Maryland Science Grades 9-12
Curriculum Standards

Concepts of Earth/Space Science	Boardworks High School Earth Science Presentations
2) Expectation: The student will describe natural forces and apply them to the study of Earth/Space Science.	
1) The student will explain the role of forces in the formation and operation of the universe.	
Newton's Universal Law of Gravitation	Gravity and Orbits
Structure and evolution of galaxies and the universe (Big Bang Theory)	Astronomical Distances
Stellar structure and evolution (life cycle of stars, stellar systems, H-R diagram)	The Life Cycle of Stars Properties of Stars
Formation and evolution of the solar system (Nebular Theory, small bodies)	Planets of the Solar System
Kepler's 3 Laws of Planetary Motion	–
Sun-Earth connection (thermonuclear process, sunspot cycle, coronal mass ejection, flares, solar wind, auroras)	Nuclear Fusion Solar Energy The Rotation of the Earth
2) The student will explain the role and interaction of revolution, rotation and gravity on the Sun-Earth-Moon system.	
Seasons (change in solar angle, yearly variation in length of day/night, absorption/reflection/scattering of insolation, solstices and equinoxes, rotation/revolution/precession, yearly variation of the sun's altitude and azimuth)	The Rotation of the Earth
Eclipses (lunar, solar, total, annular, partial, umbra, penumbra, 2 eclipse "seasons" per Earth year, yearly/monthly variations in lunar position and length of visibility of the moon)	The Moon
Earth-moon interactions (relationship between lunar phase and tide, tidal bulge and rate of lunar revolution, tides and Earth-moon distance, sidereal and synodic lunar months)	–
3) Expectation: The student will explain how the transfer of energy and matter affect Earth systems.	
1) The student will describe how energy and matter transfer affect Earth systems.	
Atmospheric circulation (heat transfer systems – conduction/convection/radiation, phase change, latent heat, pressure gradients, general global circulation, Coriolis effect)	Conduction and Convection Heat Transfer and Global Interactions
Oceanic circulation (density differences, daily and seasonal land/sea breezes, Coriolis effect)	Conduction and Convection Heat Transfer and Global Interactions
2) The student will explain how global conditions are affected when natural and human-induced change alter the transfer of energy and matter.	

Atmospheric composition and structure (greenhouse gases, stratospheric ozone concentration and distribution, aerosols, temperature)	Air Pollution Climate Change Greenhouse Gases The Atmosphere The Carbon Cycle The Impact of Using CFCs
Pollutants (particulates, tropospheric ozone concentration and distribution, acid rain)	Air Pollution The Impact of Using CFCs Water Pollution
Ocean-atmosphere-land interactions (current changes, continental movement, El Niño, La Niña)	ENSO
Cloud cover (amount, type, albedo)	Clouds
Climate type and distribution (temperature and precipitation)	Heat Transfer and Global Interactions Precipitation Weather and Climate
Sea level, glaciers and sea ice, biome location and distribution, emergent and submergent coastlines	Heat Transfer and Global Interactions Weather and Climate
4) Expectation: The student will analyze the dynamic nature of the geosphere.	
1) The student will compare the origin and structure of igneous, metamorphic and sedimentary rocks.	
Structure of matter (atoms, molecules, isotopes)	–
Physical properties (density) and chemical composition of common rock forming mineral groups	–
Origin, texture (crystal size, shape) and mineral composition of common rock groups	The Rock Cycle
2) The student will explain how the transfer of energy drives the rock cycle.	
Destructive processes (weathering, erosion, subsidence, melting)	Coastal Erosional Landforms Coastal Processes Erosion, Transportation and Deposition Weathering
Constructive processes (lithification, deformation, metamorphism, volcanism, cooling/crystallization, deposition)	Coastal Depositional Landforms The Rock Cycle Volcanoes
Landform change (surface & groundwater, coasts, glacial processes, desert processes)	Coastal Erosional Landforms Coastal Depositional Landforms Erosion, Transportation and Deposition
3) The student will explain changes in Earth's surface using plate tectonics.	
Continental drift (rock/structure/climate/fossil evidence, jigsaw fit)	Plate Tectonics

Sea floor spreading (age evidence, mantle circulation, outer core circulation/magnetic reversals, seismic activity, volcanism, mountain building, ocean ridges)	Plate Tectonics
Theory of Plate Tectonics (crustal plate composition, mantle circulation, divergent/convergent/transform fault boundaries, subduction zones, trenches, island arcs, seismic activity, volcanism, mountain building)	Plate Tectonics Earthquake Causes Earthquake Effects Volcanoes
5) Expectation: The student will investigate methods that geologists use to determine the history of Earth.	
1) The student will apply geologic principles used to date Earth's geologic and biologic events	
Relative dating (superposition in rock columns, core samples, unconformities; uniformitarianism; crosscutting relationships; correlation of rock layers, fossils)	Fossil Record
Absolute dating (radioactive dating)	Radioactive Dating
2) The student will compare events in Earth's history that have been grouped according to similarities.	
Geologic time (scale and magnitude)	–
Era, period, epoch	–