

Where in the World Does My Seafood Come From?

Subject: Oceanic Ecosystems and Sustainability

Grade Level: 5

Average Learning Time: 3 – 45 minute lessons

Lesson Summary: Students will use NOAA and other appropriate websites to research the ecosystems, food webs, and historical population levels of the fish found in their local grocery store and restaurants, and present their information in written and visual formats.

Overall Concept: Where do the fish in our grocery store and restaurants come from? Of which food webs are these fish members? Who makes sure these fish have stable ecosystems so we may continue to enjoy them for dinner and how is that accomplished?

Focus Questions:

What does this marine organism look like?

What are the distinguishing characteristics of this marine organism?

What is the common and scientific name for this marine organism?

What are the names of the oceans where this marine organism lives?

In what area of the ocean does this marine organism live? (Example: Continental Shelf, Continental Slope, etc.)

What are the names of all the organisms that are a part of this marine organism's food web?

Is this marine organism available in large numbers in the ocean?

Has there ever been a time when the population of this marine organism was declining?

If so, when and why?

What do NOAA and its fisheries departments do to insure the population of this marine organism remains stable?

Objectives:

Given pictures of 16 marine organisms studied and organisms found in their food webs, students will be able to match the marine life with the organisms in their food webs with 80% accuracy.

Given a list of marine organisms and a world map, students will be able to identify the location of the marine organisms' ecosystems with 80% accuracy.

Given the common name and picture of a studied marine organism, students will be able to identify how the fish is caught, if there is bycatch, and the sustainability status with 80% accuracy.

Background Information: Students will have prior knowledge about the parts of a fish in order to identify the distinguishing characteristics of the marine life studied in this lesson. Students will also need to know the location of the world's oceans, in order

to locate the marine life's ecosystems on a world map. Students will have learned the landforms of the ocean floor, in order to identify the area of the ocean floor where their fish lives. Students will need to have prior knowledge about ecosystems and food webs.

Materials:

Electric skillet
Cooking utensils
Recipe for seafood
Fish to cook
Research Resource Sheet
Color photographs of marine life
Art paper
Paint
Glue
Art supplies needed to create artistic likenesses of the marine life
Yarn, string or ribbon

Technical Requirements:

Computers
Internet

Teacher Preparation: The teacher will gather supplies and obtain color photographs of selected marine organisms. The teacher will provide a copy of the Research Resource Sheet for each small group of students and provide art materials needed for the students to create artistic renderings of each organism studied.

Keywords: aquaculture, biomass, bycatch, landings, sustainability

Anticipatory Set: Prepare a favorite seafood recipe in the classroom for the students to taste. Lead a discussion about marine ecosystems and why they are important to humans. Ask the students if they know what the fish they're eating looks like when it is alive in the ocean and from what part of the ocean and world their seafood comes. During the discussion, the teacher will record information shared by the students for a record of the students' prior knowledge. The teacher will tell the students that they are about to embark on an ocean adventure of discovery to see where their seafood comes from and discover what is involved with catching marine organisms for consumption.

Lesson Procedure:

The teacher will ask students to visit a local grocery store or restaurant and write down a list of the seafood that is available for sale for consumption.

Students will share their lists with the class.

From the lists brought in, the class will create a list of the marine organisms they will research.

The teacher will assign one marine organism to each small group (2-3) of students to research.

The teacher will introduce the following vocabulary through a discussion of sustainability of marine organisms that are popular seafood choices:

Aquaculture – the cultivation of fish for food.

Biomass – the amount or population levels of a particular fish in the ocean.

Bycatch – the other marine organisms, such as sea turtles or sea mammals, that are caught in the nets during commercial fishing.

Landings – the amount of catch or fish that is brought to land during commercial fishing.

Sustainability – regulating use of a resource so that the resource is not used up or damaged permanently.

The students will use the following websites to locate information about their marine organisms:

<http://www.nmfs.noaa.gov/pr/>

<http://www.nmfs.noaa.gov/fishwatch/>

The students will record their information on the Research Resource Sheet provided. The Research Resource Sheet will guide their research.

The students will study photographs of their marine organisms in the classroom and online in order to determine the distinguishing characteristics, and record this information on the Research Resource Sheet.

The students will work together to write an expository essay about their marine organism that includes information found during the research process. (See the Research Resource Sheet for information students should include in their essays.)

The students will create a life-size, visual representation of their marine organism out of selected materials that shows the distinguishing characteristics of their assigned organism.

The students will create a wall display that includes the visual representations and written information for each marine organism researched. Display the marine organisms on a large world map, placing each organism on the map where it is found. Students may also make visual representations of the other organisms included in their organism's food web and display these. Use string or yarn to connect each member of the food web.

Using the display, students will orally present the information they learned about their marine organisms; including geographic range, food webs, and a history of commercial fishing practices.

Assessment and Evaluation: A rubric will be used to evaluate the research, essays, and artistic representations of the assigned marine organism. A matching test will be given to assess student knowledge of the food web, the geographic location, and the sustainability status for each marine organism studied. This will be prepared by the teacher to reflect the marine organisms selected by his or her students.

National Science Education Standards

Content Standard A: Science As Inquiry

Understandings about scientific inquiry

Content Standard C: Life Science

Characteristics of organisms

Organisms and environments

Content Standard E: Science and Technology

Understanding about science and technology

Content Standard F: Science in Personal and Social Perspectives

Types of resources

Changes in environments

Science and technology in local challenges

Ocean Literacy Essential Principles and Fundamental Concepts

Essential Principal 5. The ocean supports a great diversity of life and ecosystems

Fundamental Concept a. Ocean life ranges in size from the smallest virus to the largest animal that has lived on Earth, the blue whale.

Fundamental Concept c. Some major groups are found exclusively in the ocean. The diversity of major groups of organisms is much greater in the ocean than on land.

Essential Principal 6. The ocean and humans are inextricably interconnected

Fundamental Concept b. From the ocean we get foods, medicines, and mineral and energy resources. In addition, it provides jobs, supports our nation's economy, serves as a highway for transportation of goods and people, and plays a role in national security.

Fundamental Concept e. Humans affect the ocean in a variety of ways. Laws, regulations and resource management affect what is taken out and put into the ocean.

Human development and activity leads to pollution (point source, non-point source, and noise pollution) and physical modifications (changes to beaches, shores and rivers). In addition, humans have removed most of the large vertebrates from the ocean.

Fundamental Concept g. Everyone is responsible for caring for the ocean. The ocean sustains life on Earth and humans must live in ways that sustain the ocean. Individual and collective actions are needed to effectively manage ocean resources for all.

State Standards

Science:

5-2: The student will demonstrate an understanding of relationships among biotic and abiotic factors within terrestrial and aquatic ecosystems. (Life Science)

5-2.5 Explain how limiting factors (including food, water, space, and shelter) affect populations in ecosystems.

5-3.6 Explain how human activity (including conservation efforts and pollution) has affected the land and the oceans of Earth.

Researching: Applying the Skills of Inquiry and Oral Communication

- 5-6.1 Clarify and refine a research topic.
- 5-6.2 Use print sources (for example, books, magazines, charts, graphs, diagrams, dictionaries, encyclopedias, atlases, thesauri, newspapers, and almanacs) and non-print sources to access information
- 5-6.3 Select information appropriate for the research topic.
- 5-6.4 Paraphrase research information accurately and meaningfully.
- 5-6.5 Create a list of sources that contains information (including author, title, and full publication details) necessary to properly credit and document the work of others.
- 5-6.6 Use the Internet as a source of information.
- 5-6.7 Use vocabulary (including Standard American English) that is appropriate for the particular audience or purpose.
- 5-6.8 Use appropriate organizational strategies to prepare written works and oral and visual presentations.

Select appropriate graphics, in print or electronic form, to support written works and oral and visual presentations.

Visual Arts:

- VA5-1.3 Use a variety of materials, **techniques**, and processes to create artworks.
- VA5-2.3 Select **elements and principles of design** to create artworks with a personal meaning.
- VA5-2.4 Discuss the ways that specific **elements and principles of design** are used to communicate meaning in his or her own works of visual art.
- VA5-6.1 Identify connections between the visual arts and content areas across the curriculum.

Additional Resources:

<http://www.nmfs.noaa.gov/pr/>
<http://www.nmfs.noaa.gov/fishwatch/>
<http://www.oceanlight.com/fish.htm>

<http://www.nefsc.noaa.gov/>
<http://www.nefsc.noaa.gov/faq/>

Author:

Barbara Gilbertsen Koch
Calhoun Academy of the Arts
1520 East Calhoun Street
Anderson, SC 29621
barbarakoch@anderson5.net

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Research Resource Sheet

Partner Names: _____

Common Name of Organism: _____

Scientific Name of Organism: _____

Geographic Range: _____

Habitat: _____

Life span: _____ Growth Rate: _____ Maximum Size: _____

Migrations: _____

Organisms in food web: _____

Predators: _____

Biomass (amount of this fish in the ocean): _____

Are the numbers of this fish in the ocean at **healthy levels** or **overfished**? _____

Has this fish ever been overfished? _____ If yes, when? _____

What was done to allow the population to recover? _____

How is this fish harvested or caught? _____

Is other marine life harmed or caught (bycatch) when this fish is caught? **Yes** or **No**

If yes, name the marine life that is caught. _____

Did you know?

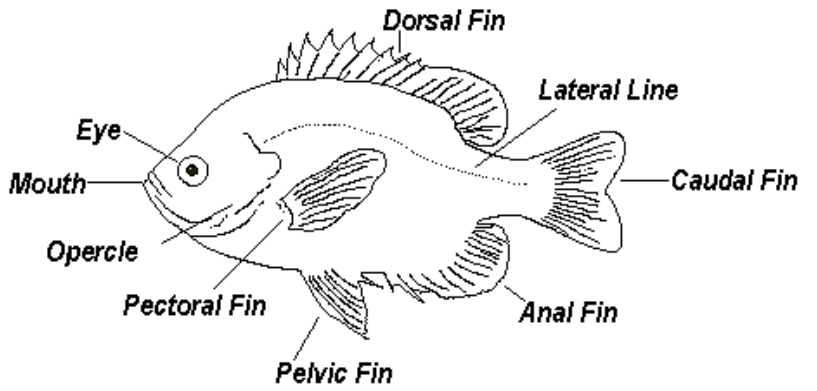
Please write down interesting information that you and your partners learned about this marine organism.

1. _____

2.

3.

Think about what your fish looks like and how you would make a likeness of it. Then, make a list of materials and art supplies that you would use to make an artistic picture of your fish. Be creative!



<http://www.extension.iastate.edu/fishiowa/fishid.html>

Make a detailed, colored, and labeled drawing of your fish below. You may include sketches of organisms in the food web.

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