# **MAST ACADEMY OUTREACH**

# MARINE SKILLS PROGRAM Miami Seaquarium

# **On-site Package**



MAST Academy Maritime and Science Technology High School Miami-Dade County Public Schools Miami, Florida

### MAST ACADEMY OUTREACH

### MIAMI SEAQUARIUM ON-SITE PACKET

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### **PROGRAM AGENDA**

### WELCOME!!

You are about to begin your Seaquarium Adventure. The following is a list of activities that you might do at the Seaquarium. Your instructor will choose some of the study possibilities depending upon time and weather.

### **EXPLORATION POSSIBILITIES**

Welcome and overview of the day			
Fish Lips/Teeth Study at the REEF TANK			
Sharks, Bony Fish and Manatees at the MANATEE			
POOL and the SHARK TANK			
Lunch (Bag or snack bar)			
Orcas and Dolphins at the WHALE SHOW			
Amazing Mangroves and Wading Birds at DISCOVERY BAY			
Close the day. Talk about what you've learned with your instructor.			

T REEF AQUARIUM PRESENTATION: A diver descends into a recreation of a giant reef and hand feeds hundreds of fish and other marine creatures

2 TOP DECK DOLPHIN SHOW: Experience the as they perform breathtaking lease and rolls.

3 GOLDEN DOME SEA LION SHOW: Under the golden geodesic dome, TV and motion picture star "Salty" the sea lion frolics with a cast of hilarious seal and sea lion pols.

**4** "FUPPER" SHOW: The mass famous resident of the park performs with his friends in the lagoon which served as the set for more man 100 Flipper television episodes and a mation picture

**5 KILLER WHALE SHOW:** (*Presented by Kodat*) will amoze and delight audiences with a show that highlights the animal's grace and neural abilities.

6 SHARK PRESENTATION: Learn about these fierce predators of the sea during daily narrated feedings

Tas they bask in the South Florida sun.

Braces OF THE RAINFOREST: Come face to face with birds, rephiles and other fascinating animals that inhabit the rainforest

**Strengthades:** learn about the Florida Alligator and other native species of strikes and fish found in one of the world's most unique environments.

TO MANATEE PRESENTATION: Discover the beauty of the gentle sec cow and learn how you can help save this very endangered species

ILLOST ISLANDS MANGROVE COAST: Experience the narrad wonder of the South florida coast along a boardwalk through a lush mangrove forest with topical birds, lish and turtles

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12 BAY VIEW FIELD: Watch for concerts, picnics and other special events that are held here throughout the year.

T3 Test your skills by maneuvering remote control vehicles through obstacles.

TROPICAL FISH AQUARIUMS: Soli and fresh water aquariums with tropical fish from around the world line the wolls of the main building.

15 CORPORATE PARTY TENT: From company picnics to exclusive Black Tie evening functions, the Party Tent offers a beautiful view of the Miami skylin

### **Map of Shows and Exhibits**

### Fish Lips/Teeth Study at the REEF TANK

**Directions:** You are going to perform a simple scientific research project about FEEDING ADAPTATIONS. You will use the following information and drawing to help you make a HYPOTHESIS (an "educated guess")

THE POSITION OF THE LIP OPENING OF A FISH CAN GIVE A CLUE TO FISH FEEDING HABITS.



\* Lips opening in the TOP THIRD of the head could be a clue that the fish gets food from the surface. The fish is called a SURFACE FEEDER.

Lips opening in the CENTRAL THIRD of the head could be a clue that the fish is a MIDWATER FEEDER.

Lips opening in the BOTTOM THIRD of the head could be a clue that the fish gets food from the bottom - a BOTTOM FEEDER.

- 1. HYPOTHESIS: I think fish in the REEF TANK will have lips opening in the \_\_\_\_\_\_ third of the head most often.
- You will now make your observations and collect data. Look at ten (10) different fish in the REEF TANK. Check off the lip position of each fish you see. Do not count fish if you are not sure where the lips open. Total each lip position in the row at the bottom.

Fish #	Lips open in the TOP third of the head.	Lips open in the CENTRAL third of the head	Lips open in the BOTTOM third of the head.
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
TOTALS			

3. You will now graph your data. Use the Graph Axis below. Draw a BAR GRAPH to show the fish you counted. Label both axes.

NUMBER OF FISH

### LIP OPENING POSITION

4. Use the data collected to make your own conclusion statement.

CONCLUSION: My research shows that the fish in the REEF 1	FANK at Miami
Seaquarium have lip openings in the	_ third of the
head. Therefore, most fish in the REEF TANK are	feeders.

5. Use the pictures below and on the following pages to identify fish in the REEF TANK. When you see a fish, look very closely to see if it has <u>teeth</u>. Write TEETH or NO TEETH on the line next to every fish you are able to find.











### Sharks, Bony Fish and Manatees at the Manatee Pool and Shark Channel

Directions: Walk around the SHARK CHANNEL until you see a shark. Observe that shark. Look for the bony fish that also live in the channel. Observe the bony fish. You are going to compare the body parts of a shark, a bony fish, and a manatee. Answer the questions on sharks and bony fish. When that is done, we will go to the MANATEE POOL to finish the questions.

You can use the drawings below to help you with body part names.

SHARKS: Sharks are fish. They have gills and fins like all other fish. They are different from bony fish because they have skeletons made of CARTILAGE. They have a different number of gill openings than do bony fish. Below is a drawing of the shark's body parts.



BONY FISH: All fish have fins and gills. Bony fish have skeletons of bone. Below is a drawing of the parts of a bony fish.



MANATEE: A Manatee is a mammal. Manatees have lungs to breathe, and use flippers to move. Below is a drawing of the parts of a manatee.



1. As you look down upon the sharks and bony fish swimming in the channel, study the head shapes. When you go to the manatee pool, look at the head shape of the manatee.

In the space below, draw the <u>top view</u> of the head of <u>any</u> shark and <u>any</u> bony fish that you see in the shark channel. When you go to the manatee pool, draw the <u>top view</u> of the manatee head.

SHARK HEAD	BONY FISH	MANATEE HEAD
(Top View)	(Top View)	(Top View)

2. Look at the gill openings on the shark and bony fish. Circle the correct answer below. When you get to the manatee pool, look for gill openings on the manatees. Circle the correct answer.

SHARK GILL	BONY FISH	MANATEE
<u>OPENINGS</u>	<u>GILL OPENINGS</u>	<u>GILL OPENINGS</u>
012345	012345	0 1 2 3 4 5

3. As you look down on the sharks and bony fish, study the pectoral fins of <u>any</u> shark and <u>any</u> bony fish. When you go to the manatee pool, look at the shape of the manatee flippers.

In the space below, draw the pectoral fins of the shark and bony fish as you see them from the top. Draw the manatee flipper. (Wait for the manatee to roll over and draw the flippers from the bottom view.)

SHARK	BONY FISH	MANATEE
PECTORAL FINS	PECTORAL FINS	<u>FLIPPERS</u>

4. As you look down upon the sharks and bony fish swimming in the channel, study tail shapes. When you go to the manatee pool, look at the tail shape of the manatee.

SHARK TAIL (Caudal Fin)

BONY FISH TAIL MANATEE TAIL (Caudal Fin)

- 5. How is the tail movement of the manatee different from the tail movement of the shark and the bony fish?
- Why is it so hard to find gill openings on a manatee? 6.
- What do both the shark and bony fish eat? 7.

What does the manatee eat?\_\_\_\_\_ 8.

How is the manatee different from the shark and bony fish? 9.

### **Orcas and Dolphins at the Whale Show**

**Background:** Dolphins, porpoises, and orcas, or killer whales are all "toothed whales". All are marine predators. They are very smart and can be trained. The behaviors you see these animals do are also done in the wild.

The animals at Seaquarium have been trained to respond ON CUE. Different hand signals and whistle signals (called a bridge) tell the animals what to do. The animals get fish and attention as a reward for doing well.

**Directions:** Answer the following questions.

- 1. Tell two ways that the Orca and Dolphin are alike.
- 2. Use this drawing of an Orca to show the black and white color pattern of its body. How does this color pattern help the Orca in the wild?



- 3. Which animal performs a BREACH during the show?\_\_\_\_\_
- 4. What are two ways in which Orcas communicate?\_\_\_\_\_
- 5. Describe the shape and location of the Orca's BLOWHOLE.
- 6. Describe the shape and size of the Orca's teeth.
- 7. Name three things the Orca would eat in the wild.

### Amazing Mangroves and Wading Birds at Discovery Bay

- **Background**: The DISCOVERY BAY area of Miami Seaquarium is filled with living things to study. This hidden part of the Seaquarium needs to be explored <u>slowly</u>. Use all your senses. SLOW DOWN! Find all the hidden creatures. Buy some fish food and feed some animals.
- **Directions:** You will see many living things at DISCOVERY BAY. You will choose to study ONE kind of living thing. Observe the others, but concentrate on your special choice
- 1. Choose the type of living thing you are going to study at DISCOVERY BAY (Circle one).

### BIRDS FISH REPTILES PLANTS

2. Look for signs along the walkway at DISCOVERY BAY. Find the names of six (6) living things that belong to the group you chose in question one.

3. All living things have patterns (similar colors, body shapes, etc.). Draw the patterns you see on five (5) living things that belong to the group you chose in question one.

PATTERN 1	PATTERN 2		PATTERN 3
PATTERN	4		PATTERN 5

### ANSWER KEY

Fish Lips/Teeth Study at the Reef Tank

- 1. Answers will vary.
- 2. Answers will vary with data collected.
- 3. Graph will vary with data collected.
- 4. Answers will vary with data collected, though most fish in the tank are midwater feeders, and should have lip openings in the central third of the head.
- 5. All fish in the reef tank have teeth, thouth they may be small. Some fish have teeth on their tongue and palate.

Sharks, Bony Fish and Manatees at the Manatee Pool and Shark Channel

- 1. See diagrams on page 8.
- 2. Number of gill openings (on each side): shark-5, bony fish-1, manatee-0.
- 3. See diagrams on page 8.
- 4. See diagrams on page 8.
- 5. A manatee tail moves up and down, while the tail (caudal fin) of a shark or bony fish moves from side to side.
- 6. Manatees use lungs rather than gills to breathe.
- 7. The sharks and bony fish in the channel eat mostly other fish.
- 8. plant/vegetable matter.
- 9. Manatees are mammals, which have hairy, rather than scale-covered bodies, breathe with lungs rather than gills, and provide milk for their young.

Orcas and Dolphins at the Whale Show

- 1. Both dolphins and orcas breathe through a blowhole, and use fins to move through the water.
- 2. The dark above and white below color pattern makes the orca more difficult to be seen by prey.
- 3. The orca breaches (leaps out of the water and crashes back down on its side).
- 4. Orcas communicate by vocalizations or clicking (used in ecolocation); orcas also communicate with their bodies, slapping the water with their fins or tail, or by snapping shut their jaws.
- 5. The blowhole is located on top of the head.
- 6. Each side of the jaw of an orca has 10-14 large, pointed teeth.
- 7 Fish, squid, seals and other marine mammals.

Amazing Mangroves and Wading Birds at Discovery Bay

- 1. 2.
- Choices will vary. Answers will vary. Answers will vary
- 3.

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