Correlation to Louisiana Physical Science and Inquiry Benchmarks

Foundations of Physics

Student Text and Investigation Manual

Standard #: Area/Grade Le	Standard	Topic	Benchmark	student text pg	detail	investigation pg	detail
PS-H-A1 Physical Science/ 9-12	Students will develop understanding of the characteristics and relationships of matter and energy	Measurement and symbolic representation	manipulating and analyzing quantitative data using the SI system	18	measurements of distance in units of length	2	practice length measurement
				19	scientists use metric units	3	convert from inches to meters
				19	description of length measured in English and metric systems	6	precision in measurement
						7	estimating mass
				20	how to convert units of measurement	9	make distance measurement
				21	calculating volume of simple shapes	18	measure the length
				21	conversions between area and volume units	23	measure the distance
						26	find length in centimeters
				27	measuring mass in kg and grams	29	measure the force
						34	measure the mass
				33	commonly used units for measuring mass	34	measure the force
				34	converting length units between systems	36	measure the new position
						36	measure the mass
				82	units of force are pounds and newtons	62	measure string length
						65	measure vertical distance
				83	understanding units for using Newton's second law	68	convert grams to kilograms
						70	measure and mark height
						78	make the string 70 cm long
						78	measure mass of ball
						153	making measurements with precision

Correlation to Louisiana Physical Science and Inquiry Benchmarks

Foundations of Physics

Student Text and Investigation Manual

Standard #: Area/Grade Le	Standard	Topic	Benchmark	student text pg	detail	investigation pg	detail
						153	make measurement with precision
						178	measure 100 grams of water
						192	find the mass of the bottle
						202	find the mass to the nearest tenth of a gram
						202	find the mass

Correlation to Louisiana Physical Science and Inquiry Benchmarks

Foundations of Physics

Student Text and Investigation Manual

Standard #: Area/Grade Le	Standard	Topic	Benchmark	student text pg	detail	investigation pg	detail
PS-H-B1 Physical Science/ 9-12	Students will develop understanding of the characteristics and relationships of matter and energy	Atomic structure	describing the structure of the atom plus identifying and characterizing the particles that compose it (including the structure and properties of isotopes)	420	electric charge is a property of the particles that make up the atom	175	identify symbol and atomic number and average atomic mass
				420	electric charge is a property of the particles that make up the atom	175	record atomic number
				422	movement of electrons in current	194	isotopes
				437	draw a model of an atom	194	identify symbol and atomic number and mass number
				444	electrons and magnetism	194	basic properties of subatomic particles
				444	magnetism is a property of particles that make up the atom	194	subatomic particles
				459	atomic currents	203	electrons and energy levels
				480	electrons in a semiconductor	203	review subatomic particles
				500	smallest piece of matter is the atom	213	explore radioactive isotopes
				502	the periodic table		
				566	three particles make up the atom		
				566	charge and mass of electrons and protons and neutrons		
				567	structure of the atom		
				567	mass and the nucleus		
				569	elements and atoms and atomic number		

Correlation to Louisiana Physical Science and Inquiry Benchmarks

Foundations of Physics

Student Text and Investigation Manual

Standard #: Standard Area/Grade Le	Standard	Topic	Benchmark	student text pg	detail	investigation pg	detail
				570	chemical properties of isotopes due to atomic structure		
				570	isotopes explained		
				571	atomic mass of stable isotopes		
				572	stability of nucleus and balance of protons and neutrons		
				572	chart of stable isotopes		
				574	Neils Bohr's theory		
				576	Neils Bohr		
				577	energy levels explain spectral lines		
				588	carbon isotopes		
				588	properties of subatomic particles		

Correlation to Louisiana Physical Science and Inquiry Benchmarks

Foundations of Physics

Student Text and Investigation Manual

Standard #: Area/Grade Le	Standard	Topic	Benchmark	student text pg	detail	investigation pg	detail
PS-H-B2 Physical Science/ 9-12	Students will develop understanding of the characteristics and relationships of matter and energy	Atomic structure	describing the nature and importance of radioactive isotopes and nuclear reactions (fission, fusion, radioactive decay)	502	elements past #92 are radioactive and decay	213	fusion and fission
				570	radioactive isotopes		
				573	fusion		
				573	nuclear reactions		
				614	radioactive decay		
				616	energy and radioactivity		
				625	nuclear reactions		
				627	fusion reactions		
				628	fission reactions		
				635	differences between fission and fusion		

Correlation to Louisiana Physical Science and Inquiry Benchmarks

Foundations of Physics

Student Text and Investigation Manual

Standard #: Area/Grade Le	Standard	Topic	Benchmark	student text pg	detail	investigation pg	detail
PS-H-E1 Physical Science/ 9-12	Students will develop understanding of the characteristics and relationships of matter and energy	Forces and motion	recognizing the characteristics and relative strengths of the forces of nature (gravitational, electrical, magnetic, nuclear)	61	any acceleration must come from a force	26	study Newton’s first law
				78	changes in motion only occur through force	27	explain how Newton’s first law applies
				79	all objects tend to resist changes in motion	152	investigate magnetic forces
				85	if there is acceleration there must be force	154	draw magnetic field lines for a bar magnet
				148	direction of force determines linear or rotational motion	155	test materials to see if they are affected by magnets
				168	Newton's first law and rotational inertia	161	experiment with pushes and pulls of permanent magnet in a rotor
				222	Newton's first law and momentum		
				419	differences between electric force and gravity		
				424	the strength of electric forces		
				426	gravity is far weaker than electric forces		
				428	comparison between electric fields and gravitational fields		
				440	magnetism explained		
				443	understanding magnetic fields		
				445	alignment of domains responds to magnetic fields		

Correlation to Louisiana Physical Science and Inquiry Benchmarks

Foundations of Physics

Student Text and Investigation Manual

Standard #: Standard Area/Grade Le	Standard	Topic	Benchmark	student text pg	detail	investigation pg	detail
				446	creating permanent magnets		
				447	the magnetic field of Earth		
				448	a compass is a magnet that lines up with Earth's magnetic field		
				449	the strength of Earth's magnetic field		
				451	magnetic field of a nucleus		
				454	magnetic field between two unlike poles		
				458	the magnetic field of loops and coils		
				459	the magnetic field of coils and permanent magnets		
				460	magnetic force on a moving charge		
				461	calculating magnetic fields and forces		
				568	forces in the atom		
				626	strong force and electromagnetic force in the nucleus		
				649	four forces in nature		

Correlation to Louisiana Physical Science and Inquiry Benchmarks

Foundations of Physics

Student Text and Investigation Manual

Standard #: Area/Grade Le	Standard	Topic	Benchmark	student text pg	detail	investigation pg	detail
PS-H-E2 Physical Science/ 9-12	Students will develop understanding of the characteristics and relationships of matter and energy	Forces and motion	understanding the relationship of displacement, time, rate of motion, and rate of change of motion; representing rate and changes of motion mathematically and graphically	37	how to calculate speed	9	collect data and calculate speed of car
				38	compare and contrast speed and velocity	10	make object move with speed of 1 m/sec
				47	position vs. time graph	12	finding speed of ball with one photogate
				48	determining speed from the slope of a position vs. time graph	13	graph speed versus position
				48	graphs showing changes in speed	14	find the speed of the ball
				48	determining speed from the slope of a position vs. time graph	15	find speed of the ball
				49	speed vs. time graph for constant speed	16	create a position vs. time graph
				50	graphs for motion of increasing speed and decreasing speed	16	create a speed vs. time graph
				50	speed vs. time graph for downhill motion	17	find the acceleration
				54	graphing speed vs. time	17	studying acceleration
				55	calculate the average speed and distance traveled	17	find two speeds
				55	analyzing distance vs. time graph	17	learn techniques for finding acceleration
				58	acceleration is the rate of change in the speed of an object	19	make a speed vs. time graph
				59	comparing speed and acceleration	20	understanding equation for uniform accelerated motion
						20	speed vs. time graph for uniform acceleration
						21	calculate speed of ball

Correlation to Louisiana Physical Science and Inquiry Benchmarks

Foundations of Physics

Student Text and Investigation Manual

Standard #: Standard Area/Grade Le	Standard	Topic	Benchmark	student text pg	detail	investigation pg	detail
				60	formula for acceleration	22	create a speed vs. time graph
				60	calculating acceleration from experiments	22	create a position vs. time graph
				61	constant speed and constant acceleration	25	derive acceleration equation
				61	zero acceleration vs. constant acceleration vs. acceleration with zero speed	26	make ball roll at constant speed
				61	general definition of acceleration	27	collect data on Newton's first law
				62	acceleration is total change of speed divided by total change in time	29	calculate the acceleration
				62	speed vs. time graph for accelerated motion	33	calculate the predicted speed
				63	complex speed vs. time graphs	39	investigating vectors
				63	calculating acceleration from a speed vs. time graph	42	find initial speed of ball
				64	calculate speed in accelerated motion	43	calculate the velocity vector
				64	calculating the speed of an object that is accelerating	50	calculate the speed of the ball
				64	calculate speed in accelerated motion	66	find the speed of the ball
				65	calculating distance from speed vs. time graph	68	what is speed of the ball?
						76	calculate speeds of projectile and target balls
						90	calculate the speed of the wave pulse
						191	calculate speed of air in homemade air-speed tester

Correlation to Louisiana Physical Science and Inquiry Benchmarks

Foundations of Physics

Student Text and Investigation Manual

Standard #: Standard Area/Grade Le	Standard	Topic	Benchmark	student text pg	detail	investigation pg	detail
				67	calculate time and distance from acceleration		
				70	calculating height and time of flight in free fall problems		
				74	sketching speed vs. time graphs for different changes of motion		
				74	describing motion with speed vs. time graph		
				75	calculations of speed		
				76	analyzing graph for changes in motion		
				84	direction of net force and acceleration and speed		
				94	seat belt problem		
				103	calculate the acceleration of a car including friction		
				118	vectors have magnitude and direction		
				119	displacement vectors		
				124	definition of the velocity vector		
				125	the velocity vector		
				125	speed is the magnitude of the velocity vector		
				126	components of the velocity vector		
				127	adding velocity vectors		

Correlation to Louisiana Physical Science and Inquiry Benchmarks

Foundations of Physics

Student Text and Investigation Manual

Standard #: Standard Area/Grade Le	Standard	Topic	Benchmark	student text pg	detail	investigation pg	detail
				128	constant velocity of horizontal component of projectile motion		
				129	analyze a horizontally launched projectile		
				130	analyzing changing velocity in vertical component of projectile motion		
				142	calculating acceleration for sled on slope		
				146	calculating linear speed of a moving wheel		
				147	the linear speed of a rolling wheel		
				150	centripetal acceleration		
				150	calculate the centripetal acceleration of a motorcycle		
				260	velocity vs. time graph of harmonic motion		
				260	position vs. time graph of harmonic motion		

Correlation to Louisiana Physical Science and Inquiry Benchmarks

Foundations of Physics

Student Text and Investigation Manual

Standard #: Area/Grade Le	Standard	Topic	Benchmark	student text pg	detail	investigation pg	detail
PS-H-E3 Physical Science/ 9-12	Students will develop understanding of the characteristics and relationships of matter and energy	Forces and motion	understanding effects of forces on changes in motion as explained by Newtonian mechanics	41	effect of friction on motion of a ball on a ramp	23	investigate the effect of gravity
				61	any acceleration must come from a force	26	study Newton's first law
				68	free fall and acceleration due to gravity	27	collect data on Newton's first law
				69	motion formulas for free fall	27	were any forces acting on the ball?
				70	solving problems with free fall	27	explain how Newton's first law applies
				71	air resistance and terminal speed	28	investigate Newton's second law
				71	acceleration of gravity does not depend on mass	30	Newton's third law and free body diagrams
				72	friction and traction and antilock brakes	30	investigate Newton's third law
				75	problem understanding acceleration due to gravity	31	draw free body diagrams and identify action-reaction pairs
				78	changes in motion only occur through force	34	investigate static and sliding friction
				78	force is an action that can change motion	45	balancing a specified force
				79	what systems in a car overcome the law of inertia	49	consider forces acting on the ball
				79	all objects tend to resist changes in motion	61	what effect does friction have on mechanical advantage?
				80	Newton's laws and cup holders	77	relationship between force and motion and the second law

Correlation to Louisiana Physical Science and Inquiry Benchmarks

Foundations of Physics

Student Text and Investigation Manual

Standard #: Standard Area/Grade Le	Standard	Topic	Benchmark	student text pg	detail	investigation pg	detail
				80	seat belts and air bags and Newton's first law	78	which ball had a greater change in momentum?
				81	Newton's second law of motion		
				81	force is related to acceleration		
				83	calculation using Newton's second law		
				83	finding the net force		
				84	Newton's second law and dynamics problems		
				84	calculating net force		
				85	force problems		
				85	finding force from acceleration		
				85	if there is acceleration there must be force		
				86	zero acceleration means net zero force		
				87	explaining Newton's third law in terms of an astronaut moving through space		
				87	forces always occur in action-reaction pairs		
				88	explaining Newton's third law in terms of moving a skateboard		

Correlation to Louisiana Physical Science and Inquiry Benchmarks

Foundations of Physics

Student Text and Investigation Manual

Standard #: Standard Area/Grade Le	Standard	Topic	Benchmark	student text pg	detail	investigation pg	detail
				88	Newton's third law operates on pairs of objects		
				89	identifying which force is acting on which object		
				89	solving problems with action-reaction forces		
				90	examples of Newton's third law		
				93	problems using Newton's first law and second law		
				94	seat belt problem		
				94	force calculations in different units		
				97	strength of gravity on Earth and Jupiter		
				98	gravity and acceleration and weightlessness		
				99	balanced force problems		
				100	the force of friction and the different types of friction		
				100	friction is a force that resists motion		
				101	a model for friction		
				102	calculating the force of friction		

Correlation to Louisiana Physical Science and Inquiry Benchmarks

Foundations of Physics

Student Text and Investigation Manual

Standard #: Standard Area/Grade Le	Standard	Topic	Benchmark	student text pg	detail	investigation pg	detail
				102	the normal force as the reaction in an action-reaction pair		
				103	friction and motion		
				103	net force includes the force of friction		
				104	reducing friction force		
				105	friction applications		
				106	net force must be zero in equilibrium		
				106	Newton's second law and net force		
				107	net force of zero and free-body diagram		
				107	forces on a free-body diagram		
				108	equilibrium and Newton's second law		
				108	use equilibrium to find an unknown force		
				111	understanding reaction forces in terms of springs and deformation		
				112	analysis of forces on a bridge		
				115	friction of a pulled sled		
				116	calculate the acceleration of a toy		
				124	projectiles and trajectories		

Correlation to Louisiana Physical Science and Inquiry Benchmarks

Foundations of Physics

Student Text and Investigation Manual

Standard #: Standard Area/Grade Le	Standard	Topic	Benchmark	student text pg	detail	investigation pg	detail
				124	effects of friction on trajectories		
				128	gravity only accelerates vertical motion		
				129	vertical motion of a projectile		
				130	projectiles launched at an angle		
				131	range of projectiles		
				133	balancing forces in two dimensions		
				134	resolving force of gravity in ramp coordinates		
				135	frictional force on an inclined plane		
				135	acceleration down an inclined plane		
				135	normal force of an inclined plane		
				136	calculating acceleration on a ramp		
				136	calculating acceleration on a ramp accounting for friction		
				137	predicting motion in three dimensions and controlling force and acceleration in space missions		

Correlation to Louisiana Physical Science and Inquiry Benchmarks

Foundations of Physics

Student Text and Investigation Manual

Standard #: Standard Area/Grade Le	Standard	Topic	Benchmark	student text pg	detail	investigation pg	detail
				137	the vector form of Newton's second law		
				137	calculating acceleration from 3-D forces		
				139	determining position by triangulation and inertial navigation		
				141	calculate the net force		
				141	effects of gravity on motion of a projectile		
				142	effects of friction on acceleration		
				148	direction of force determines linear or rotational motion		
				148	centripetal force causes circular motion		
				149	calculating centripetal force		
				150	using centripetal acceleration to create the feeling of gravity by rotating the space station		
				150	formula for centripetal acceleration		
				151	banked turns		
				152	law of universal gravitation and orbital motion		

Correlation to Louisiana Physical Science and Inquiry Benchmarks

Foundations of Physics

Student Text and Investigation Manual

Standard #: Area/Grade Le	Standard	Topic	Benchmark	student text pg	detail	investigation pg	detail
				154	orbits and gravitational force		
				155	satellite motion application		
				155	centripetal force and the law of universal gravitation combine to form the orbit equation		
				156	satellites in orbit		
				158	compare projectile motion to orbital motion		
				165	the motion of a tossed object		
				166	centers of mass and gravity may differ		
				168	Newton's first law and rotational inertia		
				169	Newton's second law applies to rotational motion		
				171	Newton's second law for rotational motion variables		
				183	friction and mechanical advantage of wheel and axle		
				184	friction and mechanical advantage of ramps and screws		
				187	work done against gravity		

Correlation to Louisiana Physical Science and Inquiry Benchmarks

Foundations of Physics

Student Text and Investigation Manual

Standard #: Area/Grade Le	Standard	Topic	Benchmark	student text pg	detail	investigation pg	detail
				191	potential energy comes from gravity		
				222	Newton's first law and momentum		
				224	momentum and Newton's third law		
				224	law of conservation of momentum		
				225	conservation of momentum in collisions		
				226	applying conservation of momentum		
				227	momentum conservation for collisions in two and three dimensions		
				228	seat belts and air bags		
				228	Newton's second law relating force and momentum		
				229	momentum form of Newton's second law		
				231	conservation of angular momentum examples		
				232	conservation of angular momentum		
				234	gyroscopes and the space shuttle		
				235	jet engines work because of conservation of momentum		

Correlation to Louisiana Physical Science and Inquiry Benchmarks

Foundations of Physics

Student Text and Investigation Manual

Standard #: Standard Area/Grade Le	Standard	Topic	Benchmark	student text pg	detail	investigation pg	detail
				238	cars that crumple in a collision		
				240	forces in a car stopping		
				245	friction causes damping in oscillators		
				252	Newton's second law and natural frequency		
				254	definition of periodic force		
				256	friction and steady state		
				370	Einstein's thinking about momentum of particles moving near the speed of light		
				425	electric forces always occur in pairs according to Newton's third law		
				548	Newton's third law and pressure in a fluid		
				550	pressure and the third law		
				557	pressure of gases		
				629	conservation of momentum in nuclear reactions		

Correlation to Louisiana Physical Science and Inquiry Benchmarks

Foundations of Physics

Student Text and Investigation Manual

Standard #: Area/Grade Le	Standard	Topic	Benchmark	student text pg	detail	investigation pg	detail
PS-H-E4 Physical Science/ 9-12	Students will develop understanding of the characteristics and relationships of matter and energy	Forces and motion	illustrating how frame of reference affects our ability to judge motion	36	speed is relative	128	relativity and frames of reference
				75	problem using frames of reference		
				127	calculating velocity vectors may require knowing frames of reference		
				366	special relativity and time dilation		
				367	relative motion and speed of light		
				369	frequency of light depends on relative motion		
				371	simultaneity depends on the relative motion of your frame of reference		
				643	frame of reference and the equivalence principle		

Correlation to Louisiana Physical Science and Inquiry Benchmarks

Foundations of Physics

Student Text and Investigation Manual

Standard #: Area/Grade Le	Standard	Topic	Benchmark	student text pg	detail	investigation pg	detail
PS-H-F1 Physical Science/ 9-12	Students will develop understanding of the characteristics and relationships of matter and energy	Energy	describing and representing relationships among energy, work, power, and efficiency	13	biomechanics	60	operate and study a block and tackle machine
				13	physics and bicycles	63	studying the concept of work
				160	using torque in household devices	64	compare output and input work
				161	force on a wrench	64	relationship between work and energy
				172	force and torque transformations in bicycles	69	calculate efficiency for each ball
				173	force and torque transformations in bicycles	70	calculate work
				178	how simple machines manipulate forces	70	calculate person's power
				179	how to calculate mechanical advantage	71	calculate work done
				180	mechanical advantage of human arm	71	calculate power output for each climber
				180	the mechanical advantage of a lever		
				181	how a lever works		
				181	crowbar as an example of a lever		
				182	mechanical advantage of ropes and pulleys		
				183	small drills use gears		
				183	how wheels and gears work		
				184	screw turns rotating motion into linear motion		

Correlation to Louisiana Physical Science and Inquiry Benchmarks

Foundations of Physics

Student Text and Investigation Manual

Standard #: Standard Area/Grade Le	Standard	Topic	Benchmark	student text pg	detail	investigation pg	detail
				184	ramps and screws		
				185	work and energy		
				185	how to calculate work		
				185	physics definition of work		
				186	the work done by a force		
				187	work done against gravity		
				187	calculating work done against gravity		
				188	for all machines work out cannot exceed work in		
				189	relationship between work and energy		
				191	the symmetry between work and energy		
				191	calculate the potential energy of a cart		
				192	calculating kinetic energy depends on speed and mass		
				193	calculate the kinetic energy of a moving car		
				193	deriving the formula for kinetic energy		
				197	calculating energy supplied by Hoover Dam		
				199	concept of work		
				200	calculate work done		

Correlation to Louisiana Physical Science and Inquiry Benchmarks

Foundations of Physics

Student Text and Investigation Manual

Standard #: Standard Area/Grade Le	Topic	Benchmark	student text pg	detail	investigation pg	detail
			202	definition of efficiency		
			203	efficiency explained		
			207	calculate power in climbing stairs		
			207	power is the rate of doing work or using energy		
			208	power formulas		
			208	units of power		
			209	estimating power requirements based on force		
			209	calculating power for common devices		
			210	estimating the power in wind		
			211	estimate average input power of a person		
			211	power in biological systems		
			213	efficiency of an energy flow process		
			216	estimating the energy in tides		
			219	ideal vs. real machine		
			220	calculate power rating		
			220	calculate efficiency of model solar car		

Correlation to Louisiana Physical Science and Inquiry Benchmarks

Foundations of Physics

Student Text and Investigation Manual

Standard #: Standard Area/Grade Le	Standard	Topic	Benchmark	student text pg	detail	investigation pg	detail
				220	calculate energy and power for humans		
				228	car crash safety		
				236	fuel efficiency of turbofan engines		
				249	harmonic motion in machines		
				311	efficiency of electric vs. fluorescent light bulbs		
				393	efficiency of hybrid cars		
				409	power and efficiency of electric cars		
				440	the difference between magnetic poles and electric charge		

Correlation to Louisiana Physical Science and Inquiry Benchmarks

Foundations of Physics

Student Text and Investigation Manual

Standard #: Area/Grade Le	Standard	Topic	Benchmark	student text pg	detail	investigation pg	detail
PS-H-F2 Physical Science/ 9-12	Students will develop understanding of the characteristics and relationships of matter and energy	Energy	applying the universal law of conservation of matter, energy, and momentum, and recognizing their implications	189	energy appears in different forms	66	law of conservation of energy
				190	conversions of energy	68	find the total energy at each position
				190	different forms of energy	72	potential to kinetic energy conversion in a pendulum
				194	the law of conservation of energy	72	draw an energy flow diagram
				194	energy transformations	74	investigating collisions and conservation of energy
				194	conservation of energy explained	78	which ball had a greater change in momentum?
				194	energy transformations	88	potential to kinetic energy conversions of a pendulum
				195	applying conservation of energy for a marble rolling on a hilly track		
				195	conservation of energy in a closed system		
				196	energy transformation hydroelectric plant		
				196	energy transformation hydroelectric plant		
				197	conservation of energy for Hoover Dam		
				199	kinetic and potential energy conversions while bouncing in a trampoline		
				202	efficiency and energy conversions		
				203	efficiency and conservation of energy		

Correlation to Louisiana Physical Science and Inquiry Benchmarks

Foundations of Physics

Student Text and Investigation Manual

Standard #: Standard Area/Grade Le	Standard	Topic	Benchmark	student text pg	detail	investigation pg	detail
				205	efficiency in biological systems		
				206	connection between efficiency and time		
				212	energy conversion		
				212	energy flow in a pendulum		
				212	understand basic forms of energy		
				213	the conversion process of energy flow		
				215	energy flows in biological systems		
				219	energy flow of a model solar car		
				224	law of conservation of momentum		
				225	conservation of momentum in collisions		
				226	applying conservation of momentum		
				227	momentum conservation for collisions in two and three dimensions		
				227	kinetic energy conservation for elastic collisions		
				231	conservation of angular momentum examples		

Correlation to Louisiana Physical Science and Inquiry Benchmarks

Foundations of Physics

Student Text and Investigation Manual

Standard #: Standard Area/Grade Le	Standard	Topic	Benchmark	student text pg	detail	investigation pg	detail
				232	conservation of angular momentum		
				235	jet engines work because of conservation of momentum		
				245	kinetic to potential energy changes in motion of an oscillator		
				253	oscillators exchange energy back and forth between potential and kinetic		
				256	resonant systems accumulate energy		
				277	waves propagate by exchanging energy between two forms		
				310	light is a form of energy		
				320	photosynthesis converts light energy to chemical energy		
				322	photons are bundles of light energy		
				324	light from chemical reactions		
				356	electromagnetic waves exchange energy between electricity and magnetic parts		

Correlation to Louisiana Physical Science and Inquiry Benchmarks

Foundations of Physics

Student Text and Investigation Manual

Standard #: Standard Area/Grade Le	Standard	Topic	Benchmark	student text pg	detail	investigation pg	detail
				370	relationship and conservation of mass and energy		
				370	Einstein's thinking about momentum of particles moving near the speed of light		
				378	electrical energy		
				384	batteries use chemical energy		
				393	conversion of energy in regenerative braking		
				400	energy conversions in a series circuit		
				451	MRI--energy exchange by a nucleus in a magnetic field		
				464	electric motor uses electromagnets to convert electrical energy to mechanical energy		
				467	electric generators transform mechanical energy into electric energy		
				469	energy conservation and Faraday's law		
				515	thermodynamics and conservation of energy		
				552	conservation of energy in fluids		

Correlation to Louisiana Physical Science and Inquiry Benchmarks

Foundations of Physics

Student Text and Investigation Manual

Standard #: Area/Grade Le	Standard	Topic	Benchmark	student text pg	detail	investigation pg	detail
				552	explanation of pressure and energy		
				553	energy conservation and Bernoulli's equation		
				619	radiation as a flow of energy		
				622	energy of x-rays		
				629	conservation of energy in nuclear reactions		
				629	conservation of momentum in nuclear reactions		
				647	energy from antimatter		
PS-H-G1 Physical Science/ 9-12	Students will develop understanding of the characteristics and relationships of matter and energy	Interactions of energy and matter	giving examples of the transport of energy through wave action	262	waves transmit energy	95	waves carry energy from one place to another
				263	waves are a form of traveling energy		
				272	waves transfer energy through absorption		
				277	energy of a wave		
				530	energy and radiation relationships		

Correlation to Louisiana Physical Science and Inquiry Benchmarks

Foundations of Physics

Student Text and Investigation Manual

Standard #: Area/Grade Le	Standard	Topic	Benchmark	student text pg	detail	investigation pg	detail
PS-H-G2 Physical Science/ 9-12	Students will develop understanding of the characteristics and relationships of matter and energy	Interactions of energy and matter	analyzing the relationship and interaction of magnetic ad electrical fields and the forces they produce	412	average power in an electric motor	159	build an electromagnet
				435	steering the electron beam on television screen	160	find out what happens to strength of electromagnet when current is increased
				456	magnetic field of a wire	160	what happens to the strength of an electromagnet when you increase the current?
				457	force on a current in a magnetic field	161	investigate how an electric motor works
				462	electromagnets	165	investigate electromagnetic induction
				463	building an electromagnet		
				464	principle of the electric motor		
				464	electric motor uses electromagnets to convert electrical energy to mechanical energy		
				465	commutation		
				465	how electromagnets are used in electric motors		
				466	battery-powered electric motors		
				467	concept of electromagnetic induction		
				471	transformers operate on electromagnetic induction		
				472	electromagnet-based maglev		
				475	diagram of electromagnet		

Correlation to Louisiana Physical Science and Inquiry Benchmarks

Foundations of Physics

Student Text and Investigation Manual

Standard #: Area/Grade Le	Standard	Topic	Benchmark	student text pg	detail	investigation pg	detail
PS-H-G3 Physical Science/ 9-12	Students will develop understanding of the characteristics and relationships of matter and energy	Interactions of energy and matter	characterizing and differentiating electromagnetic and mechanical waves and their effects on objects as well as humans	254	concept of resonance	86	investigate resonance and its importance
				255	resonance occurs when periodic force matches natural frequency	88	if frequency is increased what happens to total energy?
				259	resonance and amplitude	89	study wave pulses on elastic cord
				262	waves are all around us	89	study characteristics of a wave pulse on a string
				264	frequency and amplitude and wavelength in waves	89	making wave pulses on a string
				264	basic properties of frequency and wavelength and amplitude	90	study the speed of the wave pulse
				265	wave pulse	90	measure speed of a wave pulse
				265	concept of speed of a wave	91	making circular waves in a ripple tank
				266	formula for speed of a wave	91	make different types of waves in a ripple tank
				267	water waves are transverse and Slinky is longitudinal	91	is your water wave transverse or longitudinal?
				267	transverse and longitudinal waves	91	making plane waves in a ripple tank
				268	creating plane waves and circular waves	92	investigate diffraction in a ripple tank
				268	one- and two- and three-dimensional waves	93	investigate frequency and wavelength
				270	waves and diffraction	94	investigate the wavelength of standing waves
				272	waves and diffraction and boundaries		

Correlation to Louisiana Physical Science and Inquiry Benchmarks

Foundations of Physics

Student Text and Investigation Manual

Standard #: Standard Area/Grade Le	Standard	Topic	Benchmark	student text pg	detail	investigation pg	detail
				273	constructive and destructive interference	94	investigate the frequency of standing waves
				274	how resonance is created	95	natural frequency and resonance of standing waves on a string
				275	standing waves and natural frequency and resonance	96	investigate human perception of sound
				275	standing waves on a string	101	investigate interference with sound waves
				277	standing waves are used to store energy	122	study properties of the electromagnetic spectrum
				277	energy of a wave is proportional to frequency and amplitude	125	study the polarization of a transverse spring wave
				277	standing waves on a string		
				278	modes of a wave		
				278	wavelength of a standing wave		
				278	nodes and antinodes		
				279	modes of vibration		
				279	vibration of a drum		
				280	microwaves and resonance		
				281	microwaves		
				281	use of microwaves in microwave ovens		
				282	describe relationship between wave characteristics		

Correlation to Louisiana Physical Science and Inquiry Benchmarks

Foundations of Physics

Student Text and Investigation Manual

Standard #: Standard Area/Grade Le	Standard	Topic	Benchmark	student text pg	detail	investigation pg	detail
				283	type of wave represented by a spring		
				286	sound is a wave of pressure		
				286	sound waves require matter to traverse		
				286	properties of sound waves		
				287	frequency and pitch of sound		
				288	relationship of loudness and amplitude and pressure in sound wave		
				289	acoustics		
				289	vibrations create sound		
				291	how we know sound is a wave		
				291	pressure and amplitude of sound waves		
				292	sound is a longitudinal wave		
				292	importance of wavelength of sound waves		
				292	frequency and wavelengths of sound		
				294	effect of medium and temperature on speed of sound wave		
				295	standing wave patterns of sound		

Correlation to Louisiana Physical Science and Inquiry Benchmarks

Foundations of Physics

Student Text and Investigation Manual

Standard #: Standard Area/Grade Le	Standard	Topic	Benchmark	student text pg	detail	investigation pg	detail
				295	designing a musical instrument		
				295	resonance of sound		
				296	design of a good concert hall		
				296	interference of sound waves		
				298	sonograms		
				300	pitch and frequency in music		
				301	consonance and dissonance and beats		
				301	echolocation and beats		
				302	musical instruments		
				303	sound from a guitar		
				303	design of a guitar		
				306	list evidence that sound is a wave		
				306	beats in a musical sound		
				308	wave amplitude and harmonics of tuning fork and musical instrument		
				310	light is a form of energy		
				310	how we see		
				312	the intensity of light		
				313	light carries information		
				314	the speed of light		

Correlation to Louisiana Physical Science and Inquiry Benchmarks

Foundations of Physics

Student Text and Investigation Manual

Standard #: Standard Area/Grade Le	Standard	Topic	Benchmark	student text pg	detail	investigation pg	detail
				317	how the human eye sees color		
				318	how we perceive color		
				319	we see mostly reflected light		
				320	visible light has just the right energy for life		
				324	the process of how light is reflected		
				328	how is light used for communication?		
				338	how the human eye sees images		
				356	light can be described in terms of waves		
				357	frequency and wavelength of light		
				358	speed of light is frequency multiplied by length		
				359	descriptions of radio waves and microwaves and infrared rays		
				359	waves of the electromagnetic spectrum		
				360	x-rays and gamma rays		
				360	visible light waves		
				362	the diffraction pattern of laser light		

Correlation to Louisiana Physical Science and Inquiry Benchmarks

Foundations of Physics

Student Text and Investigation Manual

Standard #: Area/Grade Le	Standard	Topic	Benchmark	student text pg	detail	investigation pg	detail
				372	three-dimensional images and the human eye		
				373	wave fronts of light		
				452	MRI uses radio waves		
				530	electromagnetic radiation		
				585	laser application		
				586	how lasers make light		
PS-H-G4 Physical Science/ 9-12	Students will develop understanding of the characteristics and relationships of matter and energy	Interactions of energy and matter	explaining the possible hazards of exposure to various forms and amounts of energy	570	use of radioactive isotopes in medicine		
				573	nuclear reactions		
				622	x-ray machines		
				623	CAT scans		
				625	nuclear reactions		
				632	nuclear energy		
				632	nuclear energy		
SI-H-A1 Inquiry/ 9-12	The students will do science by engaging impartial and full inquiries	The abilities necessary to do scientific inquiry	identifying questions and concepts that guide scientific investigations	3	inquiry starts with questions	89	what is it that moves in the case of a wave?

Correlation to Louisiana Physical Science and Inquiry Benchmarks

Foundations of Physics

Student Text and Investigation Manual

Standard #: Area/Grade Le	Standard	Topic	Benchmark	student text pg	detail	investigation pg	detail
SI-H-A2 Inquiry/ 9-12	The students will do science by engaging impartial and full inquiries	The abilities necessary to do scientific inquiry	designing and conducting scientific investigations	3	using life experiences and common sense	11	formulate a testable hypothesis
				8	formulating a hypothesis	11	recognizing and controlling variables
				9	testing ideas against scientific evidence	33	formulate a testable hypothesis
				40	defining variables	43	perform experiment
				42	control and experimental variables	48	formulate a hypothesis
				43	dependent and independent variables in graphs	65	form a hypothesis
				54	importance of changing one variable at a time in an experiment	65	investigate motion on a roller coaster
				242	finding a basic cycle of harmonic motion	67	investigate motion on a roller coaster
				251	changing the natural frequency of a stretched rubber band	79	write a hypothesis
				432	making a simple capacitor	82	plan three experiments to determine which variable affects the period of a pendulum
				456	an experiment with a wire and compass	82	determine which variable has the greatest effect
				463	building an electromagnet with wire and a nail	82	dependent and independent variables
				467	experiment demonstrating electromagnetic induction	82	design an experiment
						166	variables that affect the performance of the generator
						201	design a procedure to separate a mixture

Correlation to Louisiana Physical Science and Inquiry Benchmarks

Foundations of Physics

Student Text and Investigation Manual

Standard #: Area/Grade Le	Standard	Topic	Benchmark	student text pg	detail	investigation pg	detail
SI-H-A3 Inquiry/ 9-12	The students will do science by engaging impartial and full inquiries	The abilities necessary to do scientific inquiry	using technology and mathematics to improve investigations and communications		data tables and graphs can be created on computer or graphing calculator	4	using a timer
						5	using photogates
						9	using timer and photogates
				11	Ptolemy model vs. Copernicus model of the solar system	11	using timer and photogates
				20	converting units using dimensional analysis	13	compare prediction to measurement
				23	reading a digital timer	13	is there a trend in measurements?
				25	why accuracy and precision are important	13	create a graph
				40	making a good model	14	using a timer and photogates
				43	draw a smooth curve; do NOT simply connect the dots	16	create a graph
						16	describe the graph
				43	constructing a graph	17	using a timer and photogates
				44	graphical models	18	use a timer and photogates
				44	using a graphical model to make a prediction and checking the model's accuracy	21	use a timer and photogates
				54	constructing a graph	22	create graphs
				55	create a graph from a data table	22	how do you measured positions compare to model?
				59	determining units of acceleration	22	compare calculation with graph estimate
				290	the process of digital sound reproduction		

Correlation to Louisiana Physical Science and Inquiry Benchmarks

Foundations of Physics

Student Text and Investigation Manual

Standard #: Standard Area/Grade Le	Standard	Topic	Benchmark	student text pg	detail	investigation pg	detail
				297	frequency spectrum	23	use a timer and photogates
				383	using a multimeter to measure voltage	25	find the average time
				385	measuring current with an ammeter or multimeter	26	use a timer and photogates
				387	using a multimeter to measure resistance	29	does experiment agree with prediction?
				411	the waveform of AC electricity	37	make a graph
				412	average voltage and current of AC power	38	make a graph
						42	use a timer and photogates
						43	how does the measurement compare to your prediction?
						43	sketch four graphs
						47	use a timer and photogate
						50	use a timer and photogate
						56	create a graph
						58	use a timer and photogate
						58	find average of three trials
						63	as mechanical advantage increases what happens to length of pulled string?
						65	use a timer and photogate
						66	what does the graph tell you?

Correlation to Louisiana Physical Science and Inquiry Benchmarks

Foundations of Physics

Student Text and Investigation Manual

Standard #: Standard Area/Grade Le	Topic	Benchmark	student text pg	detail	investigation pg	detail
					66	create a graph of speed vs. position
					67	use a timer and photogate
					67	calculate average of three times
					71	calculate average work and power
					75	use a timer and photogates
					76	compare predicted mass to actual mass
					82	analyze data
					82	use a timer and photogate
					82	make three different graphs
					87	use photogate and timer to measure the period
					87	sketch a graph
					90	use a timer and photogates
					114	are there differences between your prediction and measurement?
					131	use a multimeter to measure current
					132	use a multimeter to measure voltage
					133	did battery voltage change?

Correlation to Louisiana Physical Science and Inquiry Benchmarks

Foundations of Physics

Student Text and Investigation Manual

Standard #: Area/Grade Le	Standard	Topic	Benchmark	student text pg	detail	investigation pg	detail
						135	use a multimeter to measure current and voltage
						135	graph voltage vs. current
						136	graph voltage vs. current
						139	use a multimeter
						140	use the multimeter
						151	make a graph of voltage vs. time
						160	create a graph
						163	use a multimeter
						164	use a multimeter to measure voltage
						165	use a multimeter
						166	use a photogate and timer
						167	make a graph of voltage vs. number of magnets
						169	make a current vs. voltage graph for the diode
						169	use a multimeter
						171	use a multimeter
						202	identify two sources of experimental error

Correlation to Louisiana Physical Science and Inquiry Benchmarks

Foundations of Physics

Student Text and Investigation Manual

Standard #: Area/Grade Le	Standard	Topic	Benchmark	student text pg	detail	investigation pg	detail
SI-H-A4 Inquiry/ 9-12	The students will do science by engaging impartial and full inquiries	The abilities necessary to do scientific inquiry	formulating and revising scientific explanations and models using logic and evidence	2	understanding natural laws	12	cause and effect relationships
				3	connecting cause and effect through observation	16	what do the results tell you?
				4	inquiry through observation	18	are the accelerations different?
				7	revising explanations through observation	19	does the ball accelerate?
				7	creating explanations through observation	22	uniform acceleration model
				8	forming hypotheses and testing with experiments	24	create an algebraic model
				8	refining theories based on observations	28	solve second law equation for string tension
				9	connecting cause and effect through analysis	32	develop a model that predicts acceleration
				10	putting forth ideas and then testing them	43	what would happen if...?
				43	graphs are a way of representing data	43	test your prediction
				45	recognizing patterns using graphs	43	create algebraic model
				45	recognizing patterns and cause and effect relationships	49	write a formula
				54	understanding patterns in relationships between variables	58	explain why the angular acceleration is different
						65	where does the marble move the fastest?
						80	explain your observations
						87	explain how force applied causes the response
						90	what effect does changing the tension have?

Correlation to Louisiana Physical Science and Inquiry Benchmarks

Foundations of Physics

Student Text and Investigation Manual

Standard #: Standard Area/Grade Le	Standard	Topic	Benchmark	student text pg	detail	investigation pg	detail
				56	indicate relationships between variables in graphs	90	explain why higher tension makes waves move faster
				60	creating the acceleration formula from experiments	92	explain how wind might cause big waves in water
				66	developing the formulas for a model of motion with constant acceleration	94	give an equation that describes your observations
				246	understanding graphs of harmonic motion	109	explain how the colored filters work
				282	write a formula relating velocity of wave to period and wavelength	111	do your observations support this hypothesis?
				304	comparison of wave forms from guitar sounds	132	what conclusions can you draw?
				306	explain why hearing can be damaged by loud sounds	133	analyze data and explain a rule
				307	decibel level vs. frequency graph for human hearing	147	how did A and B tapes acquire different charge?
				312	light intensity follows an inverse square law	189	Bernoulli's equation
				323	using glow-in-the-dark plastic to demonstrate photon energy levels		
				423	charge by friction		
				427	diagramming electric fields using field lines		

Correlation to Louisiana Physical Science and Inquiry Benchmarks

Foundations of Physics

Student Text and Investigation Manual

Standard #: Area/Grade Le	Standard	Topic	Benchmark	student text pg	detail	investigation pg	detail
				443	diagramming magnetic fields using magnetic field lines		
				479	current vs.voltage graph for a transistor		

Correlation to Louisiana Physical Science and Inquiry Benchmarks

Foundations of Physics

Student Text and Investigation Manual

Standard #: Area/Grade Le	Standard	Topic	Benchmark	student text pg	detail	investigation pg	detail
SI-H-A5 Inquiry/ 9-12	The students will do science by engaging impartial and full inquiries	The abilities necessary to do scientific inquiry	recognizing and analyzing alternative explanations and models	8	Comparing a theory and a natural law	12	do your results agree with hypothesis?
				11	Ptolemy model vs. Copernicus model of the solar system	13	compare prediction to measurement
				40	making a good model	22	how do you measured positions compare to model?
				44	using a graphical model to make a prediction and checking the model's accuracy	22	compare calculation with graph estimate
				136	determining formula for acceleration on a ramp	29	does experiment agree with prediction?
				188	perpetual motion machines	33	does your experiment confirm your hypothesis?
				297	frequency spectrum	43	how does the measurement compare to your prediction?
				367	speed of light did not behave as expected for Michelson and Morley	50	does your experiment provide confirmation?
				369	proof of time dilation	66	does this agree with your hypothesis?
				375	explain Thomas Young's demonstration of the wave nature of light	76	compare predicted mass to actual mass
						111	how does what you observed support the quantum theory?
						114	are there differences between your prediction and measurement?

Correlation to Louisiana Physical Science and Inquiry Benchmarks

Foundations of Physics

Student Text and Investigation Manual

Standard #: Area/Grade Le	Standard	Topic	Benchmark	student text pg	detail	investigation pg	detail
SI-H-A6 Inquiry/ 9-12	The students will do science by engaging impartial and full inquiries	The abilities necessary to do scientific inquiry	communicating and defending a scientific argument	42	writing procedures in a lab notebook helps make sure your results are repeatable	122 122 175 202	communicate your findings present your findings display information you found for your element keep detailed notes as you work
SI-H-A7 Inquiry/ 9-12	The students will do science by engaging impartial and full inquiries	The abilities necessary to do scientific inquiry	utilizing scientific safety procedures during scientific investigations	543	safety factors	79 129 131 150 159 160 176 176 185 192 206	safety note safety precautions safety precautions safety note safety note electromagnet safety safety note heat safety safety tip gas pressure safety note acid safety

Correlation to Louisiana Physical Science and Inquiry Benchmarks

Foundations of Physics

Student Text and Investigation Manual

Standard #: Area/Grade Le	Standard	Topic	Benchmark	student text pg	detail	investigation pg	detail
SI-H-B1 Inquiry/ 9-12	The students will do science by engaging impartial and full inquiries	Understanding scientific inquiry	communicating that scientists usually base their investigations on existing models, explanation, and theories	7	developing models to explain observations	12	do your results agree with hypothesis?
				8	Comparing a theory and a natural law	22	model for uniform accelerated motion
				8	testing hypotheses with experiments	33	does your experiment confirm your hypothesis?
				40	creating useful models	50	does your experiment provide confirmation?
				101	a model for friction	66	does this agree with your hypothesis?
				102	a model for static friction	111	how does what you observed support the quantum theory?
				136	determining formula for acceleration on a ramp		
				188	perpetual motion machines		
				330	optics and optical instruments		
				367	speed of light did not behave as expected for Michelson and Morley		
				369	proof of time dilation		
				375	explain Thomas Young's demonstration of the wave nature of light		
				492	the binary number system and its use in computers		

Correlation to Louisiana Physical Science and Inquiry Benchmarks

Foundations of Physics

Student Text and Investigation Manual

Standard #: Area/Grade Le	Standard	Topic	Benchmark	student text pg	detail	investigation pg	detail
SI-H-B2 Inquiry/ 9-12	The students will do science by engaging impartial and full inquiries	Understanding scientific inquiry	communicating that scientists conduct investigations for many reasons, such as exploration of new areas, discovery of new aspects of the new world, confirmation of prior investigations, evaluation of current theories, and comparison of models and theories	4	learning about natural laws through inquiry and observation	80	explain the physics of a diver's somersaults
				13	medical and health professions use physics	92	how does sound get through tiny cracks?
				19	problems in the real world use both metric and English units	126	explain how polarizing sunglasses work
				52	Dr. Harold Edgerton and strobe photography		
				52	strobe photography		
				73	antilock braking systems		
				80	applications of Newton's first law		
				90	examples of Newton's third law in the real world		
				91	biomechanics application		
				104	reducing friction and hovercraft and maglev trains		
				105	friction is useful for brakes and tires		
				109	jack-in-the-box uses a spring		
				112	design of structures		
				118	examples of scalars		
				130	kicked soccer ball acts as a projectile launched at an angle		

Correlation to Louisiana Physical Science and Inquiry Benchmarks

Foundations of Physics

Student Text and Investigation Manual

Standard #: Standard Area/Grade Le	Standard	Topic	Benchmark	student text pg	detail	investigation pg	detail
				131	hang time		
				133	example of gymnast for forces applied at an angle		
				138	robot navigation application		
				139	inertial navigation system		
				144	examples of objects moving in a circle		
				147	speedometers and odometers		
				149	centripetal force at the amusement park		
				154	the orbits of planets and comets		
				155	satellite motion application		
				155	first artificial human-made Earth satellite was Sputnik		
				156	HEO and geostationary orbit		
				167	SUV rollovers and center of gravity		
				172	bicycle physics application		
				178	Great Pyramid of Giza and simple machines		
				211	output power from plants is input power for animals		

Correlation to Louisiana Physical Science and Inquiry Benchmarks

Foundations of Physics

Student Text and Investigation Manual

Standard #: Standard Area/Grade Le	Standard	Topic	Benchmark	student text pg	detail	investigation pg	detail
				227	accident reconstruction		
				232	angular momentum of skater spinning and diver		
				234	gyroscopes and angular momentum		
				243	examples of oscillators		
				250	why airplanes have tails		
				257	Pierre and Jacques Curie and the piezoelectric effect		
				259	wing-beat cycle of a hummingbird		
				262	examples of waves		
				269	wave motion and equilibrium		
				290	technological breakthrough of sound recording		
				290	stereo sound		
				299	understanding human hearing		
				310	past theories of light		
				323	glow-in-the-dark plastic		
				325	history of printing		
				337	rainbows are an example of dispersion		
				347	the compound microscope		

Correlation to Louisiana Physical Science and Inquiry Benchmarks

Foundations of Physics

Student Text and Investigation Manual

Standard #: Standard Area/Grade Le	Standard	Topic	Benchmark	student text pg	detail	investigation pg	detail
				348	the usefulness of recorded images		
				349	the telescope		
				361	Young's double-slit experiment		
				365	polarized sunglasses and LCD computer screens		
				368	Einstein's thinking revolutionized physics		
				390	breakdown voltage and lightning		
				398	holiday lights wired in series		
				401	why aren't birds electrocuted?		
				410	paying for electricity		
				413	wiring application		
				413	circuits in your house		
				418	charge of everyday objects		
				430	almost all electric appliances use capacitors		
				433	cameras use capacitors to supply energy for flash bulbs		
				440	scientists have never found single magnetic poles		

Correlation to Louisiana Physical Science and Inquiry Benchmarks

Foundations of Physics

Student Text and Investigation Manual

Standard #: Standard Area/Grade Le	Standard	Topic	Benchmark	student text pg	detail	investigation pg	detail
				447	discovering and using magnetism		
				448	how does a compass work?		
				458	where coils are used		
				462	electromagnet in a toaster		
				501	search for elements and alchemy		
				527	windchill factor		
				561	the Alvin research submarine		
				568	understanding how gravity works inside atoms		
				575	discovery of helium		
				583	the meaning of the uncertainty principle		
				608	how engines work		
				621	exposure to UV radiation		
				625	turning lead into gold		
				637	areas of active research in physics		
				640	unresolved questions of history of universe		
				641	research on future of the universe		
				646	a standard model for particle physics		

Correlation to Louisiana Physical Science and Inquiry Benchmarks

Foundations of Physics

Student Text and Investigation Manual

Standard #: Area/Grade Le	Standard	Topic	Benchmark	student text pg	detail	investigation pg	detail
SI-H-B3 Inquiry/ 9-12	The students will do science by engaging impartial and full inquiries	Understanding scientific inquiry	communicating that scientists rely on technology to enhance the gathering and manipulation of data	12	all technology is based on fundamental laws of physics		
				31	use of nanotechnology		
				51	analyzing motion with video and strobe photography		
				72	antilock brakes application		
				112	relationship between science and engineering and technology		
				172	bicycle physics application		
				196	hydroelectric power application		
				235	jet engines application		
				243	oscillators are used in communications and music and clocks		
				257	quartz crystals application		
				263	waves can carry information		
				280	microwave ovens application		
				325	the printing press		
				369	technological advances have allowed discovery of the expanding universe		
				372	holography application		

Correlation to Louisiana Physical Science and Inquiry Benchmarks

Foundations of Physics

Student Text and Investigation Manual

Standard #: Standard Area/Grade Le	Standard	Topic	Benchmark	student text pg	detail	investigation pg	detail
				392	hybrid gas/electric cars application		
				413	wiring application		
				429	electron beam accelerators		
				434	how television works application		
				451	MRI application		
				472	maglev train application		
				473	how magplanes levitate		
				492	computers and electronic addition of numbers application		
				516	refrigerator application		
				534	energy-efficient building application		
				560	deep water submarine Alvin application		
				585	laser application		
				615	smoke detectors		
				623	creation of CAT scans		
				631	nuclear power application		

Correlation to Louisiana Physical Science and Inquiry Benchmarks

Foundations of Physics

Student Text and Investigation Manual

Standard #: Area/Grade Le	Standard	Topic	Benchmark	student text pg	detail	investigation pg	detail
SI-H-B4 Inquiry/ 9-12	The students will do science by engaging impartial and full inquiries	Understanding scientific inquiry	analyzing a proposed explanation of scientific evidence according to the following criteria: following a logical structure, following rules of evidence, allowing for questions and modifications, and basing it on historical and current scientific knowledge	52	Dr. Harold Edgerton and strobe photography		
				62	acceleration of cars		
				91	biomechanics application		
				92	applications of biomechanics		
				112	impact of technology		
				188	perpetual motion machines		
				292	sound in space		
				372	holograms and science fiction special effects		
				576	ôtransporter beamsö		
				621	UV radiation and thinning of ozone layer		
				641	research on future of the universe		

Correlation to Louisiana Physical Science and Inquiry Benchmarks

Foundations of Physics

Student Text and Investigation Manual

Standard #: Area/Grade Le	Standard	Topic	Benchmark	student text pg	detail	investigation pg	detail
SI-H-B5 Inquiry/ 9-12	The students will do science by engaging impartial and full inquiries	Understanding scientific inquiry	communicating that the results of scientific inquiry, new knowledge, and methods emerge from different types of investigations and public communication among scientists	42	writing procedures in a lab notebook helps make sure your results are repeatable	122	communicate your findings
				367	Einstein and theory of special relativity		
				560	deep water submarine Alvin application		
				621	UV radiation and thinning of ozone layer		
				641	research on future of the universe		