



DEPTHS OF THE SEA

An Ocean Adventure

The Ocean Discovery Center was created in cooperation with the [Sonoran Sea Aquarium](#) with the mission to foster an awareness of the wonders of the ocean, placing particular emphasis on the ecosystem of the Gulf of California (Sea of Cortez). We strive to emphasize the importance of the sea in our everyday lives and the role of each individual in the preservation and conservation of its resources.

Educational Objectives:

- Introduction to the delicate and unique ecosystem of the Sea of Cortez.
- Introduction to a variety of ocean life.
- Exploration of every day products that include ingredients from the sea.
- Facilitate an understanding of the marine ecosystem and human impacts on it.

Suggested Reading List

Pre-Kindergarten and Kindergarten

- Dr. Seuss. One Fish Two Fish, Red Fish Blue Fish, Beginner Books, New York, 1960.
- Worth, Bonnie. Wish for a fish, Random House Inc., New York, 1999.

First Grade

- Walker, Sally M., Seahorse Reef: A Story of the South Pacific, Soundprints, Norwalk, CT, 2000.
- Ling, Mary. Amazing Fish, Knopf Books for Young Readers, 1991.

Second Grade

- Baker, Jeannie. The Hidden Forest, Greenwillow Books, New York, 2000.
- Kalman, Bobbie. The Amazing Octopus, Crabtree Publishing Company, 2003.

Third Grade

- Zoehfeld, Kathleen. The Great White Shark, Soundprints, Norwalk, 1995.

Fourth Grade

- Condra, Estelle. See the Ocean, Ideals Children's Books, Nashville, 1994.

Fifth Grade

- Williams, Andy. Oceans: Nature Unfolds, Rebound by Sagebrush, 2002.

Sixth Grade

- Stanley, Jacqueline V., Wolfie, the Wolf Eel, Peanut Butter Publishing, Vancouver, 1999.

- Trebitta, Christiane, Seashells, Crabs and Sea Stars: Take Along Guide, Northwood Press, 1999.

Suggested Pre/Post Visit Lessons

One Fish Two Fish

Lesson Outline

- (Reading Readiness RR1-5, PO1-4; Listening/Speaking Standard 3; Viewing/Presenting Standard 4; Science Readiness 1SC-R2, R3; 4SC-R1, 4SC-R3; 5SC-R1, Creating Art Readiness 1AV-R1 PO1 Math Readiness 2M-R1)

Summary: After reading and discussing **One Fish Two Fish**, students have been introduced to numbers, colors, physical characteristics, opposites, and concept of quantity, rhythm and rhyme scheme. This is also a basic introduction to animals.

Materials: One Fish-Two Fish, Red Fish Blue Fish by Dr. Seuss
Various craft supplies for the activity

Pre-Assessment:

Pre-reading discussion

1. Ask students basic questions about fish e.g., “Where do fish live? Can they live in your house? Are they really red and blue? Can they walk around like you and I?”
Ask students about real fish they have seen or owned.

Procedure: Read the story aloud, showing pictures as you read, ask the children questions about what they see and predict what they think will come next.

Closure:

Post-Reading Discussion

1. Discuss what colors and activities they observed the animals doing. Ask students what they thought was factual and what was made-up.

Post-Reading Activity

1. Using various craft materials, (for example, paper, feathers, vinyl, felt pom-poms, foam pieces etc.) have the students create their own “fish”. They can choose the colors, shape, size, hair and personality. They can even invent the name for it. Have students present it to the class.

Wish for a Fish

Lesson Outline

- (Workplace Skills Standard-2, Readiness. 2M-R1, R2; Reading Readiness R-R1-5, PO 1-4; Listening/Speaking Readiness, Viewing/Presenting Readiness, Science Readiness 1SC-R2, 1SC-R3; 3SC-R1; 4SC-R1, 4SC-R3; 5SC-R1; Creating Art Readiness 1AV-R1 PO1 Math Readiness 2M-R1)

Summary: After reading and discussing the story, students will begin to identify different zones, levels or spaces, a concept of depth and a familiarity with rhyme and rhythm. This will introduce students to different animals of the sea, basic biology and where they live.

Materials: Wish for a Fish by Bonnie Worth, Illustrated by Aristedes Ruiz
Various craft supplies for the activity

Pre-Assessment:

Pre-reading Activity

1. Engage students in a simple visual activity of different spaces. Have students stand upright and ask them to point to the highest part of their bodies. Repeat with middle and lowest. Ask simple spatial questions about the world around them e.g., “What is higher up, the sky or the ground? Do birds fly above us or below us?” Ask students basic questions about fish and other sea creatures.

Procedure: Read the story aloud, showing pictures as you read, ask the children questions about what you read, “Who has heard of a catfish? Is it a cat or a fish?”

Closure:

Post-Reading Discussion

1. Discuss the animals they learned about. Which ones had they already heard of and which ones were new? Can they remember any of the names for the new ones?

Post-Reading Activity

1. Using various craft materials, (for example, paper, feathers, vinyl, felt pom-poms, foam pieces etc.) have the students create their own “fish”. They can choose the colors, shape, and size. Have them add real anatomy as well as made up parts. They can even invent the name for it. Have students present it to the class.

Seahorse Reef: A Story of the South Pacific

Lesson Outline

- (Reading Foundations 1R-F3 PO1-5, 1R-F4 PO1-4, 1R-F8, PO2; Listening/Speaking Standard 3; Viewing/Presenting Standard 4; Science Foundations 1SC-F2, F4, 2SC-F1, F2, F3 3SC-F2, F3 4SC-F1-4, F7 6SC-F6 Creating Art Foundations 1AV-F1 PO1)

Summary: After reading and discussing the story, students will have been introduced to seahorse biology, predator vs. prey relationships, and the concept of environmental preservation.

Materials: Seahorse Reef: A Story of the South Pacific by Sally M. Walker
Various craft supplies: construction paper, glue, stickers, pom-poms etc.

Pre-Assessment:

Pre-reading Activity

1. “Friend or Foe” Game – Have the class stand up in a room with plenty of space to walk around in. Secretly choose one person to be “it” or the predator. Have the whole group mingle throughout the room always shaking at least one other person’s hand. There will be a special handshake that only the predator does, something

subtle like a tucked in finger or a tickle. Whenever someone receives the predator shake, they must count to five, and then fall over dead. Encourage them to shriek and tremble and be very dramatic. As the population begins to dwindle, it will become more and more clear who the “foe” is amongst the “friends”. If anyone can correctly identify the predator, and call him out, the remaining students are the survivors. *It is very important for creatures of the sea to be able to quickly identify any threats while continuing to carry out normal life activities. Those who do not may not survive, but those who do are usually better off for it.*

Procedure: Read the story aloud, showing pictures as you read, ask the children questions such as “Do you think the parrotfish will be a friend or foe? Will the seahorse be safe?”

Closure:

Post-Reading Discussion

1. Discuss the animals and interactions from the book. Which ones were expected and which were a surprise? Were there any new animals the children had never heard of before?

Post-Reading Activity

2. Design a “safe” seahorse habitat. Using all kinds of craft supplies (construction paper, foam pieces, glitter, vinyl, craft sticks, pom-poms) have the students create an ideal environment for a seahorse. They must identify what is a necessary ingredient and what to exclude. There must be a safe, secure home, but no sea snakes! Have students present it to the class.

The Hidden Forest

Lesson Outline

- (Reading Foundations -1R-F3 PO1-5, 1R-F4, 1R-F5, PO1-2, 1R-F8; Listening/Speaking Standard 3; Viewing/Presenting Standard 4; Science Foundations 1SC-F1-4, 2SC-F1-3 3SC-F2, F3 4SC-F1, F3-4, F7 6SC- F6)

Summary: After completing the lesson, students will be introduced to a whole new world called the kelp forest with a basic understanding of kelp forest ecology as well as worldwide distribution. A message of conservation and personal relevance will be delivered.

Materials: The Hidden Forest, by Jeannie Baker

A physical map of the local area including mountains, rivers, lakes etc.

Pre-Assessment:

Pre-reading Activity

1. Have a map of the world available for the students to see. Ask the class to locate various beaches or oceans they may have visited or heard of and examine their distance in relation to their hometown. Point out and discuss where some of the world’s most predominant kelp forests are located (for example, La Jolla, California and the Philippines)

Procedure: Read the story aloud, showing pictures as you read, ask the children questions about what you read. “Do you think the boy is scared? Why is he scared? Would you be scared to go into the ocean? Why?”

Closure:

Post-Reading Discussion

1. Discuss the change in attitude of the boy. “How did he change his feelings of the sea? Why did they change? How does he feel now? How does each of you feel about the sea and the animals that live in the sea?”

Post-Reading Activity

1. Have a physical map of the local area available which includes mountain ranges, rivers, streams and lakes etc. Mark the student’s current location as well. (X marks the spot.) Using different colored markers or pens, track the flow or effects on the environment you have from where you are. For example, using a blue marker, start from the X and draw lines that flow “downstream”. Where do the lines go? Where do they end up, close by or far away? Who and what do they pass by and impact on their way? Expand on the idea that our everyday activities impact the world environment.

The Great White Shark

Lesson Outline

- (Reading Foundations 1R-F3, R-F4, R-F5, PO 1-2, R-F8; Listening/Speaking Standard 3; Science Foundations 1SC-F1, F2, F4; 2SC-F1-3; 3SC-F3; 4SC-F1, F2 PO 1, F3 PO 1, F4, F7, Math Foundations 2M-F3)

Summary: After completing the lesson, students will have been introduced to the biology and behavior of sharks, the ocean’s natural food chain and develop their sense of prediction.

Materials: The Great White Shark by Kathleen Seinfeld

Gummy snacks or cheerios. A variety of utensils: spoons, straws, spatulas etc.

Pre-Assessment:

Pre-reading Activity

1. This is a fun game to illustrate shark speeds. It is a modification of ‘Red light! Green light!’ Who can swim faster? A large shark or a small shark? The larger the shark, the faster they are. Have the class line up on one side of a fairly large room or field. Have one student stand on the opposite side to be the fish. The fish controls how the sharks can approach him by calling out “big shark!” or “little shark!” When they are big sharks they can “swim “ towards the fish faster, when they are little sharks they have to “swim” slowly. The first one to reach the fish “eats” him and gets to be the next fish. Have the students come up with their own modes of swimming. Try frozen shark! Or disco shark!

Procedure: Read the story aloud, showing pictures as you read, ask the children questions about what you read. “Do you think she will have a successful hunt this time? What will happen if it is unsuccessful?”

Closure:*Post-Reading Discussion*

1. Discuss the predator/prey relationship and its natural balance. How often is the predator successful and how often does the prey escape? Is this the same ratio for all predators? What would happen if it were successful every time, what if the prey escaped every time?

Post-Reading Activity

1. What makes an efficient predator? Try to “capture” food with different size and shape mouths. Spread out some food on a tabletop or flat surface. Cheerios or gummy snacks work well. Have students choose between varieties of mouth utensils to feed with. Plastic spoons, wooden handle spoons, straws, plastic forks, tongs, spatulas etc. Which ones work the best? Which ones don't?

See The Ocean

Lesson Outline

- (Reading Essentials 1R-E1, PO3, R-E2, PO 1-4,7, R-E3, R-E4, R-E6, PO 2; Writing Essentials W-E1, E2, E3, E4, E5; Listening/Speaking Standard 3; Science Essentials 3SC-E3, 4SC-F6, E6)

Summary: Students will be able to confirm the meaning of words and ideas using context of text and illustration, identify point of view of the text, and make inferences using contextual clues. Students will be asked to use correct writing essentials to complete a writing task describing a personal experience clearly and accurately.

Materials: See the Ocean By Estelle Condra,

Various materials for the craft: construction paper, markers, magazines, foam pieces, photos etc.

Pre-Assessment:*Pre-reading Activity*

1. Have the students create a family tree but instead of writing each person's name on the branches they must use visual aids, pictures, drawings or magazine cutouts, etc. to represent each person.

Procedure: Read the story aloud, showing pictures as you read, ask the children questions about what you read. What does the illustration make you think of? How would you describe this place? What do you think will happen next?

Closure:*Post-Reading Discussion*

1. Discuss what a disability or physical impairment is (specifically RP eye disease or blindness). How does it make people different? How does the text and story relate to the artwork? Does the family remind you of your family? Did the story end like you thought it would?

Post-Reading Activity

1. Have the students choose a memorable family vacation or event and write it as a short story. They decide point of view and must include family interactions and lots of visual details. Have students present it to the class.

Oceans: Nature Unfolds

Lesson Outline

- (Reading Essentials R-E2; Standard 3 Listening and Speaking, Standard 4; Viewing and Presenting, Science Essentials 1SC-E2 PO1, 1SC-E4, 4SC-E5, 4SC-E7)

Summary: This lesson includes details of the ecosystem of the Atlantic Ocean and seafloor. Students will learn about this individual habitat and its natural zones. The book includes a key so kids can learn to visually identify individual species and learn the biology of various animal and plant life in each zone.

Materials: Oceans: Nature Unfolds by Andy Williams

Arts and crafts supplies: construction paper, stickers, foam pieces, feathers, etc.

Pre-Assessment:*Pre-reading Activity*

1. Have the students create an “under the sea” scene using the craft supplies. Have them include animals, landscape features, lighting changes etc. to make the scene as complete and detailed as they can. Set this aside.

Procedure: Read the story aloud, showing pictures as you read. The key can be enlarged to poster size or shown on an overhead projector for easier class viewing and reference.

Closure:*Post-Reading Discussion*

1. Discuss the flora and fauna introduced in the book. What was new and what did the students recognize? Was there anything especially exciting or interesting? Do names give you any clues about the animals? How did the animals vary according to the zone they lived in (specific adaptations)?

Post-Reading Activity

1. Have the students pick up their scenes and “complete” them. Add new things, correct any incongruence, and label the zones. Have students present final projects.

Wolfie, the Wolf Eel

Lesson Outline

- (Reading Essentials R-E2, E3, Writing Essentials W-E1, E2; Standard 3 Listening and Speaking, Science Essentials 4SC-E7)

Summary: A presentation of factual biology of marine life, animal interactions and reactions, details of the Wolf-eel life cycle as well as human impacts and effects on wildlife. A fun fish out of water story with a happy ending that most kids (and grown-ups) can relate to.

Materials: Wolfie, the Wolf Eel By Jacqueline Vickery Stanley

Pre-Assessment:

Pre-reading Discussion

1. What is an aquarium and how is it similar/different to a zoo? How do you think this environment affects the different animals? How does it benefit people?

Procedure: Read the story aloud, showing pictures as you read

Closure:

Post-Reading Discussion

1. Ask the students questions about Wolfie’s experiences. How do you think Wolfie felt during his adventure? Would it be scary for you to leave your “home” to go to a new place? How is it different for an animal to live in a captive environment then be released into the wild?

Post-Reading Activity:

1. Have the students write a creative story about an animal or pet that went on an adventure, which includes a plot, well-developed characters and descriptive words and phrases. Students can share the story with the class.
2. Do research as a class on recent real-life animal rescues and/or captive animal releases. Many publicized events will post updates in newspapers or on the web, on the animals and their current situations. How are they doing? Where did they go?

Additional/Optional Activities

Appropriate for any grade, this game illustrates how effective the large baleen whales are at catching enough tiny food by using their “brush-like” baleen plates to filter plankton and krill out of seawater. Some of the largest animals on the planet eat some of the smallest things on the planet; they just have to be able to catch a lot of it! Blue whales can grow up to 100 feet long and weigh 120 tons, but they eat mostly tiny crustaceans called krill. They have to be able to swallow massive quantities of them to survive. The rows of baleen plates in their mouths act as a strainer or a filter and are very effective.

Materials: A large bowl or bucket with water

Pepper

Various “feeding” supplies: plastic spoons, plastic combs, and toothbrushes or larger brushes with white bristles.

Procedure: Fill a large bucket or bowl with some water and generously add pepper. The pepper will represent the krill. The children must use various tools to try to “catch” the krill. Remember, they want to catch a lot. The spoon may catch a few, but is not very good. The plastic comb works better than the spoon, but will still miss a lot. The brush works the best! The bristles of the brush are remarkably similar to whale baleen and are very good at filtering the “food.”