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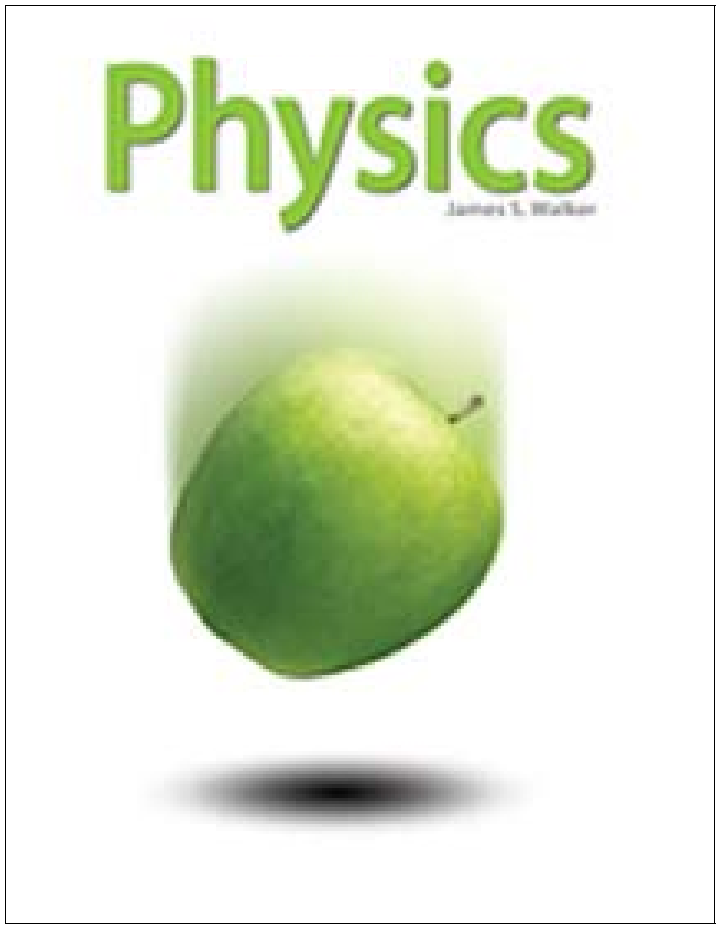

To the

Oklahoma
Academic Standards for Physics

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Oklahoma Academic Standards for Physics	Pearson Physics ©2014
PHYSICS	
HS-PS1 Matter and Its Interactions	
Performance Expectations	
HS-PS1-8 Students who demonstrate understanding can: Develop models to illustrate the changes in the composition of the nucleus of the atom and the energy released during the processes of fission, fusion, and radioactive decay.	**SE/TE:** Lesson 26.2: Radioactivity, pp. 917-924; Lesson 26.3: Applications of Nuclear Physics, pp. 925-930
HS-PS2 Motion and Stability: Forces and Interactions	
Performance Expectations	
HS-PS2-1 Students who demonstrate understanding can: Analyze data to support the claim that Newton's second law of motion describes the mathematical relationship among the net force on a macroscopic object, its mass, and its acceleration.	**SE/TE:** Lesson 5.1: Newton's Laws—Newton's Second Law, pp. 153-158; Lesson 5.2: Applying Newton's Laws, pp. 161-169; Lesson 5.3: Friction, pp. 170-176; Chapter 5, Physics Lab: Static and Kinetic Friction, p. 178; Lesson 7.2: Impulse—An impulse changes an object's momentum, pp. 235-236; Lesson 8.3: Torque—Torque is related to angular acceleration, p. 286; Lesson 9.3: Circular Motion—Centripetal force depends on mass, speed, and radius, pp. 321-322
HS-PS2-2 Students who demonstrate understanding can: Use mathematical representations to support the claim that the total momentum of a system of objects is conserved when there is no net force on the system.	**SE/TE:** Lesson 7.3: Conservation of Momentum, pp. 242-247; Lesson 7.4: Collisions, pp. 248-256; Chapter 7, Physics Lab: Momentum Conservation during a Collision, p. 258; Lesson 8.3: Torque, pp. 281-289
HS-PS2-3 Students who demonstrate understanding can: Apply scientific and engineering ideas to design, evaluate, and refine a device that minimizes the force on a macroscopic object during a collision.*	**SE/TE:** Chapter 7: How Things Work: Ballistic Pendulum, p. 257 Supporting Content: Lesson 7.2: Impulse—Increasing the time of impact decreases the force, p. 240 Lesson 7.4: Collisions, pp. 248-256 Physics Lab, Momentum Conservation during a Collision, p. 258

SE = Student Edition TE = Teacher's Edition

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HS-PS2-4 Students who demonstrate understanding can: Use mathematical representations of Newton's Law of Gravitation and Coulomb's Law to describe and predict the gravitational and electrostatic forces between objects.	**SE / TE:** Lesson 9.1: Newton's Law of Universal Gravity, pp. 307-312; Lesson 9.2: Applications of Gravity, pp. 313-319; Lesson 19.2: Electric Force, pp. 683-688; Lesson 19.3: Combining Electrical Forces—A spherical distribution of charge acts just like a point charge, p. 693; Chapter 19, Physics Lab: Investigating Coulomb's Law, p. 696
HS-PS2-5 Students who demonstrate understanding can: Plan and conduct an investigation to provide evidence that an electric current can produce a magnetic field and that a changing magnetic field can produce an electric current.	**SE / TE:** Chapter 23, Physics Lab: Electromagnetic Induction, p. 842 Supporting Content: Lesson 23.1: Electricity from Magnetism, pp. 817-827
HS-PS3 Energy	
Performance Expectations	
HS-PS3-1 Students who demonstrate understanding can: Create a computational model to calculate the change in the energy of one component in a system when the change in energy of the other component(s) and energy flows in and out of the system are known.	**SE / TE**: Lesson 6.3: Conversion of Energy, pp. 206-211; Lesson 10.3: Heat Capacity, pp. 358-366; Lesson 10.4: Phase Changes and Latent Heat, pp. 366-374; Chapter 10, Physics Lab: Investigating Specific Heat Capacity, p. 376; Lesson 11.1: The First Law of Thermodynamics, pp. 385-392; Lesson 13.2: Thermal Processes, pp. 393-400; Lesson 20.2: Electric Potential Energy and Electric Potential, pp. 718-727

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HS-PS3-2 Students who demonstrate understanding can: Develop and use models to illustrate that energy at the macroscopic scale can be accounted for as either motions of particles or energy stored in fields.	**SE / TE:** Lesson 6.2: Work and Energy—Potential Energy, pp. 202-206; Lesson 6.3: Conservation of Energy, pp. 206-211; Lesson 9.1: Newton's Law of Universal Gravity—Gravity is a force field, p. 312; Lesson 10.1: Temperature, Energy, and Heat, pp. 343-349; Lesson 10.2: Thermal Energy Transfer, pp. 354-357; Lesson 10.3: Heat Capacity, pp. 358-366 Lesson 11.1: The First Law of Thermodynamics, pp. 385-392; Lesson 11.2: Thermal Processes, pp. 393-400; Lesson 13.3: Waves and Wave Propagation—Wave Formation and Wave Types, pp.470-472 Lesson 14.1: Sound Waves and Beats, pp.493-501; Lesson 20.2: Electrical Potential Energy and Electric Potential, pp. 718-727; Lesson 22.3: The Magnetic Force, pp. 796-806
HS-PS3-3 Students who demonstrate understanding can: Design, build, and refine a device that works within given constraints to convert one form of energy into another form of energy.*	**SE / TE** Supporting Content: Chapter 6, Technology and Society: Hybrid Vehicles, p. 217; Chapter 9, Technology and Society: Tidal Energy, p. 333; Chapter 11 Physics Lab: The Mechanical Equivalent of Heat, p. 408; Chapter 15 Technology and Society: Lighting Technologies and Energy Usage, p. 554; Lesson 21.3: Power and Energy in Electric Circuits, pp. 765-771; Lesson 23.2: Electric Generators and Motors, pp. 828-831; Chapter 23, How Things Work: The Induction Motor, p. 841; Chapter 23, Physics Lab: Electromagnetic Induction, p. 842; Lesson 24.1: Quantized Energy and Photons—The photoelectric effect has practical applications, pp. 862-863; Chapter 25, Technology and Society: Hydrogen as Fuel, p. 903

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HS-PS3-4 Students who demonstrate understanding can: Plan and conduct an investigation to provide evidence that the transfer of thermal energy when two components of different temperature are combined within a closed system results in a more uniform energy distribution among the components in the system (second law of thermodynamics).	**SE/TE:** Supporting Content: Lesson 10.1: Temperature, Energy, and Heat, pp. 343-349; Lesson 11.1: The First Law of Thermodynamics, pp. 385-392; Lesson 11.2: Thermal Processes, pp. 393-400; Lesson 11.3: The Second and Third Laws of Thermodynamics, pp. 400-406
HS-PS3-5 Students who demonstrate understanding can: Develop and use a model of two objects interacting through electric or magnetic fields to illustrate the forces between objects and the changes in energy of the objects due to the interaction.	**SE/TE:** Lesson 20.1: The Electric Field, pp. 705-717; Lesson 20.2: Electrical Potential Energy and Electric Potential, pp. 718-727; Lesson 22.1: Magnets and Magnetic Fields, pp. 783-788; Lesson 22.2: Magnetism and Magnet Fields, pp. 789-795; Lesson 22.3: The Magnetic Force, pp. 796-806; Lesson 23.1: Electricity from Magnetism, pp. 817-827
HS-PS4 Waves and Their Applications in Technologies for Information Transfer	
Performance Expectations	
HS-PS4-1 Students who demonstrate understanding can: Use mathematical representations to support a claim regarding relationships among the frequency, wavelength, and speed of waves traveling in various media.	**SE/TE**: Lesson 13.3: Waves and Wave Properties, pp. 470-475; Chapter 13, Physics Lab: Standing Waves on a Coiled Spring, p. 484
HS-PS4-2 Students who demonstrate understanding can: Evaluate questions about the advantages and disadvantages of using a digital transmission and storage of information.*	**SE/TE:** Supporting Content: Lesson 18.2, Physics & You: Technology, p. 653; Lesson 25.3, Physics & You: Technology, p. 900
HS-PS4-3 Students who demonstrate understanding can: Evaluate the claims, evidence, and reasoning behind the idea that electromagnetic radiation can be described either by a wave model or a particle model, and that for some situations one model is more useful than the other.	**SE/TE:** Lesson 15.1: The Nature of Light—Light behaves like a wave and a particle, p. 534; Lesson 18.1: Interference, pp. 637-646; Lesson 18.3: Diffraction, pp. 654-661; Lesson 24.1: Quantized Energy and Photons— Quantized Light, pp. 857-861; Lesson 24.2: Wave-Particle Duality, pp. 864-866

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HS-PS4-4 Students who demonstrate understanding can: Evaluate the validity and reliability of claims in published materials of the effects that different frequencies of electromagnetic radiation have when absorbed by matter.	**SE/TE:** Supporting Content: Lesson 15.2: Color and the Electromagnetic Spectrum—X-rays, p. 540 Lesson 15.2: Color and the Electromagnetic Spectrum—Ultraviolet Light, p. 540, Gamma rays, p. 541; Lesson 26.3: Applications of Nuclear Physics—Radiation in Medicine, pp. 934-935
HS-PS4-5 Students who demonstrate understanding can: Communicate technical information about how some technological devices use the principles of wave behavior and wave interactions with matter to transmit and capture information and energy.*	**SE/TE:** Chapter 3, How Things Work: Microbursts, p. 102; Chapter 4: Technology and Society: Global Positioning Systems, p. 141; Lesson 9.4: Planetary Motion and Orbits—GPS satellites have relatively low orbits, p. 332; Chapter 10: How Things Work: Optical Pyrometer, p. 375; Lesson 14.1: Sound Waves and Beats—Physics & You: Technology, p. 498; Lesson 14.3: The Doppler Effect—Physics & You: Technology, p. 512; Lesson 14.4: Human Perception of Sound—How Things Work: Sonar Mapping, p. 520; Lesson 15.2: Color and the Electromagnetic Spectrum, pp. 536-544; Lesson 16.2: Plane Mirrors—Physics & You: Technology, p. 573; Chapter 16, How Things Work: The Hubble Space Telescope (HST), p. 587; Lesson 18.2: Interference in Thin Films—Physics & You: Technology, p. 653; Chapter 18: How Things Work: X-ray Diffraction, p. 665; Lesson 22.2: Magnetism and Electric Circuits—Physics & You: Technology, p. 795; Lesson 25.3: The Quantum Physics of Atoms—Physics & You: Technology, p. 900

*The performance expectations marked with an asterisk integrate traditional science content with engineering through a Practice or Disciplinary Core Idea.