WASHINGTON D.C.
Science – Physics I
Physics: Principles and Problems © 2002

PERFORMANCE STANDARDS	ESSENTIAL SKILLS	PAGE REFERENCES
	Physics I	
Content Standard 3: **Each student describes the structure of matter, the physical and chemical changes it undergoes, its energy sources and transformations; and applies fundamental principles of force and motion to explore the natural world.**		
The student: ● completes investigations that demonstrate understanding of physics: ● identifies states of matter; ● investigates and understands properties of objects and materials and their abilities to react with other substances; ● manipulates objects to observe and describe their position; ● observes and describes common forms of energy.	Laws Governing Motion	
	● generates and interprets graphs describing motion including the use of real-time technology;	SE: 82-87, 90-92, 95, 104-105, 119-121, 811-816 *Physics Lab* 100 TWE: CB 158 DE 96-97
	● analyzes examples of uniform and accelerated motion including linear, projectile, and circular;	SE: 82-88, 94-99, 155-160, 163-168, 180, 185-187, 811-816 *Physics Lab* 58, 100, 162, 179
	● demonstrates the effects of forces on the motion of objects;	SE: 118-125, 130-132, 150-153, 203-204, 212 *Physics Lab* 179, 213 *Pocket Lab* 141 *Problem Solving Strategies* 127
	● develops and interprets a free-body diagram for force analysis;	SE: 124, 128-129, 143, 833-839 *Physics Lab* 137
	● identifies and describes motion relative to different frames of reference.	SE: 68, 128, 161, 188-189, 811-816 *Physics Lab* 69, 137 TWE: CL 125 CQ 76

PERFORMANCE STANDARDS	ESSENTIAL SKILLS	PAGE REFERENCES
	Changes Within Physical Systems and Conservation of Energy and Motion	
	● interprets evidence for the work-energy theorem;	SE: 224-226, 248-250, 255-256, 289-290 *Physics Lab* 232
	● observes and describes examples of kinetic and potential energy and their transformations;	SE: 224-225, 233-234, 248-256, 258-261, 520-521 *Physics & Society* 266 *Physics Lab* 257 TWE: UM 264
	● calculates the mechanical energy and momentum in a physical system;	SE: 200-204, 209, 212, 214-216, 258-264 *Physics Lab* 213
	● demonstrates the conservation of energy and momentum.	SE: 258-261, 283, 510, 591, 628-629, 636 TWE: CD 697 FO 248 RT 525 UM 264
	Forces	
	● identifies the influence of mass and distance on gravitational forces;	SE: 140, 181-184, 188-191
	● researches, then interprets and shares the historical development of the concepts of gravitational, electrical, and magnetic force;	SE: 176-178, 180-184, 188-192, 468-472, 567-573, 582-583
	● identifies and analyzes the influences of charge and distance on electric forces;	SE: 462-464, 468-472, 497-498 *Physics Lab* 467 *Problem Solving Strategies* 474 TWE: A 466
	● demonstrates the relationship between electricity and magnetism;	SE: 482-485, 488-491, 497-501 *Biology Connection* 493 TWE: A 487 CUL 492
	● designs and analyzes electric circuits;	SE: 509-517, 521, 532-540, 542-544, 546-548 *Physics Lab* 518, 545 *Pocket Lab* 522 TWE: QD 523 RT 541

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	● identifies examples of electrical and magnetic forces in everyday life.	SE: 476 *How It Works* 473 TWE: CES 465 CT 464 MIN 493 TP 474, 494
	<u>Waves</u>	
	● examines and describes a variety of waves propagated in various types of media and describes wave characteristics such as velocity, frequency, amplitude, refraction, and interference;	SE: 331-333, 350-354, 358-361, 447-451 *Physics Lab* 330, 362, 446
	● identifies the characteristics and behaviors of sound and electromagnetic waves;	SE: 328-329, 331-333, 336-343, 350-355, 374-376, 386-388, 447-450, 613-617 *Physics Lab* 330, 362
	● interprets the role of wave characteristics and behaviors found in medical and industrial applications.	SE: *Biology Connection* 620 *How It Works* 405, 618 *Physics & Technology* 378, 663 TWE: AP 332, 342, 434 MIN 493 TP 365, 661
	<u>Quantum Physics</u>	
	● describes the photoelectric effect; explains the line spectra from different gas-discharge tubes.	SE: 628-633, 646-655 *Physics Lab* 634 *Pocket Lab* 659 TWE: CD 635 RT 636

Codes Used for TWE Pages

A	Activity
AP	Applying Physics
CB	Content Background
CD	Concept Development
CES	Connections to Earth Sciences
CL	Close
CQ	Convergent Question
CT	Critical Thinking
CUL	Cultural Diversity
DE	Demonstration
FO	Focus
MIN	Meeting Individual Needs
QD	Quick Demo
RT	Reteaching
TP	Tech Prep
UM	Uncovering Misconceptions