Correlation to Wisconsin Model Academic Standards for Science

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
A.12.01 Science Connections	by the end of grade 12		Apply the underlying themes of science to develop defensible visions of the future	20	how will speed change?	21	construct reasonable explanation based on data
				24	predicting speed from a graph	35	study data and determine importance of height on speed of marble
				42	predict the speed of a car	45	analyze data and explain a rule
				414	effect of electrical generating facilities on dissolved oxygen in water	76	use data to predict best string length for a pendulum clock
				437	effects of acid rain on natural environments	121	use graph to predict mass of six objects
				443	impact of increased CO2 in oceans	156	make predictions about solubility
				471	nitrogen cycle	178	actions to take to improve water quality
				479	effects of CFC's on the ozone layer	178	predict the quality of surface water to be tested and justify your answer
				481	global warming	201	predicting areas with high ozone concentration based on your data
				482	effects of burning fossil fuels	204	predicting what would happen if you place your ice/water test tube into a hot cup or a cold cup
				495	global wind patterns	230	predicting plate movement over 50 million years and the resultant land features
				502	cold fronts		
				502	effects of moving air masses		
				503	jet streams		
				503	warm fronts		
				515	permafrost		
				528	predicting what Earth might look like in 50 million years		

Correlation to Wisconsin Model Academic Standards for Science

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
				534	land features resulting from divergent plate boundaries	239	estimating the number of meteor collisions on Earth during the last 3.5 billion years
				535	resulting land features from subduction	242	predicting the results of the crystal-growing experiment
				536	land features resulting from transform plate boundaries		
				547	predict separation of North America and Europe in 75 million years		
				548	predict effects of divergent plate boundaries on Great Rift Valley		
				563	mountain-building		
				564	changes in land features due to erosion		
				566	effect of glaciers on land		

Correlation to Wisconsin Model Academic Standards for Science

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
A.12.02 Science Connections	by the end of grade 12		Show how conflicting assumptions about science themes lead to different opinions and decisions about evolution, health, population, longevity, education,…	10	process of reviewing hypothesis explained	6	asking questions and learning about natural world
				20	explain your reasoning	9	present conclusions to the class
				73	impact of Da Vinci's work	35	what evidence is there in support of your hypothesis?
				473	why do ears pop	37	describe the flow of energy based on experimental graph
				504	meteorologists use atmospheric pressure data to understand movement of weather systems	39	analyze energy transformations in different scenarios
				521	relative dating and modern geology based on Steno's theories	39	review energy theory in context of everyday scenarios
				524	Kelvin's calculations of Earth's age	39	critique group's explanation of energy transformations
				528	theory of plate tectonics	39	give a brief presentation to the class
				529	critiquing Wegener's theories of continental drift	47	present and defend an explanation
				563	Darwin's theories of the Andes formation	77	compare law of conservation of energy to motion of pendulum
				566	what causes ice ages	77	show how energy loss data could be applied to designing a real clock
				611	theories of origin of the moon		
				612	early theories of the solar system		
				647	Big Bang theory		
				648	evidence for Big Bang theory		

Correlation to Wisconsin Model Academic Standards for Science

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
						145	present findings and methods used
						151	review your hypothesis
						151	present results to the class
						171	did you prove or disprove your hypothesis?
						215	the food paradox of the oceans

Correlation to Wisconsin Model Academic Standards for Science

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
A.12.03 Science Connections	by the end of grade 12		Give examples that show how partial systems, models, and explanations are used to give quick and reasonable solutions that are accurate enough for basic needs	20 24 42	how will speed change? predicting speed from a graph predict the speed of a car	21 35 45 76 121 156 201 204 239 242	construct reasonable explanation based on data study data and determine importance of height on speed of marble analyze data and explain a rule use data to predict best string length for a pendulum clock use graph to predict mass of six objects make predictions about solubility predicting areas with high ozone concentration based on your data predicting what would happen if you place your ice/water test tube into a hot cup or a cold cup estimating the number of meteor collisions on Earth during the last 3.5 billion years predicting the results of the crystal-growing experiment

Correlation to Wisconsin Model Academic Standards for Science

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
A.12.04 Science Connections	by the end of grade 12		Construct arguments that show how conflicting models and explanations of events can start with similar evidence	20	explain your reasoning	9 21 35 37 39 45 47 145 151	present conclusions to the class construct reasonable explanation based on data study data and determine importance of height on speed of marble describe the flow of energy based on experimental graph give a brief presentation to the class analyze data and explain a rule present and defend an explanation present findings and methods used present results to the class

Correlation to Wisconsin Model Academic Standards for Science

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
A.12.05 Science Connections	by the end of grade 12		Show how the ideas and themes of science can be used to make real-life decisions about careers, work places, life-styles, and use of resources	20	explain your reasoning	6	asking questions and learning about natural world
				23	why make models?	9	present conclusions to the class
				24	scientific models	16	2nd law
				24	what is a scientific model?	20	force and motion with car and ramp
				34	Newton's research impacted mathematics	37	describe the flow of energy based on experimental graph
				48	Newton's laws explained and applied	39	give a brief presentation to the class
				50	Newton's second law applied	39	study energy transformations in daily life scenarios
				58	Newton on a skateboard	47	present and defend an explanation
				73	impact of technology	71	testing a motor for performance
				78	describe a problem that would be solved by an engineer	71	which motor gave the highest speed and why?
				120	circuits in your house	71	did draining the batteries affect motor speed?
				135	circuit board explained	145	present findings and methods used
				214	ultrasound technology	151	present results to the class
				214	ultrasound technology	163	research how trees offset accumulation of CO2
				220	voice recognition technology		
				220	voice recognition technology		
				294	invention of Kevlar		
				294	invention of Kevlar		
				333	problems with disposing of plastics		

Correlation to Wisconsin Model Academic Standards for Science

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
				355	recycling tires	163	consider a vehicle's fuel economy
				356	recycling discarded tires	163	evaluating choice of favorite car
				364	petroleum	163	research how trees offset accumulation of CO<subscript>2</>
				368	limiting reactants	163	can trees compensate for manmade CO2 from vehicles and industry?
				379	research environmental impact of fuel cells	163	too much CO2
				379	research fuel cells	163	economic impact of end-product of combustion reaction
				379	research economic impact of fuel cells	164	perform water quality tests
				379	research fuel cells	178	water quality specialist
				379	hydrogen-powered cars and the environment	178	predict the quality of surface water to be tested and justify your answer
				392	storage of nuclear waste	178	actions to take to improve water quality
				395	fossil fuels	178	predict the quality of surface water to be tested and justify your answer
				400	economic impact of reducing air pollution	178	wise use of water supply
				400	economic impact of pollution		
				400	clean air act of 1970		
				400	problems caused by airborne pollutants		
				411	effects of PCB's in Great Lakes		
				414	effect of electrical generating facilities on dissolved oxygen in water		

Correlation to Wisconsin Model Academic Standards for Science

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
				429	governments managing water resources	179	address what you can do to maintain or improve the water quality at the test site
				432	water cycle and conservation	179	researching and preparing for a field trip to test surface water
				433	wise use of water	179	maintaining water supply quality
				433	The Clean Water Act	180	perform water quality tests
				433	the clean water act	180	save water for houseplants
				433	water quality standards	182	the effects of acid rain on organisms in aquatic environments
				434	importance of water analysis	182	investigate effect of acid rain on microorganisms
				435	water quality testing	182	the effects of acid rain on organisms in aquatic environments
				435	water usage and quality	201	suggesting ways that ozone concentrations could be reduced
				436	water quality testing	201	research the causes of ozone in the lower atmosphere
				436	effect of excess nitrates on environment	202	modeling the effect of greenhouse gases on Earth's temperature
				437	effects of acid rain on natural environments		
				437	acid rain		
				437	acid rain		
				437	effects of acid rain on the soil		
				437	acid rain explained		
				438	causes and health effects of acid rain		
				439	catalytic converters and scrubbing reduce acid rain		

Correlation to Wisconsin Model Academic Standards for Science

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
				443	impact of increased CO2 on oceans	204	connecting the latent heat investigation to Earth
				443	impact of increased CO2 on oceans	212	modeling underwater rivers and waterfalls and springs
				443	impact of increased CO2 in oceans	215	the food paradox of the oceans
				444	pollution and the ocean food chain	218	understanding Doppler radar
				445	pollution and the ocean food chain	222	zoo exhibit designers
				448	research economic impact of producing gases that cause acid rain	232	construct a model that simulates an earthquake
				448	how is the government addressing the problem of acid rain?	258	setting up a scale model of the solar system
				448	research the issue of acid rain		
				448	is acid rain a problem in your community?		
				448	what is the history of your community's water supply and treatment		
				452	civil engineers and bridge design		
				452	balloons expands or contracts due to thermal expansion		

Correlation to Wisconsin Model Academic Standards for Science

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
				454	temperature vs. thermal energy for a cup or pot of soup		
				457	engineers design better products when they know specific heat		
				461	understanding thermal energy through cocoa example		
				465	examples of reflectors and absorbers		
				471	nitrogen cycle		
				473	why do ears pop		
				473	why do ears pop		
				476	atmospheric pressure in Denver		
				479	London Agreement of 1991		
				479	effects of CFC's on the ozone layer		
				481	greenhouse conditions on Earth		
				482	effects of burning fossil fuels		
				483	hydrogen powered cars		
				483	should governments enforce changes for lowering greenhouse gas levels		

Correlation to Wisconsin Model Academic Standards for Science

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
				485	research the density of Venus' and Mars' atmospheres		
				485	computer modeling to predict greenhouse effects		
				485	Earth's internal energy		
				490	using the North Star to estimate your latitude		
				494	modeling air currents		
				504	temperature inversion		
				504	meteorologists use atmospheric pressure data to understand movement of weather systems		
				509	how do animals survive in the desert		
				515	permafrost		
				518	create a model (#1)		
				524	model of Earth's history		
				533	modeling plate boundaries		
				536	analogy of plate movements		
				537	earthquakes and plate tectonics		
				538	what we can learn from seismographs		

Correlation to Wisconsin Model Academic Standards for Science

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
				542	studying seismic waves leads to information used in oil and gas exploration		
				542	using seismic waves for oil and gas exploration		
				542	seismologists		
				544	understanding earhquakes allows engineers to design safer buildings		
				545	predicting tsunamis		
				548	describe the work of a geologist and paleontologist and seismologist		
				552	geologic basis for volcanic eruptions		
				552	formation of magma in Earth's mantle		
				553	where volcanic activity occurs		
				555	geologic basis for shield volcanoes		
				556	geologic basis for stratovolcanoes		
				557	geologic bases for cinder cone volcanoes		
				560	mineral deposits and diamonds		
				561	volcanologists		

Correlation to Wisconsin Model Academic Standards for Science

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
				568	environmental impact of urban sprawl		
				576	rock cycle model		
				599	Newton's first law of motion and the space shuttle		
				614	solar system modeling		
				615	greenhouse conditions on Venus		
				624	model of the sun's anatomy		
				648	evidence for Big Bang theory		

Correlation to Wisconsin Model Academic Standards for Science

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
A.12.06 Science Connections	by the end of grade 12		Identify and, using evidence learned or discovered, replace inaccurate personal models and explanations of science-related events	10	process of reviewing hypothesis explained	6	asking questions and learning about natural world
				58	Newton on a skateboard	21	construct reasonable explanation based on data
				78	describe a problem that would be solved by an engineer	35	what evidence is there in support of your hypothesis?
				120	circuits in your house	35	study data and determine importance of height on speed of marble
				452	balloons expands or contracts due to thermal expansion	39	analyze energy transformations in different scenarios
				454	temperature vs. thermal energy for a cup or pot of soup	39	study energy transformations in daily life scenarios
				461	understanding thermal energy through cocoa example	39	review energy theory in context of everyday scenarios
				465	examples of reflectors and absorbers	39	critique group's explanation of energy transformations
				473	why do ears pop	45	analyze data and explain a rule
				473	why do ears pop	77	show how energy loss data could be applied to designing a real clock
				476	atmospheric pressure in Denver	77	compare law of conservation of energy to motion of pendulum
				490	using the North Star to estimate your latitude		
				504	meteorologists use atmospheric pressure data to understand movement of weather systems		

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Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
				509	how do animals survive in the desert	151	review your hypothesis
				521	relative dating and modern geology based on Steno's theories	151	does your experiment agree with law of conservation of mass?
				524	Kelvin's calculations of Earth's age	163	evaluating choice of favorite car
				528	theory of plate tectonics	171	did you prove or disprove your hypothesis?
				529	critiquing Wegener's theories of continental drift	179	researching and preparing for a field trip to test surface water
				536	analogy of plate movements	201	suggesting ways that ozone concentrations could be reduced
				563	Darwin's theories of the Andes formation	204	connecting the latent heat investigation to Earth
				566	what causes ice ages	215	the food paradox of the oceans
				611	theories of origin of the moon	218	understanding Doppler radar
				612	early theories of the solar system	231	evaluating your completed bathymetric map
				647	Big Bang theory	247	evaluate your ability to interpret rock formations
				648	evidence for Big Bang theory		

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Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
A.12.07 Science Connections	by the end of grade 12		Re-examine the evidence and reasoning that led to conclusions drawn from investigations, using the science themes	10	process of reviewing hypothesis explained	6	predict which car will move fastest
				20	how will speed change?	7	test the effect of one other variable
				24	predicting speed from a graph	9	devise a hypothesis
				42	predict the speed of a car	21	construct reasonable explanation based on data
				521	relative dating and modern geology based on Steno's theories	27	think about the variables
				524	Kelvin's calculations of Earth's age	34	where does the marble move the fastest?
				528	theory of plate tectonics	35	what evidence is there in support of your hypothesis?
				529	critiquing Wegener's theories of continental drift	35	study data and determine importance of height on speed of marble
				563	Darwin's theories of the Andes formation	39	analyze energy transformations in different scenarios
				566	what causes ice ages	39	review energy theory in context of everyday scenarios
				611	theories of origin of the moon	39	critique group's explanation of energy transformations
				612	early theories of the solar system	43	how did A and B tapes acquire different charge?
				647	Big Bang theory	45	analyze data and explain a rule

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Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
						75	investigate variables that affect the period of a pendulum
						76	use data to predict best string length for a pendulum clock
						77	show how energy loss data could be applied to designing a real clock
						77	compare law of conservation of energy to motion of pendulum
						121	use graph to predict mass of six objects
						151	perform the experiment you designed
						151	does your experiment agree with law of conservation of mass?
						151	explain how hypothesis compares to results
						151	review your hypothesis
						151	do the data support the hypothesis
						156	make predictions about solubility
						157	add new rules to list based on findings
						170	devise hypothesis and explain

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Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
						171	did you prove or disprove your hypothesis?
						171	what was happening at molecular level?
						197	evaluating your aneroid barometer design
						201	predicting areas with high ozone concentration based on your data
						204	predicting what would happen if you place your ice/water test tube into a hot cup or a cold cup
						208	testing hypothesis of why seasons occur against your observations in the investigation
						231	evaluating your completed bathymetric map
						239	estimating the number of meteor collisions on Earth during the last 3.5 billion years
						242	predicting the results of the crystal-growing experiment
						247	evaluate your ability to interpret rock formations

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Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
B.12.01 Nature of Science	by the end of grade 12		Show how cultures and individuals have contributed to the development of major ideas in the earth and space, life and environmental, and physical sciences	34	Aristotle vs. Newton	198	contributions of Schönbein
				45	Newton's Laws of Motion		
				54	Newton and the force of gravity		
				105	Benjamin Franklin		
				107	Charles-Augustin Coulomb		
				312	contributions of Fermi		
				320	the quests of alchemists		
				391	scientific discovery and the atomic age		
				393	contributions of Marie and Pierre Curie		
				583	history of calendars		
				585	counting the days in a year		
				586	the history of clocks and the division of time		
				589	ancient beliefs about solar eclipses		
				594	history of the telescope		
				611	historical theories of the origin of the moon		
				612	historical theories about the solar system		
				621	historical theories of which objects were planets		

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Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
				647	the Big Bang theory of the origin of the universe		

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Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
B.12.02 Nature of Science	by the end of grade 12		Identify the cultural conditions that are usually present during great periods of discovery, scientific development, and invention	73	impact of Da Vinci's work	6	asking questions and learning about natural world
				320	the quests of alchemists	198	contributions of Schönbein
				391	scientific discovery and the atomic age	215	the food paradox of the oceans
				473	why do ears pop		
				504	meteorologists use atmospheric pressure data to understand movement of weather systems		
				583	history of calendars		
				585	counting the days in a year		
				586	the history of clocks and the division of time		
				589	ancient beliefs about solar eclipses		
				594	history of the telescope		
				611	historical theories of the origin of the moon		
				612	historical theories about the solar system		
				621	historical theories of which objects were planets		
				647	the Big Bang theory of the origin of the universe		
				648	evidence for Big Bang theory		

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Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
B.12.03 Nature of Science	by the end of grade 12		Relate the major themes of science to human progress in understanding science and the world	23	why make models?	70	using engineering design cycle
				24	scientific models	178	water quality specialist
				24	what is a scientific model?	198	contributions of Schönbein
				34	Aristotle vs. Newton	202	modeling the effect of greenhouse gases on Earth's temperature
				45	Newton's Principia	212	modeling underwater rivers and waterfalls and springs
				45	Newton's Laws of Motion	222	zoo exhibit designers
				54	Newton and the force of gravity	232	construct a model that simulates an earthquake
				55	Newton and the apple legend	258	setting up a scale model of the solar system
				73	Leonardo DaVinci		
				73	impact of Da Vinci's work		
				73	relationship between science and technology		
				86	James Watt		
				105	Benjamin Franklin		
				107	Charles-Augustin Coulomb		
				110	research Franklin's electricity experiments		
				115	Volta's batteries		
				131	Georg Ohm's work with circuits		
				160	Faraday's contributions		
				214	ultrasound technology		

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Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
				220	voice recognition technology		
				294	invention of Kevlar		
				312	contributions of Fermi		
				312	Dalton's contributions		
				320	the quests of alchemists		
				321	contributions of Mendeleev		
				321	Mendeleev's periodic table		
				332	plate tectonic history		
				332	Linus Pauling and electronegativities		
				363	Antoine Lavoisier		
				370	research Lavoisier's contributions		
				391	scientific discovery and the atomic age		
				393	accomplishments of Marie Curie		
				393	Marie and Pierre Curie		
				393	contributions of Marie and Pierre Curie		
				400	clean air act of 1970		
				429	governments managing water resources		
				433	the clean water act		

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Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
				439	catalytic converters and scrubbing reduce acid rain		
				448	is acid rain a problem in your community?		
				448	what is the history of your community's water supply and treatment		
				448	how is the government addressing the problem of acid rain?		
				452	civil engineers and bridge design		
				455	contributions of Joule		
				457	Joseph Black		
				457	engineers design better products when they know specific heat		
				479	London Agreement of 1991		
				483	hydrogen powered cars		
				483	should governments enforce changes for lowering greenhouse gas levels		
				485	computer modeling to predict greenhouse effects		
				494	modeling air currents		
				518	create a model (#1)		

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Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
				524	model of Earth's history		
				528	development of plate tectonic theory		
				529	continental drift theory		
				529	continental drift theory history		
				530	using echo sounders to map the sea floor		
				533	modeling plate boundaries		
				538	what we can learn from seismographs		
				542	seismologists		
				544	understanding earhquakes allows engineers to design safer buildings		
				561	volcanologists		
				576	rock cycle model		
				583	history of calendars		
				585	counting the days in a year		
				586	the history of clocks and the division of time		
				589	ancient beliefs about solar eclipses		
				594	history of the telescope		
				597	using satellite technology		

Correlation to Wisconsin Model Academic Standards for Science

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
				599	space shuttle		
				612	changing ideas about the solar system		
				614	solar system modeling		
				624	model of the sun's anatomy		
				648	development of Big Bang theory		

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Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
B.12.04 Nature of Science	by the end of grade 12		Show how basic research and applied research contribute to new discoveries, inventions, and applications	23	why make models?	6	asking questions and learning about natural world
				24	what is a scientific model?	70	using engineering design cycle
				24	scientific models	130	investigate Rutherford's gold foil experiment
				34	Newton's research impacted mathematics	178	water quality specialist
				34	Aristotle vs. Newton	202	modeling the effect of greenhouse gases on Earth's temperature
				45	Newton's Principia	212	modeling underwater rivers and waterfalls and springs
				45	Newton's Laws of Motion	215	the food paradox of the oceans
				54	Newton and the force of gravity	222	zoo exhibit designers
				55	Newton and the apple legend	232	construct a model that simulates an earthquake
				73	Leonardo DaVinci	258	setting up a scale model of the solar system
				73	relationship between science and technology		
				73	impact of Da Vinci's work		
				73	impact of technology		
				86	James Watt		
				105	Benjamin Franklin		
				107	Charles-Augustin Coulomb		
				110	research Franklin's electricity experiments		
				115	Volta's batteries		
				131	Georg Ohm's work with circuits		

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Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
				160	Faraday's contributions		
				214	ultrasound technology		
				220	voice recognition technology		
				294	invention of Kevlar		
				312	Dalton's contributions		
				312	contributions of Fermi		
				313	development of atomic theory		
				321	contributions of Mendeleev		
				321	Mendeleev's periodic table		
				324	research and create a poster to illustrate development of atomic model		
				332	plate tectonic history		
				332	Linus Pauling and electronegativities		
				363	Antoine Lavoisier		
				370	research Lavoisier's contributions		
				393	Marie and Pierre Curie		
				393	accomplishments of Marie Curie		
				393	contributions of Marie and Pierre Curie		

Correlation to Wisconsin Model Academic Standards for Science

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
				395	impact of industrial revolution		
				400	clean air act of 1970		
				429	governments managing water resources		
				433	the clean water act		
				439	catalytic converters and scrubbing reduce acid rain		
				443	impact of carbon dioxide on life in the oceans		
				448	what is the history of your community's water supply and treatment		
				448	is acid rain a problem in your community?		
				448	how is the government addressing the problem of acid rain?		
				452	civil engineers and bridge design		
				455	contributions of Joule		
				457	Joseph Black		
				457	engineers design better products when they know specific heat		
				473	why do ears pop		
				479	scientists detect loss of ozone in atmosphere		

Correlation to Wisconsin Model Academic Standards for Science

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
				479	London Agreement of 1991		
				482	effects of global warming discovered		
				483	hydrogen powered cars		
				483	should governments enforce changes for lowering greenhouse gas levels		
				485	computer modeling to predict greenhouse effects		
				494	modeling air currents		
				496	tracking ocean currents		
				504	meteorologists use atmospheric pressure data to understand movement of weather systems		
				511	trees and global climate		
				518	create a model (#1)		
				524	model of Earth's history		
				528	development of plate tectonic theory		
				529	continental drift theory		
				529	continental drift theory history		
				530	using echo sounders to map the sea floor		

Correlation to Wisconsin Model Academic Standards for Science

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
				533	modeling plate boundaries		
				538	what we can learn from seismographs		
				542	seismologists		
				542	studying seismic waves leads to information used in oil and gas exploration		
				544	understanding earhquakes allows engineers to design safer buildings		
				545	predicting tsunamis		
				548	describe the work of a geologist and paleontologist and seismologist		
				561	volcanologists		
				568	urban sprawl		
				576	rock cycle model		
				597	using satellite technology		
				599	space shuttle		
				612	changing ideas about the solar system		
				614	solar system modeling		
				624	model of the sun's anatomy		
				648	evidence for Big Bang theory		

Correlation to Wisconsin Model Academic Standards for Science

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
				648	development of Big Bang theory		

Correlation to Wisconsin Model Academic Standards for Science

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
B.12.05 Nature of Science	by the end of grade 12		Explain how science is based on assumptions about the natural world and themes that describe the natural world	20	how will speed change?	6	asking questions and learning about natural world
				24	interpretations of patterns in data	13	graph distance vs. time
				24	predicting speed from a graph	15	construct a quantitative graphical model
				24	making a graph	15	interpret a speed vs. time graph
				26	creating graphs	21	construct reasonable explanation based on data
				27	reading a graph	35	study data and determine importance of height on speed of marble
				41	make a graph	37	organize data into a graph of speed vs. height
				42	predict the speed of a car	39	study energy transformations in daily life scenarios
				58	Newton on a skateboard	45	analyze data and explain a rule
				73	relationship between science and technology	51	graph voltage vs. current
				78	analyze lever diagram	70	using engineering design cycle
				78	describe a problem that would be solved by an engineer	76	use data to predict best string length for a pendulum clock
				120	circuits in your house	121	graph mass vs. volume
				452	balloons expands or contracts due to thermal expansion	121	use graph to predict mass of six objects
				454	temperature vs. thermal energy for a cup or pot of soup		
				461	understanding thermal energy through cocoa example		

Correlation to Wisconsin Model Academic Standards for Science

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
				465	examples of reflectors and absorbers	147	organize observations into a category table
				473	why do ears pop	151	does your experiment agree with law of conservation of mass?
				473	why do ears pop	156	make predictions about solubility
				476	atmospheric pressure at various altitudes graph	179	researching and preparing for a field trip to test surface water
				476	atmospheric pressure in Denver	185	constructing a graph of drops of acid vs pH
				490	using the North Star to estimate your latitude	187	construct a graphical model
				504	meteorologists use atmospheric pressure data to understand movement of weather systems	189	construct a temperature vs. time graph
				509	how do animals survive in the desert	197	constructing a graph from atmospheric pressure data
				530	using echo sounders to map the sea floor	201	predicting areas with high ozone concentration based on your data
				536	analogy of plate movements	201	suggesting ways that ozone concentrations could be reduced
				597	using satellite technology	203	graphing water and ice temperature readings
				599	space shuttle	204	connecting the latent heat investigation to Earth
				645	apparent brightness vs. distance graph		
				648	evidence for Big Bang theory		
				651	use the diagram to answer the questions (#2)		

Correlation to Wisconsin Model Academic Standards for Science

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
				651	arrange the items in the table (#3)	204	predicting what would happen if you place your ice/water test tube into a hot cup or a cold cup
				651	use the diagram to answer the questions (#4)	206	constructing a graph of time vs. temperature
						215	the food paradox of the oceans
						217	determining relationship between temperature of the atmosphere and relative humidity
						218	interpreting Doppler radar images
						218	understanding Doppler radar
						231	evaluating your completed bathymetric map
						237	finding a pattern of volcanoes on a bathymetric map
						239	estimating the number of meteor collisions on Earth during the last 3.5 billion years
						242	predicting the results of the crystal-growing experiment
						247	evaluate your ability to interpret rock formations

Correlation to Wisconsin Model Academic Standards for Science

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
C.12.01 Science Inquiry	by the end of grade 12		When studying science content, ask questions suggested by current social issues, scientific literature, and observations of phenomena, build hypotheses that might answer some of these questions, …	135	circuit board explained	52	the cost of using electrical appliances
				172	generating electric power	163	research how trees offset accumulation of CO2
				333	problems with disposing of plastics	163	economic impact of end-product of combustion reaction
				355	recycling tires	163	too much CO2
				356	recycling discarded tires	163	consider a vehicle's fuel economy
				364	petroleum	163	can trees compensate for manmade CO2 from vehicles and industry?
				368	limiting reactants	163	research how trees offset accumulation of CO<subscript>2</>
				379	hydrogen-powered cars and the environment	164	perform water quality tests
				379	research fuel cells	178	wise use of water supply
				379	research environmental impact of fuel cells	179	maintaining water supply quality
				379	research fuel cells	180	perform water quality tests
				379	research economic impact of fuel cells	180	save water for houseplants
				391	nuclear vs. fossil fuels	182	investigate effect of acid rain on microorganisms
				391	impact of nuclear energy	201	research the causes of ozone in the lower atmosphere
				392	storage of nuclear waste		
				395	fossil fuels		
				400	economic impact of pollution		
				400	problems caused by airborne pollutants		
				400	reducing pollution		

Correlation to Wisconsin Model Academic Standards for Science

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
				400	economic impact of reducing air pollution	262	solar energy can be used to generate electricity without producing pollution
				414	effect of electrical generating facilities on dissolved oxygen in water	262	determine the efficiency of a photovoltaic cell
				414	environmental impact of electrical generating facilities		
				432	water cycle and conservation		
				433	wise use of water		
				435	water usage and quality		
				436	effect of excess nitrates on environment		
				437	acid rain explained		
				438	impact of using fossil fuels		
				448	research economic impact of producing gases that cause acid rain		
				448	research the issue of acid rain		
				560	description of geothermal energy		
				599	how the space shuttle works		
				627	using photovoltaic cells		
				627	the efficiency of photovoltaic cells		

Correlation to Wisconsin Model Academic Standards for Science

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
C.12.02 Science Inquiry	by the end of grade 12		Identify issues from an area of science study, write questions that could be investigated, review previous research on these questions, and design and conduct responsible and safe investigations to help answer the questions	7	experimentation begins with a question	4	difference between precise and accurate data
				9	steps in the scientific method	6	predict which car will move fastest
				10	forming a hypothesis	6	electronic timer and release technique
				10	the research question and hypothesis	6	how do we ask questions and get answers from nature?
				10	process of reviewing hypothesis explained	7	doing a controlled experiment
				11	control and experimental variables	7	test the effect of one other variable
				12	importance of reliable and accurate data collection	7	design your own experiment
				19	design your own experiment	7	record time interval
				19	design your own experiment	7	perform your own experiment
				19	which group did the best experiment?	7	compare results with hypothesis
				20	how will speed change?	9	collect speed data
				20	finding variability in data	9	design three experiments and choose equipment
				24	predicting speed from a graph	9	design three experiments and choose technology
				26	independent and dependent variables	9	design three experiments using car and ramp
				28	identifying cause and effect relationships		
				41	identify cause and effect		

Correlation to Wisconsin Model Academic Standards for Science

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
				42	devise an experiment	9	conduct three experiments with appropriate equipment
				42	predict the speed of a car	9	devise a hypothesis
				73	impact of Da Vinci's work	9	design three experiments and choose equpiment
				79	look at force data and decide the usefulness of a machine	10	selecting ramp and photogates
				288	find the thickness of a single card	10	conduct car/ramp experiment
				332	plate tectonic history	12	select equipment and set up experiment
				429	why haven't we run out of water	16	decide how to vary the force on the car for this experiment
				434	what is in your tap water	16	investigate Newton's 2nd law
				437	what is acid rain	17	record times
				438	what causes acid rain	18	use data to describe relationship between force and motion
				441	why are oceans salty	18	evaluate graphs as to whether or not they show relationships between variables
				448	describe steps you would take to determine whether pH affects frog population	19	use data to infer correct relationship between variables
				451	what is temperature	20	safety tip for car/ramp setup
				452	safety caution on heating jar		
				456	determining effect of changing mass on temperature changes		
				456	asking questions pertaining to specific heat and heat flow		

Correlation to Wisconsin Model Academic Standards for Science

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
				460	thermal equilibrium	21	construct reasonable explanation based on data
				472	why is Earth's atmosphere different from other planets	21	choose independent and dependent variables for graph
				473	why do ears pop	21	determine effect of increasing mass
				492	why does Earth have seasons	21	evaluate percent change for data collected
				497	factors that shape the weather	21	think about percent change
				501	how does rain form	24	ropes and pulley safety
				509	how do animals survive in the desert	24	collect weight data
				515	what is a carbon sink	26	what variables can be changed?
				521	relative dating and modern geology based on Steno's theories	26	safety tip for hanging weights from lever
				524	Kelvin's calculations of Earth's age	27	think about the variables
				528	development of plate tectonic theory	27	recognize variables
				528	theory of plate tectonics	30	rigging block and tackle
				529	continental drift theory	30	interpret block and tackle data
				529	critiquing Wegener's theories of continental drift	34	where does the marble move the fastest?
				529	continental drift theory history	34	investigate motion on a rollercoaster
				534	why doesn't Earth get bigger and bigger	35	study data and determine importance of height on speed of marble

Correlation to Wisconsin Model Academic Standards for Science

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
				563	Darwin's theories of the Andes formation	35	what evidence is there in support of your hypothesis?
				566	what causes ice ages	36	collect precise speed and height data
				588	what causes eclipses	39	review energy theory in context of everyday scenarios
				608	relationship between orbital speed and distance between two objects	39	critique group's explanation of energy transformations
				611	theories of origin of the moon	39	analyze energy transformations in different scenarios
				612	early theories of the solar system	40	choose circuit parts to light a bulb
				612	changing ideas about the solar system	40	electrical safety
				621	is Pluto a planet	43	how did A and B tapes acquire different charge?
				627	research space solar power	44	short circuit safety warning
				647	Big Bang theory	45	analyze data and explain a rule
				648	development of Big Bang theory	56	short circuit safety warning
						58	short circuit safety warning

Correlation to Wisconsin Model Academic Standards for Science

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
						75	plan three experiments to determine which variable affects the period of a pendulum
						75	perform self-designed experiment
						75	collect mass and amplitude data
						75	design pendulum experiment
						75	investigate variables that affect the period of a pendulum
						75	evaluate statistical significance
						76	use data to predict best string length for a pendulum clock
						77	compare law of conservation of energy to motion of pendulum
						77	show how energy loss data could be applied to designing a real clock
						93	decision trees and the advantage of doing multiple trials
						121	use graph to predict mass of six objects

Correlation to Wisconsin Model Academic Standards for Science

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
						141	build models of Na and Cl and use them to explain bonding
						145	plan a procedure and select necessary equipment
						145	carry out procedure and select equipment
						146	safety in the lab
						150	chemistry safety
						151	perform the experiment you designed
						151	explain how hypothesis compares to results
						151	select materials from list
						151	review your hypothesis
						151	do the data support the hypothesis
						151	design experiment to find out if mass is conserved
						151	plan procedures and select materials
						156	make predictions about solubility
						157	add new rules to list based on findings
						158	wear goggles and apron
						168	safety equipment

Correlation to Wisconsin Model Academic Standards for Science

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
						170	devise hypothesis and explain
						170	which factor will produce fastest dissolving rate?
						170	which method will give fastest dissolving rate?
						170	what three factors influence dissolving rate?
						171	collect time data and record observations
						171	did you prove or disprove your hypothesis?
						171	what was happening at molecular level?
						171	evaluate method based on data
						172	hot water safety
						177	research pH indicators
						178	visit local water supply and perform testing
						179	safety tip for testing local surface water
						180	safety tip for water testing
						180	researching where your water comes from
						182	making hypotheses and testing them against observations

Correlation to Wisconsin Model Academic Standards for Science

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
						182	simulating the effect of acid rain on daphnia
						182	safety tips for observing Daphnia
						182	making detailed observations
						184	collecting pH readings while adding carbon dioxide
						185	analyzing the results of the buffered acid experiment
						186	collecting temperature data
						186	thermometer safety
						188	conducting investigation of efficiency of immersion heater
						188	heat safety
						189	collecting time and temperature data
						190	effect of changing mass on data
						190	effect of changing mass on collected data
						192	heat safety
						193	collecting and recording time and temperature data

Correlation to Wisconsin Model Academic Standards for Science

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
						193	conducting experiments on heat transfer
						193	explaining efficiency of heat transfer based on data
						194	design and construct an aneroid barometer
						197	evaluating your aneroid barometer design
						197	identifying relationships between air pressure and weather
						198	making qualitative observations of the amount of ozone present in the school environment
						200	evaluating your qualitative ozone strips
						201	predicting areas with high ozone concentration based on your data
						201	researching the causes of ozone
						202	safety in greenhouse gas investigation
						204	predicting what would happen if you place your ice/water test tube into a hot cup or a cold cup

Correlation to Wisconsin Model Academic Standards for Science

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
						205	investigating how specific heat of water regulates Earth's temperature
						206	identifying relationship between percent of Earth covered in water and temperature range
						207	researching how bodies of water affect climate
						208	testing hypothesis of why seasons occur against your observations in the investigation
						209	measuring the intensity of light using an electric meter and solar cell and light bulb
						210	safety using light bulbs
						211	determining whether distance from light source or axial tilt plays a more significant role in causing the seasons
						216	safety in swinging thermometers
						222	researching an animal that is adapted to live in the biome you studied
						224	reconstruct a series of events from clues
						224	sequencing events

Correlation to Wisconsin Model Academic Standards for Science

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
						227	researching forensic science
						233	identifying how the earthquake model represents an earthquake
						235	concluding which conditions affect the timeing and duration and intensity of an earthquake based on observation
						235	interpreting how the drumming affects the intensity of the earthquake in the model
						237	develop a research plan for studying volcanoes
						239	estimating the number of meteor collisions on Earth during the last 3.5 billion years
						241	justify which scenario was most likely
						242	predicting the results of the crystal-growing experiment
						249	using your sundial to collect accurate data
						252	identifying the parts of a refracting telescope and making observations of the moon's surface

Correlation to Wisconsin Model Academic Standards for Science

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
						253	calibrating your telescope
						256	investigation discovering relationship between orbital speed and distance
						256	safety in lab

Correlation to Wisconsin Model Academic Standards for Science

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
C.12.03 Science Inquiry	by the end of grade 12		Evaluate the data collected during an investigation, critique the data-collection procedures and results, and suggest ways to make any needed improvements	24	making a graph	13	graph distance vs. time
				26	creating graphs	15	construct a quantitative graphical model
				41	make a graph	37	organize data into a graph of speed vs. height
						51	graph voltage vs. current
						70	proposing and comparing different electric motor designs
						71	which motor gave the highest speed and why?
						71	did draining the batteries affect motor speed?
						71	testing a motor for performance
						121	graph mass vs. volume
						147	organize observations into a category table
						151	do the data support the hypothesis
						171	what was happening at molecular level?
						185	constructing a graph of drops of acid vs pH
						187	construct a graphical model
						189	construct a temperature vs. time graph

Correlation to Wisconsin Model Academic Standards for Science

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
						197	constructing a graph from atmospheric pressure data
						203	graphing water and ice temperature readings
						206	constructing a graph of time vs. temperature

Correlation to Wisconsin Model Academic Standards for Science

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
C.12.04 Science Inquiry	by the end of grade 12		During investigations, choose the best data-collection procedures and materials available, use them competently, and calculate the degree of precision of the resulting data	11	controlling variables in experiments	4	difference between precise and accurate data
				12	importance of reliable and accurate data collection	6	electronic timer and release technique
				19	did you run a controlled experiment?	7	what variables should be controlled?
				20	what factors could explain the variability in their data?	7	record time interval
				24	making a graph	9	collect speed data
				26	creating graphs	11	calculate % error
				41	make a graph	13	graph distance vs. time
				485	what percentage comes from this source? (problem 4)	14	record three different time intervals
				543	determining distance to an epicenter	15	construct a quantitative graphical model
				547	what explains the difference in density? (#5)	17	record times
				605	how big is Earth?	24	collect weight data
				630	what evidence was used to predict the existence of the Kuiper Belt?	25	collect force data
				630	use the data to answer the questions	27	write down the number of weights you use
				652	analysis with a spectrometer (#4)	36	collect precise speed and height data
						37	organize data into a graph of speed vs. height
						51	graph voltage vs. current
						71	which motor gave the highest speed and why?

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Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
						71	did draining the batteries affect motor speed?
						71	testing a motor for performance
						75	collect mass and amplitude data
						76	calculate % error
						121	graph mass vs. volume
						129	control the height of the liquid
						147	organize observations into a category table
						150	record data as you perform experiment
						169	why was plain water tested?
						169	what does the word control mean?
						171	collect time data and record observations
						182	observing daphnia and recording movements and behavior
						182	making detailed observations
						184	collecting pH readings while adding carbon dioxide

Correlation to Wisconsin Model Academic Standards for Science

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
						185	constructing a graph of drops of acid vs pH
						186	collecting temperature data
						187	construct a graphical model
						189	collecting time and temperature data
						189	construct a temperature vs. time graph
						193	collecting and recording time and temperature data
						197	constructing a graph from atmospheric pressure data
						197	calculating error between your barometer and a commercial barometer
						199	importance of good record keeping in order to avoid error
						203	graphing water and ice temperature readings
						206	collecting temperature and time data
						206	constructing a graph of time vs. temperature

Correlation to Wisconsin Model Academic Standards for Science

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
						210	collecting qualitative data of light intensity at scale distance from the sun
						217	collecting wet and dry bulb temperature readings
						249	using your sundial to collect accurate data
						253	calibrating your telescope

Correlation to Wisconsin Model Academic Standards for Science

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
C.12.05 Science Inquiry	by the end of grade 12		Use the explanations and models found in the earth and space, life and environmental, and physical sciences to develop likely explanations for the results of their investigations	20	how will speed change?	6	compare results with other groups
				24	predicting speed from a graph	11	graph speed vs. position
				31	determining slope of a line	11	analyze speed change of car
				38	determining slope of a line	15	calculating acceleration from the slope of the line
				42	analyze a speed/distance graph	18	study data table for relationship between force and motion
				42	predict the speed of a car	21	construct reasonable explanation based on data
				521	relative dating and modern geology based on Steno's theories	25	analyze block and tackle data
				528	theory of plate tectonics	27	analyze lever equilibrium data
				563	Darwin's theories of the Andes formation	35	study data and determine importance of height on speed of marble
				566	what causes ice ages	35	does data support hypothesis?
				611	theories of origin of the moon	39	review energy theory in context of everyday scenarios
				647	Big Bang theory	45	did battery voltage change?
						45	analyze data and explain a rule

Correlation to Wisconsin Model Academic Standards for Science

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
						76	use data to predict best string length for a pendulum clock
						76	analyze pendulum data
						121	use graph to predict mass of six objects
						147	students analyze chemical change lab results
						151	does your experiment agree with law of conservation of mass?
						151	do the data support the hypothesis
						156	make predictions about solubility
						171	what was happening at molecular level?
						187	find slope of a trend line
						189	calculate slope of a graph
						201	predicting areas with high ozone concentration based on your data
						204	predicting what would happen if you place your ice/water test tube into a hot cup or a cold cup
						231	evaluating your completed bathymetric map

Correlation to Wisconsin Model Academic Standards for Science

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
						239	estimating the number of meteor collisions on Earth during the last 3.5 billion years
						242	predicting the results of the crystal-growing experiment
						247	evaluate your ability to interpret rock formations
C.12.06 Science Inquiry	by the end of grade 12		Present the results of investigations to groups concerned with the issues, explaining the meaning and implications of the results, and answering questions in terms the audience can understand	20	explain your reasoning		vocabulary is presented in context of investigations
						9	present conclusions to the class
						37	describe the flow of energy based on experimental graph
						39	give a brief presentation to the class
						47	present and defend an explanation
						145	present findings and methods used
						145	present findings to the class
						151	present results to the class

Correlation to Wisconsin Model Academic Standards for Science

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
C.12.07 Science Inquiry	by the end of grade 12		Evaluate articles and reports in the popular press, in scientific journals, on television, and on the Internet, using criteria related to accuracy, degree of error, sampling, treatment of data, and other standards of experimental design	10	the research question and hypothesis	6	compare results with other groups
				11	controlling variables in experiments	6	how do we ask questions and get answers from nature?
				19	did you run a controlled experiment?	7	what variables should be controlled?
				19	which group did the best experiment?	9	present conclusions to the class
				20	explain your reasoning	11	graph speed vs. position
				20	what factors could explain the variability in their data?	11	analyze speed change of car
				24	interpretations of patterns in data	11	calculate % error
				24	making a graph	13	graph distance vs. time
				26	creating graphs	15	discuss and test ideas with your group
				27	reading a graph	15	construct a quantitative graphical model
				41	make a graph	15	interpret a speed vs. time graph
				42	analyze a speed/distance graph	18	study data table for relationship between force and motion
				78	analyze lever diagram	18	evaluate graphs as to whether or not they show relationships between variables
				429	why haven't we run out of water	19	explain how you arrived at your answer
				434	what is in your tap water		
				437	what is acid rain		
				441	why are oceans salty		

Correlation to Wisconsin Model Academic Standards for Science

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
				456	asking questions pertaining to specific heat and heat flow	21	evaluate percent change for data collected
				472	why is Earth's atmosphere different from other planets	25	analyze block and tackle data
				473	why do ears pop	27	analyze lever equilibrium data
				476	atmospheric pressure at various altitudes graph	29	discuss what you learned about gears
				485	what percentage comes from this source? (problem 4)	35	does data support hypothesis?
				492	why does Earth have seasons	37	organize data into a graph of speed vs. height
				501	how does rain form	37	describe the flow of energy based on experimental graph
				509	how do animals survive in the desert	39	give a brief presentation to the class
				515	what is a carbon sink	45	did battery voltage change?
				534	why doesn't Earth get bigger and bigger	47	discuss an explanation with your group
				543	determining distance to an epicenter	47	present and defend an explanation
				547	what explains the difference in density? (#5)	51	graph voltage vs. current
				547	average density (#5)	75	evaluate statistical significance
				588	what causes eclipses	76	calculate % error
				605	how big is Earth?	76	analyze pendulum data
				618	average distance from the sun	121	graph mass vs. volume

Correlation to Wisconsin Model Academic Standards for Science

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
				621	is Pluto a planet	129	find average velocity
				627	research space solar power	129	control the height of the liquid
				645	apparent brightness vs. distance graph	129	explain your answer and justify
				651	use the diagram to answer the questions (#2)	145	present findings to the class
				651	arrange the items in the table (#3)	145	present findings and methods used
				651	use the diagram to answer the questions (#4)	147	students analyze chemical change lab results
						147	organize observations into a category table
						151	present results to the class
						151	does your experiment agree with law of conservation of mass?
						169	what does the word control mean?
						169	why was plain water tested?
						171	average dissolving rate
						171	evaluate method based on data
						177	research pH indicators
						180	researching where your water comes from

Correlation to Wisconsin Model Academic Standards for Science

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
						185	constructing a graph of drops of acid vs pH
						187	construct a graphical model
						189	construct a temperature vs. time graph
						197	calculating error between your barometer and a commercial barometer
						197	constructing a graph from atmospheric pressure data
						199	importance of good record keeping in order to avoid error
						200	evaluating your qualitative ozone strips
						201	researching the causes of ozone
						203	graphing water and ice temperature readings
						206	constructing a graph of time vs. temperature
						207	researching how bodies of water affect climate
						217	determining relationship between temperature of the atmosphere and relative humidity

Correlation to Wisconsin Model Academic Standards for Science

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
						218	interpreting Doppler radar images
						222	researching an animal that is adapted to live in the biome you studied
						227	researching forensic science
						231	evaluating your completed bathymetric map
						237	finding a pattern of volcanoes on a bathymetric map
						247	evaluate your ability to interpret rock formations

Correlation to Wisconsin Model Academic Standards for Science

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
D.12.01 Physical Science	by the end of grade 12	Structure of Atoms and Matter	Describe atomic structure and the properties of atoms, molecules, and matter during physical and chemical interactions	311	protons/neutrons/electrons	132	building atom models
				311	location/size/charge of subatomic particles	133	protons and neutrons
				318	proton/electron attraction	133	location of electrons in atom
				353	physical and chemical changes and digestion	136	model stable and neutral atoms
				354	new substances are formed when a chemical change occurs	137	build atomic models
				355	physical and chemical changes in tire recycling	140	review subatomic particles
				357	chemical reactions involve rearrangement of atoms	146	investigate and observe chemical and physical changes in the lab
				372	determine if changes are chemical or physical	157	predict the products of double displacement reactions
				639	death of small to medium stars results in white dwarfs and planetary nebula and black dwarfs	264	using spectroscopy to analyze the light emitted by stars and identify most common elements
				640	death of massive stars results in supernovas and neutron stars and black holes		

Correlation to Wisconsin Model Academic Standards for Science

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
D.12.02 Physical Science	by the end of grade 12	Structure of Atoms and Matter	Explain the forces that hold the atom together and illustrate how nuclear interactions change the atom	387	fusion and fission explained	136	ions
				388	nuclear vs chemical reactions	136	strong force
				389	strong nuclear force	138	nuclear reactions
				389	forces in the nucleus	138	fusion and fission
				389	electromagnetic force	141	whan an atom ionizes
				393	carbon dating	160	radioactive decay
				393	radioisotopes in science and medicine	160	how do you simulate nuclear decay?
				400	research pros and cons of nuclear technology	161	research pros and cons of uses for radioactive elements
				623	nuclear fusion and the sun		

Correlation to Wisconsin Model Academic Standards for Science

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Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
D.12.03 Physical Science	by the end of grade 12	Structure of Atoms and Matter	Explain exchanges of energy in chemical interactions and exchange of mass and energy in atomic/nuclear reactions	321	groups of elements and valence shells	141	build model of Na and Cl atoms and explain why they bond to form a molecule
				329	periodic table columns and valence electrons	142	arrangement of electrons and groups of elements
				330	bonding and periodic table position	147	feel the heat generated by chemical reaction
				332	periodic table and electronegativities	158	measure energy changes in 3 different reactions
				335	periodic table and oxidation numbers	158	investigate energy changes in chemical reactions
				357	combustion reaction	264	using spectroscopy to analyze the light emitted by stars and identify most common elements
				357	chemical reactions involve rearrangement of atoms		
				361	heartburn reaction		
				363	history of law of conservation of mass		
				381	exothermic reactions and MREs		
				382	endothermic reactions and cold packs		
				623	nuclear fusion on the sun produces energy from matter		
				633	Einstein's equation		
				639	death of small to medium stars results in white dwarfs and planetary nebula and black dwarfs		

Correlation to Wisconsin Model Academic Standards for Science

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
				640	death of massive stars results in supernovas and neutron stars and black holes		

Correlation to Wisconsin Model Academic Standards for Science

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
D.12.04 Physical Science	by the end of grade 12	Chemical Reactions	Explain how substances, both simple and complex, interact with one another to produce new substances	278	compounds are composed of elements	140	why do atoms form chemical bonds?
				330	ionic bonds	142	why do atoms combine in certain ratios?
				331	covalent bonds	143	classify ionic compounds
				332	distinguishing between ionic and covalent bonds	143	ionic compounds
				343	mole quantities	144	show ratios in which elements combine to form a compound
				354	new substances are formed when a chemical change occurs	150	investigate conservation of mass in effervescent tablet reaction
				357	combustion reaction	156	predict products in a double displacement reaction
				357	chemical reactions involve rearrangement of atoms	156	investigate double displacement reactions
				361	heartburn reaction	157	predict the products of double displacement reactions
				364	formation of petroleum is a very slow chemical reaction	158	measure energy changes in 3 different reactions
				364	carbon chains	162	carbon reactions and the environment
				375	synthesis or addition reactions		
				376	decomposition reactions		
				377	single displacement reactions		
				377	double displacement reactions		
				409	dissolving an ionic compound		

Correlation to Wisconsin Model Academic Standards for Science

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
				410	solute dissolution depends on chemical bonds		

Correlation to Wisconsin Model Academic Standards for Science

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Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
D.12.05 Physical Science	by the end of grade 12	Chemical Reactions	Identify patterns in chemical and physical properties and use them to predict likely chemical and physical changes and interactions	278	compounds are composed of elements	133	using the periodic table
				294	development of Kevlar brand fiber	140	why do atoms form chemical bonds?
				320	groups of elements	142	why do atoms combine in certain ratios?
				330	ionic bonds	143	classify ionic compounds
				331	covalent bonds	143	predict chemical formulas
				332	distinguishing between ionic and covalent bonds	144	show ratios in which elements combine to form a compound
				336	writing a chemical formula	144	show ratios in which elements combine to form a compound
				336	writing chemical formulas	145	determine empirical formula
				338	summary of chemical formula writing rules	146	investigate and observe chemical and physical changes in the lab
				343	mole quantities	149	balance these equations
				343	mole quantities	155	calculating product yield
				353	physical and chemical changes and digestion	156	investigate double displacement reactions
				354	new substances are formed when a chemical change occurs	158	investigate energy changes in chemical reactions
				355	physical and chemical changes in tire recycling	158	measure energy changes in 3 different reactions
				368	predicting amount of product	181	water quality testing
				371	which of the equations is balanced?		
				372	determine if changes are chemical or physical		

Correlation to Wisconsin Model Academic Standards for Science

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Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
				375	synthesis or addition reactions		
				376	decomposition reactions		
				377	double displacement reactions		
				377	single displacement reactions		
				381	exothermic reactions and MREs		
				382	endothermic reactions and cold packs		
				403	why water is a nearly universal solvent		
				409	dissolving an ionic compound		
				410	solute dissolution depends on chemical bonds		
				457	engineers use specific heat of substances to design better products		

Correlation to Wisconsin Model Academic Standards for Science

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Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
D.12.06 Physical Science	by the end of grade 12	Chemical Reactions	Through investigations, identify the types of chemical interactions, including endothermic, exothermic, oxidation, photosynthesis, and acid/base reactions	354	new substances are formed when a chemical change occurs	158	investigate energy changes in chemical reactions
				357	chemical reactions involve rearrangement of atoms	158	measure energy changes in 3 different reactions
				381	exothermic reactions and MREs	176	investigate acids and bases
				382	endothermic reactions and cold packs	176	measure pH of everyday solutions
				417	H and OH ions	181	testing pH of tap water samples
				417	properties of acids	184	determining pH of water as carbon dioxide dissolves
				417	acids and bases compared/contrasted		
				417	define and compare acids and bases		
				418	formulas and reactions of acids and bases		
				418	properties of bases		
				418	strong vs. weak acids		
				419	strong vs. weak bases		
				419	weak and strong acids and bases		
				420	pH and pH scale		
				420	defining and determining pH		

Correlation to Wisconsin Model Academic Standards for Science

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Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
				420	concentration of hydronium ions determines pH and strength of acids and bases		
				421	pH of substances you use or consume		
				421	table of pH of common substances		
				422	pH and blood		
				422	examples of acid and base chemistry		
				437	concentration of ions and pH		
				437	pH of acid rain		

Correlation to Wisconsin Model Academic Standards for Science

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Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
D.12.07 Physical Science	by the end of grade 12	Motions and Forces	Qualitatively and quantitatively analyze changes in the motion of objects and the forces that act on them and represent analytical data both algebraically and graphically	13	speed is relative	8	calculating speed
				14	how to calculate speed	9	collect data and calculate speed of car
				15	compare and contrast speed and velocity	10	calculate speed of the car
				18	what is the speed of an object that is standing still?	11	draw best fit curve
						12	model the car's motion graphically
				20	find speed of bumblebee	12	find speed of car at different positions
				20	calculate speed of car		
				24	accurate speed measurements	12	calculate speed of moving car
				25	conceptual models of motion	13	draw best fit curve
						13	make a position vs. time graph
				26	drawing a best fit curve		
				29	position vs. time graph discussion	14	calculate speed of car at two places on the ramp
				30	position vs. time graphs	14	calculate acceleration of car on ramp
				32	average speed vs. instantaneous	14	exploring acceleration on a ramp
				32	average speed discussed		
				33	understanding acceleration	14	acceleration is the rate at which speed changes
				35	how to calculate acceleration	15	make a speed vs. time graph
				36	examples of acceleration	15	changes in motion can be represented graphically
				37	speed vs. time graphs	15	make a speed vs. time graph

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Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
				37	speed vs. time graph discussion	16	unbalanced forces and acceleration of car
				41	find acceleration of car	16	2nd law
				42	calculate speed from distance/time graph	16	thinking about force
				45	Newton's first law summarized	17	caclulate speed of car
				45	Newton's third law summarized	17	explore 2nd law and acceleration
				45	Newton's second law summarized	19	find correct relationship between force mass and acceleration
				46	force has potential to change motion	19	discover 2nd law of motion
				47	weight vs. mass	20	investigate effect of gravity on motion
				48	Newton's first law in detail	20	weight vs. mass
				48	Newton's laws explained and applied	20	force and motion with car and ramp
				49	force is related to acceleration	21	effect of friction on the car
				49	Newton's second law in detail	22	car and ramp and Newton' s 3rd law
				49	link between force and acceleration	23	using 3rd law to explain common phenomena
				50	Newton's second law applied	24	measure force in newtons
				51	balanced and unbalanced forces	25	discover mechanical advantage of ropes and pulleys
				51	net force explained	27	set up a lever that has mechanical advantage

Correlation to Wisconsin Model Academic Standards for Science

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Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
				52	gravity depends on mass	27	changing force and distance on a lever
				52	the effect of gravity	30	exploring force and distance with ropes and pulleys
				53	how to calculate weight	36	find speed of marble
				53	acceleration due to gravity	187	draw a line of best fit through temperature data points
				54	Newton's law of universal gravitation	197	graphing and drawing a trend line for atmospheric pressure data
				55	calculating gravitational force between objects	257	relating the relationship between orbital speed and distance to the equation of universal gravitation
				56	friction explained		
				59	Newton's third law in detail		
				60	law of conservation of momentum		
				60	how to calculate momentum		
				64	calculate momentum		
				64	research effect of friction on human joints		
				64	solving problems using f=ma		
				67	how simple machines manipulate forces		
				69	how to calculate mechanical advantage		
				69	newtons and pounds		
				70	mechanical advantage of block and tackle		

Correlation to Wisconsin Model Academic Standards for Science

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Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
				71	how a lever works		
				71	pliers as an example of a lever		
				71	parts of a lever		
				71	the human body and simple machines		
				72	mechanical advantage of a lever		
				75	how gears work		
				78	set up a lever with MA greater than 1		
				78	design a toothbrush		
				79	analyze pulleys with different numbers of supporting strings		
				79	calculate mechanical advantage		
				79	analyze block and tackle		
				80	analyzing the jaw as a lever		
				80	analyze the human jaw as a simple machine		
				80	analyze wheelbarrow		
				80	analyze block and tackle machine on a sailboat		
				599	Newton’s first law of motion and the space shuttle		

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Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
				606	Newton's law of universal gravitation		

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Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
D.12.08 Physical Science	by the end of grade 12	Motions and Forces	Understand the forces of gravitation, the electromagnetic force, intermolecular force, and explain their impact on the universal system	48	Newton's laws explained and applied	62	describing forces that magnets exert on each other
				50	Newton's second law applied	64	testing materials to see if they are affected by magnets
				52	gravity depends on mass	66	build an electromagnet
				54	Newton's law of universal gravitation	66	compare electromagnets and permanent magnets
				55	calculating gravitational force between objects	67	find out what happens to strength of electromagnet when current is increased
				106	electrical forces	134	investigating visible light with a spectrometer
				106	electrical force is incredibly strong!	136	strong force
				159	magnetism explained	257	relating the relationship between orbital speed and distance to the equation of universal gravitation
				163	understanding magnetic fields		
				164	what is an electromagnet?		
				166	building an electromagnet		
				166	increased current vs. strength of magnetic field		
				195	waves transmit energy		
				196	waves are all around us		
				237	light waves and the electromagnetic spectrum		
				237	visible light and the electromagnetic spectrum		
				237	microwave ovens		

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Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
				237	radio and television signals		
				250	identify uses of electromagnetic waves		
				272	identify uses of electromagnetic waves		
				389	forces in the nucleus		
				389	electromagnetic force		
				389	strong nuclear force		
				480	energy and radiation relationships		
				531	magnetic polarity of Earth		
				531	interesting magnetic patterns on sea floor		
				599	Newton's first law of motion and the space shuttle		
				606	Newton's law of universal gravitation		
				626	the sun's energy reaches Earth in the form of electromagnetic waves		

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Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
D.12.09 Physical Science	by the end of grade 12	Motions and Forces	Describe models of light, heat, and sound and through investigations describe similarities and differences in the way these energy forms behave	88	potential and kinetic energy explained	37	investigating conservation of energy with rollercoaster
				90	conservation of energy explained	38	explore energy transformations
				91	understand basic forms of energy	38	conservation of energy and energy transformations
				91	energy conversions	39	identify type of energy involved
				92	energy transformations and conservation	83	measure speed of a wave pulse
				93	different forms of energy described	83	find speed of a wave
				96	prove that energy is conserved	86	adjust frequency of a standing wave
				195	waves transmit energy	86	investigate frequency and wavelength
				198	frequency and wavelength and amplitude	90	investigate human perception of sound
				213	how the ear works	90	what is sound and how do we hear it?
				215	properties of sound waves	94	does sound behave like other waves?
				217	loudness and decibels	119	adding heat energy to melt an ice cube
				219	frequency of sound and pitch	119	investigate temperature and energy transfer in melting process
				221	importance of wavelength of sound waves	134	investigating visible light with a spectrometer
				222	effect of temperature on speed of sound wave		
				222	effect of medium on speed of sound wave		

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Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
				237	light waves and the electromagnetic spectrum	147	feel the heat generated by chemical reaction
				237	visible light and the electromagnetic spectrum	188	investigate heating water with an immersion heater
				242	properties of light waves	188	investigate the increase of temperature of water as thermal energy is added
				451	increasing temperature means increasing motion of molecules	188	relationship between heat and temperature
				451	temperature is a measure of average kinetic energy	190	calculating thermal energy in calories
				452	molecular motion increases when temperature increases	192	investigate convection in liquids
				454	temperature and thermal energy and heat		
				454	changes in temperature are directly related to changes in energy		
				455	definition of calorie		
				455	examples of flow of heat		
				461	conduction and convection and radiation		
				462	densely packed solids are good conductors of heat		
				462	heat transfer through air		
				463	warming hands over candle		
				463	convection currents and weather		

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Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
				464	convection currents in water		
				465	transfer of heat by radiation		
				465	solid road surface emits radiation		
				480	electromagnetic radiation		
				480	energy and radiation relationships		
				482	global warming and heat transfer by radiation		
				493	apply knowledge of heat transfer to different situations		
				538	body waves		
				626	the sun's energy reaches Earth in the form of electromagnetic waves		

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Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
D.12.10 Physical Science	by the end of grade 12	Conservation of Energy and the Increase in Disorder	Using the science themes, illustrate the law of conservation of energy during chemical and nuclear reactions	88	potential and kinetic energy explained	37	investigating conservation of energy with rollercoaster
				90	conservation of energy explained	38	explore energy transformations
				91	understand basic forms of energy	38	conservation of energy and energy transformations
				91	energy conversions	39	identify type of energy involved
				92	energy transformations and conservation	138	fusion and fission
				93	different forms of energy described	138	nuclear reactions
				96	prove that energy is conserved	147	feel the heat generated by chemical reaction
				381	exothermic reactions and MREs	158	investigate energy changes in chemical reactions
				382	endothermic reactions and cold packs	158	measure energy changes in 3 different reactions
				387	fusion and fission explained	160	radioactive decay
				388	nuclear vs chemical reactions	160	how do you simulate nuclear decay?
				393	carbon dating	161	research pros and cons of uses for radioactive elements
				393	radioisotopes in science and medicine	264	using spectroscopy to analyze the light emitted by stars and identify most common elements
				400	research pros and cons of nuclear technology		
				623	nuclear fusion and the sun		

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Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
				639	death of small to medium stars results in white dwarfs and planetary nebula and black dwarfs		
				640	death of massive stars results in supernovas and neutron stars and black holes		

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Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
D.12.11 Physical Science	by the end of grade 12	Interactions of Matter and Energy	Using the science themes, explain common occurrences in the physical world	35	how to calculate acceleration	14	calculate acceleration of car on ramp
				41	find acceleration of car	15	discuss and test ideas with your group
				49	link between force and acceleration	17	explore 2nd law and acceleration
				53	acceleration due to gravity	19	explain how you arrived at your answer
				58	Newton on a skateboard	27	changing force and distance on a lever
				60	how to calculate momentum	29	design and construct complex gear machines
				64	calculate momentum	29	discuss what you learned about gears
				68	compound machines	30	exploring force and distance with ropes and pulleys
				71	pliers as an example of a lever	36	energy conservation and the roller coaster
				78	design a toothbrush	39	make an energy flow chart
				78	describe a problem that would be solved by an engineer	39	study energy transformations in daily life scenarios
				79	analyze pulleys with different numbers of supporting strings	47	discuss an explanation with your group
				79	analyze block and tackle	82	study wave pulses on elastic cord
				80	analyze the human jaw as a simple machine	83	measure speed of a wave pulse
				80	analyze wheelbarrow		
				91	following an energy transformation		
				120	circuits in your house		

Correlation to Wisconsin Model Academic Standards for Science

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
				197	transverse and longitudinal waves	84	make different types of waves in a ripple tank
				198	frequency and wavelength and amplitude	86	investigate frequency and wavelength
				205	standing waves on a string	129	explain your answer and justify
				215	properties of sound waves	179	researching and preparing for a field trip to test surface water
				242	properties of light waves	201	suggesting ways that ozone concentrations could be reduced
				294	development of Kevlar brand fiber	204	connecting the latent heat investigation to Earth
				354	chemical reactions and digestion	218	understanding Doppler radar
				357	combustion reaction		
				361	heartburn reaction		
				452	balloons expands or contracts due to thermal expansion		
				454	temperature vs. thermal energy for a cup or pot of soup		
				457	engineers use specific heat of substances to design better products		
				461	understanding thermal energy through cocoa example		
				465	examples of reflectors and absorbers		
				473	why do ears pop		

Correlation to Wisconsin Model Academic Standards for Science

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
				476	atmospheric pressure in Denver		
				490	using the North Star to estimate your latitude		
				509	how do animals survive in the desert		
				536	analogy of plate movements		
				623	energy from the sun		
				626	harnessing the sun's energy		

Correlation to Wisconsin Model Academic Standards for Science

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
D.12.12 Physical Science	by the end of grade 12	Interactions of Matter and Energy	Using the science themes and knowledge of chemical, physical, atomic, and nuclear interactions, explain changes in materials, living things, earth's features, and stars	440	oceans as part of the hydrosphere	242	understanding how igneous rocks are formed and growing crystals to investigate their formation
				471	description of Earth's atmosphere	244	understanding how sedimentary rocks are formed and creating sedimentary deposits to investigate them
				472	effect of life on Earth's atmosphere	246	understanding and investigating how metamorphic rocks are formed
				477	layers of the atmosphere	247	interpreting how different rock formations were formed
				478	layers of the atmosphere	255	observe and describe the appearance of the moon and Jupiter and its moons
				524	table and description of the geologic time scale	264	using spectroscopy to analyze the light emitted by stars and identify most common elements
				566	ice ages		
				573	formation of igneous and sedimentary and metamorphic rocks		
				575	identifying igneous and sedimentary and metamorphic rocks		
				591	characteristics of the universe		
				633	what is a star?		
				638	the life cycle of stars		
				639	death of small to medium stars results in white dwarfs and planetary nebula and black dwarfs		
				639	description and illustration of the life cycle of stars		

Correlation to Wisconsin Model Academic Standards for Science

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
				640	elements formed by nuclear fusion in stars		
				640	death of massive stars results in supernovas and neutron stars and black holes		
				642	what is a galaxy?		
				652	research and describe astronomical objects		

Correlation to Wisconsin Model Academic Standards for Science

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
E.12.01 Earth and Space Science	by the end of grade 12	Energy in the Earth System	Using the science themes, distinguish between internal energies (decay of radioactive isotopes, gravity) and external energies (sun) in the earth's systems and show how these sources of energy have an impact on those systems	316	isotopes explained	133	exploring isotopes
				387	fusion and fission explained	136	understanding isotopes
				480	transfer of energy in and out of Earth's atmosphere	138	fusion and fission
				480	distribution of incoming solar radiation	160	radioactive decay
				481	greenhouse conditions on Earth	208	developing a hypothesis about why the seasons occur
				481	Earth's "energy budget"	210	investigating how the distance of Earth from the sun affects its intensity
				483	global temperature changing over time	211	investigating how Earth's tilt affects the sun's intensity
				485	research the density of Venus' and Mars' atmospheres	248	building a sundial to keep track of daily time based on the cycles between Earth and the sun
				485	Earth's internal energy		
				491	the effects of Earth's rotation on daytime heating and nighttime cooling		
				492	Earth's tilt causes seasons		
				525	formation of Earth's layers		
				526	description of Earth's layers		
				528	Earth's surface is changing		
				528	definition of plate tectonics		
				532	theory of plate tectonics		

Correlation to Wisconsin Model Academic Standards for Science

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
				552	formation of magma in Earth's mantle		
				585	Earth's rotation and patterns of day and night		
				587	axial tilt causes the seasons		
				588	solar eclipses		
				589	solar eclipses		
				601	identify seasons		
				615	classifying the planets		
				615	greenhouse conditions on Venus		
				623	nuclear fusion and the sun		
				624	features and diagram of the sun		
				625	features and emissions of the sun		

Correlation to Wisconsin Model Academic Standards for Science

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
E.12.02 Earth and Space Science	by the end of grade 12	Geochemical Cycles	Analyze the geochemical and physical cycles of the earth and use them to describe movements of matter	440	oceans as part of the hydrosphere	230	predicting plate movement over 50 million years and the resultant land features
				441	the five major oceans	240	estimating the effects of meteor impacts on Earth
				447	name the five big oceans on Earth	241	identifying which geologic features on Earth were caused by meteors
				471	description of Earth's atmosphere	242	understanding how igneous rocks are formed and growing crystals to investigate their formation
				472	effect of life on Earth's atmosphere	244	understanding how sedimentary rocks are formed and creating sedimentary deposits to investigate them
				477	layers of the atmosphere	246	understanding and investigating how metamorphic rocks are formed
				478	layers of the atmosphere	247	interpreting how different rock formations were formed
				525	formation of Earth's layers		
				526	description of Earth's layers		
				528	definition of plate tectonics		
				528	predicting what Earth might look like in 50 million years		
				532	theory of plate tectonics		
				533	activity of Earth's crust at plate boundaries		
				534	land features resulting from divergent plate boundaries		
				534	balance of creating and consuming Earth's crust		
				535	resulting land features from subduction		

Correlation to Wisconsin Model Academic Standards for Science

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
				536	land features resulting from transform plate boundaries		
				537	causes and descriptions of earthquakes		
				539	earthquakes rating scales		
				547	predict separation of North America and Europe in 75 million years		
				548	predict effects of divergent plate boundaries on Great Rift Valley		
				551	structure of a volcano		
				552	formation of magma in Earth's mantle		
				554	figure showing structure of different types of volcanoes		
				555	formation of Hawaiian Islands due to volcanic activity		
				558	volcanoes shape the Earth		
				562	constructive and destructive processes		
				562	constructive and destructive processes		
				563	constructive process of mountain building		

Correlation to Wisconsin Model Academic Standards for Science

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
				563	mountain-building		
				564	changes in land features due to erosion		
				564	the destructive process of erosion		
				565	formation of soil		
				565	wind erosion		
				566	effect of glaciers on land		
				573	formation of igneous and sedimentary and metamorphic rocks		
				575	identifying igneous and sedimentary and metamorphic rocks		
				576	the rock cycle		
				576	the rock cycle		

Correlation to Wisconsin Model Academic Standards for Science

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
E.12.03 Earth and Space Science	by the end of grade 12	The Origin and Evolution of the Earth Sytem	Using the science themes, describe theories of the origins and evolution of the universe and solar system, including the earth system as a part of the solar system, and relate these theories and their implications to geologic time on earth	472	comparison of Earth's atmosphere to other planets	255	observe and describe the appearance of the moon and Jupiter and its moons
				481	greenhouse conditions on Earth	258	setting up a scale model of the solar system
				485	research the density of Venus' and Mars' atmospheres	259	determining scale distances for the planets
				591	characteristics of the universe	260	determining scale sizes of the planets
				594	history of the telescope	264	understand why spectroscopy is an important tool of astronomers
				595	types and uses of telescopes	268	measuring apparent brightness to calculate the distance to stars and galaxies
				596	types and uses of telescopes		
				597	satellites as tools of astronomy		
				598	spacecraft as tools of astronomy		
				611	historical theories of the origin of the moon		
				612	historical theories about the solar system		
				613	explanation and illustration of the solar system		
				614	relative sizes and distances within the solar system		

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Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
				615	what makes Earth capable of supporting life		
				615	greenhouse conditions on Venus		
				621	historical theories of which objects were planets		
				633	what is a star?		
				634	the use of spectroscopy to analyze stars		
				638	the life cycle of stars		
				639	description and illustration of the life cycle of stars		
				640	elements formed by nuclear fusion in stars		
				641	the existence of other planetary systems		
				641	how the solar system was formed		
				642	what is a galaxy?		
				643	the structure of the Milky Way Galaxy		
				647	the Big Bang theory of the origin of the universe		
				648	evidence for the Big Bang theory		
				649	evidence for the Big Bang theory		

Correlation to Wisconsin Model Academic Standards for Science

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
				652	research and describe astronomical objects		

Correlation to Wisconsin Model Academic Standards for Science

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
E.12.04 Earth and Space Science	by the end of grade 12	The Origin and Evolution of the Earth Sytem	Analyze the benefits, costs, and limitations of past, present, and projected use of resources and technology and explain the consequences to the environment	172	generating electric power	52	the cost of using electrical appliances
				333	problems with disposing of plastics	163	research how trees offset accumulation of CO<subscript>2</>
				355	recycling tires	163	can trees compensate for manmade CO2 from vehicles and industry?
				356	recycling discarded tires	163	research how trees offset accumulation of CO2
				364	petroleum	163	consider a vehicle's fuel economy
				368	limiting reactants	163	too much CO2
				379	research environmental impact of fuel cells	163	economic impact of end-product of combustion reaction
				379	hydrogen-powered cars and the environment	164	perform water quality tests
				379	research fuel cells	178	wise use of water supply
				379	research fuel cells	178	predict the quality of surface water to be tested and justify your answer
				379	research economic impact of fuel cells	178	predict the quality of surface water to be tested and justify your answer
				391	nuclear vs. fossil fuels	178	actions to take to improve water quality
				391	impact of nuclear energy		
				392	storage of nuclear waste		
				395	fossil fuels		
				400	economic impact of pollution		
				400	problems caused by airborne pollutants		
				400	economic impact of reducing air pollution		
				400	reducing pollution		

Correlation to Wisconsin Model Academic Standards for Science

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
				411	effects of PCB's in Great Lakes	179	address what you can do to maintain or improve the water quality at the test site
				414	effect of electrical generating facilities on dissolved oxygen in water	179	maintaining water supply quality
				414	environmental impact of electrical generating facilities	180	save water for houseplants
				414	effect of electrical generating facilities on dissolved oxygen in water	180	perform water quality tests
				432	water cycle and conservation	182	investigate effect of acid rain on microorganisms
				433	The Clean Water Act	182	the effects of acid rain on organisms in aquatic environments
				433	water quality standards	182	the effects of acid rain on organisms in aquatic environments
				433	wise use of water	201	research the causes of ozone in the lower atmosphere
				434	importance of water analysis	262	determine the efficiency of a photovoltaic cell
				435	water quality testing	262	solar energy can be used to generate electricity without producing pollution
				435	water usage and quality		
				436	effect of excess nitrates on environment		
				436	water quality testing		
				437	acid rain explained		
				437	acid rain		
				437	acid rain		
				437	effects of acid rain on natural environments		

Correlation to Wisconsin Model Academic Standards for Science

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
				437	effects of acid rain on the soil		
				438	causes and health effects of acid rain		
				438	impact of using fossil fuels		
				439	illustration of acid rain formation		
				443	impact of increased CO2 in oceans		
				443	impact of increased CO2 on oceans		
				443	impact of increased CO2 on oceans		
				444	pollution and the ocean food chain		
				445	pollution and the ocean food chain		
				448	research economic impact of producing gases that cause acid rain		
				448	research the issue of acid rain		
				471	nitrogen cycle		
				479	effects of CFC's on the ozone layer		
				482	changes to the oceans due to increasing global temperatures		

Correlation to Wisconsin Model Academic Standards for Science

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
				482	effects of burning fossil fuels		
				485	Earth's internal energy		
				504	temperature inversion		
				515	permafrost		
				542	using seismic waves for oil and gas exploration		
				560	description of geothermal energy		
				560	mineral deposits and diamonds		
				568	environmental impact of urban sprawl		
				568	how urban sprawl changes local climate		
				627	using photovoltaic cells		
				627	the efficiency of photovoltaic cells		

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Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
E.12.05 Earth and Space Science	by the end of grade 12	The Origin and Evolution of the Universe	Using the science themes, understand that the origin of the universe is not completely understood, but that there are current ideas in science that attempt to explain its origin	10	process of reviewing hypothesis explained	6	asking questions and learning about natural world
				20	explain your reasoning	9	present conclusions to the class
				473	why do ears pop	15	discuss and test ideas with your group
				504	meteorologists use atmospheric pressure data to understand movement of weather systems	19	explain how you arrived at your answer
				521	relative dating and modern geology based on Steno's theories	29	discuss what you learned about gears
				524	Kelvin's calculations of Earth's age	35	what evidence is there in support of your hypothesis?
				528	theory of plate tectonics	37	describe the flow of energy based on experimental graph
				529	critiquing Wegener's theories of continental drift	39	give a brief presentation to the class
				563	Darwin's theories of the Andes formation	39	analyze energy transformations in different scenarios
				566	what causes ice ages	39	review energy theory in context of everyday scenarios
				611	theories of origin of the moon	39	critique group's explanation of energy transformations
				612	early theories of the solar system	47	present and defend an explanation
				647	Big Bang theory		
				648	evidence for Big Bang theory		

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Student Text and Investigation Manual

Standard #: Content Standard	grade	topic	Peformance Standard	student text pg	detail	investigation pg	detail
						47	discuss an explanation with your group
						77	show how energy loss data could be applied to designing a real clock
						77	compare law of conservation of energy to motion of pendulum
						129	explain your answer and justify
						145	present findings and methods used
						151	review your hypothesis
						151	present results to the class
						171	did you prove or disprove your hypothesis?
						215	the food paradox of the oceans