Gulfport School District
PACING GUIDE

EARTH AND SPACE SCIENCE

Content Strands: Inquiry (I), Earth and Space (E)		
QTR	**Competency/Objective**	
	Apply inquiry-based and problem-solving processes and skills to scientific investigations. (I)	
1.1	1a	Conduct a scientific investigation demonstrating safe procedures and proper care of laboratory equipment. (DOK 2) • Safety rules and symbols • Proper use and care of the compound light microscope, slides, chemicals, etc. • Accuracy and precision in using graduated cylinders, balances, beakers, thermometers, and rulers
1.1	1b	Formulate questions that can be answered through research and experimental design. (DOK 3)
1.1	1c	Apply the components of scientific processes and methods in classroom and laboratory investigations (e.g., hypotheses, experimental design, observations, data analyses, interpretations, theory development). (DOK 3)
1.1	1d	Construct and analyze graphs (e.g., plotting points, labeling x-and y-axis, creating appropriate titles and legends for circle, bar, and line graphs). (DOK 2)
1.1	1e	Analyze procedures, data, and conclusions to determine the scientific validity of research. (DOK 3)
1.1	1f	Recognize and analyze alternative explanations for experimental results and to make predictions based on observations and prior knowledge. (DOK 3)
1.1	1g	Communicate and defend a scientific argument in oral, written, and graphic form. (DOK 3)
	Develop an understanding of the history and evolution of the universe and Earth. (E)	
1.1	2a	Summarize the origin and evolution of the universe. (DOK 2) • Big Bang theory • Microwave background radiation • The Hubble constant • Evidence of the existence of dark matter and dark energy in the universe and the history of the universe
1.1	2b	Differentiate methods used to measure space distances, including astronomical unit, light-year, stellar parallax, Cepheid variables, and the red shift. (DOK 1)
1.1	2c	Interpret how gravitational attraction played a role in the formation of the planetary bodies and how the fusion of hydrogen and other processes in “ordinary” stars and supernovae lead to the formation of all other elements. (DOK 2)
1.1	2d	Summarize the early evolution of the Earth, including the formation of Earth’s solid layers (e.g., core, mantle, crust), the distribution of major elements, the origin of internal heat sources, and the initiation of plate tectonics. (DOK 2) • How the decay of radioactive isotopes is used to determine the age of rocks, Earth, and the solar system • How Earth acquired its initial oceans and atmosphere

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	Discuss factors which are used to explain the geological history of Earth. (E)	
1.2	3a	Develop an understanding of how plate tectonics create certain geological features, materials, and hazards. (DOK 1) • Plate tectonic boundaries (e.g., divergent, convergent, and transform) • Modern and ancient geological features to each kind of plate tectonic boundary • Production of particular groups of igneous and metamorphic rocks and mineral resources • Sedimentary basins created and destroyed through time
1.2	3b	Compare and contrast types of mineral deposits/groups (e.g., oxides, carbonates, halides, sulfides, sulfates, silicates, phosphates). (DOK 2)
1.2	3c	Categorize minerals and rocks by determining their physical and/or chemical characteristics. (DOK 2)
1.2	3d	Justify the causes of certain geological hazards (e.g., earthquakes, volcanoes, tsunamis) to their effects on specific plate tectonic locations. (DOK 2)
1.2	3e	Interpret and explain how rock relationships and fossils are used to reconstruct the geologic history of the Earth. (DOK 2)
1.2	3f	Apply principles of relative age (e.g., superposition, original horizontality, cross-cutting relations, and original lateral continuity) to support an opinion related to Earth's geological history. (DOK 3) • Types of unconformity (e.g., disconformity, angular unconformity, nonconformity) • Geological timetable
1.2	3g	Apply the principle of uniformitarianism to relate sedimentary rock associations and their fossils to the environments in which the rocks were deposited. (DOK 2)
1.2	3h	Compare and contrast the relative and absolute dating methods (e.g., the principle of fossil succession, radiometric dating, and paleomagnetism) for determining the age of the Earth. (DOK 1)
	Demonstrate an understanding of Earth systems relating to weather and climate. (E)	
2. 1	4a	Explain the interaction of Earth Systems that affect weather and climate. (DOK 1) • Latitudinal variations in solar heating • The effects of Coriolis forces on ocean currents, cyclones, anticyclones, ocean currents, topography, and air masses (e.g., warm fronts, cold fronts, stationary fronts, and occluded fronts)
2. 1	4b	Interpret the patterns in temperature and precipitation that produce the climate regions on Earth and relate them to the hazards associated with extreme weather events and climate change (e.g., hurricanes, tornadoes, El Niño/La Niña, global warming). (DOK 2)
2. 1	4c	Justify how changes in global climate and variation in Earth/Sun relationships contribute to natural and anthropogenic (human-caused) modification of atmospheric composition. (DOK 2)

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	Demonstrate an understanding of Earth systems relating to weather and climate. (E)	
2.1	4d	Summarize how past and present actions of ice, wind, and water contributed to the types and distributions of erosional and depositional features in landscapes. (DOK 1)
2.1	4e	Research and explain how external forces affect Earth's topography. (DOK 2) • How surface water and groundwater act as the major agents of physical and chemical weathering • How soil results from weathering and biological processes • Processes and hazards associated with both sudden and gradual mass wasting
	Apply an understanding of ecological factors to explain relationships between Earth systems. (E)	
2.2	5a	Draw conclusions about how life on Earth shapes Earth systems and responds to the interaction of Earth systems (lithosphere, hydrosphere, atmosphere, and biosphere). (DOK 3) • Nature and distribution of life on Earth, including humans, to the chemistry and availability of water • Distribution of biomes (e.g., terrestrial, freshwater, and marine) to climate regions through time • Geochemical and ecological processes (e.g., rock, hydrologic, carbon, nitrogen) that interact through time to cycle matter and energy, and how human activity alters the rates of these processes (e.g., fossil fuel formation and combustion, damming and channeling of rivers)
2.2	5b	Interpret the record of shared ancestry (fossils), evolution, and extinction as related to natural selection. (DOK 2)
2.2	5c	Identify the cause and effect relationships of the evolutionary innovations that most profoundly shaped Earth systems. (DOK 1) • Photosynthesis and the atmosphere • Multicellular animals and marine environments • Land plants and terrestrial environments
2.2	5d	Cite evidence about how dramatic changes in Earth's atmosphere influenced the evolution of life. (DOK 1)