Applying Science</i> 711 <i>Design Your Own LAB</i> 246-247 <i>Traditional LAB</i> 106, 180-181, 312-313 Teacher Wraparound Edition: A 5, 20; AIL 90, 466; IL 44</p>
<p>C.12.5 Use the explanations* and models* found in the earth and space, life and environmental, and physical sciences to develop likely explanations* for the results of their investigations*</p>	<p>Student Edition: <i>Design Your Own LAB</i> 116-117 <i>Launch LAB</i> 157, 289, 449 <i>MiniLAB</i> 112, 168, 198, 486 Teacher Wraparound Edition: A 329; HS 528</p>
<p>C.12.6 Present the results of investigations* to groups concerned with the issues, explaining* the meaning and implications of the results, and answering questions in terms the audience can understand</p>	<p>Student Edition: <i>Communicating Your Data</i> 405, 407, 779 <i>Science and History</i> 118 <i>Science Online</i> 479 Teacher Wraparound Edition: DI 85, 139, 325, 509, 647</p>
<p>C.12.7 Evaluate* articles and reports in the popular press, in scientific journals, on television, and on the Internet, using criteria related to accuracy, degree of error, sampling, treatment of data, and other standards of experimental design</p>	<p>Student Edition: <i>Science Skill Handbook</i> 788 Teacher Wraparound Edition: CC 10; DI 23</p>

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Standard D: Physical Science		
By the end of grade twelve, students will:		
STRUCTURE OF ATOMS AND MATTER		
D.12.1 Describe* atomic structure and the properties of atoms, molecules, and matter during physical and chemical interactions*	Student Edition: 506-511, 608-612 <i>Launch LAB 535</i> <i>MiniLAB 509</i> <i>Science Online 521, 610</i> Teacher Wraparound Edition: A 537; DI 520; IL 523, 611	
D12.2 Explain* the forces that hold the atom together and illustrate* how nuclear interactions* change the atom	Student Edition: 536-543 <i>MiniLAB 539</i> <i>Model and Invent LAB 558-559</i> Teacher Wraparound Edition: D 543; MM 537, 553	
D.12.3 Explain* exchanges of energy* in chemical interactions* and exchange of mass and energy in atomic/nuclear reactions	Student Edition: 551-553, 646-649 <i>Traditional LAB 557</i> Teacher Wraparound Edition: CU 650; LD 648; R 650; TPK 646	
CHEMICAL REACTIONS		
D.12.4 Explain* how substances, both simple and complex, interact* with one another to produce new substances	Student Edition: 641-645, 707-708 <i>Integrate Environment 637</i> <i>Launch LAB 631</i> <i>Traditional LAB 748-749</i> <i>Use the Internet LAB 652-653</i> Teacher Wraparound Edition: A 642; IL 643; MM 644	
D.12.5 Identify* patterns in chemical and physical properties and use them to predict* likely chemical and physical changes and interactions	Student Edition: 458-464 <i>Launch LAB 757</i> <i>MiniLAB 460</i> <i>Traditional LAB 466-467, 583</i> Teacher Wraparound Edition: A 461; CU 465; LD 460; QD 463; SJ 462	

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D.12.6 Through investigations*, identify* the types of chemical interactions*, including endothermic, exothermic, oxidation, photosynthesis, and acid/base reactions	Student Edition: 641-645, 648-649, 707-708 <i>Applying Science</i> 711 Teacher Wraparound Edition: A 650; IL 643, 710; LD 648; MM 644; QD 642
MOTIONS AND FORCES	
D.12.7 Qualitatively and quantitatively analyze* changes in the motion of objects and the forces that act on them and represent analytical data both algebraically and graphically	Student Edition: 38-44, 47-50, 52-55, 68-70 <i>Design Your Own LAB</i> 58-59 <i>Traditional LAB</i> 57, 90-91 Teacher Wraparound Edition: A 46; LD 50; QD 41
D.12.8 Understand* the forces of gravitation, the electromagnetic force, intermolecular force, and explain* their impact on the universal system	Student Edition: 75-77, 192-194, 224 <i>Integrate Earth Science</i> 79 <i>MiniLAB</i> 198 <i>Science and History</i> 92 <i>Traditional LAB</i> 89 Teacher Wraparound Edition: DI 225; SJ 76; VL 226
D.12.9 Describe* models* of light, heat, and sound and through investigations* describe* similarities and differences in the way these energy* forms behave	Student Edition: 159-160, 164-170, 322-324, 384-388 <i>Design Your Own LAB</i> 344-345 <i>Traditional LAB</i> 171, 405 Teacher Wraparound Edition: CU 326; LD 165; UA 386
CONSERVATION OF ENERGY AND THE INCREASE IN DISORDER	
D.12.10 Using the science themes*, illustrate* the law of conservation of energy* during chemical and nuclear reactions	Student Edition: 111-114 <i>Design Your Own LAB</i> 116-117 <i>Section Review</i> 115 #3 Teacher Wraparound Edition: LD 110

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INTERACTIONS OF MATTER AND ENERGY	
D.12.11 Using the science themes*, explain* common occurrences in the physical world	Student Edition: 107-115 <i>MiniLAB</i> 356 <i>National Geographic</i> 197, 369 <i>Traditional LAB</i> 90-91 Teacher Wraparound Edition: CC 167, 300; IL 643; R 105; SJ 84
D.12.12 Using the science themes* and knowledge of chemical, physical, atomic, and nuclear interactions*, explain* changes in materials, living things, earth's features, and stars	Student Edition: 45-46 <i>Applying Science</i> 514 <i>Integrate Earth Science</i> 176 <i>Launch LAB</i> 353 <i>Science Online</i> 773 <i>Traditional LAB</i> 466-467 Teacher Wraparound Edition: AIL 180; CC 102; IL 462; SJ 76
Standard G: Science Applications	
By the end of grade twelve, students will:	
G.12.1 Identify personal interests in science and technology, implications that these interests might have for future education, and decisions to be considered	Student Edition: <i>Integrate Career</i> 208, 240, 325, 370, 520, 576, 743 <i>Science and Society</i> 440 Teacher Wraparound Edition: DI 197; IE 581
G.12.2 Design, build, evaluate, and revise models and explanations related to the earth and space, life and environmental, and physical sciences	Student Edition: <i>Launch LAB</i> 321 <i>MiniLAB</i> 509 <i>Model and Invent LAB</i> 148-149, 438-439, 558-559 Teacher Wraparound Edition: CC 167; DI 488, 509; MM 108; R 373
G.12.3 Analyze the costs, benefits, or problems resulting from a scientific or technological innovation, including implications for the individual and the community	Student Edition: <i>Science and Society</i> 150, 280 <i>Science Online</i> 113, 434 <i>Use the Internet LAB</i> 278-279 Teacher Wraparound Edition: AIL 278; CC 265; CU 276; R 213; SJ 552

STANDARDS	PAGE REFERENCES
<p>G.12.4 Show how a major scientific or technological change has had an impact on work, leisure, or the home</p>	<p>Student Edition: 231-237, 396-399 <i>Integrate History</i> 48 <i>Science and History</i> 248, 314 Teacher Wraparound Edition: CC 227; SJ 176, 398; UP 189, 447</p>
<p>G.12.5 Choose a specific problem in our society, identify alternative scientific or technological solutions to that problem and argue its merits</p>	<p>Student Edition: 271-276 <i>Integrate Environment</i> 772 <i>Science and Society</i> 280 <i>Use the Internet LAB</i> 278-279 Teacher Wraparound Edition: A 268; AIL 278; CC 265; CU 276; IL 643</p>
<p>Standard H: Science in Personal and Social Perspectives</p>	
<p>By the end of grade twelve, students will:</p>	
<p>H.12.1 Using the science themes and knowledge of the earth and space, life and environmental, and physical sciences, analyze the costs, risks, benefits, and consequences of a proposal concerning resource management in the community and determine the potential impact of the proposal on life in the community and the region</p>	<p>Student Edition: <i>Applying Science</i> 269 <i>Science and Society</i> 280 <i>Use the Internet LAB</i> 278-279 Teacher Wraparound Edition: AIL 278; CC 265; CU 276; R 263; SJ 552</p>
<p>H.12.2 Evaluate proposed policy recommendations (local, state, and/or national) in science and technology for validity, evidence, reasoning, and implications, both short and long-term</p>	<p>Student Edition: <i>Integrate History</i> 713 <i>Science and Society</i> 280 <i>Use the Internet LAB</i> 278-279 Teacher Wraparound Edition: AIL 278</p>
<p>H.12.3 Show how policy decisions in science depend on social values, ethics, beliefs, and time-frames as well as considerations of science and technology</p>	<p>Student Edition: <i>Applying Science</i> 269 <i>Science and Society</i> 280 <i>Science Online</i> 268, 434 Teacher Wraparound Edition: CC 259, 265, 417; CD 273; D 276; SJ 552</p>

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<p>H.12.4 Advocate a solution or combination of solutions to a problem in science or technology</p>	<p>Student Edition: <i>Design Your Own LAB</i> 344-345 <i>Integrate History</i> 713 <i>Science and Society</i> 280 <i>Use the Internet LAB</i> 278-279 Teacher Wraparound Edition: A 268; AIL 278, 344; CC 265; IL 479, 643</p>
<p>H.12.5 Investigate how current plans or proposals concerning resource management, scientific knowledge, or technological development will have an impact on the environment, ecology, and quality of life in a community or region</p>	<p>Student Edition: 271-276 <i>Science and Society</i> 150, 280 <i>Use the Internet LAB</i> 278-279 Teacher Wraparound Edition: AIL 278; CU 276; SJ 552</p>
<p>H.12.6 Evaluate data and sources of information when using scientific information to make decisions</p>	<p>Student Edition: <i>Science and Society</i> 280 <i>Science Online</i> 434 <i>Use the Internet LAB</i> 278-279 Teacher Wraparound Edition: AIL 278; II 440; IL 479</p>
<p>H.12.7 When making decisions, construct a plan that includes the use of current scientific knowledge and scientific reasoning</p>	<p>Student Edition: <i>Applying Science</i> 744, 766 <i>Design Your Own LAB</i> 344-345 <i>MiniLAB</i> 54 <i>Science and Society</i> 280 <i>Science Online</i> 434 <i>Use the Internet LAB</i> 278-279 Teacher Wraparound Edition: AIL 278, 344; IL 479</p>