

Lesson Plan

Cordell Bank: Blue Water Oasis

Explore the Cordell Bank National Marine Sanctuary via film and
creation of a travel brochure

FOCUS

Learn about a unique California habitat
and the diversity of marine life it supports

Create a travel brochure for the Cordell
Bank National Marine Sanctuary (NMS)

FOCUS QUESTIONS

What features about *Cordell Bank NMS*
are interesting to see? What conditions
exist that may make it challenging to see?

What types of organisms can be found
there?

What value does Cordell Bank have to
marine life in the ocean?

If visiting it, what precautions would a
visitor need to take to be safe and protect
the sanctuary?

What makes a good travel brochure?

LEARNING OBJECTIVE

Through creating a travel brochure for the
Cordell Bank NMS

Students will:

- Learn about the diversity of marine
life and how its protected at Cordell
Bank NMS in CA
- Learn what makes a good travel
brochure through examining
commercial brochures.

5-8 (Life Science/Earth Science)

MATERIALS

- ☐ One sheet of plain white 8 1/2 X14"
paper (or slightly larger) per student.
- ☐ Colored pens and pencils and
scissors/ old magazines
- ☐ Technology needed to view DVD
- ☐ Internet access or print material for
students to research Cordell Bank
NMS
- ☐ Sample travel brochures/magazines
that highlight areas to visit
- ☐ DVD: Cordell Bank: Blue Water
Oasis/or ability to view video online
at
cordellbank.noaa.gov/library/videogallery
(contact education coordinator to receive
DVD- cordellbank@noaa.gov)

TEACHING TIME

2-3 class periods

SEATING ARRANGEMENT

Various

MAXIMUM NUMBER OF STUDENT

NONE

KEY WORDS

National Marine Sanctuary
Cordell Bank
Ocean exploration

BACKGROUND INFORMATION



The National Marine Sanctuary System consists of 14 marine protected areas that comprise over 150,000 square miles of marine and Great Lakes waters. The system includes 13 national marine sanctuaries and the Papahānaumokuākea Marine National Monument. In 1989, the National Oceanic and Atmospheric Administration (NOAA) established Cordell Bank National Marine Sanctuary to protect and preserve its extraordinary marine ecosystem.

California has four national marine sanctuaries off of its coast: Cordell Bank, Gulf of the Farallones, Monterey Bay, and Channel Islands. Cordell Bank is the northern most of our state's national marine sanctuaries, located just northwest of San Francisco Bay and beginning 6 miles offshore from the Point Reyes Lighthouse. Once at the sanctuary, one notices the vastness of the Pacific Ocean with the nearby Farallon Islands as the only visible land rising from the sea. However, below the ocean surface of the sanctuary, divers can find a much different perspective. Hidden 115 feet beneath the ocean's surface are the towering peaks of a number of submerged island ridges and pinnacles elevating from the seafloor (continental shelf) 400 feet underwater.

These unique geological features perched on the continental shelf sits inside the California Current where upwelling of rich nutrients from the ocean floor, create a rich feeding ground that attracts a diversity of marine species living above and below the bank. The sanctuary is used by over 25 species of seabirds and has been referred to as the "albatross capital of the northern hemisphere." At

least twenty-six species of whales, dolphins, seals, and sea lions frequent the surrounding waters plus one uncommon resident, the leatherback turtle. Moreover, its waters support over 200 species of fish, sharks, and rays in addition to an abundance of invertebrates, algae, and phytoplankton.

Aside from the Native Americans and local mainlanders who knew this area as a bountiful fishing area, not much was known about this location. When California formally joined the United States in the mid-1800s, the U.S. Coast Survey undertook a series of mapping expeditions to help promote maritime commerce. George Davidson, a hydrographer was the first to discover Cordell Bank in 1853. Sixteen years later in 1869, these waters were named after Edward Cordell, a surveyor who came to conduct additional surveys at this same location. It wasn't until more than a century later that researchers from Cordell Expeditions began to record the many species of marine animals that inhabit this thriving ecosystem, a *blue water oasis*—The Cordell Bank National Marine Sanctuary.

PREPARATION

Gather and organize materials
Prep DVD/or web based video for projection

LEARNING PROCEDURE

Introduce students to the 15-minute film, "*Cordell Bank: Blue Water Oasis—Exploring Cordell Bank National Marine Sanctuary.*" After the video, go over Focus questions with class. Allow students time to conduct additional Internet research through the



Cordell Bank NMS official website to learn more about the following topics:

- About the Sanctuary
- Sanctuary History
- Science

Students will reflect on the unique aspects of Cordell Bank NMS and produce a creative, “imaginative”, and colorful travel brochure about the Cordell Bank NMS.

1. First, display a variety of travel brochures/magazines and provide time for students to look through various samples. Ask them to pay attention to layout, the highlighted features, illustrations, and the style of the included text.
2. Have students brainstorm what makes an effective travel brochure. Record their responses on the board or chart paper, which may include the pictures, supporting text, or the quotes from visitors.
3. Explain that while the pictures and photos are added bonuses on travel brochures, the text plays an important role in persuading people to visit a certain place.
4. To make this project more interesting, the brochure will focus on Cordell Bank NMS that they just learned about in the film and what would make it an attractive destination to visit, but encourage students to invent *imaginative* details such as tourist travels with submersibles. Keep in mind this is a protected area, so visitation should be safe for wildlife as well.
5. Students should figure out how the panels of their brochure will appear on the paper. There are two types of folds commonly used in brochures:

the z (or accordion) fold and the barrel (or roll) fold. As the name indicates, with a z-fold, the paper is folded in alternating directions, which is good if you want to present information sequentially. The barrel fold is much like you'd fold a letter before putting it in an envelope (the second fold wraps around the first one).

Students should create a draft, by taking a scrap piece of paper and folding it the way they want their brochure to appear, then label the panels on each side with things that must be included in brochure.

Things to Include in Travel Brochure

- Brief summary of the setting, with highlights of important places
- Location, including a map of Cordell Bank NMS
- Geography
- Well-known places nearby
- Landmarks
- Recreation and Outdoor Activities—parks, sports, water
- Entertainment
- Climate and overall weather conditions
- Transportation
- Arts and Culture, including museums, theaters, places to visit
- Food that the area is known for
- Pictures/Graphics
- Additional Information
- Safety considerations

THE “ME” CONNECTION

Have students write a letter to a local newspaper or the National Marine Sanctuary Foundation and write about what they learned about this mysterious and offshore Cordell Bank National Marine



Sanctuary and the actions they believe are needed to help protect it and other ocean habitats and sanctuaries.

Address for National Marine Sanctuary Foundation
8601 Georgia Avenue
Suite 501
Silver Spring, MD 20910

CONNECTIONS TO OTHER SUBJECTS

English/Language Arts; Social Studies;
Geography/ Art/Design

EVALUATION

Have students present their product to the class or other classrooms. Have students point out *reality vs. imagination*? This place is pretty tough to visit in reality, so emphasize imagination. Create rubric for grading of brochure assigning points for attention to the *Focus Questions* and *Things to include in travel brochure*, see *Rubric at end of lesson for example*.

EXTENSIONS AND ALTERNATIVE VIDEO GUIDE

ACTIVITIES

1. Have students create a 2-minute radio or television commercial, in the form of a skit or video, to accompany the travel brochure.
2. Have class research other National Marine Sanctuaries so that each location can be compared and contrasted.
3. Have students create posters about different National Marine Sanctuaries
4. Turn to your Neighbor-After viewing the program, have students “turn to their neighbor” and ask them to explain something about the video
5. Quick Write-In a journal or on a piece of paper, have students write

quickly for two minutes to record any thoughts or facts that come to mind after viewing the video.

6. Four Corners: Choose four main concepts or topics from the video (suggestions: What is Cordell Bank? Who explored it and how? What organism live on the Bank? What animals migrate to Cordell Bank?) and label each corner of the room with one of the concepts. Ask the students to choose a corner of the room that matches the concept they want to explore. Plan an activity for the students in each corner of the room and have them share their findings with the class.
7. Think-Pair-Share-After asking a follow up question to a video program, have students pair with a neighbor to discuss their responses. Invite students to share their responses with the whole group.
8. Brainstorm: Present a key vocabulary word or concept from the video such as *biodiversity*. Ask students to form small groups to generate related concepts, such as habitats, species, ecosystems, or human effects. Select one student in each group to record the ideas and present a summary of the responses to the entire class. Allow students to questions their classmates about their particular ideas. After each group has reported, summarize the ideas of the entire class and provide additional information as needed.



RESOURCES

For more on using media for educational purposes

<http://www.pbs.org/kqed/oceanadventures/educators/sciencemedia/>

<http://cordellbank.noaa.gov>- Cordell Bank National Marine Sanctuary

<http://marinelife.noaa.gov>- Marine Sanctuary Marine Life Encyclopedia and image library

<http://sanctuaries.noaa.gov/> -- the National Marine Sanctuary Program

<http://sanctuarysimon.org>- website highlighting Cordell Bank, Gulf of the Farallones and Monterey Bay National Marine Sanctuaries.

<http://sanctuaries.noaa.gov/education/> - National Marine Sanctuary Education Program website with sections specifically designed for students and for teachers.

CONTENT STANDARDS

National Content Standard

C. Life Science:

- Regulation and Behavior
- Populations and ecosystems
- Diversity and adaptations of organisms

F: Science in Personal and Social Perspectives

- Populations, Resources, and Environments
- Natural Hazards
- Risks and Benefits
- Science and Technology in Society

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

6. The oceans and humans are inextricably interconnected

FOR MORE INFORMATION

Education Coordinator

Cordell Bank National Marine Sanctuary

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Olema, CA 94950

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415 663 0314

ACKNOWLEDGEMENT

This lesson was developed for NOAA Cordell Bank National Marine Sanctuary by Gina Schilling, seventh grade science teacher, Novato, CA.

CREDIT

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RUBRIC

Make a travel brochure about Cordell Bank NMS

CATEGORY	4	3	2	1
Amount of information	All topics are addressed and all questions answered with at least 2 sentences about each.	All topics are addressed and most questions answered with at least 2 sentences about each.	All topics are addressed, and most questions answered with 1 sentence about each.	One or more topics were not addressed.
Quality of Information	Information clearly relates to the main topic. It includes several supporting details and/or examples.	Information clearly relates to the main topic. It provides 1-2 supporting details and/or examples.	Information clearly relates to the main topic. No details and/or examples are given.	Information has little or nothing to do with the main topic.
Internet Use	Successfully uses suggested internet links to find information and navigate within these sites easily without assistance.	Usually able to use suggested internet links to find information and navigates within these sites easily without assistance.	Occasionally able to use suggested internet links to find information and navigates within these sites easily without assistance.	Needs assistance or supervision to use suggested internet links and/or to navigate within these sites.
Illustrations	Illustrations are neat, accurate, and add to the reader's understanding of the topic.	Illustrations are accurate and add to the reader's understanding of the topic.	Illustrations are neat and accurate and sometimes add to the reader's understanding of the topic.	Illustrations are not accurate OR do not add to the reader's understanding of the topic.

