



Hydrosphere

<p>Unit Outcomes At the end of this unit, your student should be able to:</p>	<p>Key Vocabulary Terms to deepen the student's understanding</p>	
<ul style="list-style-type: none"> ✓ Conclude that water is one of the most common substances on the surface of the Earth; essential to life and the oceans are one of Earth's most valuable natural resources ✓ Discuss how the ocean is one of Earth's most valuable natural resources and the oceans are an integral component of the world's climate due to its capacity to collect, drive and mix water, heat and carbon dioxide ✓ Conclude that the water cycle is the continuous movement of water in and around the Earth ✓ Determine that a river basin is the portion of land drained by a river and its tributaries and that land dwellers live in a river basin ✓ Defend the understanding that the ocean is a dynamic system in which many chemical, biological and physical changes are taking place ✓ Discuss that estuaries are areas where fresh and salt water mix, producing variations in salinity and high biological activity ✓ Propose that from the seashore to the deepest depths, the oceans are the home to the most diverse life on Earth ✓ Discuss that there are innumerable individual food chains overlapping and intersecting to form complex food webs in the oceans ✓ Determine that seawater has many different gases dissolved in it, to include nitrogen, oxygen and carbon dioxide ✓ Propose that the health of a water system is determined by the balance between physical, chemical and biological variables and water quality can be assessed by using bioindicators (macroinvertebrates) ✓ Discuss that the temperature of water in rivers and lakes determines the kinds of organisms that can survive there ✓ Determine that measuring dissolved oxygen is an important factor in determining water quality, pH is a measure of how acidic or basic water is and that turbidity is a measure of how clear water is ✓ Conclude that clear water may contain odorless, tasteless and colorless harmful contaminants ✓ Determine that the term water quality is used to describe the chemical, physical or biological characteristics of water 	<ul style="list-style-type: none"> ✓ Hydrosphere ✓ River basin ✓ Tributaries ✓ Water cycle ✓ Ground water ✓ Freshwater ✓ Salt water ✓ Lithosphere ✓ Atmosphere ✓ Biosphere ✓ Salinity ✓ Hydrothermal vents ✓ Estuary ✓ Nitrates ✓ Phosphates ✓ Algae blooms ✓ Contaminants ✓ Water quality ✓ Stewardship 	<ul style="list-style-type: none"> ✓ Upwelling ✓ Dissolved oxygen ✓ pH ✓ Sedimentation ✓ Organic materials ✓ Inorganic materials ✓ Brackish water ✓ Phytoplankton ✓ Eutrophication ✓ Acid(ic) ✓ Base(ic) ✓ Turbidity ✓ Bioindicators (macroinvertebrate)
<p>Key Standards Addressed Connections to Common Core/NC Essential Standards</p>	<p>Where This Unit Fits Connections to prior and future learning</p>	
<p>8.E.1.1 Explain the structure of the hydrosphere including:</p> <ul style="list-style-type: none"> • Water distribution on Earth • Local river basins and water availability <p>8.E.1.2 Summarize evidence that Earth's oceans are a reservoir of nutrient, mineral, dissolved gases and life forms:</p>	<p>Coming into this unit, students should have a strong foundation in:</p> <ul style="list-style-type: none"> ✓ Comparing Earth's saltwater and freshwater features (including oceans, seas, rivers, lakes, ponds, streams and glaciers) ✓ Explaining how the cycling of water in and out of 	



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<p>estuaries, marine ecosystems, upwelling, behavior of gases in the marine environment and deep ocean technology and understanding gained.</p> <p>8.E.1.3 Predict the safety and potability of water supplies in North Carolina based on physical and biological factors, including:</p> <ul style="list-style-type: none"> • Temperature • Dissolved oxygen • pH • Nitrates and Phosphates • Turbidity • Bio-indicators <p>8.E.1.4 Conclude that the good health of humans requires:</p> <ul style="list-style-type: none"> • Monitoring of the hydrosphere • Water quality standards • Methods of water treatment • Maintaining safe water quality • Stewardship 	<p>the atmosphere and atmospheric conditions relate to the weather patterns on Earth</p> <ul style="list-style-type: none"> ✓ Summarizing the basic needs of a variety of different animals (including air, water and food) for energy and growth <p>This unit builds to the following future skills and concepts:</p> <ul style="list-style-type: none"> ✓ Explaining how groundwater and surface water interact ✓ Evaluating human influences on freshwater availability ✓ Attributing changes in Earth systems to global climate change (temperature change, changes in pH of ocean, sea level changes, etc) ✓ Evaluating human influences on water quality
<p>Additional Resources</p> <p>Materials to support understanding and enrichment</p>	<p>“Learning Checks”</p> <p>Questions Parents Can Use to Assess Understanding</p>
<ul style="list-style-type: none"> ✓ Ck12.org online textbook: Natural Resources ✓ Ck12.org online textbook: Oceans Resources ✓ CK12.org online textbook: Conserving water ✓ CK12.org online textbook: Groundwater depletion and Groundwater pollution ✓ Discovery Ed Video: Source of Life: water in our environment ✓ Ducksters.com: Biology for kids website with information on the water cycle: http://www.ducksters.com/science/the_water_cycle.php ✓ Ducksters.com: Biology for kids website with information on the water cycle: <ul style="list-style-type: none"> ○ http://www.ducksters.com/science/ecosystems/freshwater_biome.php ✓ Harcourtschools.com interactive activity on the water cycle http://www.harcourtschool.com/activity/science_up_close/308/deploy/interface.swf ✓ MBGnet.net information about marine and freshwater habitats http://www.mbgnet.net/ 	<ul style="list-style-type: none"> ✓ How do factors interact to determine the distribution of water in the hydrosphere? ✓ How does the water cycle affect water distribution on Earth? ✓ How do river basins affect water availability? ✓ What are the oceans made of and how do we know? ✓ How do Earth’s oceans affect other marine and land ecosystems? ✓ How are physical and biological factors used to determine the quality the water? ✓ What can we do to protect our water supply? ✓ In what capacity does freshwater occur on Earth? ✓ Why is the ocean considered to be one of Earth’s valuable resources? ✓ What is the role of macroinvertebrates in determining water quality?