Ocean Sciences Sequence for Grades 3–5
Correlations to National Science Education Standards (Grades K–4)

Key: • • • The standard is addressed completely with explicit instruction and repeated learning opportunities. • • The standard is addressed partially with explicit instruction and some learning opportunities. • The standard is touched upon, with a few learning opportunities and/or instruction; instruction may be expanded to more fully address this standard.	Unit 1	Unit 2	Unit 3
SCIENCE AS INQUIRY			
Understandings about scientific inquiry			
Scientific investigations involve asking and answering a question and comparing the answer with what scientists already know about the world.	• •	• •	• •
Scientists use different kinds of investigations depending on the questions they are trying to answer. Types of investigations include describing objects, events, and organisms; classifying them; and doing a fair test (experimenting).	• •	• •	• •
Simple instruments, such as magnifiers, thermometers, and rulers, provide more information than scientists obtain using only their senses.	• • •	•	
Scientists develop explanations using observations (evidence) and what they already know about the world (scientific knowledge). Good explanations are based on evidence from investigations.	• • •	• • •	• • •
Scientists make the results of their investigations public; they describe the investigations in ways that enable others to repeat the investigations.	• •	• •	• •
Scientists review and ask questions about the results of other scientists' work.	• • •	• • •	• • •
PHYSICAL SCIENCE			
Properties of objects and materials			
Objects have many observable properties, including size, weight, shape, color, temperature, and the ability to react with other substances. Those properties can be measured using tools, such as rulers, balances, and thermometers.	• •		•
LIFE SCIENCE			
The characteristics of organisms			
Organisms have basic needs. For example, animals need air, water, and food; plants require air, water, nutrients, and light. Organisms can survive only in environments in which their needs can be met. The world has many different environments, and distinct environments support the life of different types of organisms.	•	• • •	
Each plant or animal has different structures that serve different functions in growth, survival, and reproduction. For example, humans have distinct structures for walking, holding, seeing, and talking.		• • •	
Life cycles of organisms			
Plants and animals have life cycles that include being born, developing into adults, reproducing, and eventually dying. The details of this life cycle are different for different organisms.		• • •	

Ocean Sciences Sequence for Grades 3–5

Correlations to National Science Education Standards (Grades K–4) (continued)

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LIFE SCIENCE (continued)			
Organisms and their environments			
All animals depend on plants. Some animals eat plants for food. Other animals eat animals that eat plants.		• • •	• •
An organism's patterns of behaviors are related to the nature of that organism's environment, including the kinds and numbers of other organisms present, the availability of food and resources, and the physical characteristics of the environment. When the environment changes, some plants and animals survive and reproduce, and others die or move to new locations.		• • •	• •
Humans depend on their natural and constructed environments. Humans change environments in ways that can be either beneficial or detrimental for themselves and other organisms.		• •	• • •
EARTH AND SPACE SCIENCE			
Changes in the Earth and sky			
The surface of the Earth changes. Some changes are due to slow processes, such as erosion and weathering, and some changes are due to rapid processes, such as landslides, volcanic eruptions, and earthquakes.	• •		
SCIENCE AND TECHNOLOGY			
Understandings about science and technology			
People have always had questions about their world. Science is one way of answering questions and explaining the natural world.	• • •	• • •	• • •
People have always had problems and invented tools and techniques (ways of doing something) to solve problems. Trying to determine the effects of solutions helps people avoid some new problems.	• •	• •	• • •
Scientists and engineers often work in teams with different individuals doing different things that contribute to the results. This understanding focuses primarily on teams working together and secondarily on the combination of scientist and engineer teams.	• •	• •	• •
Tools help scientists make better observations, measurements, and equipment for investigations. They help scientists see, measure, and do things that they could not otherwise see, measure, and do.	• • •	• • •	• •
SCIENCE IN PERSONAL AND SOCIAL PERSPECTIVES			
Types of resources			
Resources of things that we get from the living and nonliving environment to meet the needs and wants of a population.			• • •
Some resources are basic materials, such as air, water, and soil; some are produced from basic resources, such as food, fuel, and building materials; and some resources are nonmaterial, such as quiet places, beauty, security, and safety.			• • •
The supply of many resources is limited. If used, resources can be extended through recycling and decreased use.			• • •

Ocean Sciences Sequence for Grades 3–5

Correlations to National Science Education Standards (Grades K–4) (continued)

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SCIENCE IN PERSONAL AND SOCIAL PERSPECTIVES (continued)			
Changes in environments			
Environments are the space, conditions, and factors that affect an individual's and a population's ability to survive and their quality of life.		• •	• •
Changes in environments can be natural or influenced by humans. Some changes are good, some are bad, and some are neither good nor bad. Pollution is a change in the environment that can influence the health, survival, or activities of organisms, including humans.		• •	• • •
Some environmental changes occur slowly, and others occur rapidly. Students should understand the different consequences of changing environments in small increments over long periods as compared with changing environments in large increments over short periods.			• •
HISTORY AND NATURE OF SCIENCE			
Science as a human endeavor			
Science and technology have been practiced by people for a long time.	•		
Men and women have made a variety of contributions throughout the history of science and technology.	•	•	•
Although men and women using scientific inquiry have learned much about the objects, events, and phenomena in nature, much more remains to be understood. Science will never be finished.	• •	• • •	• •
Many people choose science as a career and devote their entire lives to studying it. Many people derive great pleasure from doing science.	• •	• •	• •

Ocean Sciences Sequence for Grades 3–5
Correlations to National Science Education Standards (Grades 5–8)

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SCIENCE AS INQUIRY			
Understandings about scientific inquiry			
Different kinds of questions suggest different kinds of scientific investigations. Some investigations involve observing and describing objects, organisms, or events; some involve collecting specimens; some involve experiments; some involve seeking more information; some involve discovery of new objects and phenomena; and some involve making models.	• •	• •	• •
Current scientific knowledge and understanding guide scientific investigations. Different scientific domains employ different methods, core theories, and standards to advance scientific knowledge and understanding.	• •	• •	• •
Technology used to gather data enhances accuracy and allows scientists to analyze and quantify results of investigations.	• • •	• • •	• •
Scientific explanations emphasize evidence; have logically consistent arguments; and use scientific principles, models, and theories. The scientific community accepts and uses such explanations until displaced by better scientific ones. When such displacement occurs, science advances.	• • •	• • •	• • •
Science advances through legitimate skepticism. Asking questions and querying other scientists' explanations is part of scientific inquiry. Scientists evaluate the explanations proposed by other scientists by examining evidence, comparing evidence, identifying faulty reasoning, pointing out statements that go beyond the evidence, and suggesting alternative explanations for the same observations.	• • •	• • •	• • •
Scientific investigations sometimes result in new ideas and phenomena for study, generate new methods or procedures for an investigation, or develop new technologies to improve the collection of data. All of these results can lead to new investigations.	• •	• •	• •
LIFE SCIENCE			
Regulation and behavior			
All organisms must be able to obtain and use resources, grow, reproduce, and maintain stable internal conditions while living in a constantly changing external environment.		• •	
An organism's behavior evolves through adaptation to its environment. How a species moves, obtains food, reproduces, and responds to danger is based in the species' evolutionary history.		• •	
Populations and ecosystems			
A population consists of all the individuals of a species that occur together in a given place and time. All populations living together and the physical factors with which they interact compose an ecosystem.		• • •	
For ecosystems, the major source of energy is sunlight. Energy entering ecosystems as sunlight is transferred by producers into chemical energy through photosynthesis. That energy then passes from organism to organism in food webs.		• •	

Ocean Sciences Sequence for Grades 3–5

Correlations to National Science Education Standards (Grades 5–8) (continued)

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LIFE SCIENCE (continued)			
Populations and ecosystems (continued)			
The number of organisms an ecosystem can support depends on the resources available and abiotic factors, such as quantity of light and water, range of temperatures, and soil composition. Given adequate biotic and abiotic resources and no disease or predators, populations (including humans) increase at rapid rates. Lack of resources and other factors, such as predation and climate, limit the growth of populations in specific niches in the ecosystem.		• •	
Diversity and adaptations of organisms			
Millions of species of animals, plants, and microorganisms are alive today. Although different species might look dissimilar, the unity among organisms becomes apparent from an analysis of internal structures, the similarity of their chemical processes, and the evidence of common ancestry.		• •	
SCIENCE AND TECHNOLOGY			
Understandings about science and technology			
Science and technology are reciprocal. Science helps drive technology as it addresses questions that demand more sophisticated instruments and provides principles for better instrumentation and technique. Technology is essential to science because it provides instruments and techniques that enable observation of objects and phenomena that are otherwise unobservable due to factors such as quantity, distance, location, size, and speed. Technology also provides tools for investigations, inquiry, and analysis.	• • •	• • •	• •
HISTORY AND NATURE OF SCIENCE			
Science as a human endeavor			
Women and men of various social and ethnic backgrounds—and with diverse interests, talents, qualities, and motivations—engage in the activities of science, engineering, and related fields such as the health professions. Some scientists work in teams, and some work alone, but all communicate extensively with others.	• •	• •	• •
Science requires different abilities, depending on such factors as the field of study and type of inquiry. Science is very much a human endeavor, and the work of science relies on basic human qualities, such as reasoning, insight, energy, skill, and creativity—as well as on scientific habits of mind, such as intellectual honesty, tolerance of ambiguity, skepticism, and openness to new ideas.	• •	• •	• •

Ocean Sciences Sequence for Grades 3–5

Correlations to National Science Education Standards (Grades 5–8) (continued)

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HISTORY AND NATURE OF SCIENCE (continued)			
Nature of science			
Scientists formulate and test their explanations of nature using observation, experiments, and theoretical and mathematical models. Although all scientific ideas are tentative and subject to change and improvement in principle, for most major ideas in science, there is much experimental and observational confirmation. Those ideas are not likely to change greatly in the future. Scientists do and have changed their ideas about nature when they encounter new experimental evidence that does not match their existing explanations.	• •	• •	• •
In areas where active research is being pursued and in which there is not a great deal of experimental or observational evidence and understanding, it is normal for scientists to differ with one another about the interpretation of the evidence or theory being considered. Different scientists might publish conflicting experimental results or might draw different conclusions from the same data. Ideally, scientists acknowledge such conflict and work toward finding evidence that will resolve their disagreement.	• •	• •	• •
It is part of scientific inquiry to evaluate the results of scientific investigations, experiments, observations, theoretical models, and the explanations proposed by other scientists. Evaluation includes reviewing the experimental procedures, examining the evidence, identifying faulty reasoning, pointing out statements that go beyond the evidence, and suggesting alternative explanations for the same observations. Although scientists may disagree about explanations of phenomena, about interpretations of data, or about the value of rival theories, they do agree that questioning, response to criticism, and open communication are integral to the process of science. As scientific knowledge evolves, major disagreements are eventually resolved through such interactions between scientists.	• •	• •	• •