

Correlation to Maryland Voluntary State Curriculum - Science

CPO Science Earth Science (Middle School)

Student Text and Investigation Manual

Standard #: Grade	Standard	Topic	Indicator	Volume 1 Student Text Page	Volume 2 Investigation Manual Page
01.A.1 6 - 8	Skills and Processes	Constructing Knowledge	Design, analyze, or carry out simple investigations and formulate appropriate conclusions based on data obtained or provided.	4 describe the steps of the scientific method 8 describe the steps of the scientific method 10 interpreting observations and proposing explanations 11 writing a procedure in your notebook 11 describe the steps of the scientific method 14 describe steps of the scientific method 15 example lab report including procedure 18 steps of the scientific method 20 interpreting observation and proposing explanations 21 make a sample lab notebook page 22 interpreting observations and posing explanations 40 design scientific experiments 50 interpret observations and pose explanations	6 conducting scientific inquiry by asking questions and formulating hypotheses 20 interpret observations 32 writing a procedure for constructing a pointer for an aneroid barometer 36 interpret observations 47 design scientific investigations 53 interpret observations and propose explanations 63 interpret observations 64 interpret observations and pose explanations 67 interpreting observations 68 interpreting observations 78 interpret observations 81 interpret observations 84 interpret observations 95 interpret observations 99 interpret observations 116 interpret observations 116 proposing explanations

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				52	conduct scientific inquiry through lab investigations	149	design experiment that someone else can follow
				52	steps of scientific method	166	observation
				114	interpret observations and propose explanations		
				150	proposing explanations		
				180	proposing explanations		
				209	interpreting observations		
				211	interpreting observations		
				213	interpret observations		
				218	interpreting observations		
				219	interpreting observations		
				220	interpreting observations		
				247	steps of scientific theory		
				298	develop a lab procedure that someone else can follow		
				372	interpreting observation and proposing explanations		
				444	proposing explanations		

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01.B.1 6 - 8	Skills and Processes	Applying Evidence and Reasoning	Review data from a simple experiment, summarize the data, and construct a logical argument about the cause-and-effect relationships in the experiment.	15 cause and effect relationships 34 analysis of errors in measurement 52 interpret patterns from data 276 analyze trends from data 378 interpretation of patterns in data 380 interpretation of data from graphs and charts 394 trends in data 412 interpret patterns in data from tables 420 interpretation of data from tables 444 analyze trends from data 444 interpretation of patterns from data	3 trends from data 9 interpretation of pattern in data from observation 11 analysis of errors in measurement 12 errors in measurement 13 errors in measurement 24 trends from data 29 determining relationship between temperature of the atmosphere and relative humidity 34 calculating error between your barometer and a commercial barometer 34 identifying relationships between air pressure and weather 40 analyze trends from data 40 interpret patterns in data 57 interpretation of data 68 analyze trends from data 68 interpretation of patterns from data 90 identify cause and effect relationships

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					100 identifying cause and effect relationships 151 analyze trends from data
01.C.1 6 - 8	Skills and Processes	Communicating Scientific Information	Develop explanations that explicitly link data from investigations conducted, selected readings and, when appropriate, contributions from historical discoveries.		21 construction reasonable explanations based on direct and indirect data 51 construct reasonable explanations based on scientific evidence 87 construct reasonable explanations supported by evidence 88 construct explanations based on evidence 97 construct explanations supported by scientific evidence 100 construct explanations supported by evidence 123 make explanations 127 construct explanations based on observations 129 make reasonable explanation based on data 133 use observations to construct explanations

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01.D.1 6 - 8	Skills and Processes	Technology	Explain that complex systems require control mechanisms.	52 examples of systems and questions about them 52 plan and conduct an experiment 87 identify parts of a system 99 identify and describe parts of solar system 392 parts of a system found in nature	15 investigate a river system 19 investigate a convection system 25 create and study a water cycle system model 31 create a compression chamber system 35 create and study land and water systems 46 observing water current systems 98 investigate river systems 102 investigate system of land erosion 110 investigate ecosystems 120 solar system modeling
01.D.2 6 - 8	Skills and Processes	Technology	Analyze, design, assemble and troubleshoot complex systems.		120 design models

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01.D.3 6 - 8	Skills and Processes	Technology	Analyze the value and the limitations of different types of models in explaining real things and processes.	39 graphical models 39 understand that scientific knowledge is often in the form of models 39 creating and using an algebraic model 41 making graphs from data 42 making graphical model from data 43 how to make graphical model from data 44 making graphical model from data 45 constructing a graph 51 constructing graphical models 52 making graphs 52 scientific knowledge is often in the form of models 74 making and interpreting graphs 268 scientific knowledge in form of models 394 create and evaluate graph 444 construct and evaluate data from graphical model	9 constructing and evaluating a graphical model 33 constructing a graph from atmospheric pressure data 36 constructing and evaluating graphical models from data 43 construct graphical model from data and evaluate 51 construct and evaluate a quantitative graphical model 67 creating and evaluating graphical model from data 69 science is often in the form of models 113 construct and evaluate graphical models 116 renewable resources 127 construct graphical model from data and evaluate 136 construct graphical model from data and evaluate 166 lab notebook 167 making graphs

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Standard #: Grade	Standard	Topic	Indicator	Volume 1 Student Text Page	Volume 2 Investigation Manual Page
				470 understand science is often in the form of mathematical models	

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02.A.2 6	Earth/Space Science	Materials and Processes That Shape A Planet	Cite evidence to demonstrate and explain that physical weathering and chemical weathering cause changes to Earth materials.	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 210 how rocks are broken down and surface features change due to action of water 252 major Earth systems—lithosphere 308 rock gets broken down into soil 327 how rocks are broken down 328 running water shapes landscape 329 how rocks are broken down by water and ice 332 how rocks are broken down and turned back into soil 334 water running downhill shapes Earth 334 rivers streams erosion and deposition	100 rivers and streams 101 rivers and streams 101 running water shapes the landscape 102 water running causes erosion

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				337	
					rocks broken down into soil
				340	
					Earth's surface changes because of water
				343	
					streams and erosion
				343	
					water running shapes landscape
				356	
					soil formation
				358	
					how rocks break down into soil
				359	
					rocks are broken down into soil
				360	
					how rocks are broken down into soil
				361	
					rocks broken down into soil
				363	
					how rocks are broken down into soil

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Standard #: Grade	Standard	Topic	Indicator	Volume 1 Student Text Page	Volume 2 Investigation Manual Page
02.A.4 6	Earth/Space Science	Materials and Processes That Shape A Planet	Differentiate among sedimentary, igneous, and metamorphic rocks based upon the processes by which they are formed.	199 types of rock and how they are formed 295 how rocks are formed 307 types of rocks and how they are made 308 rock cycle and types of rock 310 igneous rock formation 311 how igneous rocks are formed 312 how rocks are formed 315 how sedimentary rocks are formed 316 metamorphic rock formation 317 formation of metamorphic rocks 318 how rocks are formed 327 rock cycle 336 types of rock and how they are formed 358 rock formation	90 how rocks are formed 94 explain how rocks are formed 100 types of rocks and how they are formed

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02.B.1 8	Earth/Space Science	Earth History	Explain how sedimentary rock is formed periodically, embedding plant and animal remains and leaving a record of the sequence in which the plants and animals appeared and disappeared.	6	fossils	81	fossils
				208	explain origin and formation of fossils		
				209	how rocks and fossils are used to determine age of Earth		
				210	how rocks are used to tell age of Earth		
				211	how fossils are formed		
				211	how rocks and fossils are used to date Earth		
				212	fossils used to determine age of Earth		
				213	how rocks and fossils are used to date Earth		
				217	how rocks are used to tell the age of Earth		
				223	explain how rocks are used to determine age of Earth		
				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		

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				359	how rocks can help tell age of Earth
02.B.2 8	Earth/Space Science	Earth History	Recognize and explain that fossils found in layers of sedimentary rock provide evidence of changing life forms.	209	how rocks and fossils are used to determine age of Earth
				210	how rocks are used to tell age of Earth
				211	how rocks and fossils are used to date Earth
				212	fossils used to determine age of Earth
				213	how rocks and fossils are used to date Earth
				217	how rocks are used to tell the age of Earth
				223	explain how rocks are used to determine age of Earth
				307	how rocks are used to tell age of Earth
				359	how rocks can help tell age of Earth

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02.C.1 6	Earth/Space Science	Plate Tectonics	Recognize and describe the internal and external structure of the Earth.	5	explain factors that helped shape Earth—volcanism	69	model Earth
				18	recognize forces that shape Earth—volcanoes	70	model inner layers of Earth
				54	inner structure of Earth		
				89	watersheds and rivers		
				92	caves		
				190	use maps to identify major features		
				203	use maps to identify features 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		
				237	diagram of structure of inner Earth		
				238	structures of inner Earth		

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				341	
					forces that shape Earth such as erosion
				358	
					forces that change Earth's surface (erosion)
				358	
					forces that change Earth's surface erosion
				392	
					volcanism
				392	
					inner structure of Earth
				392	
					volcanism
				393	
					inner structure of Earth

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02.C.2 6	Earth/Space Science	Plate Tectonics	Recognize and explain how major geologic events are a result of the movement of Earth's crustal plates.	16 plate tectonics 235 behavior of Earth's crust 246 theory of plate tectonics 247 plate tectonics explains surface features of Earth 248 plate tectonics 253 plate tectonics 254 plate tectonics 267 plate tectonics 268 plate tectonics 269 plate tectonics 273 plate tectonics 318 plate tectonics 384 how human activity affects renewable and nonrenewable resources	80 plate tectonics 81 plate tectonics 87 theory of plate tectonics
02.D.1 8	Earth/Space Science	Astronomy	Identify and describe the components of the universe.	442 sun's characteristics 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	121 general characteristics of universe

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02.D.2 8	Earth/Space Science	Astronomy	Identify and explain celestial phenomena using the regular and predictable motion of objects in the solar system.	112 relationships between Earth's rotation and currents 113 compare orbits of planets 114 explain relationship between Earth, Sun, and patterns of seasons 124 Coriolis effect 124 know the relationship between rotation of Earth and the circular motion of air currents 125 Coriolis effect 135 Coriolis effect 137 Coriolis effect 159 Coriolis effect 183 Coriolis effect 403 orbits of moons and planets 404 Earth's rotation and patterns of day and night 411 compare orbits of planets in solar system 415 orbits of other bodies in the solar system 416 other bodies in solar system	117 relationship between sun and Earth and day and night 117 orbits of moon and planets 118 orbits of moons and other planets 119 relationship between sun and Earth 119 orbits of planets 124 relationship between sun and Earth and days 127 phases of the moon 131 how Sun and Earth distances cause seasons 132 Earth and Sun positions causing seasons 133 Sun and Earth positions and their relationship with seasons 133 relationship between Earth sun and light 137 appearance of moon 138 appearance of the moon 138 orbits of planets

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				418	
					compare orbits of planets and other bodies in solar system
				423	
					relationship of Earth and moon
				423	
					relationship of sun and Earth
				423	
					orbits of planets and moons
				424	
					orbits of planets in solar system
				424	
					relationship of Earth and sun
				425	
					compare orbits of planets 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
				430	
					explain orbit of Earth
				430	
					patterns of day and night and years
				432	
					phases of the moon
				433	
					phases of moon
				434	
					lunar eclipses

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				435 solar eclipses 435 solar eclipses 435 solar eclipses 436 seasons and relationship between Earth and sun 437 identify seasons 445 identify seasons	
02.D.3 8	Earth/Space Science	Astronomy	Recognize and explain the effects of the tilt of Earth's axis.	114 general cause of seasons 114 explain relationship between Earth, Sun, and patterns of seasons 404 Earth's rotation and patterns of day and night 423 relationship of sun and Earth 424 relationship of Earth and sun 430 patterns of day and night and years 435 solar eclipses 435 solar eclipses 436 seasons and relationship between Earth and sun 437 identify seasons 445 identify seasons	117 relationship between sun and Earth and day and night 119 relationship between sun and Earth 124 relationship between sun and Earth and days 131 how Sun and Earth distances cause seasons 132 Earth and Sun positions causing seasons 133 Sun and Earth positions and their relationship with seasons 133 relationship between Earth sun and light

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02.D.4 8	Earth/Space Science	Astronomy	Recognize and explain how the force of gravity causes the tides.	423	relationship of Earth and moon	127	phases of the moon
				426	giant impact theory	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		

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02.E.1 8	Earth/Space Science	Interactions of Hydrosphere and Atmosphere	Cite evidence to explain the relationship between the hydrosphere and atmosphere.	98	discuss atmosphere	30	major Earth systems such as atmosphere
				99	components of Earth's atmosphere	45	investigate ocean currents
				105	atmosphere	50	investigate wave speed
				105	water vapor as part of the atmosphere		
				106	Earth's atmosphere		
				107	atmosphere structure		
				117	how oceans affect weather		
				126	water cycle related to weather		
				126	how water cycle affects weather		
				129	water vapor as part of atmosphere		
				131	water vapor as part of atmosphere		
				131	atmosphere		
				132	how water cycle relates to weather		
				137	water cycle affects weather		
				139	how oceans affect weather including El Nino		
				141	water affects climates		
				141	oceans affect climate		

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				143	
				water affects temperature	
				158	
				oceans affect climate	
				158	
				how water cycle relates to weather patterns	
				159	
				ocean currents	
				160	
				ocean currents	
				178	
				ocean currents	
				179	
				ocean currents	
				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	
				390	
				significance of greenhouse effect	
				432	
				orbit of moon	

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02.E.2 8	Earth/Space Science	Interactions of Hydrosphere and Atmosphere	Recognize and describe the various factors that affect climate.	105 effect of elevation on climate 111 weather and climate are based on heat transfer 122 weather involves transfer of energy 125 effect of latitude on climate 128 how climate is related to transfer of energy 134 things that affect climate and weather 135 weather is due to energy transfer 137 know weather is the result of energy transfers 138 know weather has to do with energy transfer 139 effect on climate of ocean currents 141 know effects on climate of altitude, latitude, topography, and bodies of water 141 effects of latitude and elevation and topography and proximity to water on climate 142 know that climate is based on energy transfer	49 climate change over time and what it would do to currents

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					interaction of wind, ocean currents, and mountains results in distribution of biomes
				143	
					mountains affect climate
				144	
					latitudes and distribution of biomes
				145	
					latitudes affect where biomes occur
				145	
					distribution of deserts and rain forests because of oceans
				159	
					effects of climate based on warm or cold ocean currents
				159	
					interaction of wind patterns and ocean currents

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02.E.3 8	Earth/Space Science	Interactions of Hydrosphere and Atmosphere	Identify and describe the atmospheric and hydrospheric conditions related to weather systems.	74 know the rate of solar radiation 107 fate of incoming solar radiation 108 fate of incoming solar radiation 111 fate of incoming solar radiation 112 relationships between Earth's rotation and currents 116 hurricanes 117 hurricanes 117 how oceans affect weather 117 differential heating of oceans 122 changes in and causes for weather 122 large scale movement of air and how it affects weather 122 differential heating of Earth causes circulation 123 large movements of air 124 how differential heating of Earth causes air movements	30 changes in weather 40 describe changes in weather 42 causes for tornadoes 44 hurricanes 45 investigate ocean currents 48 differential heating causes circulation of currents 50 investigate wave speed

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				158 movements of air affect weather patterns 158 oceans affect climate 158 how water cycle relates to weather patterns 159 Coriolis effect 159 ocean currents 160 ocean currents 178 ocean currents 179 ocean currents 183 Coriolis effect	
04.C.1gr6 6	Chemistry	States of Matter	Provide evidence and examples illustrating that many substances can exist as a solid, liquid, or gas depending on temperature.	38 explain relationships between real materials and the concept of molecules and atoms 66 relationship between real materials and ideas of atoms and molecules 67 relationship between materials and matter and molecules 70 explain relation of real materials and atoms and molecules	