

Correlation to Sunshine State Science Content Assessed by FCAT grade 10

Introduction to Earth and Space Science

Student Text and Investigation Manual

Standard #: Strand	Standard	Grade tested	Benchmark	student text pg	detail	investigation pg	detail
SC.D.1.4.1 Processes that shape the Earth	The student recognizes that processes in the lithosphere, atmosphere, hydrosphere, and biosphere interact to shape the Earth.	10	The student knows how climatic patterns on Earth result from an interplay of many factors (Earth's topography, its rotation on its axis, solar radiation, the transfer of heat energy where the atmosphere interfaces with lands and ocean currents ect..	32	transfer of energy in and out of Earth's atmosphere	23	research how large bodies of water affect climate
				35	global temperature changing over time	23	research how large bodies of water affect climate
				43	Earth's temperature varies with latitude	25	investigating factors which cause the seasons
				44	Earth's tilt causes seasons	29	exploring how temperature-dependent layering creates currents
				45	convection currents in the atmosphere	31	understanding the Atlantic gyre
				46	the Coriolis effect	35	use radar to detect a tornado
				47	global wind patterns	36	using radar to track a hurricane
				48	descriptions of ocean currents and their effects on climate		
				48	effects of the Gulf Stream on climate of Great Britain		
				49	factors which influence the weather		
				51	cloud formation		
				54	effects of moving air masses		
				54	cold fronts		
				55	jet streams		
				55	warm fronts		
				56	rotation of air masses due to Coriolis effect		

Correlation to Sunshine State Science Content Assessed by FCAT grade 10
Introduction to Earth and Space Science
Student Text and Investigation Manual

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				57	description of thunderstorms		
				58	description of hurricanes		
				59	description of tornadoes		
				60	causes and effects of the El Nino Southern Oscillation		
				62	effect of cold ocean currents on formation of fog desserts		
				63	effect of warm ocean currents on formation of tropical rainforest		
				65	effect of large bodies of water on climate		
				67	alpine tundra occurs at high altitudes		
				70	create a model to explain why Earth has seasons		
				102	Earth's surface is changing		

Correlation to Sunshine State Science Content Assessed by FCAT grade 10
Introduction to Earth and Space Science
Student Text and Investigation Manual

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SC.D.1.4.2 Processes that shape the Earth	The student recognizes that processes in the lithosphere, atmosphere, hydrosphere, and biosphere interact to shape the Earth.	10	The student knows that the solid crust of earth consists of slow-moving, separate plates that float on a denser, molten layer of Earth and that these plates interact with each other, changing the Earth's surface in many ways.	102	definition of plate tectonics	52	listing which kind of plate boundary is associated with each geologic feature
				104	sea-floor spreading and mid-ocean ridges	53	identifying tectonic plates and plate boundaries
				105	magnetic patterns on the sea floor		
				106	theory of plate tectonics		
				107	describing plate boundaries		
				108	divergent plate boundaries		
				109	convergent plate boundaries		
				110	transform plate boundaries		

Correlation to Sunshine State Science Content Assessed by FCAT grade 10

Introduction to Earth and Space Science

Student Text and Investigation Manual

Standard #: Strand	Standard	Grade tested	Benchmark	student text pg	detail	investigation pg	detail
SC.D.1.4.3 Processes that shape the Earth	The student recognizes that processes in the lithosphere, atmosphere, hydrosphere, and biosphere interact to shape the Earth.	10	The student knows that changes in Earth's climate, geological activity, and life forms may be traced and compared.	33	global warming	54	predicting plate movement over 50 million years and the resultant land features
				34	changes to the oceans due to increasing global temperatures		
				83	illustration of acid rain formation		
				95	origin of fossils		
				97	faunal succession		
				98	table and description of the geologic time scale		
				98	extinction of the dinosaurs due to giant meteor hitting Earth		
				102	predicting what Earth might look like in 50 million years		
				108	land features resulting from divergent plate boundaries		
				109	resulting land features from subduction		
				110	land features resulting from transform plate boundaries		
				121	predict separation of North America and Europe in 75 million years		

**Correlation to Sunshine State Science Content Assessed by FCAT grade 10
Introduction to Earth and Space Science
Student Text and Investigation Manual**

Standard #: Strand	Standard	Grade tested	Benchmark	student text pg	detail	investigation pg	detail
				122	predict effects of divergent plate boundaries on Great Rift Valley		
				137	mountain-building		
				138	changes in land features due to erosion		
				140	ice ages		
				140	effect of glaciers on land		
				142	how urban sprawl changes local climate		
				193	how an asteroid event may have caused the extinction of dinosaurs		
SC.D.1.4.4 Processes that shape the Earth	The student recognizes that processes in the lithosphere, atmosphere, hydrosphere, and biosphere interact to shape the Earth.	10	The student knows that Earth's systems and organisms are the result of a long, continuous change over time.	33	global warming		
				35	global temperature changing over time		
				97	faunal succession		
				98	extinction of the dinosaurs due to giant meteor hitting Earth		
				98	table and description of the geologic time scale		
				102	Earth's surface is changing		
				140	ice ages		
				193	how an asteroid event may have caused the extinction of dinosaurs		

Correlation to Sunshine State Science Content Assessed by FCAT grade 10
Introduction to Earth and Space Science
Student Text and Investigation Manual

Standard #: Strand	Standard	Grade tested	Benchmark	student text pg	detail	investigation pg	detail
SC.D.2.4.1 Processes that shape the Earth	The student understands the need for protection of the natural systems on Earth.	10	The student understands the interconnectedness of the systems on Earth and the quality of life.	23	nitrogen cycle	40	predict the quality of surface water to be tested and justify your answer
				31	effects of CFC's on the ozone layer		
				34	effects of burning fossil fuels	40	actions to take to improve water quality
				34	changes to the oceans due to increasing global temperatures		
				67	permafrost		
				73	the water cycle		
				79	pond ecosystem and water quality		
				81	effects of acid rain on natural environments		
				82	acid rain formation system		
				83	illustration of acid rain formation		
				87	impact of increased CO2 in oceans		
				142	how urban sprawl changes local climate		

Correlation to Sunshine State Science Content Assessed by FCAT grade 10
Introduction to Earth and Space Science
Student Text and Investigation Manual

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SC.E.1.4.1 Earth and Space	The student understands the interaction and organization in the Solar System and the universe and how this affects life on Earth.	10	The student understands the relationships between events on Earth and the movements of the Earth, its moon, the other planets, and the sun.	43	the effects of Earth's rotation on daytime heating and nighttime cooling	24	developing a hypothesis about why the seasons occur
				44	Earth's tilt causes seasons	26	investigating how the distance of Earth from the sun affects its intensity
				46	the Coriolis effect	27	investigating how Earth's tilt affects the sun's intensity
				56	rotation of air masses due to Coriolis effect	62	why studying the moon's surface is useful for understanding Earth
				158	the lunar cycle	72	building a sundial to keep track of daily time based on the cycles between Earth and the sun
				159	Earth's rotation and patterns of day and night	74	modeling the lunar cycle
				161	axial tilt causes the seasons	75	constructing a lunar calendar
				162	lunar eclipses		
				162	solar eclipses		
				163	solar eclipses		
				163	solar eclipses		
				165	characteristics of the universe		
				175	identify seasons		
				181	properties of the moon		
				182	the moon as a satellite of Earth		
				183	the moon's effect on tides on Earth		
				184	the Earth-moon system		
				185	giant impact theory		

Correlation to Sunshine State Science Content Assessed by FCAT grade 10
Introduction to Earth and Space Science
Student Text and Investigation Manual

Standard #: Strand	Standard	Grade tested	Benchmark	student text pg	detail	investigation pg	detail
				207	what is a star?		
				216	what is a galaxy?		
				226	research and describe astronomical objects		
SC.E.1.4.2 Earth and Space	The student understands the interaction and organization in the Solar System and the universe and how this affects life on Earth.	10	The student knows how the characteristics of other planets and satellites are similar to and different from those of the Earth.	24	comparison of Earth's atmosphere to other planets	80	simulate an object in orbit and investigate how orbital period varies within distance
				186	orbits of planets around the sun	82	setting up a scale model of the solar system
				187	explanation and illustration of the solar system	83	determining scale distances for the planets
				188	relative sizes and distances within the solar system	84	determining scale sizes of the planets
				189	what makes Earth capable of supporting life		
				193	asteroids and comets		
				194	meteors and meteorites and the Kuiper Belt		
				215	the existence of other planetary systems		

Correlation to Sunshine State Science Content Assessed by FCAT grade 10
Introduction to Earth and Space Science
Student Text and Investigation Manual

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SC.E.1.4.3 Earth and Space	The student understands the interaction and organization in the Solar System and the universe and how this affects life on Earth.	10	The student knows the various reasons that Earth is the only planet in our Solar System that appears to be capable of supporting life as we know it.	24 189 190 191 192 195	comparison of Earth's atmosphere to other planets what makes Earth capable of supporting life classifying the planets classifying the planets comparing properties of the planets is Pluto a planet		
SC.E.2.4.1 Earth and Space	The student recognizes the vastness of the universe and the Earth's place in it.	10	The student knows that the stages in the development of three categories of stars are based on mass: stars that have the approximate mass of our sun, stars that are two-to-three-stellar masses and develop into neutron stars ect.	212 213 213 214 214	the life cycle of stars death of small to medium stars results in white dwarfs and planetary nebula and black dwarfs description and illustration of the life cycle of stars death of massive stars results in supernovas and neutron stars and black holes elements formed by nuclear fusion in stars	79 88	observe and describe the appearance of the moon and Jupiter and its moons using spectroscopy to analyze the light emitted by stars and identify most common elements
SC.E.2.4.2 Earth and Space	The student recognizes the vastness of the universe and the Earth's place in it.	10	The student identifies the arrangement of bodies found within and outside our galaxy.	217	the structure of the Milky Way Galaxy		

Correlation to Sunshine State Science Content Assessed by FCAT grade 10

Introduction to Earth and Space Science

Student Text and Investigation Manual

Standard #: Strand	Standard	Grade tested	Benchmark	student text pg	detail	investigation pg	detail
SC.E.2.4.3 Earth and Space	The student recognizes the vastness of the universe and the Earth's place in it.	10	The student knows astronomical distance and time.	166 167 168 169 170 171 172 208	calculating and using light years light years and time history of the telescope types and uses of telescopes types and uses of telescopes satellites as tools of astronomy spacecraft as tools of astronomy the use of spectroscopy to analyze stars	88 92 92	understand why spectroscopy is an important tool of astronomers calculating the distance to stars and galaxies using apparent brightness and absolute brightness measuring apparent brightness to calculate the distance to stars and galaxies
SC.E.2.4.4 Earth and Space	The student recognizes the vastness of the universe and the Earth's place in it.	10	The student understands stellar equilibrium.	212 213 213 214 214	the life cycle of stars death of small to medium stars results in white dwarfs and planetary nebula and black dwarfs description and illustration of the life cycle of stars death of massive stars results in supernovas and neutron stars and black holes elements formed by nuclear fusion in stars	79 88	observe and describe the appearance of the moon and Jupiter and its moons using spectroscopy to analyze the light emitted by stars and identify most common elements

Correlation to Sunshine State Science Content Assessed by FCAT grade 10
Introduction to Earth and Space Science
Student Text and Investigation Manual

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SC.E.2.4.5 Earth and Space	The student recognizes the vastness of the universe and the Earth's place in it.	10	The student knows various scientific theories on how the universe was formed.	185 186 195 221 222 223	historical theories of the origin of the moon historical theories about the solar system historical theories of which objects were planets the Big Bang theory of the origin of the universe evidence for the Big Bang theory evidence for the Big Bang theory		
SC.E.2.4.6 Earth and Space	The student recognizes the vastness of the universe and the Earth's place in it.	10	The student knows the various ways in which scientists collect and generate data about our universe (e.g., X-ray telescopes, computer simulations of gravitational systems, nuclear reactions, space probes, and supercollider simulations).	168 169 170 171 172 208 222 223	history of the telescope types and uses of telescopes types and uses of telescopes satellites as tools of astronomy spacecraft as tools of astronomy the use of spectroscopy to analyze stars evidence for the Big Bang theory evidence for the Big Bang theory	88 92	understand why spectroscopy is an important tool of astronomers measuring apparent brightness to calculate the distance to stars and galaxies

Correlation to Sunshine State Science Content Assessed by FCAT grade 10
Introduction to Earth and Space Science
Student Text and Investigation Manual

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SC.E.2.4.7 Earth and Space	The student recognizes the vastness of the universe and the Earth's place in it.	10	The student knows that mathematical models and computer simulations are used in studying evidence from many sources to form a scientific account of the universe.	168	history of the telescope	88	using spectroscopy to analyze the light emitted by stars and identify most common elements
				169	types and uses of telescopes		
				170	types and uses of telescopes	88	understand why spectroscopy is an important tool of astronomers
				171	satellites as tools of astronomy		
				172	spacecraft as tools of astronomy	92	calculating the distance to stars and galaxies using apparent brightness and absolute brightness
				208	the use of spectroscopy to analyze stars		
				213	death of small to medium stars results in white dwarfs and planetary nebula and black dwarfs	92	measuring apparent brightness to calculate the distance to stars and galaxies
				214	death of massive stars results in supernovas and neutron stars and black holes		
				222	evidence for the Big Bang theory		
				223	evidence for the Big Bang theory		

Correlation to Sunshine State Science Content Assessed by FCAT grade 10
Introduction to Earth and Space Science
Student Text and Investigation Manual

Standard #: Strand	Standard	Grade tested	Benchmark	student text pg	detail	investigation pg	detail
SC.G.2.4.5 How Living Things Interact with Their Environment	The student understands the consequences of using limited natural resources.	10	The student understands that the amount of life any environment can support is limited and that human activities can change the flow of energy and reduce the fertility of the Earth.	23	nitrogen cycle	40	predict the quality of surface water to be tested and justify your answer
				31	effects of CFC's on the ozone layer		
				34	effects of burning fossil fuels	40	actions to take to improve water quality
				34	changes to the oceans due to increasing global temperatures	44	the effects of acid rain on organisms in aquatic environments
				56	temperature inversion		
				67	permafrost		
				81	effects of acid rain on natural environments		
				81	acid rain		
				82	causes and health effects of acid rain		
				83	illustration of acid rain formation		
				87	impact of increased CO2 in oceans		
				87	impact of increased CO2 on oceans		
				142	how urban sprawl changes local climate		
				142	environmental impact of urban sprawl		

Correlation to Sunshine State Science Content Assessed by FCAT grade 10
Introduction to Earth and Space Science
Student Text and Investigation Manual

Standard #: Strand	Standard	Grade tested	Benchmark	student text pg	detail	investigation pg	detail
SC.G.2.4.6 How Living Things Interact with Their Environment	The student understands the consequences of using limited natural resources.	10	The student knows the ways in which humans today are placing their environmental support systems at risk (e.g., rapid human population growth, environmental degradation, and resource depletion).	23	nitrogen cycle	40	predict the quality of surface water to be tested and justify your answer
				31	effects of CFC's on the ozone layer		
				34	effects of burning fossil fuels	40	predict the quality of surface water to be tested and justify your answer
				56	temperature inversion		
				67	permafrost		
				77	The Clean Water Act	40	actions to take to improve water quality
				79	water quality testing	41	address what you can do to maintain or improve the water quality at the test site
				80	water quality testing		
				81	acid rain		
				81	acid rain	44	the effects of acid rain on organisms in aquatic environments
				81	effects of acid rain on the soil		
				81	effects of acid rain on natural environments	44	the effects of acid rain on organisms in aquatic environments
				82	causes and health effects of acid rain		
				87	impact of increased CO2 on oceans		
				87	impact of increased CO2 in oceans		
				87	impact of increased CO2 on oceans		
				88	pollution and the ocean food chain		

Correlation to Sunshine State Science Content Assessed by FCAT grade 10
Introduction to Earth and Space Science
Student Text and Investigation Manual

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				89	pollution and the ocean food chain		
SC.H.1.4.1 The Nature of Science	The student uses the scientific processes and habits of mind to solve problems.	10	The student knows that investigations are conducted to explore new phenomena, to check on previous results, to test how well a theory predicts, and to compare different theories.	25	why do ears pop	21	investigating how specific heat of water regulates Earth's temperature
				56	meteorologists use atmospheric pressure data to understand movement of weather systems	31	the food paradox of the oceans
				92	describe steps you would take to determine how pH affects frog population	4	conducting investigation of efficiency of immersion heater
				222	evidence for Big Bang theory	44	simulating the effect of acid rain on daphnia
						57	identifying how the earthquake model represents an earthquake
						61	develop a research plan for studying volcanoes
						9	conducting experiments on heat transfer

Correlation to Sunshine State Science Content Assessed by FCAT grade 10
Introduction to Earth and Space Science
Student Text and Investigation Manual

Standard #: Strand	Standard	Grade tested	Benchmark	student text pg	detail	investigation pg	detail
SC.H.1.4.2 The Nature of Science	The student uses the scientific processes and habits of mind to solve problems.	10	The student knows that from time to time, major shifts occur in the scientific view of how the world works, but that more often the changes that take place in the body of scientific knowledge are small modifications of prior knowledge.	95 98 102 103 137 140 185 186 221	relative dating and modern geology based on Steno's theories Kelvin's calculations of Earth's age theory of plate tectonics critiquing Wegener's theories of continental drift Darwin's theories of the Andes formation what causes ice ages theories of origin of the moon early theories of the solar system Big Bang theory	13	evaluating your aneroid barometer design
SC.H.1.4.3 The Nature of Science	The student uses the scientific processes and habits of mind to solve problems.	10	The student understands that no matter how well one theory fits observations, a new theory might fit them as well or better, or might fit a wider range of observations, because in science, the testing, revising, and occasional discarding ect.			13 55 71	evaluating your aneroid barometer design evaluating your completed bathymetric map evaluate your ability to interpret rock formations

Correlation to Sunshine State Science Content Assessed by FCAT grade 10

Introduction to Earth and Space Science

Student Text and Investigation Manual

Standard #: Strand	Standard	Grade tested	Benchmark	student text pg	detail	investigation pg	detail
SC.H.1.4.4 The Nature of Science	The student uses the scientific processes and habits of mind to solve problems.	10	The student knows that scientists in any one research group tend to see things alike and that therefore scientific teams are expected to seek out the possible sources of bias in the design of their investigations and in their data analysis.	37 46 70 98 107 150 188 198	computer modeling to predict greenhouse effects modeling air currents create a model (#1) model of Earth's history modeling plate boundaries rock cycle model solar system modeling model of the sun's anatomy	18 28 56 82	modeling the effect of greenhouse gases on Earth's temperature modeling underwater rivers and waterfalls and springs construct a model that simulates an earthquake setting up a scale model of the solar system
SC.H.1.4.5 The Nature of Science	The student uses the scientific processes and habits of mind to solve problems.	10	The students understands that new ideas in science are limited by the context in which they are conceived, are often rejected by the scientific establishment, sometimes spring from unexpected finding, and usually grow slowly from many contributors.	157 159 160 163 168	history of calendars counting the days in a year the history of clocks and the division of time ancient beliefs about solar eclipses history of the telescope	14	contributions of Schönbein

Correlation to Sunshine State Science Content Assessed by FCAT grade 10

Introduction to Earth and Space Science

Student Text and Investigation Manual

Standard #: Strand	Standard	Grade tested	Benchmark	student text pg	detail	investigation pg	detail
SC.H.1.4.6 The Nature of Science	The student uses the scientific processes and habits of mind to solve problems.	10	The student understands that, in the short run, new ideas that do not mesh well with mainstream ideas in science often encounter vigorous criticism and that, in the long run, theories are judged by how they fit with other theories.	95 98 102 103 137 140 185 186 221	relative dating and modern geology based on Steno's theories Kelvin's calculations of Earth's age theory of plate tectonics critiquing Wegener's theories of continental drift Darwin's theories of the Andes formation what causes ice ages theories of origin of the moon early theories of the solar system Big Bang theory		
SC.H.1.4.7 The Nature of Science	The student uses the scientific processes and habits of mind to solve problems.	10	The student understands the importance of a sense of responsibility, a commitment to peer review, truthful reporting of the methods and outcomes of investigations, and making the public aware of the findings.			41 43 45	create water quality report write paragraph to explain results write summary of findings

Correlation to Sunshine State Science Content Assessed by FCAT grade 10
Introduction to Earth and Space Science
Student Text and Investigation Manual

Standard #: Strand	Standard	Grade tested	Benchmark	student text pg	detail	investigation pg	detail
SC.H.2.4.1 The Nature of Science	The student understands that most natural events occur in comprehensible, consistent patterns.	10	The student knows that scientists assume that the universe is a vast system in which basic rules exist that may range from very simple to extremely complex, but scientists operate on the belief that the rules can be discovered by careful, systemic study.	25 56 222	why do ears pop meteorologists use atmospheric pressure data to understand movement of weather systems evidence for Big Bang theory	31	the food paradox of the oceans

Correlation to Sunshine State Science Content Assessed by FCAT grade 10
Introduction to Earth and Space Science
Student Text and Investigation Manual

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SC.H.2.4.2 The Nature of Science	The student understands that most natural events occur in comprehensible, consistent patterns.	10	The student knows that scientists control conditions in order to obtain evidence, but when that is not possible for practical or ethical reasons, they try to observe a wide range of natural occurrences to discern patterns.	8	determining effect of changing mass on temperature changes	13	identifying relationships between air pressure and weather
				12	thermal equilibrium	22	identifying relationship between percent of Earth covered in water and temperature range
				25	why do ears pop		
				49	factors that shape the weather	27	determining whether distance from light source or axial tilt plays a more significant role in causing the seasons
				56	meteorologists use atmospheric pressure data to understand movement of weather systems	31	the food paradox of the oceans
				82	what causes acid rain	48	sequencing events
				182	relationship between orbital speed and distance between two objects	59	concluding which conditions affect the timing and duration and intensity of an earthquake based on observation
				222	evidence for Big Bang theory	6	effect of changing mass on data
						6	effect of changing mass on collected data
						65	justify which scenario was most likely
						80	investigation discovering relationship between orbital speed and distance

Correlation to Sunshine State Science Content Assessed by FCAT grade 10
Introduction to Earth and Space Science
Student Text and Investigation Manual

Standard #: Strand	Standard	Grade tested	Benchmark	student text pg	detail	investigation pg	detail
SC.H.3.4.1 The Nature of Science	The student understands that science, technology, and society are interwoven and interdependent.	10	The student knows that performance testing is often conducted using small-scale models, computer simulations, or analogous systems to reduce the chance of system failure.	37	computer modeling to predict greenhouse effects	10	design and construct an aneroid barometer
				46	modeling air currents	13	constructing a graph from atmospheric pressure data
				70	create a model (#1)	18	modeling the effect of greenhouse gases on Earth's temperature
				98	model of Earth's history	19	graphing water and ice temperature readings
				107	modeling plate boundaries	22	constructing a graph of time vs. temperature
				150	rock cycle model	28	modeling underwater rivers and waterfalls and springs
				188	solar system modeling	3	construct a graphical model
				198	model of the sun's anatomy	38	design a scale model of a zoo
						47	constructing a graph of drops of acid vs pH
						5	construct a temperature vs. time graph
						55	evaluating your completed bathymetric map
						56	construct a model that simulates an earthquake
						56	simulate an earthquake

Correlation to Sunshine State Science Content Assessed by FCAT grade 10
Introduction to Earth and Space Science
Student Text and Investigation Manual

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						70 71 73 82	design a metamorphism simulation evaluate your ability to interpret rock formations design a sundial setting up a scale model of the solar system
SC.H.3.4.2 The Nature of Science	The student understands that science, technology, and society are interwoven and interdependent.	10	The student knows that technological problems often create a demand for new scientific knowledge and that new technologies make it possible for scientists to extend their research in a way that advances science.	35 77 83 104 112 118 171 173	hydrogen powered cars the clean water act catalytic converters and scrubbing reduce acid rain using echo sounders to map the sea floor what we can learn from seismographs understanding earthquakes allows engineers to design safer buildings using satellite technology space shuttle		

Correlation to Sunshine State Science Content Assessed by FCAT grade 10
Introduction to Earth and Space Science
Student Text and Investigation Manual

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SC.H.3.4.3 The Nature of Science	The student understands that science, technology, and society are interwoven and interdependent.	10	The student knows that scientists can bring information, insights, and analytical skills to matters of public concern and help people understand the possible causes and effects of events.	116 119	studying seismic waves leads to information used in oil and gas exploration predicting tsunamis		
SC.H.3.4.4 The Nature of Science	The student understands that science, technology, and society are interwoven and interdependent.	10	The student knows that funds for science research come from federal government agencies, industry, and private foundations and that this funding often influences the areas of discovery.	31 35 73 92 92 92	London Agreement of 1991 should governments enforce changes for lowering greenhouse gas levels governments managing water resources how is the government addressing the problem of acid rain? what is the history of your community's water supply and treatment is acid rain a problem in your community?		

Correlation to Sunshine State Science Content Assessed by FCAT grade 10
Introduction to Earth and Space Science
Student Text and Investigation Manual

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SC.H.3.4.5 The Nature of Science	The student understands that science, technology, and society are interwoven and interdependent.	10	The student knows that the value of a technology may differ for different people and at different times.	35 77 83 104 112 118 171 173	hydrogen powered cars the clean water act catalytic converters and scrubbing reduce acid rain using echo sounders to map the sea floor what we can learn from seismographs understanding earthquakes allows engineers to design safer buildings using satellite technology space shuttle		

Correlation to Sunshine State Science Content Assessed by FCAT grade 10
Introduction to Earth and Space Science
Student Text and Investigation Manual

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SC.H.3.4.6 The Nature of Science	The student understands that science, technology, and society are interwoven and interdependent.	10	The student knows that scientific knowledge is used by those who engage in design and technology to solve practical problems, taking human values and limitations into account.			10 10 38 38 56 56 70 70 73 73	build your own atmospheric pressure gauge design and construct an aneroid barometer design a scale model of a zoo desisgn a scale model of a zoo simulate an earthquake simulate an earthquake design a metamorphism simulation design a metamorphism simulation design a sundial design a sundial