

Science
Environmental Geoscience
Unit 3: The Hydrosphere

Essential Understandings	<ul style="list-style-type: none"> ▪ Causation: Nothing “just happens”. Everything is caused. ▪ Interrelatedness: Everything in the universe is connected to everything else in the universe. ▪ Dynamism: Everything is changing in some way all the time. ▪ Uniformitarianism: The way the universe works today is the way it worked yesterday and the way it will work tomorrow.
Essential Questions	<ul style="list-style-type: none"> ▪ Why is the hydrosphere important to Earth? ▪ What is the hydrosphere? ▪ What sub-systems exist within the hydrosphere? In what ways are they interrelated? ▪ How is the world’s population affected by hydrosphere systems? ▪ What political and economic controversies exist related to the hydrosphere?
Essential Knowledge	<ul style="list-style-type: none"> ▪ The hydrological circle/system connects all water on Earth and in the atmosphere as one large-scale system. ▪ The hydrological system is made up of sub-systems, including surface water, groundwater, and frozen water systems. ▪ Currents in the oceans are connected as one large-scale conveyor belt of heat, salinity, and life, and impact people all around the Earth. ▪ The hydrosphere is in a delicate geological balance, and climate change and anthropogenic influences affect that balance.
Vocabulary	<ul style="list-style-type: none"> ▪ <u>Terms:</u> <ul style="list-style-type: none"> ○ hydrosphere, hydrologic cycle, wetland, river/stream, ocean, groundwater, water table, contour line, topographic map, groundwater flow map, infiltration, evaporation, condensation, precipitation, density, salinity, climate
Essential Skills	<ul style="list-style-type: none"> ▪ Explain the interactions among the biosphere, hydrosphere, and lithosphere. ▪ Explain a political and/or economic controversy related to the hydrosphere and give ideas for resolving that controversy. ▪ Read, interpret, and construct a topographic and a groundwater flow map.

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<p>Related Maine Learning Results</p>	<p><u>Science and Technology</u> B. The Skills and Traits of Scientific Inquiry and Technological Design B1.The Skills and Traits of Scientific Inquiry Students methodically plan, conduct, analyze data from, and communicate results of in-depth scientific investigations, including experiments guided by a testable hypothesis. a. Identify questions, concepts, and testable hypotheses that guide scientific investigations. b. Design and safely conduct methodical scientific investigations, including experiments with controls. c. Use statistics to summarize, describe, analyze, and interpret results. d. Formulate and revise scientific investigations using logic and evidence. e. Use a variety of tools and technologies to improve investigations and communications. f. Recognize and analyze alternative explanations and models using scientific criteria. g. Communicate and defend scientific ideas. C. The Scientific and Technological Enterprise C2.Understandihngs About Science and Technology Students explain how the relationship between scientific inquiry and technological design influences the advancement of ideas, products, and systems. a. Provide an example that shows how science advances with the introduction of new technologies and how solving technological problems impacts new scientific knowledge. b. Provide examples of how creativity, imagination, and a good knowledge base are required to advance scientific ideas and technological design. c. Provide examples that illustrate how technological solutions to problems sometimes lead to new problems of new fields of inquiry.</p>
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Related Maine Learning Results	<p>C3. Science, Technology, and Society Students describe the role of science and technology in creating and solving contemporary issues and challenges.</p> <ol style="list-style-type: none"> a. Explain how science and technology influence the carrying capacity and sustainability of the planet. b. Explain how ethical, societal, political, economic, and cultural factors influence personal health, safety, and the quality of the environment. c. Explain how ethical, societal, political, economic, religious, and cultural factors influence the development and use of science and technology. <p>D. The Physical Setting D2. Earth Students describe and analyze the biological, physical, energy, and human influences that shape and alter Earth Systems.</p> <ol style="list-style-type: none"> a. Describe and analyze the effect of solar radiation, ocean currents, and atmospheric conditions on the Earth’s surface and the habitability of Earth. b. Describe Earth’s internal energy sources and their role in plate tectonics. c. Describe and analyze the effects of biological and geophysical influences on the origin and changing nature of Earth Systems. d. Describe and analyze the effects of human influences on Earth Systems.
Sample Lessons And Activities	<ul style="list-style-type: none"> ▪ Read a topographic map and interpret topography using stereoscopic glasses. ▪ Learning Lab A+ lesson on hydrology and underground water.
Sample Classroom Assessment Methods	<ul style="list-style-type: none"> ▪ Quizzes on class lectures ▪ Laboratory and project grades ▪ Examination at the end of unit
Sample Resources	<ul style="list-style-type: none"> ▪ <u>Publications:</u> <ul style="list-style-type: none"> ○ <u>Modern Earth Science</u>, William L. Ramsey et al., Holt, Rinehart and Winston, Inc., Austin: 1989. ▪ <u>Other Resources:</u> <ul style="list-style-type: none"> ○ Science Resource Center (Library online database)