

IDEAS FROM TEACHERS: USING THE OCEAN LITERACY FRAMEWORK

From the initial drafts to the final review, and every step along the way, classroom teachers have been integral to developing the Ocean Literacy Scope and Sequence for Grades K-12. They shared their pedagogical content knowledge—their professional judgment on how to transform subject-matter knowledge into forms accessible to the students being taught. This expertise was critical for breaking down the Ocean Literacy Essential Principles and Fundamental Concepts appropriately for each of the grade bands, showing connections between concepts, and then organizing the concepts in ways that represent increasingly sophisticated understanding. Several of these teachers offer insights on how they have or plan to use the Ocean Literacy Principles and the Scope and Sequence.

Pam Stryker, Elementary Teacher, Barton Creek School, Austin, Texas

All students love the ocean (and I love teaching it); but when I began teaching (38 years ago) there was very little guidance as to what was important for students to know about the ocean. Ocean units tended to be random collections of unrelated topics: whales, shells, sharks, etc. Slowly through attending marine education workshops and conferences, I began to see the big picture: the diversity of life that it supports, its function in so many of Earth's natural cycles, and the role it plays in all of our lives (even if you live 200 miles from the shore). Ocean literacy is for everyone. The national and state standards act as general guides to the big concepts that need to be taught at each grade with little specificity. It is left to the districts and schools to interpret. With no guiding documents as to what is important to know about the ocean, ocean studies were usually relegated to coastal areas. The Ocean Literacy Principles show how the ocean impacts all of us, as well as how we impact the ocean. There is a global need to know and understand the ocean. The Ocean Literacy Scope and Sequence breaks down those big ideas into manageable pieces that can easily be aligned into local curriculums. Within our own district, we will be revising our science scope and sequence to the new Texas Essential Knowledge and Skills. As a part of the committee, I will be providing both the Ocean Literacy Principles and the Scope and Sequence documents and encouraging each grade level to incorporate them into their curriculum. After all, our Colorado River does flow right into the Gulf of Mexico, so what we do here, 200 miles away, does impact the ocean. We probably should know a little about it!

Mellie Lewis, Elementary Teacher, Howard Public Schools, Maryland

I will use the Ocean Literacy Scope and Sequence in two ways. First, as a fifth grade science resource teacher developing an enrichment program for accelerated students, I will use the



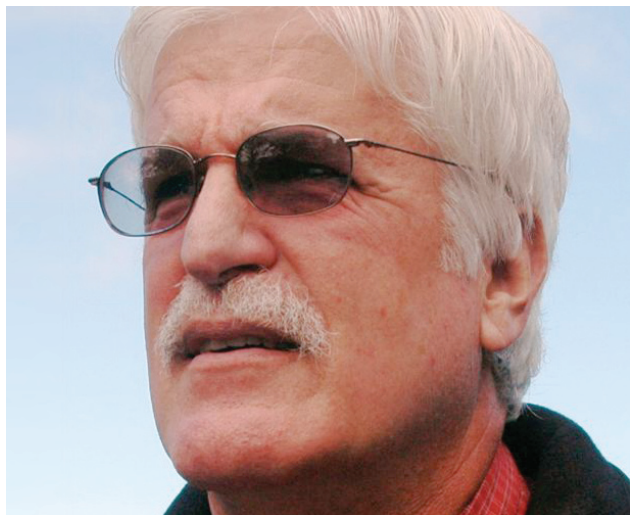
Mellie Lewis

Scope and Sequence to extend the regular instruction of the Fifth Grade Elementary Science Curriculum. For example, one of the curriculum objectives is for students to identify components of the Chesapeake Bay ecosystem. Using the Scope and Sequence, and referring to Principle 5: *The ocean supports a great diversity of life and ecosystems*, I have a resource that will aid in developing grade-level appropriate and sequential lessons to extend the regular fifth grade science curriculum. Second, I will use the Scope and Sequence to develop curriculum and an instructional program for our before-school enrichment class for students in grades 3-5. Since I have not taught many of these students in the past, I am unaware of their science experience and background. I plan to use the Scope and Sequence to design a pre-assessment knowledge indicator, which will provide me with an understanding of my students' background knowledge, so that I can build upon this to develop appropriate and sequential lessons.

Carmelina Livingston, Lead Science Teacher, St. Andrew's School of Math and Science, Charleston, South Carolina

As a science teacher for elementary (K-5th) grades, the Ocean Literacy Scope and Sequence is a "blueprint of concepts that is both developmentally age and grade appropriate" for all students. The Scope and Sequence models the "basic to specific" and the "concrete to abstract" method of learning. When I plan for classroom instruction, both the Ocean Literacy Principles and the State Science Curriculum Standards are incorporated. The Ocean Literacy Principles are not considered as an extra set of standards or guidelines to teach students, but an integration of concepts that are age and grade appropriate in a sequential manner. For instance, in the state standards, students in grades K-2nd observe objects by using the senses and compare and classify objects based on properties. According to the Ocean

Literacy Principle 1, students observe the properties of ocean water. In this particular lesson, my goal for students is to apply the process skill of observation with the properties of ocean water. I design an investigation for students to explore salt water during a science lab lesson as one concrete way to practice this kind of learning. The Ocean Literacy Principles are a valuable asset for designing science experiences, and teachers are encouraged to use them to include ocean science in daily science instruction.



Gene Williamson

Gene Williamson, Retired Junior High/Intermediate schoolteacher, Beaverton, Oregon

In my 30 years of teaching, I never had any problem figuring out what to teach about ocean science. I've always been passionate about the subject matter and have kept up on the content. The thing that kept me up late at night—every year—was trying to decide in what sequence to present the concepts and topics that I wanted to teach. There are so many ways to organize instruction, and I learned the hard way that not all of them are good. I would have loved to have had the Ocean Literacy Scope and Sequence when I was teaching. It provides a map that shows how the ideas build on one another. It is an invaluable resource to beginning and experienced teachers.

Barbara Walton-Faria, Middle School Science Teacher and Curriculum Developer, Thompson Middle School, Newport, Rhode Island

I use the Ocean Literacy Principles to help develop curriculum and units of study for public school students in grades 6-8. By using the matrix to cross-reference specific Ocean Literacy Essential Principles and Fundamental Concepts with the National Science Education Standards, educators are able to expand their teachings about our ocean environment. It is not only possible, but easy to teach an entire middle school earth, life, or physical science course from an ocean perspective, using the matrix attached to the Ocean Literacy Principles.



Barbara Walton-Faria

Beth Jewell, High School Biology and Oceanography Teacher, Fairfax County Public Schools, Virginia

As a high school biology teacher, I use the Ocean Literacy Principles as I prepare my lessons and course of study for my students. Wanting to emphasize the importance of the ocean, I try to incorporate ocean topics in many of my biology lessons. The Ocean Literacy Scope and Sequence will make it easy for me to see where students have been and where I can take them. For instance, when teaching about photosynthesis I can follow Principle 4: *The ocean makes the Earth habitable* through the grade bands to build on what students have been taught in middle school and the direction I should be taking them. I can also use the Scope and Sequence as a guide, as my students and I plan and prepare grade-appropriate activities for 150 elementary students. In the fall of each school year, we organize an oceanography day camp for elementary students. My expertise is not at the K-5 level; however, this document steers me as I develop suitable learning experiences for the campers that build on what is being taught in their classrooms.



Beth Jewell