



Food from the Ocean – Second Grade

Purpose

Students will identify different types of organisms that live in shells, explain the role of the shell, and explain why natural resources are so important for sustainable aquaculture.

Subject Area(s)

English Language Arts, Math, Science and Social Studies

Common Core/Essential Standards

English Language Arts

- **CCSS.ELA–Literacy RL.2.7** Use information gained from the illustrations and words in a print or digital text to demonstrate understanding of its characters, setting, or plot.
- **CCSS.ELA-Literacy RI.2.1** Ask and understand such questions as who, what, why, and how to demonstrate understanding of key details in a text.
- **CCSS.ELA-Literacy RI.2.5** Know and use various text features (e.g., captions, bold print, subheadings, glossaries, indexes, electronic menus, icons) to locate key facts or information in a text efficiently.

Math

- **CCSS-Math-Measurement and Data 2.MD.D.10** Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put together, take-apart, and compare problems using information presented in the bar graph.

Science

- **NC Essential Standard 2.L.2 Evolution and Genetics** Remember that organisms differ from or are similar to their parents based on the characteristics of the organism.
- **2.L.2.1** Identify ways in which many plants and animals closely resemble their parents in observed appearance and ways they are different.
- **2.L.2.1** Recognize that there is variation among individuals that are related.

Social Studies

- **NC Essential Standard 2.G.2 Geography and Environmental Literacy** Understand the effects humans have interacting with their environment.
- **2.G.2 .2** Explain how people positively and negatively affect the environment.

Agricultural Literacy Outcomes

Agriculture and Environment Outcomes

- Describe the importance of soil and water in raising crops and livestock.
- Identify natural resources.

Plants and Animals for Food, Fiber and Energy Outcomes

- Identify the importance of natural resources (e.g., sun, soil, water, minerals) in farming.

Culture, Society, Economy & Geography Outcomes

- Identify plants and animals grown or raised locally that are used for food, clothing, shelter, and landscapes.
- Explain why farming is important to communities.

Essential Questions

1. What are some characteristics of shells?
2. Why is a shell important to an organism?
3. Are all organisms born with shells? Give an example of one born with a shell and one without.
4. What is an example of an organism that molts? What do you think happens to the old shell?
5. Where are some areas that you can find shells?
6. What are some types of shells?
7. Are there different groups of shells? Give an example and their characteristics.
8. Why is water quality important to the growth, production, and harvesting of shellfish?
9. What are some types of shellfish that people are able to consume?
10. What are some uses that people have for shells?

Vocabulary

Shell: an animal's home.

Hollow: having a hole or empty space inside.

Tentacle: flexible limb of an invertebrate animal that is used for grasping, moving, or sensing.

Snail: a mollusk that has a single spiral shell that the body can be drawn into.

Mollusk: an invertebrate that includes snails, slugs, mussels, and octopus.

Mussel: bivalve mollusk with brown or black shell.

Oyster: bivalve mollusk with rough irregular shell - many can be farmed for eating or harvesting pearls.

Clam: a marine bivalve mollusk.

Bivalve: aquatic mollusk whose body is enclosed in a hinged shell, such as oysters, clams, mussels, and scallops.

Scallop: edible bivalve mollusk with a ribbed fan-shaped shell.

Molt: time at which an organism outgrows its exoskeleton and sheds it. There is a new exoskeleton underneath.

Student Motivator

Give each student a shell (shells do not have to be intact.). Give students one minute to use their senses to make observations about their shell. At the end of the minute have students turn and talk to a neighbor about their shell. Once students have had an opportunity to share their observations, have the pairs place the shells side by side and make examinations about the similarities and differences between the two shells. Give students 2 minutes to discuss. When the two minutes are up have students write at least three observations about their shell in complete sentences. Choose three to five students to share their written observations (try to choose students that have different types of shells). Once each student has shared with the class, show the shell to the entire class and ask *What type of animal might have lived in the shell?* Repeat this with each of the shells. At this time do not confirm or deny any of the student answers. On the board record each student's name that shared and the suggested animals that might live in the shell. You will go back to these answers once you have finished reading the book.

Background Knowledge

The book *What Lives in a Shell* focuses on different types of animals that live in shells. Many are born with shells and others use shells from other animals. In the book it addresses animals that live both on land and in the water. The book serves as an opportunity to introduce students to animals that live in shells as well as identify the names of some shells that they may or may not have seen before.

North Carolina has a thriving aquaculture business that can be found in both fresh and saltwater habitats. Good stewardship of natural resources is important, but even more so for aquaculture where the product lives and depends on water and more specifically high quality water. There are areas in coastal North Carolina where the pollution levels have impacted the water quality. Because of pollution aquaculture in these areas has been impacted. Students in North Carolina need to learn about aquaculture so they can better care for natural resources and because North Carolina has such diverse agriculture commodities that are raised and grown on land and in its waterways.

Procedures

Activity 1

1. Introduce the book *What Lives in a Shell?* Written by Kathleen Weidner Zoehfeld.
2. Ask *What do you see on the cover? Have you ever seen one of these objects before?* Hopefully students will be able to say yes based on the student motivator that you did prior to the lesson.

3. *Where do you think the story takes place? What evidence supports your answer? What season is represented by the cover? Have any of you ever been to a location that looks like this? What was the name of the location?* If possible have a map of North and South Carolina available so if any beaches from NC or SC are given you can point to those areas.
4. On page 5 at the end ask students *What type of animal would live in this shell?* Students may or may not know the answer at this time. *What is the purpose of this shell?* The book indicates that the shell is the animal's home.
5. Continue reading until page 7. After reading ask students to give examples other than the ones in the book about animal's homes.
6. On page 8 and 9 have students use the diagram to identify the parts of a snail's body. *What body parts do we have in common with a snail and what parts are different? What body part do we have that compares to the one the snails have? Does this shell look like one that we have already seen in the book?* Refer back to page 5 if they have difficulty answering the question.
7. Continue reading until page 15. *What characteristics do the turtle and snail have in common? Does the shell serve the same purpose for both organisms?*
8. Page 18 introduces the crab. This is the first mention of an animal that grows out of its shell and molts. *What do you think happens to the shell when the crab molts? Have any of you ever found a crab shell not a dead crab but the shell?* Discuss with students that many types of insects and reptiles also molt. Cicadas and snakes are great examples that students may have observed before. Also on this page the setting of the book changes. We go from the back yard to a pond/lake, and then to the beach. Ask *What is the setting for the crab compared to the snail and the turtle?* Ask students *Do we have beaches in North Carolina?*
9. As you continue reading the book ask students *if their shell matches any that are shown in the illustrations?* If any say yes have the student come forward and compare their shell to the one in the book and determine if it is the same. Then have the student use the subheading to determine the name of the shell. Record the name of the shell on a sentence strip and place the shell off to the side with the shell name.
10. On page 22 is the first reference to an organism that already has a shell but that shell doesn't protect the organism very well so it uses the shell of a dead organism to live in and protect itself. Ask students *Do you think this is molting? What is the thinking behind your answer?*
11. Continue to read and on page 24 and 25 ask the class if they have a shell that matches one in the book and repeat the procedure from step 9.
12. On page 26 and 27 the setting changes again. Have students identify the new setting and the characteristics of the setting. Page 27 also provides a new purpose of the shell beyond protection. Once you read page 27 stop and ask *Are there any additional uses for a shell?* Have students refer to the text to support their response. When discussing the scallop, oyster, and clam

ask students *Have you ever eaten a scallop, oyster, or clam? How about crab, either soft shell, legs, dip, etc...? Where do you think these foods came from?* Depending on where your school is located you can ask students if these types of food are available locally. *What type of an ecosystem must be present in order to find and harvest these types of organisms?*

13. Finish reading the book and review the purpose of a shell; where can shells be found; what types of organisms use shells; and what are some categories of shells.
14. As an evaluation of the lesson provide each student with a template of a shell. Each student will complete an acrostic using the word “SHELL” as their guiding word. See **Essential Files** for the shell template. Example of an acrostic: S- Shells are Shiny, H- Homes for hermit crabs and snails. E- Everywhere at the beach and in the ocean, L- Lost by a scallop and found by you, L- Lots of different shapes and sizes.

Activity 2

1. Divide your class into groups with 2-3 students per group.
2. Give each group a variety of shells.
3. Provide each group with books about shell identification or a folding guide for Shells of the Southeast Atlantic Coast.
4. Provide each group with graph paper and markers.
5. Explain to students that they will be creating a bar graph based on the variety of shells that they have in their bag and the quantity they have of each shell.
6. The groups can use the books and guides to determine the types of shells they have based on the physical characteristics of the shells. Once they have sorted the shells they will use the data from from sorting to complete the graph.
7. Discuss with the groups how they sorted their shells. Shells just like any other animal group have varieties. The shells within their sorting should have similar characteristics.
8. All of the group graphs will be posted around the room.
9. Using sticky notes groups will rotate around the room and create simple put together, take-apart, and compare problems. <http://www.corestandards.org/Math/Content/mathematics-glossary/Table-1/>
10. Students will write their problems on the sticky note (not solution) and place on the graph. Each group will need to create two problems.
11. Allow 3-5 minutes for the groups to work and then have groups rotate to the next graph where they will repeat the same process. Groups should look at the sticky notes already placed on the graph so there are not duplicate problems.
12. Continue this rotation pattern until each group returns to their original graph. The original group will then work together to solve the simple problems that were created based on their graph data.

Activity 3

1. Using the same groups as before give each group a copy of the reading passage *A Week at the Beach*.
2. Inform students that they are going to read the passage and determine the character, setting, and time of year. The students also have to identify what is the problem within the passage.
3. Give each group a fishbone organizer. The organizer can be found in the **Essential Files**. Using the organizer the group needs to record the problem in the passage and four possible solutions. Students can use technology to research additional information about the pollution problem as well as possible solutions.
4. Once the group has come up with their solutions they will be making a poster sharing the problem and their solutions.

Materials

- *What Lives in a Shell?* Written by Kathleen Weidner Zoehfeld
- Variety of shells (Link for purchase found in **Essential Links**)
- Sentence Strips
- Markers
- Shell template
- Graph paper
- Sticky notes
- Shell identification books/shell folding guides
- Technology
- Poster board
- *Week at the Beach*
- Fishbone Organizer

Suggested Companion Resources

- *A House for Hermit Crab* Written by Eric Carle
- *Pearlie Oyster A Tale of an Amazing Oyster* Written by Suzanne Tate
- *Clam I am All About the Beach* Written by Tish Rabe
- *Shells of the Southeast Atlantic Coast* folding guide
- New Way to Grow Oysters-NC Farm Bureau
<https://www.youtube.com/watch?v=Boqv4xU3sIk>
- National Geographic
<http://animals.nationalgeographic.com/animals/invertebrates/oyster/>

Essential Files

- [Shell Template](#)
- [Fishbone Organizer](#)
- [Reading passage; *Our Week at the Beach*](#)

Essential Links

- New Way to Grow Oysters-NC Farm Bureau
<https://www.youtube.com/watch?v=Boqv4xU3sIk>
- North Carolina Sea Grant
<http://ncseagrant.ncsu.edu/>
- NC DENR Department of Marine Fisheries
<http://portal.ncdenr.org/web/mf/oysters-scallops-and-clams>
- a-z Animals
<http://a-z-animals.com/animals/oyster/>
- South Carolina Oyster Restoration and Enhancement
<http://score.dnr.sc.gov/deep.php?subject=2&topic=15>
- Seashell World
<http://www.seashellworld.com/assorted-seashells.html>
- Shells of the Southeast Atlantic Coast
www.foldingguides.com

Ag Facts

- NC harvests clams, oysters, soft shell crabs, southern flounder, and black sea bass.
- Shellfish makes up 44% of saltwater aquaculture.
- Softshell crab make up 56% of saltwater aquaculture.
- There are three main types of aquaculture in NC. Cool and coldwater flow-through tank production, water limited recirculating tank production, and warmwater pond production.
- NC produces both freshwater and saltwater products.
- The majority of NC clams are harvested when they are two years old even though they can live until they are 35.
- Poor water quality and loss of habitat have led to the decline oyster harvesting.
- Bay scallops have been depleted to the point where the Division of Marine Fisheries have closed commercial and recreational bay scallop harvesting.

Extension Activities

- Using the book *Pearlie Oyster A Tale of an Amazing Oyster* Written by Suzanne Tate have students compare and contrast the information to *What Lives in a Shell?*
- Have students research the life cycle of an oyster, clam, and crab and compare to one another.
- Have students collect data from other classes about their favorite type of seafood and have them graph the data using a bar graph.
- Students will bring in recipes that feature shellfish. Using these recipes students will practice fractions.

Sources & Credits

- North Carolina Sea Grant
<http://ncseagrant.ncsu.edu/>
- Merriam-Webster
<http://www.merriam-webster.com/>
- North Carolina Department of Agriculture and Consumer Resources
<http://www.ncagr.gov/index.htm>
- Printable Paper
<http://www.printablepaper.net/>
- Division of Marine Fisheries
<http://portal.ncdenr.org/web/mf/oysters-scallops-and-clams>
- Worksheet Works
<http://www.worksheetworks.com/>
- Museum of Coastal Carolina
<http://museumplanetarium.org/>
- Purdue Scientific Literacy Project
<http://www.purduescientificliteracyproject.org/>