

Physics Textbook (Merrill)	SIM Lab	Alabama Course of Study	Alabama High School Graduation Exam
Chapters 1-25	All SIM Labs	1. Understand fundamental assumptions about the Universe upon which the scientific enterprise is based.	Standard I: Understand concepts dealing with the nature of science. Objective 1: Analyze the methods of science used to identify and solve problems.
Chapter 2	All SIM Labs	2. Discuss science as a body of knowledge and an investigative process.	Standard 1—Objective 1
Chapters 4, 7, 23	All SIM Labs	3. Conduct scientific investigations systematically.	Standard 1—Objective 1
Chapters 3, 4, 6, 7, 9, 11-14, 16, 17, 22-25	All SIM Labs	4. Exhibit attitudes and habits appropriate to the scientific enterprise.	Standard 1—Objective 1
Chapters 3, 4, 5, 7	All SIM Labs	5. Demonstrate the correct care and safe use of instruments, equipment, materials, and living organisms.	Standard 1—Objective 1
Chapters 6, 9, 10, 13	All SIM Labs	6. Demonstrate the ability to choose, construct, and/or assemble appropriate equipment for scientific investigations.	Standard 1—Objective 1
Chapters 9-14, 16, 25	All SIM Labs	7. Apply critical and integrated science thinking skills. –observing –classifying –measuring with appropriate units and significant figures –communicating –inferring –predicting –solving problems –interpreting data –designing experiments –formulating hypotheses	Standard 1—Objective 1

Physics Textbook	SIM Lab	Alabama Course of Study	Alabama High School Graduation Exam
Chapters 14, 19, 22	All SIM Labs	8. Use mathematical, simple statistical, and graphical models to express patterns and relationships determined from sets of scientific data.	Standard 1—Objective 1
Chapters 14, 15	All SIM Labs	9. Solve for unknown quantities by manipulating variables.	Standard 1—Objective 1
Chapters 7, 17, 18, 21, 22	All SIM Labs	10. Use written and oral communication skills to explain scientific phenomena and concepts in appropriate technical and non-technical language.	Standard 1—Objective 1
Chapters 1-25	All SIM Labs	11. Choose appropriate technology to retrieve relevant information from the Internet such as electronic encyclopedias, indices, and databases.	Standard 1—Objective 1
Chapters 1-25	All SIM Labs	12. Analyze the advantages and disadvantages of widespread use of and reliance on technology.	Standard 1—Objective 1
Chapters 1-25	All SIM Labs	13. Practice responsible use of technology systems, information, and software such as following copyright laws.	Standard 1—Objective 1
Chapters 1-25	All SIM Labs	14. Evaluate technology-based options for lifelong learning.	Standard 1—Objective 1
Chapters 1-25	All SIM Labs	15. Identify uses of technology in scientific applications.	Standard 1—Objective 1
Chapters 1-25	All SIM Labs	16. Collect data and construct and analyze graphs, tables, and charts using tools such as computers or calculator-based probeware.	Standard 1—Objective 1

Physics Textbook	SIM Lab	Alabama Course of Study	Alabama High School Graduation Exam
Chapter 4		17. Describe the four basic natural forces. –gravitational –electromagnetic –strong nuclear –weak nuclear	
Chapters 3-4	Match the Graph / Position, Velocity, & Acceleration / Newton's 2 nd Law / Atwood's Machine / Projectile Motion Constant Velocity of battery powered car Cart launch: distance time & acceleration	18. Understand the interrelationships among mass, distance, force, velocity, acceleration, and time.	Standard VIII: Understand concepts of force and motion. Objective 1: Relate Newton's three laws of motion to real-world applications.
Chapter 3	Match the Graph Position, Velocity & Acceleration	19. Explain the significance of slope and area under a curve when graphing motion data.	Standard VIII—Objective 1
Chapter 3	Composition & Resolution of Vectors Vectors / Trig	20. Analyze vector problems graphically and trigonometrically.	Standard VIII—Objective 1
Chapter 3	“	21. Use vectors to analyze the motion of an object acted upon by more than one force.	Standard VIII—Objective 1
Chapter 6	Momentum & Its Conservation Linear momentum	22. Demonstrate an understanding of momentum.	Standard VII: Understand concepts of energy. Objective 1: Relate the Law of Conservation of Energy to energy transformations.
Chapter 7	Astronomy & Planetary Motion	23. Explain planetary motion and navigation in space in terms of Kepler's and Newton's laws.	Standard VIII—Objective 1
Chapters 4-5, 11	Horsepower Club	24. Apply quantitative relationships involving mass, weight, distance, work, power, gravitational potential energy, and kinetic energy.	
Chapters 10-11	Electrical Equivalent of Heat Specific Heat	25. Explain the laws of thermodynamics.	

Physics Textbook	SIM Lab	Alabama Course of Study	Alabama High School Graduation Exam
Chapters 10-11	Electrical Equivalent of Heat Specific Heat	26. Describe relationships qualitatively and quantitatively between changes in heat energy and changes in temperature.	Standard VII: Understand concepts of energy Objective 2: Relate waves to the transfer of energy.
Chapter 12	Resonance & Speed of Sound	27. Classify waves according to type. –mechanical or electromagnetic –transverse or longitudinal	Standard VII—Objective 2
Chapters 14-15	Optic Kits Snell;s Law Spectrum Analysis Diffraction: Single & Double Slit	28. Explain wave behavior in terms of reflection, refraction, and diffraction.	Standard VII—Objective 2
Chapter 16	Resonance & Speed of Sound	29. Differentiate between constructive and destructive wave interference.	Standard VII—Objective 2
Chapters 13-14	Optic Kits	30. Relate physical properties of sound and light to wave characteristics.	Standard VII—Objective 2
Chapters 12-15	Optic Kits	31. Explain the impact of change in media upon the speed, frequency, and wavelength of a wave.	Standard VII—Objective 2
Chapters 13-14		32. Describe how different components of the electromagnetic spectrum are used for communication purposes.	Standard VII—Objective 2
Chapters 14	Optic Kits	33. Demonstrate an understanding of reflection.	Standard VII—Objective 2
Chapters 15	Optic Kits	34. Demonstrate and understanding of refraction.	Standard VII—Objective 2
Chapters 16		35. Demonstrate an understanding of diffraction.	Standard VII—Objective 2
Chapters 14		36. Explain polarization. –production –characteristics –uses	Standard VII—Objective 2

Physics Textbook	SIM Lab	Alabama Course of Study	Alabama High School Graduation Exam
Chapters 17		37. Describe similarities in the calculation of electrical force, magnetic force, and gravitational force between objects.	Standard VII—Objective 1
Chapters 17		38. Explain the production of static charge in an electroscope through induction and conduction.	Standard VII—Objective 1
Chapters 17		39. Identify methods by which an electric field can be created.	Standard VII—Objective 1
Chapters 17-20	Ohm's Law	40. Apply quantitative relationships among charge, current, potential energy, potential difference, resistance, and electrical power for simple series, parallel, or combination DC circuits.	Standard VII—Objective 1
Chapters 17	Optics: Spectra	41. Determine the force on charged particles using Coulomb's law.	Standard VII—Objective 1
Chapters 23		42. Demonstrate an understanding of the scientific implications of the following as they relate to the nature of particles (atoms) –Thompson's cathode ray experiment –Rutherford's gold foil experiment –Bohr's bright line spectra experiment –Millikan's oil drop experiment –Deroglie's wave theory –Einstein's photoelectric-effect theory –Michelson/Morley theory	Standard II: Understand concepts dealing with matter. Objective 2: Relate particle motion to the states of matter (solids, liquids, and gases).