

Correlation to Tennessee Middle School Learning Expectations
CPO Science Earth Science (Middle School)
Student Text and Investigation Manual

Standard #: Grade level	Topic	Conceptual Strand	Learning Expectations	Volume 1 Student Text Page		Volume 2 Investigation Manual Page	
GLE 0607.06.1 6	Universe	The cosmos is vast and explored well enough to know its basic structure and operational principles.	Analyze information about the major components of the universe.	99	compare Earth's atmosphere with other planets	117	orbits of moon and planets
				100	comparison of Earth's atmosphere to other planets	117	place of Earth in solar system
				113	compare Earth with other planets with respect to supporting life	118	orbits of moons and other planets
				113	compare orbits of planets	118	Earth's position among planets
				399	general structure of solar system	119	orbits of planets
				399	compare planets	119	Earth's position among the planets
				401	general structure of the solar system	121	general characteristics of universe
				403	orbits of moons and planets	121	position of Earth among planets
				405	general position of Earth	138	orbits of planets
				407	classifying planets		
				408	what makes Earth capable of supporting life		
				409	compare Earth to Mars in relation to supporting life		
				409	classify and compare planets		
				409	classifying the planets		
				410	compare planets		

Correlation to Tennessee Middle School Learning Expectations
CPO Science Earth Science (Middle School)
Student Text and Investigation Manual

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				411	
					compare orbits of planets in solar system
				412	
					comparing planets
				412	
					compare Earth to other planets with respect to supporting life
				414	
					other planets in universe
				415	
					orbits of other bodies in the solar system
				416	
					other bodies in solar system
				418	
					compare planets
				418	
					compare orbits of planets and other bodies in solar system
				419	
					compare planets
				420	
					compare planets
				420	
					Earth is unique to support life
				423	
					orbits of planets and moons
				424	
					orbits of planets in solar system
				424	
					place of Earth in solar system
				425	
					compare orbits of planets and moon

Correlation to Tennessee Middle School Learning Expectations
CPO Science Earth Science (Middle School)
Student Text and Investigation Manual

Standard #: Grade level	Topic	Conceptual Strand	Learning Expectations	Volume 1 Student Text Page	Volume 2 Investigation Manual Page
				425	
					role of gravity in solar system
				427	appearance of night sky
				427	general structure of solar system
				428	role of gravity in solar system
				430	explain orbit of Earth
				432	orbit of moon
				440	features and emissions of the sun
				442	structure of sun
				442	sun's characteristics
				443	sun as star
				444	Sun as a star
				447	galaxies
				447	appearance of night sky
				455	the appearance of constellations in the night sky
				456	compare the Sun to other stars
				456	explain how stars form and features of life cycle
				457	how stars produce energy
				458	brightness of a star

Correlation to Tennessee Middle School Learning Expectations
CPO Science Earth Science (Middle School)
Student Text and Investigation Manual

Standard #: Grade level	Topic	Conceptual Strand	Learning Expectations	Volume 1 Student Text Page	Volume 2 Investigation Manual Page
				460	compare sun to other stars
				460	how stars form
				460	stages of star's life are determined by balance between gravitational collapse and nuclear fusion
				461	how the solar system was formed
				461	the existence of other planetary systems
				464	features of universe as we currently understand it
				465	characteristics of the universe
				466	how doppler shift and cosmic background radiation are evidence for Big Bang
				467	how stars form
				467	evidence for Big Bang
				468	evidence for Big Bang
				468	star life cycle
				469	description of galaxy as we know it
				469	evidence for Big Bang
				474	research and describe astronomical objects

Correlation to Tennessee Middle School Learning Expectations
CPO Science Earth Science (Middle School)
Student Text and Investigation Manual

Standard #: Grade level	Topic	Conceptual Strand	Learning Expectations	Volume 1 Student Text Page		Volume 2 Investigation Manual Page	
GLE 0607.06.2 6	Universe	The cosmos is vast and explored well enough to know its basic structure and operational principles.	Describe the relative distance of objects in the solar system from earth.	10	how astronomical instruments increase our understanding of the universe	120	use astronomical units
				19	describe how astronomical instruments and technology have increased our understanding of the universe	120	use of light years
						122	astronomical units
						122	relative sizes of object
						123	relative sizes of object
				38	understand that changes in scale influence characteristics of a system		
				99	compare Earth's atmosphere with other planets		
				100	comparison of Earth's atmosphere to other planets		
				113	compare Earth with other planets with respect to supporting life		
				190	changes in scale influence characteristics		
				370	describe how astronomical instruments and technology have increased our understanding of the universe		
				405	AU		

Correlation to Tennessee Middle School Learning Expectations
CPO Science Earth Science (Middle School)
Student Text and Investigation Manual

Standard #: Grade level	Topic	Conceptual Strand	Learning Expectations	Volume 1 Student Text Page	Volume 2 Investigation Manual Page
				408	
					what makes Earth capable of supporting life
				409	
					compare Earth to Mars in relation to supporting life
				410	
					astronomical instruments
				411	
					how astronomical instruments help us understand universe
				412	
					compare Earth to other planets with respect to supporting life
				415	
					how astronomical instruments help us understand the universe
				420	
					Earth is unique to support life
				442	
					astronomical instruments
				443	
					astronomical instruments increase understanding of universe
				448	
					astronomical instruments lead to increased understanding of the universe
				450	
					light years and time
				451	
					history of the telescope
				452	
					types and uses of telescopes

Correlation to Tennessee Middle School Learning Expectations
CPO Science Earth Science (Middle School)
Student Text and Investigation Manual

Standard #: Grade level	Topic	Conceptual Strand	Learning Expectations	Volume 1 Student Text Page	Volume 2 Investigation Manual Page
				453 astronomical instruments increase understanding of universe	
				459 the use of spectroscopy to analyze stars	
				463 how astronomical instruments helped us learn about the universe	
				465 light years	
				469 astronomical instruments	
				469 light years	

**Correlation to Tennessee Middle School Learning Expectations
CPO Science Earth Science (Middle School)
Student Text and Investigation Manual**

Standard #: Grade level	Topic	Conceptual Strand	Learning Expectations	Volume 1 Student Text Page		Volume 2 Investigation Manual Page	
GLE 0607.06.3 6	Universe	The cosmos is vast and explored well enough to know its basic structure and operational principles.	Explain how the positional relationships among the earth, moon, and sun control the length of the day, lunar cycle, and year.	113	compare orbits of planets	117	orbits of moon and planets
				114	explain relationship between Earth, Sun, and patterns of seasons	117	relationship between sun and Earth and day and night
				403	orbits of moons and planets	118	orbits of moons and other planets
				404	Earth's rotation and patterns of day and night	119	orbits of planets
				411	compare orbits of planets in solar system	119	relationship between sun and Earth
				415	orbits of other bodies in the solar system	124	relationship between sun and Earth and days
				416	other bodies in solar system	127	phases of the moon
				418	compare orbits of planets and other bodies in solar system	131	how Sun and Earth distances cause seasons
				423	relationship of Earth and moon	132	Earth and Sun positions causing seasons
				423	orbits of planets and moons	133	Sun and Earth positions and their relationship with seasons
				423	relationship of sun and Earth	133	relationship between Earth sun and light
				424	relationship of Earth and sun	137	appearance of moon
				424	orbits of planets in solar system	138	orbits of planets
				425	role of gravity in solar system	138	appearance of the moon

Correlation to Tennessee Middle School Learning Expectations
CPO Science Earth Science (Middle School)
Student Text and Investigation Manual

Standard #: Grade level	Topic	Conceptual Strand	Learning Expectations	Volume 1 Student Text Page	Volume 2 Investigation Manual Page
				425	
					compare orbits of planets and moon
				426	
					giant impact theory
				428	
					tides and Earth and moon's relationship
				428	
					role of gravity in solar system
				430	
					patterns of day and night and years
				430	
					explain orbit of Earth
				432	
					orbit of moon
				432	
					phases of the moon
				433	
					phases of moon
				434	
					lunar eclipses
				435	
					solar eclipses
				435	
					solar eclipses
				435	
					solar eclipses
				436	
					seasons and relationship between Earth and sun
				437	
					identify seasons
				445	
					identify seasons

**Correlation to Tennessee Middle School Learning Expectations
CPO Science Earth Science (Middle School)
Student Text and Investigation Manual**

Standard #: Grade level	Topic	Conceptual Strand	Learning Expectations	Volume 1 Student Text Page		Volume 2 Investigation Manual Page	
GLE 0607.06.4 6	Universe	The cosmos is vast and explored well enough to know its basic structure and operational principles.	Describe the different stages in th lunar cycle.	423	relationship of Earth and moon	121	general characteristics of universe
				426	giant impact theory	127	phases of the moon
				427	appearance of night sky	137	appearance of moon
				428	tides and Earth and moon's relationship	138	appearance of the moon
				432	phases of the moon		
				433	phases of moon		
				434	lunar eclipses		
				435	solar eclipses		
				447	appearance of night sky		
				455	the appearance of constellations in the night sky		
				464	features of universe as we currently understand it		
				465	characteristics of the universe		
				469	description of galaxy as we know it		
				474	research and describe astronomical objects		

**Correlation to Tennessee Middle School Learning Expectations
CPO Science Earth Science (Middle School)
Student Text and Investigation Manual**

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GLE 0607.06.5 6	Universe	The cosmos is vast and explored well enough to know its basic structure and operational principles.	Produce a model to demonstrate how the moon produces tides.	423 relationship of Earth and moon 425 role of gravity in solar system 426 giant impact theory 428 tides and Earth and moon's relationship 428 role of gravity in solar system 432 phases of the moon 433 phases of moon 434 lunar eclipses 435 solar eclipses	127 phases of the moon 137 appearance of moon 138 appearance of the moon

**Correlation to Tennessee Middle School Learning Expectations
CPO Science Earth Science (Middle School)
Student Text and Investigation Manual**

Standard #: Grade level	Topic	Conceptual Strand	Learning Expectations	Volume 1 Student Text Page		Volume 2 Investigation Manual Page	
GLE 0607.06.6 6	Universe	The cosmos is vast and explored well enough to know its basic structure and operational principles.	Illustrate the relationship between the seasons and the earth-sun system.	99	compare Earth's atmosphere with other planets	117	relationship between sun and Earth and day and night
				100	comparison of Earth's atmosphere to other planets	117	place of Earth in solar system
				113	compare orbits of planets	117	orbits of moon and planets
				113	compare Earth with other planets with respect to supporting life	118	Earth's position among planets
				114	general cause of seasons	118	orbits of moons and other planets
				114	explain relationship between Earth, Sun, and patterns of seasons	119	relationship between sun and Earth
				399	general structure of solar system	119	Earth's position among the planets
				401	general structure of the solar system	119	orbits of planets
				403	orbits of moons and planets	121	position of Earth among planets
				404	Earth's rotation and patterns of day and night	124	relationship between sun and Earth and days
				405	general position of Earth	131	how Sun and Earth distances cause seasons
				408	what makes Earth capable of supporting life	132	Earth and Sun positions causing seasons
				409	compare Earth to Mars in relation to supporting life	133	Sun and Earth positions and their relationship with seasons
				411	compare orbits of planets in solar system	133	relationship between Earth sun and light

Correlation to Tennessee Middle School Learning Expectations
CPO Science Earth Science (Middle School)
Student Text and Investigation Manual

Standard #: Grade level	Topic	Conceptual Strand	Learning Expectations	Volume 1 Student Text Page	Volume 2 Investigation Manual Page		
				412	compare Earth to other planets with respect to supporting life	138	orbits of planets
				415	orbits of other bodies in the solar system		
				416	other bodies in solar system		
				418	compare orbits of planets and other bodies in solar system		
				420	Earth is unique to support life		
				423	relationship of sun and Earth		
				423	orbits of planets and moons		
				424	relationship of Earth and sun		
				424	place of Earth in solar system		
				424	orbits of planets in solar system		
				425	compare orbits of planets and moon		
				427	general structure of solar system		
				430	explain orbit of Earth		
				430	patterns of day and night and years		

**Correlation to Tennessee Middle School Learning Expectations
CPO Science Earth Science (Middle School)
Student Text and Investigation Manual**

Standard #: Grade level	Topic	Conceptual Strand	Learning Expectations	Volume 1 Student Text Page	Volume 2 Investigation Manual Page
				432 orbit of moon 435 solar eclipses 435 solar eclipses 436 seasons and relationship between Earth and sun 437 identify seasons 445 identify seasons	
GLE 0607.06.7 6	University	The cosmos is vast and explored well enough to know its basic structure and operational principles.	Describe the causes of lunar and solar eclipse.	423 relationship of Earth and moon 426 giant impact theory 428 tides and Earth and moon's relationship 432 phases of the moon 433 phases of moon 434 lunar eclipses 435 solar eclipses	127 phases of the moon 137 appearance of moon 138 appearance of the moon

**Correlation to Tennessee Middle School Learning Expectations
CPO Science Earth Science (Middle School)
Student Text and Investigation Manual**

Standard #: Grade level	Topic	Conceptual Strand	Learning Expectations	Volume 1 Student Text Page		Volume 2 Investigation Manual Page	
GLE 0607.08.1 6	Atmosphere	The earth is surrounded by an active atmosphere and an energy system that controls the distribution life, local weather, climate, and global temperature.	Design and conduct an investigation to determine how the sun drives atmospheric convection.	54	movement of heat through radiation	19	movement of heat—convection
				62	movement of heat through convection	20	convection
				63	movement of heat through solids—conduction	20	convection
				64	transfer of heat through radiation	30	major Earth systems such as atmosphere
				65	movement of heat by conduction, convection, and radiation	35	heat transfer through radiation
				74	investigate types of heat transfer	48	differential heating causes circulation of currents
				76	types of heat transfer		
				98	discuss atmosphere		
				105	atmosphere		
				106	Earth's atmosphere		
				107	atmosphere structure		
				111	movement of heat through convection and conduction and radiation		
				117	differential heating of oceans		
				122	differential heating of Earth causes circulation		
				123	movement of heat through gas by convection		

Correlation to Tennessee Middle School Learning Expectations
CPO Science Earth Science (Middle School)
Student Text and Investigation Manual

Standard #: Grade level	Topic	Conceptual Strand	Learning Expectations	Volume 1 Student Text Page	Volume 2 Investigation Manual Page
				124	
					how differential heating of Earth causes air movements
				124	
					movement of heat through convection
				125	
					differential heating of Earth results in circulation of air
				131	
					atmosphere
				135	
					differential heating of Earth leads to distribution of heat
				160	
					movement of heat through liquids
				231	
					major Earth systems
				233	
					movement of heat through liquids—convection
				236	
					interaction of major Earth systems
				236	
					convection in Earth
				241	
					convection
				242	
					major systems of Earth
				252	
					movement of heat through liquids—convection
				271	
					major Earth systems

Correlation to Tennessee Middle School Learning Expectations
CPO Science Earth Science (Middle School)
Student Text and Investigation Manual

Standard #: Grade level	Topic	Conceptual Strand	Learning Expectations	Volume 1 Student Text Page	Volume 2 Investigation Manual Page
				274 major Earth systems—lithosphere	
				357 major Earth systems hydrosphere and atmosphere and biosphere and geosphere	
				358 major Earth systems	
				360 major systems hydrosphere and biosphere and geosphere	
				390 significance of greenhouse effect	
				392 movement of heat through convection	
				442 movement of heat through convection	

**Correlation to Tennessee Middle School Learning Expectations
CPO Science Earth Science (Middle School)
Student Text and Investigation Manual**

Standard #: Grade level	Topic	Conceptual Strand	Learning Expectations	Volume 1 Student Text Page		Volume 2 Investigation Manual Page	
GLE 0607.08.2 6	Atmosphere	The earth is surrounded by an active atmosphere and an energy system that controls the distribution life, local weather, climate, and global temperature.	Describe how the sun's energy produces the wind.	74	know the rate of solar radiation	30	major Earth systems such as atmosphere
				98	discuss atmosphere	48	differential heating causes circulation of currents
				105	atmosphere		
				106	Earth's atmosphere		
				107	atmosphere structure		
				107	fate of incoming solar radiation		
				108	fate of incoming solar radiation		
				111	fate of incoming solar radiation		
				117	differential heating of oceans		
				122	differential heating of Earth causes circulation		
				122	large scale movement of air and how it affects weather		
				123	large movements of air		
				124	how differential heating of Earth causes air movements		
				125	differential heating of Earth results in circulation of air		
				125	how air movement affects weather		

Correlation to Tennessee Middle School Learning Expectations
CPO Science Earth Science (Middle School)
Student Text and Investigation Manual

Standard #: Grade level	Topic	Conceptual Strand	Learning Expectations	Volume 1 Student Text Page	Volume 2 Investigation Manual Page
				126	
				131	
				133	
				134	
				135	
				137	
				141	
				142	
				142	
				145	
				158	
				159	

Correlation to Tennessee Middle School Learning Expectations
CPO Science Earth Science (Middle School)
Student Text and Investigation Manual

Standard #: Grade level	Topic	Conceptual Strand	Learning Expectations	Volume 1 Student Text Page	Volume 2 Investigation Manual Page
				231 major Earth systems 236 interaction of major Earth systems 242 major systems of Earth 271 major Earth systems 274 major Earth systems—lithosphere 357 major Earth systems hydrosphere and atmosphere and biosphere and geosphere 358 major Earth systems 360 major systems hydrosphere and biosphere and geosphere	
GLE 0607.08.3 6	Atmpshere	The earth is surrounded by an active atmosphere and an energy system that controls the distribution life, local weather, climate, and global temperature.	Investigate the relationship between currents and oceanic temperature differences.	117 differential heating of oceans 122 differential heating of Earth causes circulation 124 how differential heating of Earth causes air movements 125 differential heating of Earth results in circulation of air 135 differential heating of Earth leads to distribution of heat	48 differential heating causes circulation of currents

Correlation to Tennessee Middle School Learning Expectations
CPO Science Earth Science (Middle School)
Student Text and Investigation Manual

Standard #: Grade level	Topic	Conceptual Strand	Learning Expectations	Volume 1 Student Text Page	Volume 2 Investigation Manual Page
GLE 0607.08.4 6	Atmosphere	The earth is surrounded by an active atmosphere and an energy system that controls the distribution life, local weather, climate, and global temperature.	Analyze meteorological data to predict weather conditions.	32 thermometers and temperature-measuring instruments 33 thermometers and temperature-measuring instruments 34 temperature measuring instruments 35 thermometers 60 thermometers 103 techniques for atmospheric measurement 116 hurricanes 116 tools (planes) for atmospheric measurement 117 techniques for atmospheric measurement 117 how oceans affect weather 117 hurricanes 122 large scale movement of air and how it affects weather 122 changes in and causes for weather 123 large movements of air 125 how air movement affects weather	30 changes in weather 30 describe techniques for atmospheric measurement 31 make a barometer for air pressure readings 38 use techniques for atmospheric measurement 39 use techniques for atmospheric measurement 40 describe changes in weather 41 techniques of atmospheric measurement 42 causes for tornadoes 44 hurricanes 45 investigate ocean currents 50 investigate wave speed 96 thermometers 150 thermometers 156 temperature measuring devices

**Correlation to Tennessee Middle School Learning Expectations
CPO Science Earth Science (Middle School)
Student Text and Investigation Manual**

Standard #: Grade level	Topic	Conceptual Strand	Learning Expectations	Volume 1 Student Text Page	Volume 2 Investigation Manual Page
				126	
					how water cycle affects weather
				126	
					water cycle related to weather
				126	
					movement of air affects weather
				129	
					types of precipitation based on dewpoint
				130	
					describe changes in weather (i.e. clouds)
				131	
					reasons for changes in weather
				132	
					how water cycle relates to weather
				132	
					different forms of precipitation
				132	
					changes in weather
				133	
					large scale movement of air causes weather changes
				133	
					changes in weather
				134	
					reasons for changes in weather
				134	
					movement of air affects weather
				136	
					causes of severe weather
				137	
					changes in weather and causes for storms

Correlation to Tennessee Middle School Learning Expectations
CPO Science Earth Science (Middle School)
Student Text and Investigation Manual

Standard #: Grade level	Topic	Conceptual Strand	Learning Expectations	Volume 1 Student Text Page	Volume 2 Investigation Manual Page
				137	
					movement of air affects weather
				137	
					water cycle affects weather
				138	
					reasons for tornadoes
				139	
					how oceans affect weather including El Nino
				141	
					water affects climates
				141	
					movement of air affects climate
				141	
					oceans affect climate
				143	
					water affects temperature
				148	
					describe techniques for atmospheric observation
				149	
					tools used to measure atmosphere
				158	
					movements of air affect weather patterns
				158	
					how water cycle relates to weather patterns
				158	
					oceans affect climate
				159	
					ocean currents
				160	
					ocean currents
				178	
					ocean currents
				179	
					ocean currents

**Correlation to Tennessee Middle School Learning Expectations
CPO Science Earth Science (Middle School)
Student Text and Investigation Manual**

Standard #: Grade level	Topic	Conceptual Strand	Learning Expectations	Volume 1 Student Text Page		Volume 2 Investigation Manual Page	
GLE 0707.07.1 7	The Earth	Major geologic events that occur over eons or brief moments in time continually shape and reshape the surface of the Earth, resulting in continuous global change.	Describe the physical properties of minerals.	234	know properties of minerals	91	properties of minerals and ways to identify minerals
				257	properties of minerals—rocks	92	properties of minerals and how to identify them
				286	properties of minerals		
				304	properties of minerals		
				305	properties of minerals (i.e. cleavage)		
				306	properties of minerals (i.e. hardness)		
				316	minerals		
				320	properties of minerals		
			321	properties of diamond			

Correlation to Tennessee Middle School Learning Expectations
CPO Science Earth Science (Middle School)
Student Text and Investigation Manual

Standard #: Grade level	Topic	Conceptual Strand	Learning Expectations	Volume 1 Student Text Page	Volume 2 Investigation Manual Page
GLE 0707.07.2 7	The Earth	Major geologic events that occur over eons or brief moments in time continually shape and reshape the surface of the Earth, resulting in continuous global change.	Summarize the basic events that occur during the rock cycle.	169 explain how rocks are broken down by the action of water 170 how rocks are broken down and how surface features are affected by water 171 erosion and how surface features change 199 types of rock and how they are formed 210 how rocks are broken down and surface features change due to action of water 252 major Earth systems—lithosphere 295 how rocks are formed 307 types of rocks and how they are made 308 rock cycle and types of rock 308 rock gets broken down into soil 310 igneous rock formation 311 how igneous rocks are formed 312 how rocks are formed	90 how rocks are formed 94 explain how rocks are formed 100 types of rocks and how they are formed

Correlation to Tennessee Middle School Learning Expectations
CPO Science Earth Science (Middle School)
Student Text and Investigation Manual

Standard #: Grade level	Topic	Conceptual Strand	Learning Expectations	Volume 1 Student Text Page	Volume 2 Investigation Manual Page
				315	
					how sedimentary rocks are formed
				316	
					metamorphic rock formation
				317	
					formation of metamorphic rocks
				318	
					how rocks are formed
				327	
					how rocks are broken down
				327	
					rock cycle
				329	
					how rocks are broken down by water and ice
				332	
					how rocks are broken down and turned back into soil
				336	
					types of rock and how they are formed
				337	
					rocks broken down into soil
				340	
					Earth's surface changes because of water
				356	
					soil formation
				358	
					rock formation
				358	
					how rocks break down into soil
				359	
					rocks are broken down into soil

Correlation to Tennessee Middle School Learning Expectations
CPO Science Earth Science (Middle School)
Student Text and Investigation Manual

Standard #: Grade level	Topic	Conceptual Strand	Learning Expectations	Volume 1 Student Text Page	Volume 2 Investigation Manual Page
				360 how rocks are broken down into soil	
				361 rocks broken down into soil	
				363 how rocks are broken down into soil	

**Correlation to Tennessee Middle School Learning Expectations
CPO Science Earth Science (Middle School)
Student Text and Investigation Manual**

Standard #: Grade level	Topic	Conceptual Strand	Learning Expectations	Volume 1 Student Text Page	Volume 2 Investigation Manual Page
GLE 0707.07.3 7	The Earth	Major geologic events that occur over eons or brief moments in time continually shape and reshape the surface of the Earth, resulting in continuous global change.	Analyze the characteristics of the earth's layers and the location of the major plates.	16 plate tectonics 54 inner structure of Earth 225 diagram inner structure of Earth 228 diagram inner Earth 229 diagram structure of Earth 230 diagram inner structure of Earth 231 diagram and explain structure of inner Earth 232 Earth's inner structure 233 diagram inner structure of Earth 234 diagram inner structure of Earth 235 behavior of Earth's crust 237 diagram of structure of inner Earth 238 structures of inner Earth 239 structure of inner Earth 241 Earth's structure 242 structure of inner Earth 246 theory of plate tectonics 247 plate tectonics explains surface features of Earth 248 plate tectonics	69 model Earth 70 model inner layers of Earth 80 plate tectonics 81 plate tectonics 87 theory of plate tectonics

Correlation to Tennessee Middle School Learning Expectations
CPO Science Earth Science (Middle School)
Student Text and Investigation Manual

Standard #: Grade level	Topic	Conceptual Strand	Learning Expectations	Volume 1 Student Text Page	Volume 2 Investigation Manual Page
				253	
				plate tectonics	
				254	
				plate tectonics	
				267	
				plate tectonics	
				268	
				plate tectonics	
				269	
				plate tectonics	
				273	
				plate tectonics	
				293	
				inner structure of Earth	
				312	
				inner workings of volcano	
				318	
				plate tectonics	
				384	
				how human activity affects renewable and nonrenewable resources	
				392	
				inner structure of Earth	
				393	
				inner structure of Earth	

**Correlation to Tennessee Middle School Learning Expectations
CPO Science Earth Science (Middle School)
Student Text and Investigation Manual**

Standard #: Grade level	Topic	Conceptual Strand	Learning Expectations	Volume 1 Student Text Page		Volume 2 Investigation Manual Page	
GLE 0707.07.4 7	The Earth	Major geologic events that occur over eons or brief moments in time continually shape and reshape the surface of the Earth, resulting in continuous global change.	Explain how earthquakes, mountain building, volcanoes, and sea floor mountain building, volcanoes, and sea floor spreading are associated with movements of the earth's major plates.	16	plate tectonics	70	types of features found along plate boundaries
				118	evolution of land features from gradual changes	74	mountain building
				235	behavior of Earth's crust	76	three types of plate boundaries and features associated with them
				239	cause of earthquakes		
				246	theory of plate tectonics	77	students know why earthquakes occur
				247	plate tectonics explains surface features of Earth	78	explanation for placement and properties of volcanoes
				248	plate tectonics		
				253	structures that form at plate boundaries	78	types of features at plate boundaries
				253	evolution of land features resulting from gradual changes	78	students know the structures that form at plate boundaries
				253	plate tectonics		
				254	plate boundaries	78	structures that form at certain plate boundaries
				254	plate tectonics	80	plate tectonics
				255	plate boundaries	81	plate tectonics
				256	plate boundaries	82	students know why earthquakes occur
				258	predict results of gradual changes—mountain building	82	students know why earthquakes occur
				259	know how earthquakes occur	85	students understand how earthquakes occur
				260	structures that form at plate boundaries	87	theory of plate tectonics

**Correlation to Tennessee Middle School Learning Expectations
CPO Science Earth Science (Middle School)
Student Text and Investigation Manual**

Standard #: Grade level	Topic	Conceptual Strand	Learning Expectations	Volume 1 Student Text Page	Volume 2 Investigation Manual Page		
				264	principal structures that form at plate boundaries	88	students know why and how earthquakes occur and the scales used to measure their intensity
				264	know that the explanation for the location and properties of volcanoes are due to hot spots and subduction	88	students know there are two types of volcanoes—one with violent eruptions and voluminous lava flows
				266	plate boundaries		
				267	plate tectonics	89	know what forms at different types of plate boundaries
				267	plate boundaries		
				268	plate tectonics	89	two types of volcanoes violent and gentle
				268	plate boundaries		
				269	plate tectonics	89	students know that there are two kinds of volcanoes
				270	why and how earthquakes occur	89	students know structures that form at the three different plate boundaries
				273	plate tectonics		
				274	students know why and how earthquakes occur	90	explanation of location of volcanoes
				279	earthquake scale	90	types of volcanoes
				280	types of features at plate boundaries	102	predict evolution of land features resulting from erosion
				280	scale for earthquakes		
				281	know scales used to measure intensity of earthquakes	104	predict results of erosion
						105	predict results of erosion
				286	different types of volcanoes		

Correlation to Tennessee Middle School Learning Expectations
CPO Science Earth Science (Middle School)
Student Text and Investigation Manual

Standard #: Grade level	Topic	Conceptual Strand	Learning Expectations	Volume 1 Student Text Page	Volume 2 Investigation Manual Page
				287	
					two types of volcanoes—violent and voluminous lava
				288	types of volcanoes
				289	types of volcanoes
				290	structures that form at plate boundaries
				292	volcanoes occur at hotspots due to subduction
				293	volcanoes occur at hotspots created because of subduction
				293	volcanic islands appear at plate boundaries
				294	islands form at plate boundaries
				295	two types of volcanoes—violent and with voluminous lava
				310	types of plate boundaries
				317	types of formations found at different plate boundaries
				318	plate tectonics
				318	structures formed at types of plate boundaries
				326	predict evolution of land features resulting from gradual changes

Correlation to Tennessee Middle School Learning Expectations
CPO Science Earth Science (Middle School)
Student Text and Investigation Manual

Standard #: Grade level	Topic	Conceptual Strand	Learning Expectations	Volume 1 Student Text Page	Volume 2 Investigation Manual Page
				339 evolution of land features from gradual changes	
				342 predict evolution of land features because of erosion	
				359 evolution of land features from erosion	
				362 evolution of land features by erosion	
				384 how human activity affects renewable and nonrenewable resources	

**Correlation to Tennessee Middle School Learning Expectations
CPO Science Earth Science (Middle School)
Student Text and Investigation Manual**

Standard #: Grade level	Topic	Conceptual Strand	Learning Expectations	Volume 1 Student Text Page		Volume 2 Investigation Manual Page	
GLE 0707.07.5 7	The Earth	Major geologic events that occur over eons or brief moments in time continually shape and reshape the surface of the Earth, resulting in continuous global change.	Differentiate between renewable and nonrenewable resources in terms of their use by man.	47	environmental impact of landfills	104	draw conclusions about effects of human activity on resources
				108	how people affect Earth's atmosphere	105	draw conclusions about effects of human activity on resources
				291	volcanoes occur at subduction zones	107	make wise choices in the use of resources
				305	economic usage of quartz	108	make wise choices in the conservation of resources
				320	economic importance of minerals	109	make wise choices in the conservation of resources
				321	economic importance of diamond	109	renewable and non-renewable resources
				322	conservation of resources	112	make inferences and draw conclusions about effects of human activity on renewable and nonrenewable resources
				322	how humans activities affect resources	115	classify resources as renewable or nonrenewable
				340	explain relationship between hydrosphere, climate, and human activity		
				341	how humans affect soil resources		
				349	make inferences and draw conclusions about effect of humans activity on Earth's renewable resources		
				350	how humans activities affect resources		
				350	conservation of resources		

**Correlation to Tennessee Middle School Learning Expectations
CPO Science Earth Science (Middle School)
Student Text and Investigation Manual**

Standard #: Grade level	Topic	Conceptual Strand	Learning Expectations	Volume 1 Student Text Page	Volume 2 Investigation Manual Page
				356	
					how human activity affects soil and water resources
				361	
					human impact on soil
				362	
					draw conclusions about human activity on Earth's resources
				364	
					wise choices in conservation of water resources
				365	
					relationship between hydrosphere and human activity
				365	
					effects of human activity on water
				366	
					wise choices in resources
				366	
					relationship between hydrosphere and human activity
				367	
					relationship between humans and hydrosphere
				368	
					sense of environmental impact and conservation
				371	
					human effects on natural resources
				375	
					effects of human activity on natural resources
				376	
					how human activity affects natural resources

**Correlation to Tennessee Middle School Learning Expectations
CPO Science Earth Science (Middle School)
Student Text and Investigation Manual**

Standard #: Grade level	Topic	Conceptual Strand	Learning Expectations	Volume 1 Student Text Page	Volume 2 Investigation Manual Page
				378	
					conclusions about human activity and effects on Earth's resources
				379	
					how human activity affects resources—renewable and nonrenewable
				380	
					classify resources as renewable or nonrenewable
				382	
					research and classify resources as renewable or nonrenewable
				383	
					classify resources as renewable or nonrenewable
				386	
					make wise choices in use of resources with regards to environmental impact
				386	
					wise choices in conservation of research
				387	
					how human activity affects renewable and nonrenewable resources
				389	
					make wise choices about conserving resources
				390	
					make wise choices in conservation of resources
				472	
					how humans activities affect resources

**Correlation to Tennessee Middle School Learning Expectations
CPO Science Earth Science (Middle School)
Student Text and Investigation Manual**

Standard #: Grade level	Topic	Conceptual Strand	Learning Expectations	Volume 1 Student Text Page	Volume 2 Investigation Manual Page
				472 conservation of resources	
GLE 0707.07.6 7	The Earth	Major geologic events that occur over eons or brief moments in time continually shape and reshape the surface of the Earth, resulting in continuous global change.	Evaluate how human activities affect the earth's land, oceans, and atmosphere.	108 air pollution 340 explain relationship between hydrosphere, climate, and human activity 341 how technology shapes landscape (i.e. erosion) 362 how technology shapes Earth's surface 364 origins and effects of water pollution 365 relationship between hydrosphere and human activity 366 relationship between hydrosphere and human activity 367 relationship between humans and hydrosphere 377 how human activity affects resources 387 describe origins of air pollution 388 origins and effects of water pollution 390 origin of air pollution	

**Correlation to Tennessee Middle School Learning Expectations
CPO Science Earth Science (Middle School)
Student Text and Investigation Manual**

Standard #: Grade level	Topic	Conceptual Strand	Learning Expectations	Volume 1 Student Text Page		Volume 2 Investigation Manual Page	
GLE 0807.05.3 8	Biodiversity and Change	A rich variety of complex organisms have developed in response to a continually changing environment.	Analyze how structural, behavioral, and physiological adaptations within a population enable it to survive in a given environment.	93	adaptations of animals to caves	49	factors regarding populations
				102	adaptations of animals to different environments	49	food chains
				142	what things affect biomes and populations there	80	evolution
				145	factors like water that affect populations in ecosystems		
				146	adaptations of plants to different biomes		
				157	adaptation of animals to ocean environment		
				220	adaptation of plants to different environments		
				224	adaptations of plants to certain areas		
				348	adaptation of plants to certain environments		
				371	adapation of plants to environments		
				399	adaptation of animals to different environments		
				420	adaptation of animals to environment		

**Correlation to Tennessee Middle School Learning Expectations
CPO Science Earth Science (Middle School)
Student Text and Investigation Manual**

Standard #: Grade level	Topic	Conceptual Strand	Learning Expectations	Volume 1 Student Text Page		Volume 2 Investigation Manual Page	
GLE 0807.05.6 8	Biodiversity and Change	A rich variety of complex organisms have developed in response to a continually changing environment.	Investigate fossils in sedimentary rock layers to gather evidence of changing life forms.	6	fossils	49	climate change over time and what it would do to currents
				208	explain origin and formation of fossils		
				209	how rocks and fossils are used to determine age of Earth	81	fossils
				210	how rocks are used to tell age of Earth		
				211	how rocks and fossils are used to date Earth		
				211	how fossils are formed		
				212	fossils used to determine age of Earth		
				213	how rocks and fossils are used to date Earth		
				215	fossil record helps to understand the history of Earth		
				216	fossil record used to understand Earth's history		
				217	how rocks are used to tell the age of Earth		
				223	explain how rocks are used to determine age of Earth		
				237	general Earth systems		
				238	lithosphere		

Correlation to Tennessee Middle School Learning Expectations
CPO Science Earth Science (Middle School)
Student Text and Investigation Manual

Standard #: Grade level	Topic	Conceptual Strand	Learning Expectations	Volume 1 Student Text Page	Volume 2 Investigation Manual Page
				307 how rocks are used to tell age of Earth 310 structure of Earth specifically mantle 315 how fossils are formed 315 explain the origin and formation of fossils 359 how rocks can help tell age of Earth	
GLE 0807.12.4 8	Forces in Nature	Everything in the universe exerts a gravitational force on everything else; there is an interplay between magnetic fields and electrical currents.	Identify factors that influence the amount of gravitational force between objects.	16 gravitation 17 law of gravity 22 law of gravity 27 law of gravity 324 law of gravity 353 law of gravity 374 law of gravity 402 Newton's universal law of gravitation 425 role of gravity in solar system 428 role of gravity in solar system	

Correlation to Tennessee Middle School Learning Expectations
CPO Science Earth Science (Middle School)
Student Text and Investigation Manual

Standard #: Grade level	Topic	Conceptual Strand	Learning Expectations	Volume 1 Student Text Page		Volume 2 Investigation Manual Page	
GLE 0807.12.5 8	Forces in Nature	Everything in the universe exerts a gravitational force on everything else; there is an interplay between magnetic fields and electrical currents.	Recognize that gravity is the force that controls the motion of objects in the solar system.	113	compare orbits of planets	117	orbits of moon and planets
				403	orbits of moons and planets	118	orbits of moons and other planets
				411	compare orbits of planets in solar system	119	orbits of planets
				415	orbits of other bodies in the solar system	138	orbits of planets
				416	other bodies in solar system		
				418	compare orbits of planets and other bodies in solar system		
				423	orbits of planets and moons		
				424	orbits of planets in solar system		
				425	compare orbits of planets and moon		
				425	role of gravity in solar system		
				428	gravity causes orbits		
				428	role of gravity in solar system		
				430	explain orbit of Earth		
				432	orbit of moon		
				461	how the solar system was formed		

**Correlation to Tennessee Middle School Learning Expectations
CPO Science Earth Science (Middle School)
Student Text and Investigation Manual**

Standard #: Grade level	Topic	Conceptual Strand	Learning Expectations	Volume 1 Student Text Page	Volume 2 Investigation Manual Page
GLE0807.09.5 8	Matter	The composition and structure of matter is known, and it behaves according to principles that are generally understood.	Apply the chemical properties of the atmosphere to illustrate a mixture of gases.	98 discuss atmosphere 99 components of Earth's atmosphere 105 water vapor as part of the atmosphere 105 atmosphere 106 Earth's atmosphere 107 atmosphere structure 129 water vapor as part of atmosphere 131 water vapor as part of atmosphere 131 atmosphere 231 major Earth systems 236 interaction of major Earth systems 242 major systems of Earth 271 major Earth systems 274 major Earth systems—lithosphere 357 major Earth systems hydrosphere and atmosphere and biosphere and geosphere 358 major Earth systems	30 major Earth systems such as atmosphere

Correlation to Tennessee Middle School Learning Expectations
CPO Science Earth Science (Middle School)
Student Text and Investigation Manual

Standard #: Grade level	Topic	Conceptual Strand	Learning Expectations	Volume 1 Student Text Page	Volume 2 Investigation Manual Page
				360 major systems hydrosphere and biosphere and geosphere	

**Correlation to Tennessee Middle School Learning Expectations
CPO Science Earth Science (Middle School)
Student Text and Investigation Manual**

Standard #: Grade level	Topic	Conceptual Strand	Learning Expectations	Volume 1 Student Text Page		Volume 2 Investigation Manual Page	
INQ.1 6-8	Inquiry	Understandings about scientific inquiry and the ability to conduct inquiry are essential for living in the 21st century.	Design and conduct open ended scientific investigations	11	writing a procedure in your notebook	6	conducting scientific inquiry by asking questions and formulating hypotheses
				15	example lab report including procedure	6	testing explanations against observations
				21	make a sample lab notebook page	9	recognizing and controlling variables
				36	recognizing and controlling variables in observations and experiments	32	writing a procedure for constructing a pointer for an aneroid barometer
				37	recognizing and controlling variables	47	design scientific investigations
				40	design scientific experiments	68	scientific inquiry through field investigations
				40	recognizing and controlling variables in an experiment	114	recognize and control variables
				41	recognizing variables	149	design experiment that someone else can follow
				43	recognizing variables	166	observation
				45	recognizing variables		
				47	field work		
				50	recognizing variables		
				52	conduct scientific inquiry through lab investigations		
				52	recognize variables		
				52	design experiment as part of a team over one week		
				77	field investigation		

Correlation to Tennessee Middle School Learning Expectations
CPO Science Earth Science (Middle School)
Student Text and Investigation Manual

Standard #: Grade level	Topic	Conceptual Strand	Learning Expectations	Volume 1 Student Text Page	Volume 2 Investigation Manual Page
				298 develop a lab procedure that someone else can follow	
				394 recognize controlling variables	

**Correlation to Tennessee Middle School Learning Expectations
CPO Science Earth Science (Middle School)
Student Text and Investigation Manual**

Standard #: Grade level	Topic	Conceptual Strand	Learning Expectations	Volume 1 Student Text Page		Volume 2 Investigation Manual Page	
INQ.2 6-8	Inquiry	Understandings about scientific inquiry and the ability to conduct inquiry are essential for living in the 21st century.	Use appropriate tools and techniques to gather, organize, analyze, and interpret data.	24	measurements—including appropriate tools and units	1	measuring
				25	measurements—units	2	averages
				26	measurement	4	measuring including use of appropriate tools
				28	measurement—choosing appropriate units	9	constructing and evaluating a graphical model
				31	measurement—including correct units	9	interpretation of pattern in data from observation
				34	collect data with precision	10	measuring and choosing tools
				39	graphical models	11	measuring
				40	select appropriate equipment	13	measuring
				40	collect data with precision	14	design experiment including selecting equipment
				41	making graphs from data	29	determining relationship between temperature of the atmosphere and relative humidity
				42	making graphical model from data	33	constructing a graph from atmospheric pressure data
				43	how to make graphical model from data	36	constructing and evaluating graphical models from data
				44	making graphical model from data	40	interpret patterns in data
				45	constructing a graph	43	construct graphical model from data and evaluate
				48	measurement—including selecting appropriate tools		
				49	measure—select units		
				51	making measurements		

**Correlation to Tennessee Middle School Learning Expectations
CPO Science Earth Science (Middle School)
Student Text and Investigation Manual**

Standard #: Grade level	Topic	Conceptual Strand	Learning Expectations	Volume 1 Student Text Page	Volume 2 Investigation Manual Page		
				51	constructing graphical models	51	construct and evaluate a quantitative graphical model
				52	interpret patterns from data	57	interpretation of data
				52	making graphs	64	collect observational data
				74	making and interpreting graphs	66	making measurements
				205	making measurements	67	creating and evaluating graphical model from data
				345	measuring	68	interpretation of patterns from data
				378	interpretation of patterns in data	73	measurements
				380	interpretation of data from graphs and charts	82	measurements
				394	create and evaluate graph	96	measurement
				412	interpret patterns in data from tables	113	construct and evaluate graphical models
				420	interpretation of data from tables	116	renewable resources
				444	construct and evaluate data from graphical model	121	measuring
				444	interpretation of patterns from data	124	measurement
						125	measurement
						127	construct graphical model from data and evaluate
						129	measurements
						136	construct graphical model from data and evaluate
						152	measuring
						153	measuring

Correlation to Tennessee Middle School Learning Expectations
CPO Science Earth Science (Middle School)
Student Text and Investigation Manual

Standard #: Grade level	Topic	Conceptual Strand	Learning Expectations	Volume 1 Student Text Page	Volume 2 Investigation Manual Page
					154 measuring 158 measuring 159 measuring 160 measuring 161 measuring 166 lab notebook 167 making graphs

**Correlation to Tennessee Middle School Learning Expectations
CPO Science Earth Science (Middle School)
Student Text and Investigation Manual**

Standard #: Grade level	Topic	Conceptual Strand	Learning Expectations	Volume 1 Student Text Page		Volume 2 Investigation Manual Page	
INQ.3 6-8	Inquiry	Understandings about scientific inquiry and the ability to conduct inquiry are essential for living in the 21st century.	Synthesize information to determine cause and effect relationships between evidence and explanations.	4	pose questions and state hypothesis based on prior experiences	5	recognize that repeatability is necessary
				10	interpreting observations and proposing explanations	7	repeatability of investigations is necessary
				15	revise explanations based on observational evidence	20	interpret observations
				15	making hypothesis based on prior experiences	21	construction reasonable explanations based on direct and indirect data
				15	cause and effect relationships	34	identifying relationships between air pressure and weather
				16	recognize the repeatability of data is necessary for validation of evidence	34	evaluating your aneroid barometer design
				20	interpreting observation and proposing explanations	36	interpret observations
				22	interpreting observations and posing explanations	51	construct reasonable explanations based on scientific evidence
				37	pose questions and state hypothesis	53	interpret observations and propose explanations
				50	interpret observations and pose explanations	63	interpret observations
				80	pose questions and state hypothesis based on prior experiences	64	interpret observations and pose explanations
						67	interpreting observations
						68	interpreting observations
						78	interpret observations
		81	interpret observations				
		84	interpret observations				

**Correlation to Tennessee Middle School Learning Expectations
CPO Science Earth Science (Middle School)
Student Text and Investigation Manual**

Standard #: Grade level	Topic	Conceptual Strand	Learning Expectations	Volume 1 Student Text Page	Volume 2 Investigation Manual Page		
				150	proposing explanations	87	construct reasonable explanations supported by evidence
				180	proposing explanations		
				209	interpreting observations	88	construct explanations based on evidence
				211	interpreting observations		
				213	interpret observations	90	identify cause and effect relationships
				218	interpreting observations	95	interpret observations
				219	interpreting observations	97	construct explanations supported by scientific evidence
				220	interpreting observations		
				372	interpreting observation and proposing explanations	99	interpret observations
				407	revising explanations based on evidence	100	construct explanations supported by evidence
				426	theories of origin of the moon	100	identifying cause and effect relationships
				444	proposing explanations	114	analyze hypothesis based on data
						116	proposing explanations
						116	interpret observations
						123	make explanations
						125	recognize repeatability of investigations is necessary for verification of evidence
						127	construct explanations based on observations

**Correlation to Tennessee Middle School Learning Expectations
CPO Science Earth Science (Middle School)
Student Text and Investigation Manual**

Standard #: Grade level	Topic	Conceptual Strand	Learning Expectations	Volume 1 Student Text Page	Volume 2 Investigation Manual Page
					<p>129 make reasonable explanation based on data</p> <p>133 use observations to construct explanations</p> <p>168 analyze hypothesis based on evidence</p>

**Correlation to Tennessee Middle School Learning Expectations
CPO Science Earth Science (Middle School)
Student Text and Investigation Manual**

Standard #: Grade level	Topic	Conceptual Strand	Learning Expectations	Volume 1 Student Text Page	Volume 2 Investigation Manual Page
INQ.4 6-8	Inquiry	Understandings about scientific inquiry and the ability to conduct inquiry are essential for living in the 21st century.	Recognize possible sources of bias and error, alternative explanations, and questions for further exploration.	<p>5 specify implications for future research</p> <p>9 observation—senses help to develop awareness of events or objects and their properties</p> <p>10 observing—using senses to develop an awareness of events or objects and their properties</p> <p>13 observing and using observations</p> <p>16 recognize the repeatability of data is necessary for validation of evidence</p> <p>18 implications for further research</p> <p>34 analysis of errors in measurement</p> <p>96 snow-making and the water cycle</p> <p>120 when you hit a baseball does it go farther in Denver?</p> <p>239 limits of scientific knowledge</p> <p>397 resources and conservation info</p>	<p>5 recognize that repeatability is necessary</p> <p>7 repeatability of investigations is necessary</p> <p>9 collaboration and peer review</p> <p>11 analysis of errors</p> <p>11 analysis of errors in measurement</p> <p>12 errors in measurement</p> <p>13 errors in measurement</p> <p>34 calculating error between your barometer and a commercial barometer</p> <p>125 recognize repeatability of investigations is necessary for verification of evidence</p>

**Correlation to Tennessee Middle School Learning Expectations
CPO Science Earth Science (Middle School)
Student Text and Investigation Manual**

Standard #: Grade level	Topic	Conceptual Strand	Learning Expectations	Volume 1 Student Text Page		Volume 2 Investigation Manual Page	
INQ.5 6-8	Inquiry	Understandings about scientific inquiry and the ability to conduct inquiry are essential for living in the 21st century.	Communicate scientific understanding using descriptions, explanations, and models.	13	making diagrams	20	diagrams
				15	communication—written	20	communication
				15	formal lab report	20	drawings and sketches
				19	writing up scientific results	26	creating sketches and diagrams
				19	communicating is key to scientific process	53	drawings and diagrams
				22	making sketches	53	group discussion skills—clarify
				22	writing up scientific results	62	making sketches
				22	explaining through discussion	64	observational skills
				30	making sketches	69	communicating
				30	dimensional drawings	96	sketches
				30	written communication	99	dimensioned drawings
				35	communication written	99	making sketches
				57	making sketches	100	make an oral presentation about results
				71	making sketches	103	drawing sketches
				110	interpreting diagrams	104	drawing sketches
				114	making sketches	120	design models
				127	diagrams	149	formal lab report
				180	interpret drawings	150	lab report
				194	creating dimensional sketches	150	communicating results is essential to science
				200	creating dimensional drawings	151	writing up results
222	dimensioned drawings	151	lab report				

**Correlation to Tennessee Middle School Learning Expectations
CPO Science Earth Science (Middle School)
Student Text and Investigation Manual**

Standard #: Grade level	Topic	Conceptual Strand	Learning Expectations	Volume 1 Student Text Page	Volume 2 Investigation Manual Page
				224 explaining—scientific ideas are made clear through discussion	167 lab reports
				237 diagrams	167 making graphs
				243 drawings	168 formal lab report
				266 communicating	168 sketches
				268 sketches	
				281 communication	
				298 making an oral presentation of scientific objects	
				298 sketches	
				376 explaining	
				377 making sketches	
				429 communicating written scientific notation	
				444 create line graph	
				471 effectively conveying written info is essential to science	

Correlation to Tennessee Middle School Learning Expectations
CPO Science Earth Science (Middle School)
Student Text and Investigation Manual

Standard #: Grade level	Topic	Conceptual Strand	Learning Expectations	Volume 1 Student Text Page	Volume 2 Investigation Manual Page	
TE.1 6-8	Technology and Engineering	Society benefits when engineers apply scientific discoveries to design materials and processes that develop into enabling technologies.	Explore how technology responds to social, political, and economic needs.	7	applications of science can make life better for people	115 understand how waste products cause pollution
				7	understand connections between science and technology	
				7	science and technology can be used to meet society's needs	
				40	scientific knowledge is often in the form of models	
				47	science helps meet needs of society	
				89	conservation of water	
				200	how science and technology meet society's needs	
				201	how science and technology meet the needs of a society	
				236	appreciation of the broad societal impact of science and technology	
				387	understand how waste products of technology can be pollution	
471	science skills lead to contributions to society					

**Correlation to Tennessee Middle School Learning Expectations
CPO Science Earth Science (Middle School)
Student Text and Investigation Manual**

Standard #: Grade level	Topic	Conceptual Strand	Learning Expectations	Volume 1 Student Text Page	Volume 2 Investigation Manual Page
TE.2 6-8	Technology and Engineering	Society benefits when engineers apply scientific discoveries to design materials and processes that develop into enabling technologies.	Know that the engineering design process involves an ongoing series of events that incorporate design constraints, model building, testing, evaluating, modifying, and retesting.	222 modify tested solution and document change in performance	120 design models

**Correlation to Tennessee Middle School Learning Expectations
CPO Science Earth Science (Middle School)
Student Text and Investigation Manual**

Standard #: Grade level	Topic	Conceptual Strand	Learning Expectations	Volume 1 Student Text Page		Volume 2 Investigation Manual Page	
TE.3 6-8	Technology and Engineering	Society benefits when engineers apply scientific discoveries to design materials and processes that develop into enabling technologies.	Compare the intended benefits with the unintended consequences of a new technology.	89	conservation of water	114	environmental impact of using different energy sources
				366	environmental impact of chemical reactions	114	environmental impact of using different energy sources
				381	compare economic and environmental impacts of using different energy sources	115	understand how waste products cause pollution
				383	compare economic and environmental impacts of using different energy sources	115	economic and environmental effects of using different resources
				383	investigate the economic and environmental impacts of using different energy sources	115	economic and environmental effects of using different resources
				383	investigate the economic and environmental impacts of using different energy sources		
				387	understand how waste products of technology can be pollution		