

Side-by-Side Comparison of the Texas Educational Knowledge and Skills (TEKS) and Louisiana Grade Level Expectations (GLEs)

SCIENCE: Physics

TEKS	Comments	Louisiana GLE
(Phy.1) Scientific Processes. The student, for at least 40% of instructional time, conducts field and laboratory investigations using safe, environmentally appropriate, and ethical practices.		The Abilities Necessary to Do Scientific Inquiry Understanding Scientific Inquiry
(Phy.1.A) demonstrate safe practices during field and laboratory investigations;	<i>Approximate</i>	SI GLE 10. Given a description of an experiment, identify appropriate safety measures (SI-H-A7)
(Phy.1.B) make wise choices in the use and conservation of resources and the disposal or recycling of materials.	<i>Not specifically addressed in LA</i>	
(Phy.2) Scientific Processes. The student uses scientific methods during field and laboratory investigations.	<i>Implied</i>	Science as Inquiry The Abilities Necessary to Do Scientific Inquiry Understanding Scientific Inquiry
(Phy.2.A) plan and implement experimental procedures including asking questions, formulating testable hypotheses, and selecting equipment and technology;	<i>Approximate</i>	SI GLE 1. Write a testable question or hypothesis when given a topic (SI-H-A1) SI GLE 2. Describe how investigations can be observation, description, literature survey, classification, or experimentation (SI-H-A2) SI GLE 3. Plan and record step-by-step procedures for a valid investigation, select equipment and materials, and identify variables and controls (SI-H-A2) SI GLE 4. Conduct an investigation that includes multiple display data appropriately (SI-H-A2) SI GLE 5. Utilize mathematics, organizational tools, and graphing skills to solve problems (SI-H-A3) SI GLE 6. Use technology when appropriate to enhance laboratory investigations and presentations of findings (SI-H-A3)
(Phy.2.B) make quantitative observations and measurements with precision;	<i>Implied</i>	Phys GLE 1. Measure and determine the physical quantities of an object or unknown sample using correct prefixes and metric system units (e.g., mass, charge, pressure, volume, temperature, density) (PS-H-A1) Phys GLE 2. Determine and record measurements correctly using significant digits and scientific notation (PS-H-A1)
(Phy.2.C) organize, analyze, evaluate, make inferences, and predict trends from data;	<i>Approximate</i>	SI GLE 5. Utilize mathematics, organizational tools, and graphing skills to solve problems (SI-H-A3)

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		SI GLE 9. Write and defend a conclusion based on logical analysis of experimental data (SI-H-A6) (SI-H-A2) SI GLE 15. Analyze the conclusion from an investigation by using data to determine its validity (SI-H-B4)
(Phy.2.D) communicate valid conclusions;	<i>Implied</i>	SI GLE 7. Choose appropriate models to explain scientific knowledge or experimental results (e.g., objects, mathematical relationships, plans, schemes, examples, role-playing, computer simulations) (SI-H-A4) SI GLE 9. Write and defend a conclusion based on logical analysis of experimental data (SI-H-A6) (SI-H-A2) SI GLE 15. Analyze the conclusion from an investigation by using data to determine its validity (SI-H-B4)
(Phy.2.E) graph data to observe and identify relationships between variables; and	<i>Implied</i>	SI GLE 3. Plan and record step-by-step procedures for a valid investigation, select equipment and materials, and identify variables and controls (SI-H-A2) SI GLE 5. Utilize mathematics, organizational tools, and graphing skills to solve problems (SI-H-A3)
(Phy.2.F) read the scale on scientific instruments with precision.	<i>Approximates</i>	Phys GLE 3. Determine accuracy and precision of measured data (PS-H-A1)
(Phy.3) Scientific Processes. The student uses critical thinking and scientific problem solving to make informed decisions.	<i>Implied across LA SI GLEs involving problem-solving processes</i>	Science as Inquiry
(Phy.3.A) analyze, review, and critique scientific explanations, including hypotheses and theories, as to their strengths and weaknesses using scientific evidence and information;	<i>Implied</i>	SI GLE 11. Evaluate selected theories based on supporting scientific evidence (SI-H-B1) SI GLE 12. Cite evidence that scientific investigations are conducted for many different reasons (SI-H-B2) SI GLE 13. Identify scientific evidence that has caused modifications in previously accepted theories (SI-H-B2) SI GLE 15. Analyze the conclusion from an investigation by using data to determine its validity (SI-H-B4) SI GLE 16. (See Appendix for complete text of this GLE.)
(Phy.3.B) express laws symbolically and employ mathematical procedures including vector addition and right-triangle geometry to solve physical problems;	<i>Implied</i>	Phys GLE 12. Model scalar and vector quantities (PS-H-E2) Phys GLE 13. Solve for missing variables in kinematic equations relating to actual situations (PS-H-E2)

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		SI GLE 5. Utilize mathematics, organizational tools, and graphing skills to solve problems (SI-H-A3)
(Phy.3.C) evaluate the impact of research on scientific thought, society, and the environment;	<i>Implied</i>	SI GLE 13. Identify scientific evidence that has caused modifications in previously accepted theories (SI-H-B2) SI GLE 14. Cite examples of scientific advances and emerging technologies and how they affect society (e.g., MRI, DNA in forensics) (SI-H-B3)
(Phy.3.D) describe the connection between physics and future careers; and	<i>Not specifically addressed in LA GLEs</i>	
(Phy.3.E) research and describe the history of physics and contributions of scientists.	<i>Not specifically addressed in LA GLEs</i>	
(Phy.4) Science Concepts. The student knows the laws governing motion.		Forces and Motion in Physics
(Phy.4.A) generate and interpret graphs describing motion including the use of real-time technology;	<i>Implied</i>	Phys GLE 11. Plot and interpret displacement-time and velocity-time graphs and explain how these two types of graphs are interrelated (PS-H-E2) Phys GLE 13. Add and resolve vectors graphically and mathematically to determine resultant/equilibrant of concurrent force vectors (PS-H-E3)
(Phy.4.B) analyze examples of uniform and accelerated motion including linear, projectile, and circular;	<i>Implied</i>	SI GLE 9. Describe and measure motion in terms of position, displacement time, and the derived quantities of velocity and acceleration (PS-H-E2) SI GLE 10. Determine constant velocity and uniform acceleration mathematically and graphically (PS-H-E2) SI GLE 15. Calculate centripetal force and acceleration in circular motion (PS-H-E3) SI GLE 16. Analyze circular motion to solve problems relating to angular velocity, acceleration, momentum, and torque (PS-H-E3) SI GLE 18. Demonstrate the independence of perpendicular components in projectile motion and predict the optimum angles and velocities of projectiles (PS-H-E3)
(Phy.4.C) demonstrate the effects of forces on the motion of objects;	<i>Approximate</i>	Phys GLE 14. Add and resolve vectors graphically and mathematically to determine resultant/equilibrant of concurrent force vectors (PS-H-E3) Phys GLE 17. Analyze simple harmonic motion (PS-H-E3)
(Phy.4.D) develop and interpret a free-body diagram for force analysis;	<i>Not specifically addressed in LA</i>	

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	<i>GLEs</i>	
(Phy.4.E) identify and describe motion relative to different frames of reference.	<i>Not specifically addressed in LA at the Physics level. This concept is introduced in 9th grade PS GLE 35</i>	
(Phy.5) Science Concepts. The student knows that changes occur within a physical system and recognizes that energy and momentum are conserved.		Physics: Energy
(Phy.5.A) interpret evidence for the work-energy theorem;	<i>Not specifically addressed in LA at the Physics level.</i>	
(Phy.5.B) observe and describe examples of kinetic and potential energy and their transformations;	<i>Implied</i>	Phys GLE 19. Explain quantitatively the conversion between kinetic and potential energy for objects in motion (PS-H-F1)
(Phy.5.C) calculate the mechanical energy and momentum in a physical system such as billiards, cars, and trains;	<i>Approximates</i>	Phys GLE 24. Apply the concept of momentum to actual situations with different masses and velocities (PS-H-F2)
(Phy.5.D) demonstrate the conservation of energy and momentum.	<i>Approximates</i>	Phys GLE 23. Apply the law of conservation of momentum to collisions in one and two dimensions, including angular momentum (PS-H-F2)
(Phy.6) Science Concepts. The student knows forces in nature.		Physics: Forces and Motion
(Phy.6.A) identify the influence of mass and distance on gravitational forces;	<i>Approximates</i>	Phys GLE 7. Relate gravitational force to mass and distance (PS-H-E1)
(Phy.6.B) research and describe the historical development of the concepts of gravitational, electrical, and magnetic force;	<i>Not specifically addressed in LA at the Physics level.</i>	
(Phy.6.C) identify and analyze the influences of charge and distance on electric forces;	<i>Approximates</i>	Phys GLE 8. Compare and calculate electrostatic forces acting within and between atoms to the gravitational forces acting between atoms (PS-H-E1)
(Phy.6.D) demonstrate the relationship between electricity and magnetism;	<i>Approximates</i>	Phys GLE 31. Describe the relationship of electricity, magnetism, and inductance as aspects of a single electromagnetic force (PS-H-G2)
(Phy.6.E) design and analyze electric circuits;	<i>Implied</i>	Phys GLE 30. Construct basic electric circuits and solve problems involving voltage, current, resistance, power, and energy (PS-H-G2)
(Phy.6.F) identify examples of electrical and magnetic forces in everyday life.	<i>Implied</i>	Phys GLE 29. Describe observed electrostatic phenomena, calculate Coulomb's law, and test charge pole, electric field, and magnetic field (PS-H-G2)
(Phy.7) Science Concepts. The student knows the laws of thermodynamics.		Energy
(Phy.7.A) analyze and explain everyday examples that illustrate the laws of thermodynamics;	<i>Implied</i>	Phys GLE 22. Analyze energy transformations using the law of conservation of energy (PS-H-F2)
(Phy.7.B) evaluate different methods of heat energy transfer that result in an increasing amount of disorder.	<i>Implied</i>	Phys GLE 21. Explain and calculate the conversion of one form of energy to another (e.g., chemical to thermal, thermal to mechanical, magnetic to

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		electrical) (PS-H-F1) Phys GLE 22. Analyze energy transformations using the law of conservation of energy (PS-H-F2)
(Phy.8) Science Concepts. The student knows the characteristics and behavior of waves.		Interactions of Energy and Matter
(Phy.8.A) examine and describe a variety of waves propagated in various types of media and describe wave characteristics such as velocity, frequency, amplitude, and behaviors such as reflection, refraction, and interference;	<i>Implied</i>	Phys GLE 9. Describe and measure motion in terms of position, displacement time, and the derived quantities of velocity and acceleration (PS-H-E2) Phys GLE 25. Determine the relationships among amplitude, wavelength, frequency, period, and velocity in different media (PS-H-G1) Phys GLE 26. Evaluate how different media affect the properties of reflection, refraction, diffraction, polarization, and interference (PS-H-G1) Phys GLE 27. Investigate and construct diagrams to illustrate the laws of reflection and refraction (PS-H-G1) Phys GLE 28. Draw constructive and destructive interference patterns and explain how the principle of superposition applies to wave propagation (PS-H-G1)
(Phy.8.B) identify the characteristics and behaviors of sound and electromagnetic waves;	<i>Implied</i>	Phys GLE 32. Compare properties of electromagnetic and mechanical waves (PS-H-G3) Phys GLE 34. Compare the properties of the electromagnetic spectrum as a wave and as a particle (PS-H-G3) Phys GLE 35. Analyze the Doppler effect of a moving wave source (PS-H-G3)
(Phy.8.C) interpret the role of wave characteristics and behaviors found in medicinal and industrial applications.	<i>Approximate</i>	SI GLE 14. Cite examples of scientific advances and emerging technologies and how they affect society (e.g., MRI, DNA in forensics) (SI-H-B3)
(Phy.9) Science Concepts. The student knows simple examples of quantum physics.		Interactions of Energy and Matter
(Phy.9.A) describe the photoelectric effect;	<i>Implied</i>	Phys GLE 34. Compare the properties of the electromagnetic spectrum as a wave and as a particle (PS-H-G3)
(Phy.9.B) explain the line spectra from different gas-discharge tubes.	<i>Not specifically addressed in LA GLEs</i>	
	<i>Not specifically addressed in TX TEKS</i>	Phys GLE 6. Explain the role of strong nuclear forces and why they are the strongest of all forces (PS-H-E1)

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	<i>Not specifically addressed in TX TEKS</i>	Phys GLE 8. Give an example of how new scientific data can cause an existing scientific explanation to be supported, revised, or rejected (SI-H-A5)
	<i>Not specifically addressed in TX TEKS</i>	Phys GLE 20. Calculate the mechanical advantage and efficiency of simple machines and explain the loss of efficiency using the dynamics of the machines (PS-H-F1)