

SUGGESTED REFERENCES

- *Tasmania: Department of Primary Industries, Water, and Environment*
<http://www.dpiwe.tas.gov.au/inter.nsf/ThemeNodes/LBUN-5362ZN?open>
Whales and Dolphins
- *Ichthyology at the Florida Museum of Natural History*
<http://www.flmnh.ufl.edu/fish/Sharks/sharks.htm>
- *NASA Goddard Space Flight Center*
<http://seawifs.gsfc.nasa.gov/SEAWIFS.html>
The Living Ocean
- *Cetacea*
<http://www.cetacea.org/index.htm>
key word: dolphins
- *"Voracious Evolution". Natural History, June 1998, by John G. Maisey*
<http://www.findarticles.com>
- Evans, P. G. H.
The Natural History of Whales and Dolphins. Facts on File
Publications, New York. (1987).

NATIONAL SCIENCE EDUCATION STANDARDS

5 - 8

Life Science

Structure and Function in living organisms
Population and Ecosystems
Diversity and adaptations of organisms

9 - 12

Life Science

Biological evolution
Interdependence of organisms
Behavior of organisms

*Source: *National Science Education Standards, 1996, National Academy Press*

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SCIENCE SCREEN REPORT

VOLUME 34 ISSUE 7/8

WATERY CREATURES: LIFE IN THE SEA



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SYNOPSIS

Oceans cover nearly seventy-five percent of the earth's surface, with depths greater than land's highest mountains. Flowing with salts, minerals and dissolved gases, these waters allow sea life to thrive. Recently, oceanographers have journeyed into the ocean to learn more about the survival of many species.

This edition of SCIENCE SCREEN REPORT travels into the depths of the oceans, observing and discovering the most amazing creatures. It is here that many different species have adapted to their environment, while others have existed unchanged for millions of years. As we explore this watery world, we will learn how many species live within the complex waters they call home.

CURRICULUM UNITS

- BIOLOGY
- ENVIRONMENTAL SCIENCE
- MARINE BIOLOGY
- OCEANOGRAPHY
- ZOOLOGY

RUNNING TIME

22:12

BACKGROUND

Deep below the oceans surface lurk sea creatures that have existed for billions of years. Although the ocean provides a perfect balance of life's essentials, the development and perfection of hunting and survival techniques allow sea life to thrive.

Species dwell at all depths of the ocean. Each possesses a hunting strategy that is adapted to its surroundings. The ocean's surface provides sunlight and oxygen that nourishes tiny organisms and microscopic plants. In the coastal and inter-tidal areas, fish are preyed upon as the main course. Where light is nonexistent, in the ocean's greatest depths, microscopic organisms are meals for many. With a combination of senses, such as smell, sight and electrical sensitivity, the ocean's creatures dine daily. However, some species hunt best when working cooperatively, while others prefer to hunt in solitude.

Solitary hunters have perfected a wide range of feeding techniques. Some of the most remarkable techniques are those of the numb ray. This creature has the ability to stun its prey by generating its own electricity. For others, hunting is as simple as opening their mouths. Ascidians are great examples of this technique. They have large filtrating feeders that extract nourishment from floating particles.

For every predator that possesses hunting techniques, there are prey that possess survival techniques. This part of life is essential in the continuation of each species. For many species, camouflage is the key to survival. Camouflaging has many variations ranging from adaptation to the environment's background, use of surroundings as decoration, and counter shading. The most common form of camouflage is counter shading. With a combination of environment and reflecting light, creatures can darken their dorsal side leaving the ventral side lighter. This allows them to blend in when viewed from above or below.

Survival in the ocean also requires unique adaptations to meet unique challenges. One of the most basic is mobility. Some species move through the waters by swimming or flapping, while others walk or slide. Of course, speed plays a large role in whether a fish becomes prey. The shark is the most efficiently mobile of all fish. With a fusiform body, a shark's shape enables it to reduce drag and swim at speeds near thirty kilometers per hour.

All sea dwellers have one survival tactic in common - to survive long enough to reproduce. Sometimes life in the sea takes a nontraditional approach. For example, once a female seahorse produces her eggs, she deposits them into the male's pouch where he is then responsible for fertilizing, incubating and delivering live young.

The oceans of our world are vital to life on earth. It is in these waters that the first life form began. Covering nearly seventy-five percent of the earth, only a fraction of the ocean has been explored. The depths below hold secrets of creatures yet to be discovered, and each species plays an important role in the preservation of the ocean.

ADVANCED ORGANIZERS

Prior to showing this video, students should have some understanding of the following benchmarks for Science Literacy, Oxford University Press which are excerpted and, in some cases, abbreviated below. Refer to the Benchmarks for more information.

Benchmark 5: The Living Environment

Section A - Diversity of Life

Know by Grade 8

- Animals and plants have a great variety of body plans and internal structures that contribute to their being able to make or find food and reproduce.

Know by Grade 12

- The variation of organisms within a species increases the likelihood that at least some members of the species will survive under changed environmental conditions, and a great diversity of species increases the chance that at least some living things will survive in the face of large changes in the environment.

Section D - Interdependence of Life

Know by Grade 12

- Human beings are part of the earth's ecosystems. Human activities can, deliberately or inadvertently, alter the equilibrium in ecosystems.

**Benchmarks can be found at www.project2061.org/tools/benchol/bolintro.htm*

CRITICAL THINKING EXERCISES

- Classify species mentioned in the video into solitary/cooperative hunters and identify their hunting techniques.
- Illustrate and label an ocean food web or food chain.
- Observe the effects light has on the growth of ocean vegetation with the use of two salt-water tanks in different light conditions.
- Ask students to determine what role each species plays in the ocean's food web.
- Compare/contrast the different ecosystems within the ocean.
- Research and illustrate a sea creature. Identify where it lives in the ocean, its survival techniques, ways it has adapted to its environment, food sources etc.
- Create a table distinguishing the difference between a sea mammal such as a dolphin or a whale and a fish such as a shark.
- Identify and graph land's highest mountains and the ocean's deepest trenches.

VOCABULARY

Ascidians	Mantle	Plankton
Baleen	Metabolic rate	Polyp
Breaching	Migrational	Porpoising
Callosities	Nematocysts	Spawn
Cetacean	Neurotoxin	Spy-hopping
Communal	Nictating membrane	Trenches
Conductor	Pinnepeds	Vortices
Dermal denticles	Photosynthetic	Vestigial
Fusiform	Placoid scales	

CAREER POSSIBILITIES

- BIOLOGIST
- DIVER
- ENVIRONMENTAL SCIENTIST
- MARINE BIOLOGIST
- OCEANOGRAPHER
- OCEAN ENGINEER
- ZOOLOGIST