

LESSON PLAN

1

Skills: geography, mapping, visual perception

Preparation: obtain a map of the world and a globe

Materials: poster paper, writing materials, construction paper

Resources: *Wonders of the Sea*, by Louis Sabin; *The Seashore First Discovery Book*, Gallimard Jeunesse

Words with Special

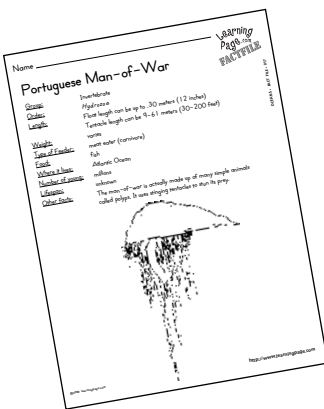
Meanings

oceans: the great bodies of salt water that cover 71% of the Earth

Funsheets: Grade 1 [Science 3](#); Grade 2, [Science 1, 2](#)

Tips: Point out the oceans, continents and countries that border them on a map of the world.

Mention to students that the Atlantic is shaped like the letter "S;" the Pacific, "O;" the Indian, upside-down "V;" Arctic and Antarctic, "O."



Unit Objective: Students will develop an awareness of oceans through activities featuring marine life (undersea and seashore) and physical, geographical and environmental aspects of oceans. Students will be able to point out the five oceans on a map or globe.

Introduction: If your school is located at a distance from a coast, ask the class if they've been to the ocean. Then ask, "What is an ocean? What do you know about the ocean?" Consider all answers, prompt if necessary. Ask, "What would you like to know about oceans?" List these items on a sheet of butcher paper displayed on the wall. Keep it there to refer to throughout the unit.

Read: *Wonders of the Sea*

Procedure:

1. Begin the discussion by showing the class a large globe. Ask, "Where are the oceans of the world? How do we know which are the oceans on the globe?"
2. Name the oceans and point to them on the globe. Also refer to them on a large wall map.
3. "As you look at the globe, can you estimate how much of the Earth is covered by oceans?" Note where the equator lies; what do you notice about the water north of the equator and the water south of the equator? (N: 1.5x as much water as land; S: 4x as much water as land.)
4. Divide the class into five sections and have each of them take an ocean. Have the groups independently find out facts about their oceans and be able to tell the rest of the class about them.

Further Possibilities: Locate your area on a map and ask students to locate the nearest ocean, bay, harbor, sea, island. Have these words on the board or on displayed word cards. They can practice writing these words in their Journals. Using the colors they see on the maps and globe, have students draw a map showing their state and the closest ocean.

Book Arts: For detailed instructions on how to make an Oceans Journal, see [Dinosaurs, Grade Preschool-K, Lesson 2](#), and [Dinosaurs, Grade 1-2, Lesson 2](#); the shape could be an ocean animal, plant, shell, or boat and the Oceans Journal could be used for creative writing, spelling practice, and drawing. See [Grade Preschool-K, Lesson 9](#), for further book ideas.

Oceans Learning Center: Shop second-hand and thrift shops for old *Natural History*, *National Geographic*, *Smithsonian*, *Discover*, *Falcon*, and *Ranger Rick* magazines; use as examples of animals and their habitats, and cut up to make collages and for other art activities. Leave these in the [Oceans Learning Center](#).

***FACT FILES:** Copy the Learning Page [Fact Files](#) and distribute with a colored pocket folder. Give students time to organize the pages and decorate the covers. As an introduction to the Unit, look at the [Fact Files](#), page by page, reading the information slowly as students follow with their eyes and fingers.

LESSON PLAN 2

Skills: sort, recognize differences, recall facts

Preparation: Make flash cards from the Fact Files. One way: Fold each page just above the illustration, then open flat. Bring the fold line up to just under the Ocean animal's name, and press flat (all the facts should be covered.) Paste this onto a piece of cardboard or oaktag. To make it easier, you could also paste the facts onto the reverse side of the card for reference.

Resources: *What's It Like to Be a Fish?* by Wendy Pfeffer; *How Many Fish? (My First I Can Read Book)* by Caron Lee Cohen

Words with Special Meanings

ichthyology: the branch of zoology dealing with fishes

Funsheets: Grade 1, Science 5, 7

Tip: See Grade Preschool-K Lesson 3 for ideas about creating a classroom underwater environment for the unit.

Objective: Students will be able to identify several characteristics of fish and be able to discriminate between animals that are fish and those that are not.

Introduction: Ask: "What is a fish?" Write responses on the board as students make guesses. Points to emphasize: most fish live in water, breathe with their gills, have scales, and swim using fins. All fish have backbones, (which means they are vertebrates), and a skeleton inside their bodies. Fish have a streamlined shape that allows them to maneuver smoothly through the water. Just because an animal lives in water does not make it a fish. Seals and dolphins may be streamlined but they need to come to the surface for air. Shellfish like clams are mollusks. Ask them what other animals with "fish" names are really not fish.

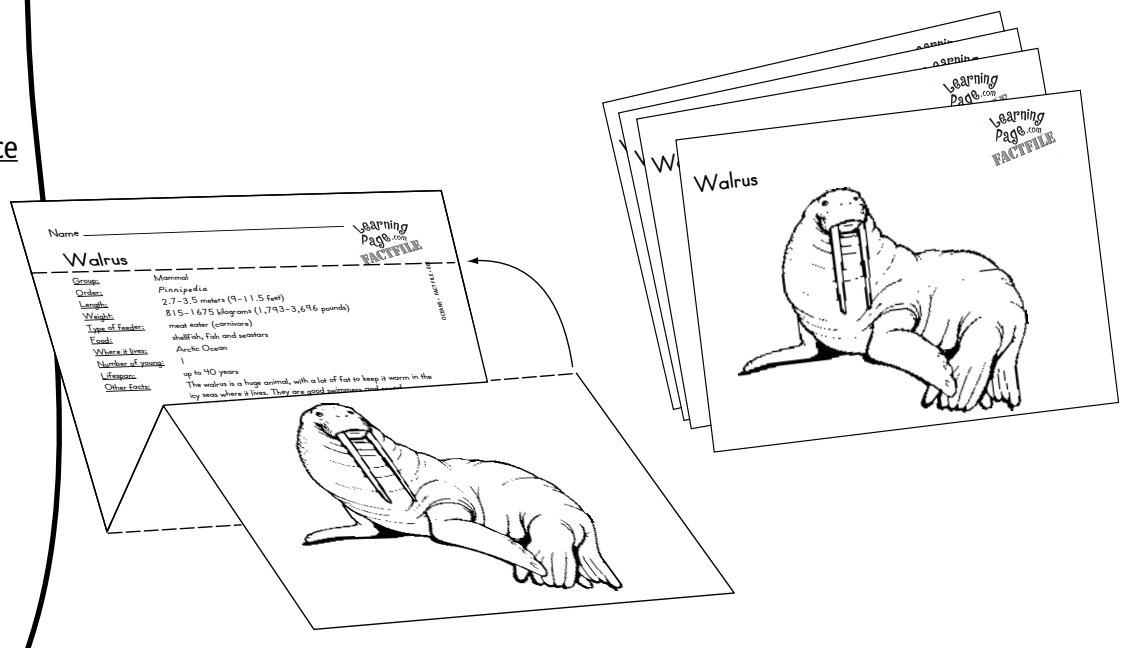
Read: *What's It Like to Be a Fish?*

Procedure: Create a fish painting using either of these methods; be sure to include all the parts that make a fish a fish.

1. With only light colored wax crayons, demonstrate drawing on white paper; draw all kinds of fish swimming in the ocean. It will look invisible.
2. Using water colors with lots of water, show students how to paint a "wash" over the crayon fish. The fish will pop out from the blue watery background.

Conclusion: Be sure that all students include the fish characteristics you discussed earlier.

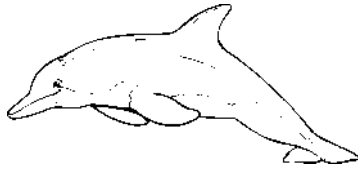
Further Possibilities: Using your Fact Files Flash cards, quiz students up to the Unit. They can guess which animals are fish and which are not based on the information above. Then using their Fact Files, have them construct graphs, sorting the animals according to group: fish, mammal, bird, invertebrate or reptile.



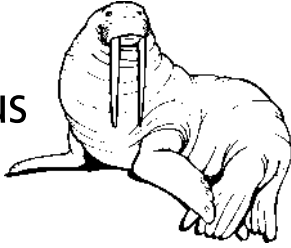
OCEANS INVENTORY

Name _____

Bottle-nosed
Dolphin



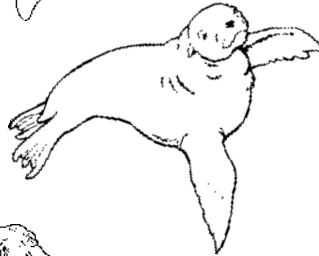
Walrus



Great
White Shark



California
Sea Lion



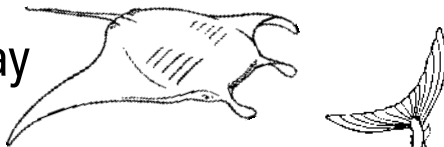
Northern
Elephant Seal



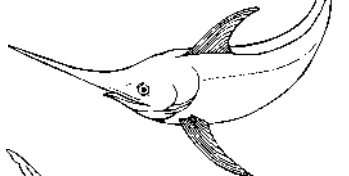
Octopus



Manta Ray



Swordfish



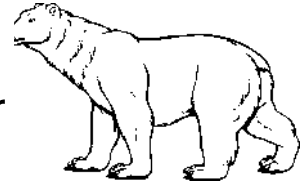
Hammerhead
Shark



Leatherback
Turtle



Polar Bear



Emperor Penguin



Killer Whale



Blue Whale



Whale Shark



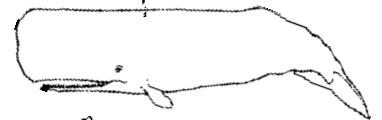
Manatee



Portuguese
Man-of-War



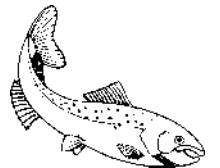
Sperm
Whale



Seahorse



Atlantic Salmon



LESSON PLAN

3

Skills: alphabetical order, beginning sounds, research using Fact Files

Preparation: copy enough Oceans Inventory sheets for each student.

Materials: white drawing paper, drawing materials

Resources: *The Underwater Alphabet Book*, by Jerry Pallota; *The Oceans Alphabet Book*, by Jerry Pallota; *ABSea*, by Bobbie Kalman; *Alphabet Sea*, by Carolyn Spencer

Funsheets: Fundamentals 35; Kindergarten Science 1; Grade 1, Science 10; Language 3

Objective: Students will become familiar with one ocean creature and be able to share what he or she learns.

Introduction: Have each student choose a marine animal that will be their adopted creature for this activity; or, use the ocean animal inventory sheet cut into strips and folded and have them pick one at random from a hat.

Read: one of the alphabet books at left.

Procedure:

1. Pass out a copy of the Oceans Inventory Sheet to each student and have them put the animals in alphabetical order on a separate piece of paper. Then assign each child to an animal, or have them choose one as their own. If they initiate it, they can pick one that is not on the list (that begins with a letter that is not on the list).
2. Have the students draw their animal in the center of a large sheet of drawing paper, as well as the letter it starts with.
3. Using their Fact Files, or other materials from the Learning Center, have students fill the rest of the paper with features of the habitat, the surroundings of the fish.

Conclusion: Go around the room and have each student stand, display their picture, and tell what they learned about that animal.

Further Possibilities:

1. Movement: Be your animal, swimming under water, breathing underwater; use arms and legs freely, crawl like a crab.
2. Art: make a painting of your ocean animal.
3. Book Arts: construct a book all about your sea creature. Use any book form you like.
4. Language: write or draw pictures of as many things you can think of that begin with the same letter of the alphabet as your chosen animal.

LESSON PLAN

4

Skills: recalling octopus facts, prefixes, octo-, the number eight, plurals

Preparation: create a plastic bag octopus in advance; the students will be fascinated by it's "color" and "texture."

Materials: clear plastic kitchen trash bags, string, scissors; additional materials if making alternative method octopi.

Tip: the first writing ink was made from the pigment (color) found in octopus's ink sac. Today, the ink is used as a color and flavoring for pasta and sauces.

Resources: *My very Own Octopus*, by Bernard Most; *An Octopus Followed Me Home*, by Dan Yaccarino; *An Octopus is Amazing*, by Patricia Lauber; *The Tickle Octopus*, Audry Wood

Words with Special Meanings

octo-: a prefix meaning eight

tentacles: flexible feelers for touching, feeling and smelling

Funsheets: Kindergarten Math 1, Science 7

Objective: Students will be able to say three facts about the octopus and know it is an invertebrate; students will know what the prefix octo- means.

Introduction: Write the word octopus on the board. Then again, separated into two parts: octo – pus. Talk about prefixes, and ask, "What does the prefix octo- mean? Take guesses, responses and then ask if any one knows any other words that start with octo-? This is a stretch for early grades but suggest the word octagon, write it on the board and draw a picture of it. Other words: octave (music), octet (a group of eight), octuplet (one of eight), octogenarian (eighty-year old person.)

The octopus has eight arms, called tentacles. They are used for swimming, crawling, fighting, building, holding food, and breeding. What would we do with eight legs? How would we walk? Can two students demonstrate the movements of one eight-legged creature?

Read: Book about octopi from the list at left.

Procedure:

1. Demonstrate to students how to make an octopus using this method or any of the others below.
2. Take one clear garbage bag, roll it up into a tight ball and stuff it into the the other bag. Grab it tightly by the "neck" and secure what is now the head with a cord or rubber band. Then with scissors, divide the "skirt" of the plastic bag into eight strips. This may take some care, the arms do not need to be the same size but there should be eight. If a student ends up with more, simply cut them off.
3. Whatever method you use to create an octopus, pay special attention to the creation of the eight arms or tentacles. When each student has finished making them, have them line them up and count them 1 to 8. The class can also do this in unison.

Conclusion: Using heavy thread or twine, hang the octopi around the room. Then ask, if this is an octopus, what do you call two of these creatures. Octopuses? Maybe sometimes, but another form of this plural is not as simple as adding an "s." They are called *octopi*. This is derived from the Latin language.

Further Possibilities: There are unlimited ways for children to create octopi from available materials. The body can be made out of a small butter tub, a paper plate cut in half, a small paper or clear lunch bag stuffed with newspaper or waxed paper; the legs can be anything from accordion-folded strips of paper to pipe cleaners to extra thick yarn. If made out of long strips of construction paper, have students stamp the "suction cups" using a finger and contrasting paint or stamp pad with washable ink.

LESSON PLAN

5

Skills: visual perception, see similarities and differences, matching, create similarities

Preparation: Have the Oceans Mural prepared ahead of time and posted on a bulletin board. (put together but not colored in) Copy and enlarge [Grade One Science Fun Sheet 10](#) and [Grade Preschool– K Lesson 5](#) for a variety of fish to draw. Preread the books below and bookmark the sections about oceans.

Resources: *How to Hide an Octopus*, by Ruth Heller; *Animal Camouflage: A Closer Look*, by Joyce Powzyk; *Animals in Camouflage*, by Phyllis Limbacher Tildes; *Can You See Me?*, by Shirley Greenway; *Clever Camouflagers*, by Anthony D. Fredericks; *Under the Sea*, The Nature Company, p. 22–23

Words with Special Meanings

predator: an organism that eats another organism

camouflage: the colors and patterns of an animal that blend in with the background and conceal it from predators and help it to ambush prey.

Funsheets: Kindergarten Language 9, Math 5

Objective: Students will understand the importance of camouflage: shape and coloration in undersea environments.

Introduction: Ask: “Have you ever played Hide and Seek?” Talk more about hiding and ask students to think of when they would be disguised to avoid detection. Playing games, dressing up for Halloween or a part in a play.

In the natural world, it’s not a game: hiding can mean survival.

Why are some fish such beautiful colors and patterns? Talk about different ways that marine animals use their colors and ability to change colors: warning, calling attention to themselves for mating, announcing their social status, trickery, mimicry, disruptive coloration, hiding among coral and plants. Some fish can change color instantly to blend in with their background. Read about the butterfly fish, that has a black “eye” on its back that can confuse a predator.

Note that the females of any species may be more blandly colored to be able to better protect their young. The male is often brightly colored to attract females for mating. Also, young fish (juveniles) are often different colors than their parents so that they can travel freely away from the protection of their parents, among other kinds of fish, and be unharmed.

Read: *How to Hide an Octopus* or several of the premarked sections of the other books.

Procedure:

1. Using the Mural, have children draw and color a fish or sea creature of their choice, any color, any shape, any features. Then have them fill in the background behind their creature so that it is protected. See **Preparation** at left.
2. Or, students may draw and color individual pictures. Assign a background that their creature must survive in: stripey green seaweed, a spotty gray rock, a pebbly sandy bottom, pink leggy coral.
3. When the mural is completed, have the class stand back and look at it. Then stand back further. Decide which creatures are most successfully camouflaged.

Conclusion: Talk about other animals you have studied that use camouflage to their benefit ([Zoo Animals, Preschool–K Lesson 7](#); [Insects, Grade 1–2 Lesson 9](#)).

LESSON PLAN

6

Skills: observation, conservation, cooperation

Preparation: obtain a large piece of coral from an aquarium store or biology supply house, if you are not near an ocean. Also find an example of coral jewelry to borrow and wear; South-western Native Americans have traditionally used coral in their silver jewelry, (beads, set as a stone, or inlaid in delicate silver work). Make copies of the work sheet on the next page.

Tip: mention that the tiny polyps have tentacles similar to the ones the octopus has, but much much smaller.

Resources: *Look Closer: Coral Reef*, by Barbara Taylor; *At Home in the Coral Reef*, by Katy Muzik; *Treasures of the Great Barrier Reef*, Nova (VHS); *Coral Reef*, by Donald M. Silver

Words with Special Meanings

ecosystem: the combination of all the communities and environmental factors in an area

Objective: Students will understand the rich variety of life that lives just below the ocean surface in coral reefs, and be aware of conservation efforts towards this fragile ecosystem.

Introduction: Show students the samples of coral and ask them to identify it. Explain that we call this coral, but it is actually the skeleton of the coral. Discuss how coral reefs colonies are made up of millions of tiny coral animals (called polyps) that build up limestone as they grow. It take many years to grow enough coral to produce a reef, and it is a delicate and balanced environment. Fish, plants, algae, invertebrates and coral live in harmony and depend on each other. For many reasons brought on by man and industrialized society, reef ecosystems are struggling to survive.

Watch: *Treasures of the Great Barrier Reef*, or another video about coral reefs.

Procedure:

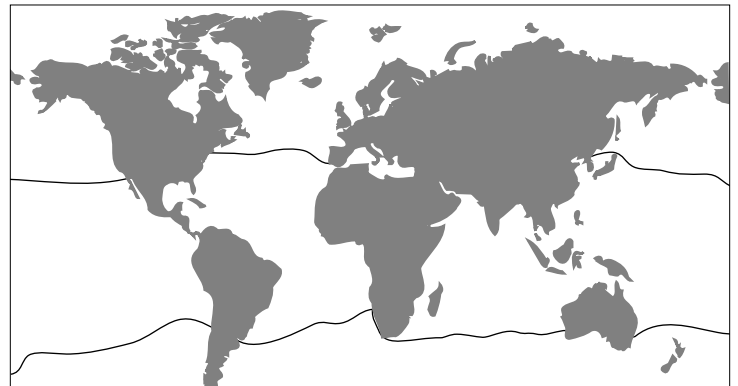
1. Ask for students' reactions and what they remember about what they watched.
2. List on the board the creatures students can recall that live in the reef.
3. Have the students color the worksheet on the next page to identify four types of coral.

Conclusion:

1. Have students name several ways that creatures living in a coral reef help each other and ask them to draw and color a picture of one of those relationships
2. Ask for suggestions: What can we do to help protect the coral reef ecosystem?
3. Say: "The Great Barrier Reef is in Australia. Can anyone point to Australia on the map?" (pinpoint the location of the Reef) What else have we studied about Australia? (Zoo Animals: Koalas and kangaroos originated in Australia.)

Further Possibilities:

1. Call a local dive shop (these exist even in landlocked communities) to arrange for a speaker to come to class and talk about the training, equipment and responsibilities of snorkeling and scuba diving. They usually have excellent videos on underwater topics.
2. Look at the world map and using both arms, show the northern and southern boundaries of the area where coral reefs can live, where the water never gets colder than 68°F (20°C).





Color the branch coral red. Color the fan coral yellow. Color the brain coral tan. Color the bubble coral blue.

LESSON PLAN

7

Skills: language arts, creative writing, rhyming, alliteration

Resources: *Creatures of the Earth, Sea and Sky*, by Georgia Heard; *The Random House Book of Poetry for Children*, edited by Jack Prelutsky; *All the Small Poems*, by Valerie Worth; *Sea Gifts*, by George Shannon; *Hailstones and Halibut Bones*, by Mary O'Neill

Words with Special Meanings

alliteration: repetition of an initial sound (usually a consonant or cluster) in two or more words in a phrase.

Funsheets: Grade 2
Language 6

Objective: Students will write a poem about the ocean.

Introduction: Let's practice using some of our new words by writing. First we will listen to some poems that others have written about oceans.

Read: Several poems about fish from some of the books mentioned at left.

Procedure:

1. Make a Word Bank list to post to get students started on their poems. Ask them for more word ideas to add to the list.
2. Go through the list and brainstorm rhyming words for the words in the Bank. Then, ask for words that begin with the same letter or sound. To take it further, ask for action words that begin with the same sound.
3. Give students a time limit to sit quietly and write their first poems. You may also give them a limit of lines or words to use to keep it simple at first.
4. If students are having trouble getting started, give them an assignment: begin your poem with an ocean animal. Then use only words that have the same beginning sound, at least 6; it does not need to rhyme.

Example: Fiddler Crab finds frog.

Funny?

Frightened first,

Forever friends.

Conclusion: Poems can be copied into the Ocean Journals and illustrated. Other stimulants for writing poetry could be a field trip to an aquarium or a fish market, watching a video such as *The Yellow Submarine*, or an experience with a live ocean creature.

Sample Word Bank:

ocean word	rhyming word	word with same beginning	verb with same beginning
sea	tree	splash	swim
beach	reach	blue	bike
shore	floor	shadow	shout
shell	tell	shiny	shut
fish	wish	flower	fling
whale	tail	wish	walk
snail	pail	sneak	soar
crab	grab	cloud	crawl
sand	land	sail	spin
fin	win	four	fly
tide	wide	time	tiptoe

LESSON PLAN

8

Skills: estimate, confirm, compare and make inferences, collect and organize similar objects

Preparation: Get the largest clear plastic jar you can find and fill it with all kinds of shells. If you are near a coast they will be easy to find; farther inland you'll need to find someone who collects shells, ask a friend who lives closer to the sea, or shop in second hand and craft stores; art prints of shells in art if available.

Materials: a plastic bowl for each group

Resources: *Is This a House for Hermit Crab?*, Megan McDonald; *Shell*, by Alex Arthur; *A House for a Hermit Crab*, by Eric Carle; *Sea Shells of the World*, A Golden Nature Guide; *The Shell Book*, by Barbara Hirsch Lember; *Seashells, Crabs, and Sea Stars*, by Christiane Kump Tibbitts; *Georgia O'Keeffe*, by Mike Venezia

Words with Special Meanings

bivalve: a mollusk with a shell that has two halves hinged together

Funsheets: Kindergarten Math 9, Language 8

Objective: Students will reinforce their counting, estimating, ordering and sorting skills, and appreciate the variety and beauty of shells.

Introduction: Refer to the large clear container of shells in the Learning Center. Ask, "What are shells? What are they made of? Who lived in these shells?" List some of the creatures that live in shells: clams, muscles, oysters, scallops, etc., animals with hard shells outside and soft bodies inside are called mollusks.

Look again at the large jar of shells and ask, "Can anyone guess how many shells are in the jar?" Record the estimates.

"Today we are going to hear a story about an animal that lives in a shell built by another kind of animal."

Read: *Is This a House for Hermit Crab?*

Procedure: Divide the class into groups of students that can comfortably work together at a big table. Roughly divide the shells into the same number of groups. Tell the class how beautiful shells are. Pick one up.

1. "Feel its shape, its smoothness, its hard edges. Feel the texture of the surface." Using a magnifying lens, look at it up close.
2. Sort the shells by size, length, or weight. Which shell is the biggest in each group? The whole class? Sort by color and shape.
3. Count the shells by ones, then group by fives.
4. Students can refer to a shell field guide to identify a few of their shells and share their knowledge with the class.

Conclusion: Have the class go around the room and look at what the other groups have done with their shells. Ask again for guesses on how many shells there were in the jar. Compare to the estimates.

Further Possibilities:

1. Use the shells in a drawing exercise, a still life type of arrangement or a close-up of one special shell. Use the magnifying lens. (Show Georgia O'Keeffe's painting, *Shell #1* featuring a large moon shell.)
2. The varieties of colors and shape of shells are an inviting way for a child to begin a collection, which can lead to a lifelong interest and study. Students can bring home shells when they go to visit different beaches and organize them by location. Shells can be mounted in frames or specimen boxes, labeled and documented in a Shell Journal.
3. There are many craft projects to make using shells. Glue flat scallop shells onto a small cardboard or wood box, and finish with natural spray polyurethane. Thread shells on heavy cord to hang as windchimes in the garden. Look for shells with holes already worn into them. Students can probably come up with lots of other ideas.



LESSON PLAN

9

Skills: work, commerce, natural resources

Preparation: Look at the following books before class and bookmark sections to read in class, during one or more days.

Materials: basic drawing and painting materials, white poster paper

Resources: *You Can Be a Woman Marine Biologist*, by Florence McAlary; *I'd Like to Be a Marine Biologist: Learning About Whales, Sea Turtles and Ocean Life*, by Kim M. Thompson; *Marine Biologist: Swimming With the Sharks*, by Keith Elliot Greenberg; *Opportunities in Marine and Maritime Careers*, by William Ray Heitzman and Jean-Michel Cousteau; *Jacques Cousteau: Saving Our Seas*, by Lorraine J. Hopping

Words with Special Meanings

oceanographer: a person who studies the oceans including the waters, depths, beds, animals, and plants

Objective: Students will demonstrate an understanding of the economy of the oceans and the people who work in that economy.

Introduction: Ask students if they can name kinds of workers connected to oceans. Make a list on the board. Here are some possibilities: oceanographer, marine biologist, marine geologist, commercial fisherman, offshore driller, diver, mariculturist, navigator, marine ichthyologist, marine ecologist, underwater welder, sailor in the Navy. "Does anyone know of anyone that works in any of these fields?"

Read: Sections of any of the books mentioned, spotlighting several different types of work associated with the oceans. Refer students to the Learning Center for more materials for researching careers involved.

Procedure:

1. Have each student choose one of the job titles on the board, or any other they may think of.
2. Have the children draw a poster to attract others to their chosen occupation. Before beginning, encourage brainstorming about the area they have chosen and answer any questions.
3. Suggest that students begin with a dominant figure of the person at work (male or female): what kinds of clothes would they wear? The background can be any marine image they have seen or can invent. They can copy the titles from the list of the board to use as headlines for their posters if desired.

Conclusion: After looking over all of the posters, ask if anyone would like to work in jobs connected with the oceans. Why? (Reasons why: be outside, help animals, be near the ocean, dress casually, like science, like to travel, help the environment. Reasons why not: can't swim, get sea sick, afraid of water, don't want to live near the ocean.)

Further Possibilities: Read about the famous oceanographer, Jacques Cousteau and discuss his contributions to the study and appreciation of the ocean.

LESSON PLAN

10

Skills: culture, nourishment, commerce

Preparation: shop for the tunafish sandwich makings, paper plates and napkins; obtain several star-shaped cookie cutters

Materials: map of the world

Resources: *Famous Seaweed Soup*, by Antoinette Martin; *It's Disgusting—And We Ate It!*, by James Solheim; *Lobster for Lunch*, by Bob Hartman; *Shellfish Aren't Fish*, by Allan Fowler

Funsheets: Kindergarten, Science 5

Objective: Students will be aware of the vast resource of foods that come from the oceans.

Introduction: On the map, point out that countries that border oceans (specifically say, Japan, China, Italy, Mexico) depend on the ocean for nourishment and have strong seafood-based culinary traditions.

Read: One or two of the books mentioned at left.

Procedure:

1. Have students brainstorm all the foods they can think of that come from the ocean, noting the ones that may be local. Write them on the board. Samples: canned tuna, sardines, anchovies, sushi, ceviche, fish sticks, clam chowder, clams and oysters on the half shell, clam sauce, smoked salmon, fried catfish, and caviar.
2. Ask students to pretend they are restaurant owners and to design and illustrate a menu featuring ocean foods. Use the Fact Files and old magazines for picture ideas to illustrate their menus.
3. Read the label from the can of tuna aloud to the class or have a student read it. Consider the ingredients, the nutritional content, calories, etc. Together, make a batch of tuna salad (tuna, mayo, pickle relish, salt and pepper). Then make sandwiches on whole wheat bread and cut out with a star-shaped cookie cutter for an afternoon snack.

Conclusion: Talk about other careers and work opportunities revolving around fish and other seafoods. Fish market manager, fisherman, shrimp importer, working in a cannery or fish market.

Further Possibilities: There are many other products that come from the oceans. Pearls, beads, mother-of-pearl, agar (a thickener used as a substitute for gelatin). A visit to an oriental market would be an eye opener for children, seeing the fresh seafood and also the many varieties of canned, dried, pickled, and preserved fish, shellfish, seaweed products. Perhaps you could make the visit and bring to the classroom a sampling of the preserved products.