Middlesex County Schools Curriculum Pacing Guide

Grade/Course Earth Science **School Year** 2012-2013

Time Frame	Unit/SOLs	SOL #	Strand
1.5 wks	**Scientific Investigation** 1a) volume, area, mass, elapsed time, direction, temperature, pressure, distance, density, and changes in elevation/depth are calculated utilizing the most appropriate tools 1b) technologies including computers, probeware, and geospatial technologies, are used to collect, analyze, and report data to demonstrate concepts and simulate experimental conditions 1c) scales, diagrams, charts, graphs, tables, imagery, models and profiles are constructed and interpreted 1d) maps and globes are read and interpreted, including location by latitude and longitude 1e) variables are manipulated with repeated trials 1f) current applications are used to reinforce Earth science concepts	1	plan and conduct investigations
	2a) science explains and predicts the interactions and dynamics of complex Earth systems 2b) evidence is required to evaluate hypotheses and explanations 2c) observation and logic are essential for reaching a conclusion 2d) evidence is evaluated for scientific theories	2	demonstrate an understanding of the nature of science and scientific reasoning and logic
3 wks	**Meteorology** 11a) scientific evidence for atmospheric composition changes over geologic time 11b) current theories related to the effects of early life on the chemical makeup of the atmosphere 11c) atmospheric regulation mechanisms including the effects of density differences and energy transfer 11d) potential changes to the atmosphere and climate due to human, biologic, and geologic activity	11	investigate and understand the origin and evolution of the atmosphere and the interrelationship of geologic processes, biologic processes, and human activities on its composition and dynamics
	12a) observation and collection of weather data 12b) prediction of weather patterns 12c) severe weather occurrences, such as tornadoes, hurricanes, and major storms 12d) weather phenomena and the factors that affect climate including radiation, conduction, and convection	12	investigate and understand that energy transfer between the sun and Earth and its atmosphere drives weather and climate on Earth

3 wks	**Oceanography and Groundwater** 8a) processes of soil development 8b) development of karst topography 8c) relationships between groundwater zones, including saturated and unsaturated zones, and the water table 8d) identification of sources of fresh water including rivers, springs, and aquifers with reference to the hydrologic cycle 8e) dependence on freshwater resources and the effects of human usage on water quality 8f) identification of the major watershed systems in Virginia, including the Chesapeake Bay and its tributaries	8	investigate and understand how freshwater resources are influenced by geologic processes and the activities of humans
	10a) physical and chemical changes related to tides, waves, currents, sea level and ice cap variations, upwelling and salinity variations 10b) importance of environmental and geologic implications 10c) systems interactions 10d) features of the sea floor as reflections of tectonic processes 10e) economic and p[public policy issues concerning the oceans and the coastal zone including the Chesapeake Bay	10	investigate and understand that oceans are complex, interactive, physical, chemical, and biological systems and are subject to long and short-term variations
5 wks	**Rocks & Minerals (Geology)** 4a) hardness, color and streak, luster, cleavage, fracture, and unique properties 4b) uses of minerals	4	investigate and understand how to identify major rock-forming and ore minerals based on physical and chemical properties
	5a) igneous rocks 5b) sedimentary rocks 5c) metamorphic rocks	5	investigate and understand the rock cycle as it relates to the origin and transformation of rock types and how to identify common rock types based on mineral composition and textures
	7a) geologic processes and their resulting features 7b) tectonic processes	7	investigate and understand geologic processes including plate tectonics
	9a) traces and remains of ancient, often extinct, life are preserved by; various means in many sedimentary rocks 9b) superposition, cross-cutting relationships, index fossils, and radioactive decay are methods of dating bodies or rock 9c) absolute and relative dating have different applications but can be used together to determine the age of rocks and structures 9d) rocks and fossils from many different geologic periods and epochs are found in Virginia	9	investigate and understand that many aspects of history and evolution of Earth and life can be inferred by studying rocks and fossils
	6a) fossil fuels, minerals, rocks, water, and vegetation 6b) advantages and disadvantages of various energy sources	6	investigate and understand the differences between renewable and

	6c) resources found in Virginia 6d) environmental costs and benefits		nonrenewable resources
2.5 wks	**Astronomy** 3a) position of Earth in the solar system 3b) sun-Earth-moon relationships 3c) characteristics of the sun, planets, and their moons, comets, meteors, and asteroids 3d) the history and contributions of space exploration 13a) cosmology including the Big Bang theory 13b) the origin and evolution of stars, star systems, and galaxies	3 13	investigate and understand the characteristics of Earth and the solar system investigate and understand specific concepts related to the origin and evolution of the universe
2.5 wks	**SOL Review and Make-up time**	All	