Harford County Public Schools - GRADE 5 Science Curriculum

Next Generation Science Standards (NGSS)

Access Grade Level Standards by clicking on Unit Titles below:

	Quarters 1-2 Earth Space Science	Quarters 2-3 Physical Science	Quarters 3-4 Life Science
Unit Title & Standards	 **Earth, Space, & Stars** *(Space Systems: Stars & the Solar System)* *Includes two Planetarium Experiences Planetarium Program at HCPS	 **Matter: Structure and Properties of Matter*** *(Matter & Its Interactions: Matter Structure & Properties; Chemical Reactions)*	 **Earth: Systems and Interactions & Matter and Energy in Life & Ecosystems*** *(Matter & Energy in Organisms and Ecosystems + Earth Systems: Earth Spheres & Roles of Water on Earth)*
Unit Overview & Essential Question	The Grade 5 Earth Space Science Unit includes concepts focused on the Earth's place in the universe. The students will explore patterns of the Earth's movement and placement in the universe as well as the effect that the moon has on the Earth including the gravitational force that is exerted on Earth. Students will explore our complex Solar System (the Earth and its planets, the moon, the Sun, and the stars) and patterns of daily changes in the length and direction of shadows, day and night, and the seasonal appearance of some stars in the night sky. ***Unit Essential Question*:** *What patterns are revealed due to Earth's place in the Universe?*	The Grade 5 Physical Science Unit includes concepts focused on the *Structure and Properties of Matter* as well as *Chemical Reactions*. In this unit, the students will explore the properties of matter through transformations of water and how it changes over time. Students will be introduced to the scientific phenomenon of ships that are stranded in a field where the Aral Sea once existed many years ago. Through a series of hands-on investigations, students will investigate how and why the sea has changed over time. ***Unit Essential Question:*** *How does water transform and change over time?*	The Grade 5 Life Science Unit includes *Earth Science* concepts. The Earth has four spheres which interact with each other - geosphere, biosphere, hydrosphere, and atmosphere – and support life on earth. The distribution of water on the Earth's surface will be explored as well as how organisms depend on air and water to grow and survive. Engineers design models to describe the movement of matter among plants, animals, decomposers, and the environment and how energy in animals' food was once energy from the sun. ***Unit Essential Question:*** *How are ecosystems influenced by humans and earth systems?*
Lesson Experience Topics	**Experience 1: *Structure and Roles of the Solar System* –** The Solar System contains the sun, the moon, the stars, and the planets. Each has different properties, roles, and relationships to each other which have observable patterns in the sky.	**Experience 1: *Water, A Liquid* -** Matter (water) transforms and changes over considering weight and volume. **Experience 2: *Water, A Vapor* -** Matter (water) transforms and changes over time in a closed and open system.	**Experience 1: *Four Spheres of Earth* -** The Earth's four spheres (Hydrosphere, Atmosphere, Biosphere, Geosphere) interact with each other and support the growth and survival of plants and animals.

	Experience 2: *Time Through Our Solar System* – Earth's rotation and revolution are patterns observed that cause day and night, changes in the seasons including the appearance of the Sun during the seasons, and shadows that look different throughout the day. **Experience 3: *Earth and Its Moon* -** The gravitational force of Earth acting on an object near Earth's surface pulls that object toward the planet's center. **Experience 4: *Constellations* -** The distance from Earth affects the brightness and color of a star, stars change color, and some constellations are seen all year round while others only half the year.	**Experience 3: *Water to Ice*** – Matter (water) transforms and changes over time considering the properties of liquids and solids. **Experience 4: *Air, A Gas*** - Matter (water) transforms and changes over time considering the properties of air. **Experience 5: *Two Scales*** – Matter (water) transforms and changes over time in a model and in the real world.	**Experience 2: *Healthy Ecosystems*** - Newly introduced species can have a positive or negative impact on an ecosystem through the food chain which is evidenced in food webs and how energy from food originated from the sun. **Experience 3: *Engineering Design Challenge - Cleaning up an Oil Spill*** – Environmental engineers use their creativity and science knowledge of the environment to design solutions to protect and preserve the Earth's resources.
Unit Title & Standards		***"FLOATING" UNIT:* Environmental Stewardship** **Grade 5 Meaningful Watershed Educational Experience (MWEE)** **NGSS Earth Environmental Science** *Earth and Human Activity* & *Maryland Environmental Literacy Standards Framework* *2-3 week unit that includes 3-day field experience at *Harford Glen Environmental Education Center*. The Harford Glen schedule dictates when this unit will be taught for each school. **Harford Glen PAGE**	
Unit Overview & Essential Question	Humans are stewards of the environment, and the best way to learn about the world in which we live is to experience it firsthand. The ***Environmental Stewardship*** Unit combines experiences at school with field experiences at the *Harford Glen Environmental Education Center* in Bel Air. All experiences are designed to fully engage fifth grade students, high school counselors and teachers as environmental stewards through a project-based learning experience where the goal is the implementation of a realistic school action plan. The ***Environmental Stewardship*** Unit is the culmination of the elementary science curriculum which encompasses both *Next Generation Science Standards* and *Maryland Environmental Literacy Standards.* ***Unit Essential Question:*** *How do humans help protect the earth's resources and environment?*		
Lesson Experience Topics	**Experience 1: *I Speak for the Trees* –** Environmental stewardship positively affects the Earth's resources and environment. Humans change the Earth, and they can choose to positively impact the environment by their actions. The *Environmental Issues Investigation & Action Process* is a way that humans, including fifth graders, can identify an environmental issue, ask questions, research, investigate, and determine a positive action that will improve the problem. **Experience 2: *What Do We Speak for at our School?*** – Step 1 of the *Environmental Issues Investigation & Action Process* includes collecting evidence as part of research to determine an environmental issue either indoors or outdoors and then develop an investigative question. **Experience 3: *What Do We Speak for at Harford Glen?* –** The *Harford Glen Environmental Education Center* provides an immersive, onsite learning field experience for fifth graders to deepen their understanding of the *Environmental Issues Investigation & Action Process* by experiencing various projects in action at Harford Glen. **Experience 4: *Unless Someone Like You Cares a Whole Awful Lot* –** developing an action plan and project to solve an identified environmental issue is the final step of the *Environmental Issues Investigation & Action Process.*		