

Objective: The Cabrillo Marine Aquarium is devoted to promoting awareness and knowledge of the rich marine life of southern California through exhibits, programs, and research. The aquarium had the largest collection of Southern California marine life on exhibit in the world. 20,000 gallons of seawater circulate through the museum's 35 aquaria, outdoor touch tank and sea water laboratories. It also has a very large display depicting marine vertebrates (sharks, rays, fish, marine reptiles, birds, and marine mammal. In fact, the marine vertebrate display is one of the best at any museum on the western side of the United States. For this lab exercise, we will be concentrating on the marine vertebrates displayed both alive and dead throughout the aquarium/museum.

Introduction

The museum/aquarium is divided into the following areas.

1. Courtyard

Swimming above the courtyard are a killer whale, dolphins, hammerhead sharks and a leatherback turtle. Touch a whalebone, compare your size to a bull elephant seal, or young gray whale, or get eye to eye with a spy-hopping bray whale.

2. John M. Olguin Auditorium

Multimedia shows on marine life are shown daily.

3. Exhibit Hall

The Exhibit Hall is divided into three major environments:

(1) Rocky Shores

The rocky shore is a difficult place to live, with drying air at low tide and battering surf at high tide. There are tanks, which illustrate Camouflage, Egg Cases of Sharks, Territorial Fishes, the Morey Eel, and the wide range of ways animals feed and protect themselves.

(2) Sand and Mud

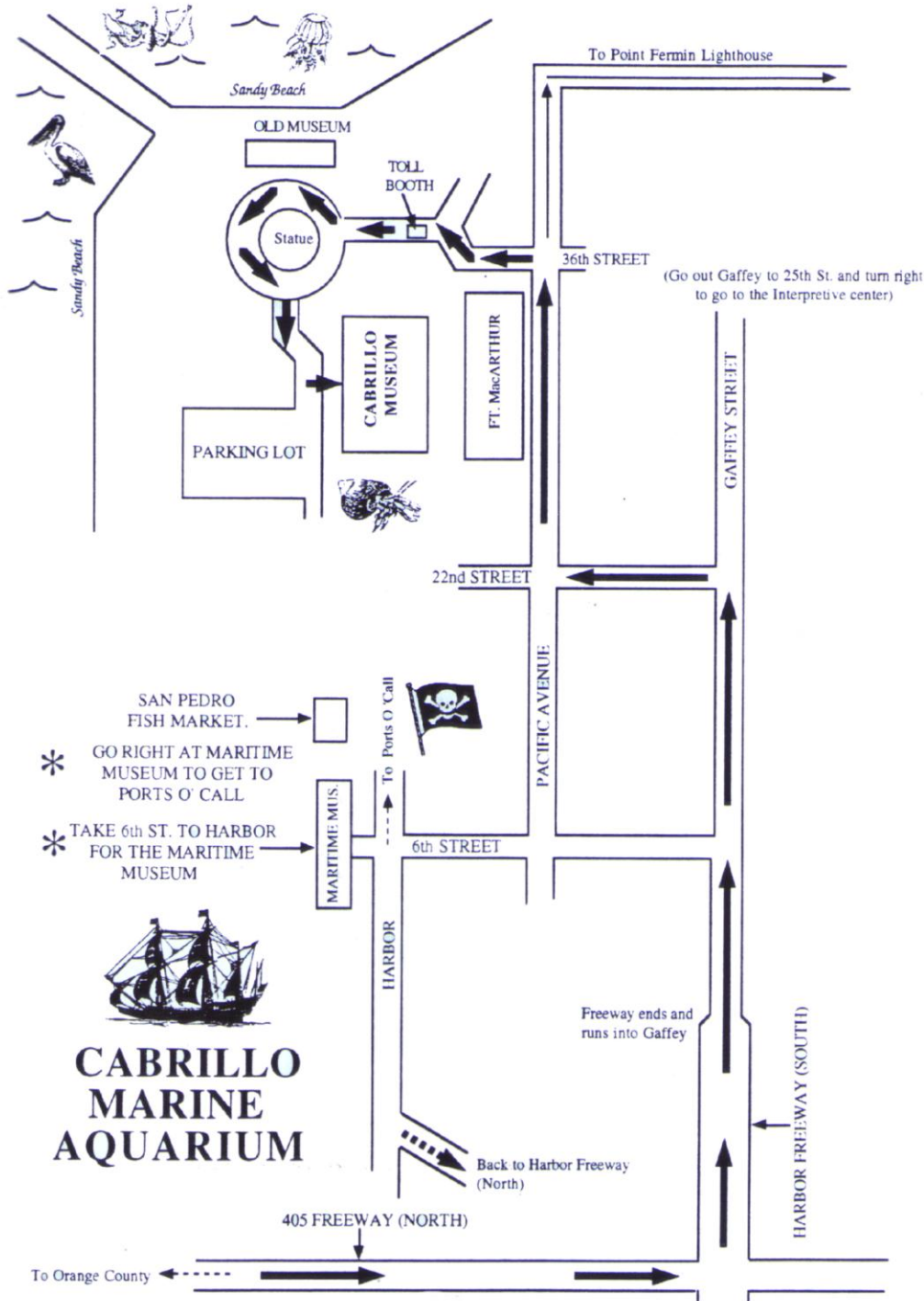
Sand and mud are constantly shifting habitats in which only a few animals have become specialized enough to survive.

(3) Open Ocean

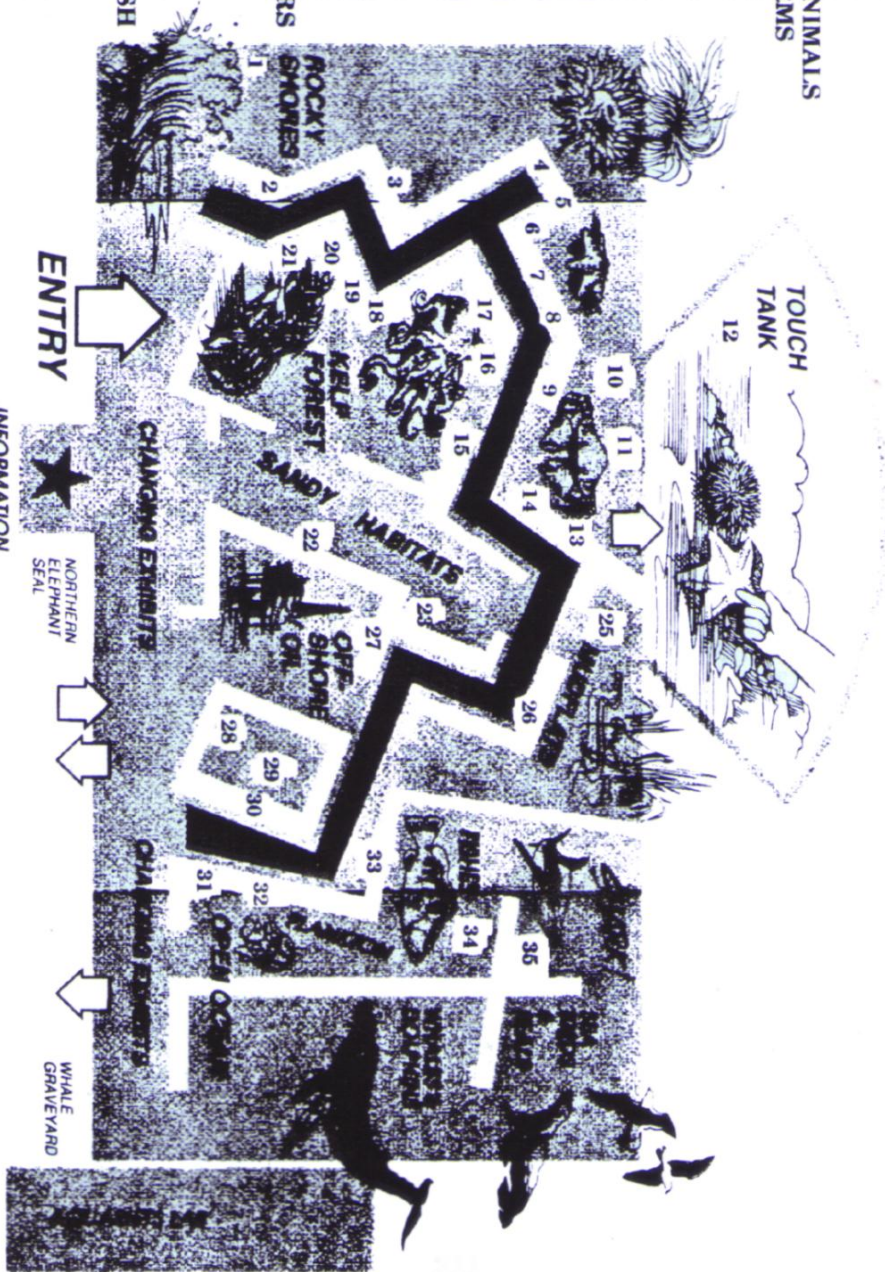
There are tanks, which explore the Fish Diversity, Schooling of Fishes, and Sharks. There are excellent displays of Seabirds, Seals and Sea Lions, and Whales and Dolphins.

INSTRUCTIONS

Using the map provided of the Cabrillo Marine Aquarium as a guide to exhibits, answer all the questions on the following lab sheets. Answers must be in your own words and not simply copied off the signs present throughout the Aquarium/Museum. In other words, to receive full credit for this assignment, you must carry out some critical thinking and use your intuition to come up with your own answers to the questions asked about marine vertebrates. The map below illustrates how to get to the Cabrillo Marine Aquarium.



- 1 LIVING IN THE SURF
- 2 HOUSEBUILDERS
- 3 GRAZERS AND BROWERS
- 4 PLANTLIKE ANIMALS
- 5 PREDATORS OF PLANTLIKE ANIMALS
- 6 NON PREDATORY ECHINODERMS
- 7 PREDATORY SEASTARS
- 8 PREDATORY SNAILS
- 9 SENSIBLE SOLUTIONS (DEMONSTRATION TANK)
- 10 INTERTIDAL ORGANISMS
- 12 TOUCH TANK
- 13 CRUSTACEANS
- 14 CRUSTACEANS
- 15 EGG CASES
- 16 TERRITORIAL FISH
- 17 OCTOPUS
- 18 MORAY EEL
- 19 CAMOUFLAGE
- 20 COLOR CHANGE
- 21 KELP FOREST
- 22 SANDY BEACH WAVE TANK
- 23 (DEMONSTRATION TANK)
- 25 A MUDDFLAT METROPOLIS
- 26 BURROWS AND TUBEDWELLERS
- 27 FISHING PIER
- 28 BIOLUMINESCENCE
- 29 BIOLUMINESCENCE
- 30 BIOLUMINESCENCE
- 31 DEEP WATER ANIMALS
- 32 PLANKTONKREISEL: JELLYFISH
- 33 FISH DIVERSITY
- 34 SCHOOLING FISH
- 35 SHARKS AND RAYS

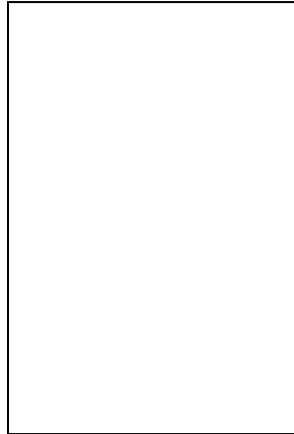


CABRILLO MARINE AQUARIUM

CABRILLO MARINE AQUARIUM WORKSHEET

SECTION #1 – Find the Shark Egg Case Exhibit in the Aquarium

- A. Make a drawing of each of the two egg cases in the tank (include the embryo, is possible. Be sure and label which shark produces which egg case.



Type of shark



Type of shark

SECTION #2 - Find the TERRITORIAL FISH Exhibit

- A. List the Common names of three territorial fish.

1. _____

2. _____

3. _____

- B. Discuss (below): What do fish achieve by being territorial?

SECTION #3 – Find the exhibit on CLEANERS

A. Explain how the Red Rock Shrimp (Lysmata california) cleans the Moray Eel.

B. Do Moray Eels eat these shrimp? _____

SECTION #4 – Find the exhibit on CAMOUFLAGE

A. List the common and scientific name of a specific species of fish that uses camouflage.

B. Explain below: How does this fish change colors and what colors are found in these fish?

C.. Find and List (below) five reasons why fish change color.

1. _____
2. _____
3. _____
4. _____
5. _____

SECTION #5 – Find the Exhibit focused on the Kelp forest

Locate the part of this exhibit dedicated to the Sea Otter

- A. Sea Otters have about _____ hairs per square inch of their body and they must eat _____ to _____ of their body weight daily.

SECTION #6 - SANDY BEACH (WAVE TANK) WITH FISH

- A. List the Common names of three kinds of Turbots displayed in the tank.

1. _____
2. _____
3. _____

SECTION #7 - A MUDFLAT METROPOLIS

- A. Why are mudflats considered the “cradle of life”?

- B. How do commercially valuable fish use mudflats?

SECTION #8, – BIOLUMINESCENCE

- A. Explain how bioluminescent light is a product.

- B. List the ways that bioluminescent light is used by marine vertebrates in the sea

1. _____
2. _____
3. _____
4. _____

SECTION #9 - DEEP WATER ANIMALS

- A. Observe the tank to see how marine vertebrates live in deep water. Describe below any unusual modifications that you observe in these marine vertebrates for this type of life.

SECTION #10 - FISH DIVERSITY

- A. Observe the tank to see the diversity in fish. Describe in detail below a specific examples of unusual modifications that you observe is a specific species of fish.

SECTIONS #11 SCHOOLING FISH

- A. List below the species of fish in this tank and observe the tank to see schooling in fish. Describe any unusual modifications that you observe in this type of fish for the type of life.

SECTION #12 -SHARKS AND RAYS

- A. How is the shark skeleton different from bony fish skeleton? (Be specific)

- B. How does electrical detection in sharks compare with electrical detection in other animals?

C. Explain below: How does the Pacific Electric Ray produce an electric shock?

SECTION #13: SEABIRDS AND SEALS

A. What are the common names of four Otariidae found in southern California.

1. _____
2. _____
3. _____
4. _____

B. Common names of two Phocidae found in southern California.

1. _____
2. _____

C. Name 7 methods of feeding in Seabirds.

- | | |
|----------|----------|
| 1. _____ | 2. _____ |
| 3. _____ | 4. _____ |
| 5. _____ | 6. _____ |
| 7. _____ | |

D. Interior body adaptations of Seabirds.

1. Find and describe at least two interior body adaptations within seabirds bodies.

a. _____

b. _____

E. Exterior body adaptations of Seabirds.

1. Find and describe at least two exterior body adaptations outside of seabirds bodies.

a. _____

b. _____

F. Reproductive Behavior and Nesting adaptations of seabirds. All birds must

reproduce and must build a nest. Find one specific example of the reproductive behavior of a specific species of bird, describe it below and describe the type of nest that this seabird creates.

SECTION #14 - WHALES AND DOLPHINS

A. What are the differences between baleen whales and toothed whales?

B. What is Baleen? _____

C. What are the Genus and Species names and common name of the whale with the longest known migration?

_____ / _____
Genus Species

Common Name _____

D. What is the length of their migration (round trip)?

E. How is the flipper of the whale similar to the human hand? _____

F. Echolocation in toothed whale (find the exhibit about echolocation). How do toothed whales generate and focus the sound they produce when they echolocate?

G. How good is the echolocation of a dolphin or a large toothed whale? How high and low can their frequencies be and how powerful can their sound be?

H. How are whales and dolphins (as well as sea otters, seals, sea lions, and manatees) put in danger, killed, contaminated, or injured today by humans?

SECTION #15 – SUMMARY AND CONCLUSION – In the space below write a short summary about what you learned about marine vertebrates during today's lab. Also, what was the most interesting marine vertebrate you encountered? (explain why)

