Unit # - 3 – Oceanography and Climate (8 weeks)

Standards Addressed	Student Learning Objectives For this Unit	Content Skills and Knowledge	Learning Activities and Instructional Strategies
NSES Standards: Structure & Function in Living Things Science as Inquiry Science & Technology Science in Personal and Social Perspective PA STEE Standards: 3.2.7.A (sci. k) 3.2.7.B (app k) 3.3.7.B (str funct) 3.4.7.B (e ht trn) 3.1.7.B (models) 3.7.7.B (instr) 1.2 Read Critically 1.4 Writing 1.8 Presentation	Standard: Energy in the Earth System and Structure of the Earth ▪ Heating of earth's surface and atmosphere by the sun drives convection within the atmosphere and oceans, producing winds and ocean currents. ▪ Global climate is determined by energy transfer from the sun at and near the earth's surface. This energy transfer is influenced by dynamic processes such as cloud cover and the earth's rotation, and static conditions such as the position of mountain ranges and oceans ▪ Global patterns of atmospheric movement influence local weather. Oceans have a major effect on climate, because water in the oceans holds a large amount of heat. ▪ Living organisms have played many roles in the earth system, including affecting the composition of the atmosphere, producing some types of rocks, and contributing to the weathering of rocks. ▪ Explain the physical and chemical components of ocean and fresh water. Note* - The focus of this unit is physical oceanography, NOT marine biology. Marine Biology example can be used when they can be used to help illustrate oceanography concepts. For example… ▪ Migration Patters and Ocean Currents ▪ Echolocation and Dolphin Movement ▪ Algae blooms and nutrient levels ▪ Animal adaptations and ocean floor topography ▪	**Knowledge** ▪ The major divisions of the global ocean ▪ The history of the earth's oceans ▪ Properties of ocean water ▪ Interactions between the ocean and atmosphere ▪ Technologies for studying the ocean floor ▪ Identify the 2 major regions of the ocean floor ▪ Marine Life – see note (may be covered in Ecology Unit) ▪ Describe surface and deep currents and factors that control them. ▪ Explain how currents affect climate. ex. El Nino ▪ Explain the parts of the wave and how they relate to movement **Skills** ▪ Explain the relationship between currents and climate ▪ Describe the technologies for studying the ocean: compare and contrast them. ▪ Be able to use a topographic map to describe the ocean floor, mountains, and trenches.	**Lab or Demonstration:** Probing the Depths lab (H) Ocean Floor Mapping (Vernier Motion Detector) Spin Cycle Demo (H) Doing the Wave **Reading:** Directed Reading (H) Critical Thinking: Chain Reaction **Worksheet:** Exploring the Oceans **Technology**: Hurricane Tracking from a Safe Distance: http://www.mcps.k12.md.us/departments/eventscience/EBS.HU1_RS.html