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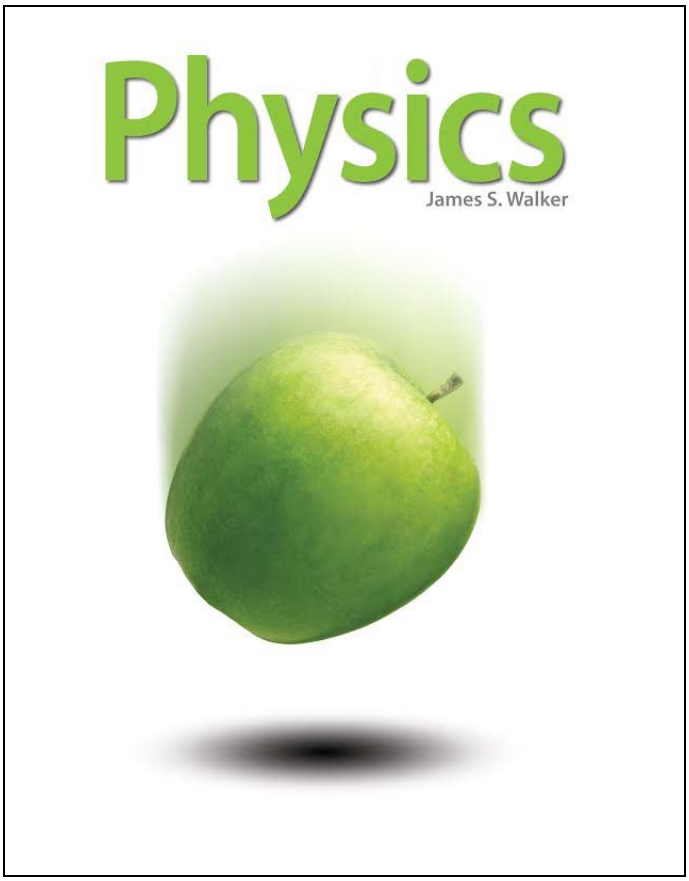

To the

Georgia Standards of Excellence Physics

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A Correlations of Pearson Physics ©2014 to the Georgia Standards of Excellence - Physics

Introduction

This document demonstrates how ***Pearson Physics,* ©2014** meets the Georgia Standards of Excellent for Physics. References are to the Student and Teacher Edition feature and page levels. Course content references are to the chapter and lesson levels.

Pearson Physics offers a new path to mastery— a "concepts first" approach that supports a superior, step-by-step problem solving process.

Pearson Physics is the only high school program that blends conceptual development and quantitative problem solving. The conversational and engaging writing style, numerous and varied examples, annotated art program, and dual emphasis on concepts and math—together with MasteringPhysics®— deliver a superior program.

Pearson Physics Key Features:

Four distinct example types—and their related Practice Problems-build problem-solving skills for both math-based and conceptual-based problems.

- **Conceptual Examples** reinforce basic concepts and make connections to numerical calculations
- **Quick Examples** present short, simple calculations to aid in understanding a new equation
- **Active Examples** bridge the gap between examples and homework problems
- **Guided Examples** use detailed strategies and solutions to develop problem-solving skills and deepen student understanding of concepts

- ✓ The chapter-opening Big Idea statement outlines the chapter's overarching theme.
- ✓ The chapter-opening Inquiry Lab provides a simple exploratory activity that stimulates interest and provides a glimpse of the chapter concepts.
- ✓ The end-of-chapter Physics Lab provides an in-depth, full-page traditional lab activity that applies the concepts learned.

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SP1. Obtain, evaluate, and communicate information about the relationship between distance, displacement, speed, velocity, and acceleration as functions of time.	
a. Plan and carry out an investigation of one-dimensional motion to calculate average and instantaneous speed and velocity. • Analyze one-dimensional problems involving changes of direction, using algebraic signs to represent vector direction. • Apply one-dimensional kinematic equations to situations with no acceleration, and positive, or negative constant acceleration.	**SE/TE:** 50-53, 58-61, 76-81, 82-90 Practice Problems: 52, 62, 78, 79, 81, 83, 85, 88, 90 Lesson Check: 53, 57 (#34), 62, 81, 91 Assessment: 67, 69 Inquiry Labs: 73 Physics Labs: 64, 103 Lab Manual: 19-22, 23-24, 25-29, 31-34, 35-36 Stem Activity : Motion And Stability: Forces and Interactions **TE Only:** Differentiated Instruction: 50, 79 Math Remediation: 86 Disciplinary Core Idea: 77
b. Analyze and interpret data using created or obtained motion graphs to illustrate the relationships among position, velocity, and acceleration, as functions of time.	**SE/TE:** 54-56, 60, 76-77, 82, 84, 92-95, 100-101 Practice Problems: 56, 60, 79 Lesson Check: 57, 81 (#18), 96 Assessment: 67 (#74-77), 68, 70 (#119-122), 105 (#75, 76), 106 (#81), 107 (#93-97), 109 (#129, 130), 110 (#132) Physics Labs: 103 Lab Manual: 15-17, 19-22, 23-24, 25-29
c. Ask questions to compare and contrast scalar and vector quantities.	**SE/TE:** 32, 45, 46, 50, 113-117, 118-120 Assessment: 120 (#10-14, 17) Lab Manual: 47-50

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d. Analyze and interpret data of two-dimensional motion with constant acceleration. • Resolve position, velocity, or acceleration vectors into components (x and y, horizontal and vertical). • Add vectors graphically and mathematically by adding components. • Interpret problems to show that objects moving in two dimensions have independent motions along each coordinate axis. • Design an experiment to investigate the projectile motion of an object by collecting and analyzing data using kinematic equations. • Predict and describe how changes to initial conditions affect the resulting motion. • Calculate range and time in the air for a horizontally launched projectile.	**SE/TE:** 113-117, 118-119, 120, 121-126, 127-129, 131-133, 134-137, 138-140 Practice Problems: 117, 119, 126, 130, 133, 135, 138 Lesson Check: 120, 126, 130, 140 Assessment: 144-148 Inquiry Labs: 113 Physics Labs: 142 Lab Manual: 47-50, 51-55, 57-61, 63-64 **TE Only:** Common Misconceptions: 138

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SP2. Obtain, evaluate, and communicate information about how forces affect the motion of objects.	
a. Construct an explanation based on evidence using Newton's Laws of how forces affect the acceleration of a body. • Explain and predict the motion of a body in absence of a force and when forces are applied using Newton's 1st Law (principle of inertia). • Calculate the acceleration for an object using Newton's 2nd Law, including situations where multiple forces act together. • Identify the pair of equal and opposite forces between two interacting bodies and relate their magnitudes and directions using Newton's 3rd Law.	**SE/TE:** 151-153, 152 (Figure 5.2), 153-157, 154 (Figures 5.3, 5.4), 158-159, 161-162, 166 (Figures 5.11, 5.12) Guided Example: 164 Practice Problems: 155, 158, 159, 164 Lesson Check: 160 Assessment: 180-181 Inquiry Labs: 151 Lab Manual: 65-69, 71-73, 75-78, 79-81, 83-84 Stem Activity: Motion And Stability: Forces and Interactions **TE Only:** Differentiated Instruction: 152
b. Develop and use a model of a Free Body Diagram to represent the forces acting on an object (both equilibrium and non-equilibrium).	**SE/TE:** 161-169 Practice Problems: 164, 167 Lesson Check: 169 Assessment: 181-183 Lab Manual: 65-69, 71-73, 75-78 **TE Only:** Differentiated Instruction: 162
c. Use mathematical representations to calculate magnitudes and vector components for typical forces including gravitational force, normal force, friction forces, tension forces, and spring forces.	**SE/TE:** 162-164, 165-166, 167-169, 170-172, 173-174 Practice Problems: 164, 167, 172, 175 Lesson Check: 169, 176 Assessment: 181-186 Physics Labs: 178 Lab Manual: 65-69, 71-73, 75-78, 79-81, 83-84
d. Plan and carry out an investigation to gather evidence to identify the force or force component responsible for causing an object to move along a circular path. • Calculate the magnitude of a centripetal acceleration.	**SE/TE:** 320-323 Inquiry Lab: 307 Lesson Check: 326 (#36, 37) Assessment: 337 (#77) Physics Labs: 334 Lab Manual: 113-116, 117-119, 121-122

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e. Develop and use a model to describe the mathematical relationship between mass, distance, and force as expressed by Newton's Universal Law of Gravitation.	**SE/TE:** 308 (Figure 9.2), 308-309, 309-310, 310 (Figure 9.3) Practice Problems: 309, 311, Lesson Check: 312 (5-8, 10-15) Assessment: 336 Lab Manual: 117-119 **TE Only:** Differentiated Instruction: 308
SP3. Obtain, evaluate, and communicate information about the importance of conservation laws for mechanical energy and linear momentum in predicting the behavior of physical systems.	
a. Ask questions to compare and contrast open and closed systems.	For related content, see: **SE/TE:** 207 Lab Manual: 85-88
b. Use mathematics and computational thinking to analyze, evaluate, and apply the principle of conservation of energy and the Work-Kinetic Energy Theorem. • Calculate the kinetic energy of an object. • Calculate the amount of work performed by a force on an object.	**SE/TE:** 189-196, 197-200, 201-204, 205, 206-208, 209-210 Practice Problems: 191, 193, 201, 203, 204, 209 Lesson Check: 196, 206, 211 Assessment: 220-223, 224-225 Physics Labs: 218 Stem Activity: Designing Machines Lab Manual: 85-88, 89-92, 93-94 **TE Only:** Common Misconceptions: 194
c. Plan and carry out an investigation demonstrating conservation and rate of transfer of energy (power) to solve problems involving closed systems.	**SE/TE:** 211-215 Practice Problems: 213, 214, 215 Lesson Check: 216 Stem Activity: Energy Lab Manual: 85-88, 89-92, 93-94 **TE Only:** Science & Engineering Practices: 212

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d. Construct an argument supported by evidence of the use of the principle of conservation of momentum to • explain how the brief application of a force creates an impulse. • describe and perform calculations involving one dimensional momentum. • connect the concepts of Newton's 3rd law and impulse. • experimentally compare and contrast inelastic and elastic collisions.	**SE/TE:** 229-233, 234-240, 242-247, 248-253, 254-256 Practice Problems: 230, 233, 236, 240, 245, 252, 254 Lesson Check: 233, 241, 247, 256 Assessment: 260-264 Inquiry Labs: 229 Physics Labs: 259 Lab Manual: 95-98, 99-100 Physics & You: 257 **TE Only:** Differentiated Instruction: 237, 243 Common Misconceptions: 249
SP4. Obtain, evaluate, and communicate information about the properties and applications of waves.	
a. Develop and use mathematical models to explain mechanical and electromagnetic waves as a propagating disturbance that transfers energy. (*Clarification statement:* Mathematically describe how the velocity, frequency, and wavelength of a propagating wave are related.)	**SE/TE:** 473-475, 533, 536-538, 539-541 Practice Problems: 474, 534, 538 Lesson Check: 475, 544 Assessment: 487-488, 558 Lab Manual: 147-150 151-156, 157-158 Stem Activity: Using Waves To Explore Earth's Interior **TE Only:** Differentiated Instruction: 533 Science & Engineering Practices: 539
b. Develop and use models to describe and calculate characteristics related to the interference and diffraction of waves (single and double slits).	**SE/TE:** 476-478, 637-645, 647-653, 654-659, 662-664 Practice Problems: 477, 640, 646, 650, 652, 656, 657, 660, 663 Lesson Check: 646, 653, 664 Assessment: 668-672 Physics Labs: 666 Lab Manual: 205-208, 209-210 **TE Only:** Differentiated Instruction: 642, 659 Science & Engineering Practices: 651 Real World: 662

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c. Construct an argument that analyzes the production and characteristics of sounds waves. (*Clarification statement:* Includes, but not limited to, Doppler Effect, standing waves, wavelength, the relationship between amplitude and the energy of the wave, and the relationship between frequency and pitch.)	**SE/TE:** 473-475, 493-497, 501-506, 507-512, 513-514 Practice Problems: 474, 495, 496, 503, 504, 510, 511, 514 Lesson Check: 475 (#42-44), 501 (#11, 13, 14), 506, 512 Assessment: 488 (#86-92), 523, 524 Inquiry Labs: 493 Physics Labs: 484, 521 Lab Manual: 159-163, 165-167, 169-171 Stem Activity: Using Waves To Explore Earth's Interior **TE Only:** Science & Engineering Practices: 508
d. Plan and carry out investigations to characterize the properties and behavior of electromagnetic waves. (*Clarification statement:* Properties of waves include, but not limited to, amplitude, frequency, wavelength, and the relationship between frequency or wavelength and the energy of the wave.)	**SE/TE:** 533, 536-541 Practice Problems: 534, 538 Lesson Check: 544 (#24-26) Inquiry Labs: 529 Lab Manual: 171-174 **TE Only:** Science & Engineering Practices: 539
e. Plan and carry out investigations to describe common features of light in terms of color, polarization, spectral composition, and wave speed in transparent media. • Analyze experimentally and mathematically aspects of reflection and refraction of light waves and describe the results using optical ray diagrams. • Perform calculations related to reflections from plane surfaces and focusing using thin lenses.	**SE/TE:** 529-532, 537-543, 545-552, 565-569, 570-574, 575-580, 597-605, 606-611, 612-617 Practice Problems: 532, 538, 547, 572, 580, 599, 600, 603, 608, 6310, 618 Lesson Check: 544, 553, 569, 574, 605, 611, 618 Assessment: 558-561, 629-632 Inquiry Labs: 529, 565, 597 Physics Labs: 555, 588, 627 Lab Manual: 171-174, 175-176, 177, 179-182, 183-185, 187-188, 189-193 **TE Only:** Science & Engineering Practices: 539, 568, 611, 615

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f. Plan and carry out investigations to identify the behavior of light using lenses. (*Clarification statement:* Investigations concerning Snell's Law, optical ray diagrams, and thin lens equation should be conducted.)	**SE/TE:** 599-600, 612-615, 616-617, 619-625 Physics Labs: 627 Lab Manual:189-193, 195-197, 199-200, 201-204 **TE Only:** Science & Engineering Practices: 615 Real World: 624
g. Plan and carry out investigations to describe changes in diffraction patterns associated with geometry and wavelength for mechanical and electromagnetic waves.	**SE/TE:** 654-659, 662-664 Practice Problems: 657, 660, 663 Lesson Check: 661 Physics Labs: 666 Lab Manual: 201-204, 205-208, 209-210 **TE Only:** Science & Engineering Practices: 611 Real World: 662
SP5. Obtain, evaluate, and communicate information about electrical and magnetic force interactions.	
a. Develop and use mathematical models and generate diagrams to compare and contrast the electrical and gravitational forces between two charged objects.	**SE/TE:** 684-688 Practice Problems: 688 Lesson Check: 682, 689 Assessment: 698-699 Inquiry Labs: 675 Lab Manual: 211-214, 215-216
b. Plan and carry out investigations to demonstrate and qualitatively explain charge transfer by conduction, friction, and induction.	**SE/TE:** 678-680, 680-682, 715-717 Lesson Check: 682 Assessment: 698 Lab Manual: 211-214, 215-216, 217-220 **TE Only:** Science & Engineering Practices: 679

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c. Construct an explanation based on evidence of the behavior of charges in terms of electric potential energy.	**SE/TE:** 718-727 Practice Problems: 720, 723, 725, 726 Lesson Check: 727 Assessment: 739-740 Lab Manual: 211-214, 215-216, 217-220 **TE Only:** Science & Engineering Practices: 719
d. Plan and carry out an investigation of the relationship between voltage, current, and power for direct current circuits. (*Clarification statement:* Application of Ohm's Law to different circuit configurations, not limited to parallel and series, and calculations of equivalent resistance are expected.)	**SE/TE:** 745-751, 752-753, 757-764, 765-771 Practice Problems: 747, 751, 759, 762, 763, 766, 769, 771 Lesson Check: 757, 765, 771 Assessment: 775-779 Inquiry Labs: 745 Physics Labs: 773 Lab Manual: 225-228, 229-233, 235-237, 239-240, 241-242 **TE Only:** Differentiated Instruction: 767 Science & Engineering Practices: 752
e. Plan and carry out investigations to clarify the relationship between electric currents and magnetic fields. (*Clarification statement:* This includes coils and their importance in the design of motors and generators.)	**SE/TE:** 789-794, 817-826, 828-831 Practice Problems: 791, 794, 821, 822, 830 Lesson Check: 795, 827, 831 Assessment: 844-845 Inquiry Labs: 783, 817 Physics Labs: 808, 842 Lab Manual: 243-247, 249-252, 253-256 **TE Only:** Differentiated Instruction: 792, 824 Science & Engineering Practices:830

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SP6. Obtain, evaluate, and communicate information about nuclear changes of matter and related technological applications.	
a. Develop and use models to explain, compare, and contrast nuclear processes including radioactive decay, fission, and fusion.	**SE/TE:** 911-913, 916, 917-924, 925-930 Practice Problems: 913, 927 Inquiry Labs: 911 Physics Labs: 942 Lab Manual: 267-271, 273-275
b. Construct an argument to compare and contrast mechanisms and characteristics of radioactive decay. (*Clarification statement:* Include alpha, beta, and gamma decays and their effects.)	**SE/TE:** 917-924 Practice Problems: 921, 923 Lesson Check: 925 Assessment: 944-945 Lab Manual: 267-271, 273-275
c. Develop and use mathematical models and representations to calculate the amount of substance present after a given amount of time based on its half-life and relate this to the law of conservation of mass and energy.	**SE/TE:** 930-935 Practice Problems: 934, 935 Assessment: 944-945 Physics Labs: 942 Lab Manual: 267-271, 273-275