

**Science Textbook and Instructional Materials Correlation to the
2010 Physics Standards of Learning and Curriculum Framework**

Publisher Information

Publisher Pearson	Text Conceptual Physics
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2010 Physics Standards of Learning	
STANDARD	Correlation: Must address both the standards and the curriculum framework. Use page number and SE for Student Edition or CT for Core Technology. (Identify no more than 8 correlations.)
PH.1 The student will plan and conduct investigations using experimental design and product design processes. Key concepts include	TE: 2-5 Lab Manual TE: 107-109
a) the components of a system are defined;	TE: 112-113, 470
b) instruments are selected and used to extend observations and measurements;	TE: 86 Lab Manual TE: 67-69, 75-77, 145-148, 209-211, 217-220, 241-245, 265-268
c) information is recorded and presented in an organized format;	TE: 834-836 Lab Manual TE: 72-73, 76-77, 118-120, 171-172, 178-179, 259-260, 306
d) the limitations of the experimental apparatus and design are recognized;	TE: 767, 776
e) the limitations of measured quantities are recognized through the appropriate use of significant figures or error ranges;	Lab Manual TE: 373-376

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f) models and simulations are used to visualize and explain phenomena, to make predictions from hypotheses, and to interpret data; and	TE: 46, 76, 302, 352, 490, 494, 782, 808
g) appropriate technology, including computers, graphing calculators, and probeware, is used for gathering and analyzing data and communicating results.	Lab Manual TE: 37-42, 107-109, 117-120, 171-172, 177-179, 221-224, 229-232; Probeware Lab Manual: All Labs

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PH.2 The student will investigate and understand how to analyze and interpret data. Key concepts include	TE: 834-836 Lab Manual TE: 2, 4, 13, 29-35, 67-69, 76-77, 120
a) a description of a physical problem is translated into a mathematical statement in order to find a solution;	TE: 89, 135, 191, 348, 414, 496, 536, 650
b) relationships between physical quantities are determined using the shape of a curve passing through experimentally obtained data;	TE: 57-58, 834-836 Lab Manual TE: 29-35, 39-42, 53-54, 73, 120, 260
c) the slope of a linear relationship is calculated and includes appropriate units;	TE: 57-58, 835-836 Lab Manual TE: 35, 42
d) interpolated, extrapolated, and analyzed trends are used to make predictions; and	Lab Manual TE: 35, 38-39, 49, 306
e) situations with vector quantities are analyzed utilizing trigonometric or graphical methods.	TE: 16, 19-22, 69-72, 75-77, 135-136, 837-839 Lab Manual TE: 7-10, 11-14

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PH.3 The student will investigate and demonstrate an understanding of the nature of science, scientific reasoning, and logic. Key concepts include	TE: 1-4
a) analysis of scientific sources to develop and refine research hypotheses;	TE: 4 Lab Manual TE: 1-2
b) analysis of how science explains and predicts relationships;	TE: 4
c) evaluation of evidence for scientific theories;	TE: 3
d) examination of how new discoveries result in modification of existing theories or establishment of new paradigms; and	TE: 3
e) construction and defense of a scientific viewpoint.	TE: 2-3, 4

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PH.4 The student will investigate and understand how applications of physics affect the world. Key concepts include	TE: 1, 5, 344, 352
a) examples from the real world; and	TE: 11, 28, 37, 48-52, 130, 611, 642-643, 693-694
b) exploration of the roles and contributions of science and technology.	TE: 5, 7, 29, 34, 163, 248, 275, 648

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PH.5 The student will investigate and understand the interrelationships among mass, distance, force, and time through mathematical and experimental processes. Key concepts include	TE: 46-59, 68-79, 86-97, 106-116, 144-163, 170-180, 233-236 Lab Manual: 117-120
a) linear motion;	TE: 46-59 Lab Manual TE: 37-42
b) uniform circular motion;	TE: 170-180
c) projectile motion;	TE: 68-79 Lab Manual TE: 55-58, 59-65
d) Newton's laws of motion;	TE: 28-39, 86-97, 106-116, 130

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e) gravitation;	TE: 232-254 Lab Manual TE: 161-162
f) planetary motion; and	TE: 233-236, 262-275 Lab Manual TE: 63-164, 165-169, 171-172
g) work, power, and energy.	TE: 144-163 Lab Manual TE: 103-104

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PH.6 The student will investigate and understand that quantities including mass, energy, momentum, and charge are conserved. Key concepts include	TE: 130-132, 153-154, 221-222, 644-647 Lab Manual TE: 91-96, 107-109, 117-120, 157-159
a) kinetic and potential energy;	TE: 148, 150, 153-154 Lab Manual TE: 117-120
b) elastic and inelastic collisions; and	TE: 132-135 Lab Manual TE: 91-96, 97-100
c) mass/energy equivalence.	TE: 305-306, 817-820 Lab Manual TE: 117-120

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PH.7 The student will investigate and understand that energy can be transferred and transformed to provide usable work. Key concepts include	TE: 144-146, 151-152, 153-154, 159-160, 493-494, 730-731
a) transfer and storage of energy among systems including mechanical, thermal, gravitational, electromagnetic, chemical, and nuclear systems; and	TE: 147-149, 153-154, 436, 443, 451, 672-673, 817-820 Lab Manual TE: 323-324
b) efficiency of systems.	TE: 158-160, 475-477, 482

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PH.8 The student will investigate and understand wave phenomena. Key concepts include	TE: 488, 490-506, 514, 515-525 Lab Manual TE: 261-264, 265-268
a) wave characteristics;	TE: 490-497
b) fundamental wave processes; and	TE: 497, 500-506, 578-590, 625-630
c) light and sound in terms of wave models.	TE: 503, 505-506, 514, 515-525, 536, 542-546

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PH.9 The student will investigate and understand that different frequencies and wavelengths in the electromagnetic spectrum are phenomena ranging from radio waves through visible light to gamma radiation. Key concepts include	TE: 436, 493, 533, 536, 753-755, 767-771 Lab Manual TE: 309-312
a) the properties, behaviors, and relative size of radio waves, microwaves, infrared, visible light, ultraviolet, X-rays, and gamma rays;	TE: 436, 536
b) wave/particle dual nature of light; and	TE: 533, 767-771
c) current applications based on the respective wavelengths.	TE: 345, 436, 437, 518, 636

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PH.10 The student will investigate and understand how to use the field concept to describe the effects of gravitational, electric, and magnetic forces. Key concepts include	TE: 242-244, 248-251, 665-667, 668-669, 722-723, 751-756 Lab Manual TE: 339-340, 341-343
a) inverse square laws (Newton’s law of universal gravitation and Coulomb’s law); and	TE: 237-239, 240-241, 648-650
b) technological applications.	TE: 275, 668, 669, 672-674, 726-731, 743-746

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PH.11 The student will investigate and understand how to diagram, construct, and analyze basic electrical circuits and explain the function of various circuit components. Key concepts include	TE: 702-712 Lab Manual TE: 319-322, 323-324, 325-328, 329-332, 333-336, 337-338
a) Ohm’s law;	TE: 685-688 Lab Manual TE: 325-328
b) series, parallel, and combined circuits;	TE: 704-706, 707-708, 710-711 Lab Manual TE: 333-336
c) electrical power; and	TE: 693-694, 711-712
d) alternating and direct currents.	TE: 688-690, 743-745

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PH.12 The student will investigate and understand that extremely large and extremely small quantities are not necessarily described by the same laws as those studied in Newtonian physics. Key concepts may include	TE: 768-777 Lab Manual TE: 355-358, 359-362
a) wave/particle duality;	TE: 767, 770-773
b) wave properties of matter;	TE: 771, 772-773
c) matter/energy equivalence;	TE: 305-306, 817-820
d) quantum mechanics and uncertainty;	TE: 775, 776

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e) relativity;	TE: 282-295, 302-316
f) nuclear physics;	TE: 306, 782-801, 808-824, 829
g) solid state physics;	TE: 344, 345
h) nanotechnology;	TE: N/A
i) superconductivity; and	TE: 684
j) radioactivity.	TE: 785-791,792-795,796-800 Lab Manual TE: 363-364