CORRELATION TO THE GEORGIA PERFORMANCE STANDARDS

Subject Area: Physics **State-Funded Course:**

Textbook Title: Physics in Context: An Integrated Approach

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Standard (Cite Number)	**Standard** (Cite specific standard)	**Where Taught** (Page numbers in text)
SCSh1. Students will evaluate the importance of curiosity, honesty, openness, and skepticism in science.	a. Exhibit the above traits in their own scientific activities.	Embedded in lab activities.
	b. Recognize that different explanations often can be given for the same evidence.	Embedded in lab activities.
	c. Explain that further understanding of scientific problems relies on the design and execution of new experiments which may reinforce or weaken opposing explanations.	Embedded in lab activities.
SCSh2. Students will use standard safety practices for all classroom laboratory and field investigations.	a. Follow correct procedures for use of scientific apparatus.	Embedded in lab activities.
	b. Demonstrate appropriate techniques in all laboratory situations.	Embedded in lab activities.
	c. Follow correct protocol for identifying and reporting safety problems and violations.	Embedded in lab activities.
SCSh3. Students will identify and investigate problems scientifically.	a. Suggest reasonable hypotheses for identified problems.	Embedded in lab activities.
	b. Develop procedures for solving scientific problems.	Embedded in lab activities.
	c. Collect, organize and record appropriate data.	Embedded in lab activities.
	d. Graphically compare and analyze data points and/or summary statistics.	Embedded in lab activities.
	e. Develop reasonable conclusions based on data collected.	Embedded in lab activities.
	f. Evaluate whether conclusions are reasonable by reviewing the process and checking against other available information.	Embedded in lab activities.

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SCSh4. Students will use tools and instruments for observing, measuring, and manipulating scientific equipment and materials.	a. Develop and use systematic procedures for recording and organizing information.	Embedded in lab activities.
	b. Use technology to produce tables and graphs.	Depends on classroom resources.
	c. Use technology to develop, test, and revise experimental or mathematical models.	Depends on classroom resources.
SCSh5. Students will demonstrate the computation and estimation skills necessary for analyzing data and developing reasonable scientific explanations.	a. Trace the source on any large disparity between estimated and calculated answers to problems.	Embedded in lab activities.
	b. Consider possible effects of measurement errors on calculations.	Embedded in text and lab activities.
	c. Recognize the relationship between accuracy and precision.	Embedded in text and lab activities.
	d. Express appropriate numbers of significant figures for calculated data, using scientific notation where appropriate.	Embedded in text and lab activities.
	e. Solve scientific problems by substituting quantitative values, using dimensional analysis, and/or simple algebraic formulas as appropriate.	Embedded in text and lab activities.
SCSh6. Students will communicate scientific investigations and information clearly.	a. Write clear, coherent laboratory reports related to scientific investigations.	Embedded in lab activities.
	b. Write clear, coherent accounts of current scientific issues, including possible alternative interpretations of the data.	Embedded in lab activities.
	c. Use data as evidence to support scientific arguments and claims in written or oral presentations.	Embedded in lab activities.
	d. Participate in group discussions of scientific investigation and current scientific issues.	Embedded in lab activities.
SCSh7. Students will analyze how scientific knowledge is developed.	a. Students will recognize that: The universe is a vast single system in which the basic principles are the same everywhere.	Embedded in text and lab activities.

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	b. Students will recognize that: Universal principles are discovered through observation and experimental verification.	Embedded in text and lab activities.
	c. Students will recognize that: From time to time, major shifts occur in the scientific view of how the world works. More often, however, the changes that take place in the body of scientific knowledge are small modifications of prior knowledge. Major shifts in scientific views typically occur after the observation of a new phenomenon or an insightful interpretation of existing data by an individual or research group.	Embedded in text and lab activities.
	d. Students will recognize that: Hypotheses often cause scientists to develop new experiments that produce additional data.	Embedded in text and lab activities.
	e. Students will recognize that: Testing, revising, and occasionally rejecting new and old theories never ends.	Embedded in text and lab activities.
SCSh8. Students will understand important features of the process of scientific inquiry.	a. Students will recognize that: Scientific investigators control the conditions of their experiments in order to produce valuable data.	Embedded in text and lab activities.
	b. Students will recognize that: Scientific researchers are expected to critically assess the quality of data including possible sources of bias in their investigations' hypotheses, observations, data analyses, and interpretations.	Embedded in text and lab activities.
	c. Students will recognize that: Scientists use practices such as peer review and publication to reinforce the integrity of scientific activity and reporting.	Embedded in text and lab activities.
	d. Students will recognize that: The merit of a new theory is judged by how well scientific data are explained by the new theory.	Embedded in text and lab activities.
	e. Students will recognize that: The ultimate goal of science is to develop an understanding of the natural universe which is free of biases.	Embedded in text and lab activities.
	f. Students will recognize that: Science disciplines and traditions differ from one another in what is studied, techniques used, and outcomes sought.	Embedded in text and lab activities.

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SCSh9. Students will enhance reading in all curriculum areas by:	a. Reading in All Curriculum Areas • Read a minimum of 25 grade-level appropriate books per year from a variety of subject disciplines and participate in discussions related to curricular learning in all areas. • Read both informational and fictional texts in a variety of genres and modes of discourse. • Read technical texts related to various subject areas.	Depends on classroom resources and teacher direction.
	b. Discussing books • Discuss messages and themes from books in all subject areas. • Respond to a variety of texts in multiple modes of discourse. • Relate messages and themes from one subject area to messages and themes in another area. • Evaluate the merit of texts in every subject discipline. • Examine author's purpose in writing. • Recognize the features of disciplinary texts.	Depends on classroom resources and teacher direction.
	c. Building vocabulary knowledge • Demonstrate an understanding of contextual vocabulary in various subjects. • Use content vocabulary in writing and speaking. • Explore understanding of new words found in subject area texts.	Embedded in text and lab activities.
	d. Establishing context • Explore life experiences related to subject area content. • Discuss in both writing and speaking how certain words are subject area related. • Determine strategies for finding content and contextual meaning for unknown words.	Embedded in text and lab activities.

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Standard (Cite Number)	**Standard** (Cite specific standard)	Where Taught (Page numbers in text)
SP1 Students will analyze the relationships between force, mass, gravity, and the motion of objects.	a. Calculate average velocity, instantaneous velocity, and acceleration in a given frame of reference.	122-137, 181; Lab 3.1; *learningincontext.com* web site
	b. Compare and contrast scalar and vector quantities.	4, 8-26, 33, 41, 53-54, 125-130, 134-135, 168-183, 186-190, 196-197, 240, 326-338; Lab 2.1, 4.1; *learningincontext.com* web site
	c. Compare graphically and algebraically the relationships among position, velocity, acceleration, and time.	123-131; Lab 3.1; *learningincontext.com* web site
	d. Measure and calculate the magnitude of frictional forces and Newton's three Laws of Motion.	12-26, 41, 85-87, 170-183, 189, 244, 326, 332-338, 351; Lab 4.1; *learningincontext.com* web site
	e. Measure and calculate the magnitude of gravitational forces.	7, 10-13, 17, 22-26, 32-39, 43-45, 47-49, 52-55, 61-62, 86-89, 93-94, 173-183, 188-190, 232, 243-247, 252-253, 258-261, 295, 300; Lab 1.1, 2.1, 2.2, 2.3, 4.1, 5.2, 6.1, 6.2, 8.1; *learningincontext.com* web site
	f. Measure and calculate two-dimensional motion (projectile and circular) by using component vectors.	*learningincontext.com* web site
	g. Measure and calculate centripetal force.	471, 490
	h. Determine the conditions required to maintain a body in a state of static equilibrium.	11-14, 21-24, 41-46, 170, 173, 177
SP2 Students will evaluate the significance of energy in understanding the structure of matter and the universe.	a. Relate the energy produced through fission and fusion by stars as a driving force in the universe.	413-420; *learningincontext.com* web site
	b. Explain how the instability of radioactive isotopes results in spontaneous nuclear reactions.	405-414, 418-420; Lab 9.2; *learningincontext.com* web site

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SP3 Students will evaluate the forms and transformations of energy.	a. Analyze, evaluate, and apply the principle of conservation of energy and measure the components of work-energy theorem by • Describing total energy in a closed system. • Identifying different types of potential energy. • Calculating kinetic energy given mass and velocity. • Relating transformations between potential and kinetic energy.	87, 94, 114-115, 230-295; Lab 2.3, 6.1; *learningincontext.com* web site
	b. Explain the relationship between matter and energy.	408-409, 418, 421; *learningincontext.com* web site
	c. Compare and contrast elastic and inelastic collisions.	333, 338; *learningincontext.com* web site
	d. Demonstrate the factors required to produce a change in momentum.	328-338; Lab 7.2; *learningincontext.com* web site
	e. Analyze the relationship between temperature, internal energy, and work done in a physical system.	157-166, 216-227, 277-295; Lab 3.3; *learningincontext.com* web site
	f. Analyze and measure power.	296-323; Lab 6.1, 6.2, 6.3; *learningincontext.com* web site
SP4 Students will analyze the properties and applications of waves.	a. Explain the processes that results in the production and energy transfer of electromagnetic waves.	113, 163-165, 266-269, 386-403; Lab 9.1
	b. Experimentally determine the behavior of waves in various media in terms of reflection, refraction, and diffraction of waves.	354-383; Lab 10.1, 10.2, 10.3; *learningincontext.com* web site
	c. Explain the relationship between the phenomena of interference and the principle of superposition.	369-383, 450-467; *learningincontext.com* web site
	d. Demonstrate the transfer of energy through different mediums by mechanical waves.	354-368; Lab 8.1, 8.2; *learningincontext.com* web site
	e. Determine the location and nature of images formed by the reflection or refraction of light.	426-449; Lab 10.1, 10.2; *learningincontext.com* web site

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SP5 Students will evaluate relationships between electrical and magnetic forces.	a. Describe the transformation of mechanical energy into electrical energy and the transmission of electrical energy.	115, 241, 269, 294, 313, 315; Lab 5.3; *learningincontext.com* web site
	b. Determine the relationship among potential difference, current, and resistance in a direct current circuit.	203-204, 206-215; Lab 4.3; *learningincontext.com* web site
	c. Determine equivalent resistances in series and parallel circuits.	57-60, 63, 111-112, 117, 149-151, 201-215; Lab 1.3, 2.3, 3.3, 4.3; *learningincontext.com* web site
	d. Determine the relationship between moving electric charges and magnetic fields.	266-274, 386-388; Lab 5.3; *learningincontext.com* web site
SP6 The student will describe the corrections to Newtonian physics given by quantum mechanics and relativity when matter is very small, moving fast compared to the speed of light, or very large.	a. Explain matter as a particle and as a wave.	398-401, 487, 491-492; *learningincontext.com* web site
	b. Describe the Uncertainty Principle.	
	c. Explain the differences in time, space, and mass measurements by two observers when one is in a frame of reference moving at constant velocity parallel to one of the coordinate axes of the other observer's frame of reference if the constant velocity is greater than one tenth the speed of light.	*learningincontext.com* web site
	d. Describe the gravitational field surrounding a large mass and its effect on a ray of light.	*learningincontext.com* web site