LIFE IN THE SEA

4-H 360
4HMEL 40

LEADERS' GUIDE

Marine Research · Education · Advisory Services
A Sea Grant Program for Florida

Florida Cooperative Extension Service
Institute of Food and Agricultural Sciences
University of Florida, Gainesville

This leaders' guide contains the same questions which appear in 4-H 359, LIFE IN THE SEA - 4H MEMBERS' PROJECT RECORD and the answers to those questions.

This publication and the project record should be used in conjunction with 4H 358, LIFE IN THE SEA - A PROJECT GUIDE FOR 4H MEMBERS. The project guide contains seven activities which can be used while visiting an oceanarium such as Sea World in Orlando, Marineland of Florida south of St. Augustine, Seaquarium south of Miami, Ocean World in Ft. Lauderdale, or Gulfarium in Ft. Walton Beach.

DOLPHINS

Answers to Dolphin Questions

1. What is the difference between the mammal "dolphin" and the fish "dolphin?"
   The mammal "dolphin" is a warm blooded animal with hair (located on its head), lungs for breathing air and gives birth to living young. The fish "dolphin" is a cold blooded fish with scales, gills, etc.

2. What is the difference between a dolphin and a porpoise?
   Although the words "dolphin" and "porpoise" are used interchangeably when talking about the mammal, there is a difference scientifically. A dolphin has a prominent snout, such as the bottlenosed dolphin. A porpoise does not have a prominent snout. A porpoise's head is rounded off with the snout.

3. What is the blowhole used for?
   Breathing and making sounds.

4. Why is it an advantage to the dolphin in having its blowhole connected directly to its lungs?
   The young can breathe while feeding on the milk from its mother's mammary glands. The adults can feed on fish while breathing.

5. Do dolphins have vocal cords? How do dolphins make sounds? What kind of sounds do they make?
   No! As air escapes through the blowhole, the size of the blowhole changes, making sounds. Air also moves back and forth within sac-like sinuses producing squeeks, clicks and whistles.

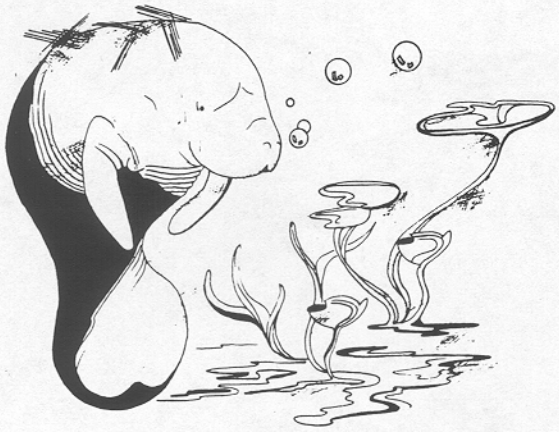
6. Why are dolphins considered to be mammals?
   They are warm blooded, have hair (on top of head), breathe air with lungs and give birth to living young.

7. Do dolphins chew their food? What do they eat?
   No! They hold the food with their teeth and swallow it whole. Fish, squid and octopus.

8. How long do dolphins live?
   Varies between species but for about 25 years.

9. How large do they get?
   Adults (depending on species) vary from 50 to 500 lbs. The adult of the Atlantic bottlenosed dolphin weighs between 330-450 lbs.

10. How intelligent are dolphins?
    There is no general agreement as to dolphin's intelligence. Some individuals seem to be smarter than others, as is true with dogs, cats and even humans. Dolphins are easy to train. Their so called intelligence is enhanced through their ability to carry on echolocation.



MANATEES

Answers to Manatee Questions

1. What is the difference, structurally (anatomically), between a manatee and a sea cow (dugong)?
   A manatee has a rounded tail and a deeply cleft upper lip. The dugong's tail is shaped like a dolphin's fluke and its upper lip is not deeply cleft.

2. What is the distribution of the manatee? The sea cow (dugong)?
   Manatees exist along the coast of the southeast U. S., The West Indies, northern part of South America, the Amazon River and west part of Africa. The sea cow (dugong) lives in the Indo Pacific.

3. Why do manatees go into rivers during the winter months?
   To get away from the cold water of the ocean.

4. Why are manatees considered to be mammals?
   They breathe air with lungs, have hair (on upper lips and scattered over the body), are warm blooded and give birth to living young.

5. How do manatees feed? What do they eat?
   They bring food toward their mouth with front flippers, upper lips tear food, whiskers help put food into the mouth and teeth (molars) in the back of the mouth grind up the food. They eat vegetation.

6. Are manatees dangerous to man? Why or why not?
   They are not dangerous to human beings. They have no way of hurting humans.

7. About how long do manatees live?
   25 years.

8. How large do they get?
   Around 14 feet long and 1500 lbs.

9. How are manatees protected?
   Florida law ($500 fine and 6 months prison term for molesting), Marine Mammal Protection Act of 1972 ($20,000 fine and one year prison term), and by the Endangered Species Act of 1973.

10. Do manatees have any other enemies than man? If so, what is it?
    There are not many other enemies than man. Sharks could possibly be an enemy in the ocean.

SEALS AND SEA LIONS

Answers to Seal and Sea Lion Questions

1. How has the absence of ear flaps helped the seal in its environment?
   Provides for a more streamlined body.

2. In what ways does the layer of blubber under the skin of a seal help it?
   Protects them against cold, serves as a source of energy, helps to buoy them up and acts as a padding.

3. Why have some seals and sea lions almost become extinct?
   They have been hunted by man for their meat, skin and fur. They have also been killed by fishermen who think they eat their commercial catches.

4. Why are seals and sea lions considered to be mammals?
   They breathe air with lungs, have hair, are warm blooded and give birth to living young.

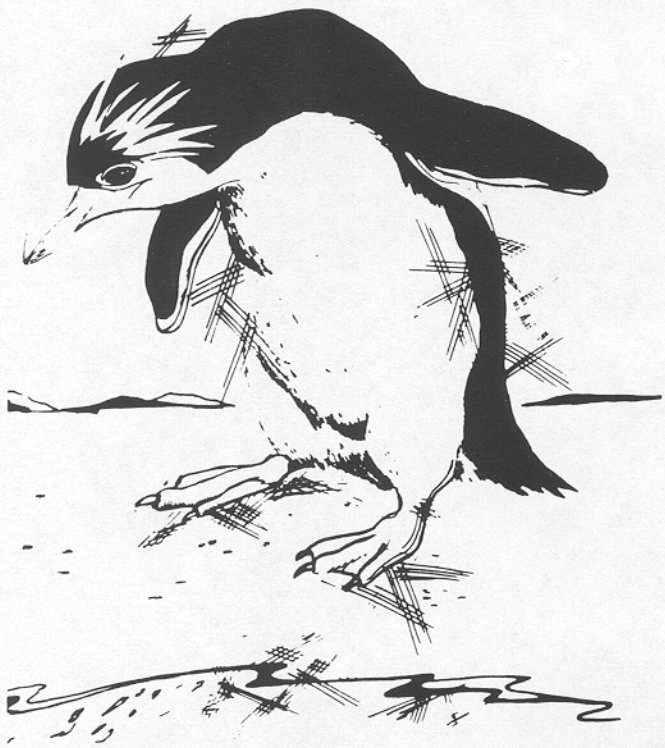
5. Sea Lions can rotate the hind flippers under their bodies, so they can "gallop" along on all four flippers. Seals "hump" along undulating their bodies like caterpillars and pushing with their front flippers. Which animal is better adapted to a marine environment and why?
   Seals! Seals are more streamlined and are able "to swim like a fish".

6. Sea lions toss and catch pebbles in their mouths. How might this be useful in catching food in the sea?
   It will help in giving them the ability to catch food head first. This is important because spines, scales, fins, etc. going down the wrong way can cause injury.

7. Seal and sea lion pups play mock battles, jousting chest-to-chest, weaving their necks and nipping and barking. How will this behavior be used as adults?
   This behavior will later be used in battling for mates. The stronger bull will get to mate with the cows providing for stronger offspring.

8. During the breeding season and when sunning on the rocks, seals and sea lions group together. What are some of the advantages of this social behavior?
   As a group they are able to see and hear enemies who might be trying to sneak up on them. Also as a group it would be easier in finding mates.

9. Seals and sea lions must return to land to rear their young. Why do you think this is necessary?
   The newborn does not have a sufficient layer of blubber to protect it against the cold water.



PENGUINS

Answers to Penguin Questions

1. Is the penguin more at home on land or in the water?
   In the water. The penguin is designed for swimming. Its wings have developed into swimming flippers, feet and tail are used in steering like a rudder and the body is streamlined so as to move easily in water.

2. Where are penguins naturally found on earth?
   They are found in the Southern Hemisphere, usually in cold areas.

3. What two penguins are restricted to the Antarctic?
   The Adelie penguin and the Emperor penguin.

4. Are any penguins found naturally as far north as the equator? Yes
   If so, which one (ones)? The Galapagos penguin.

5. How do penguins stay warm? Match the left column with the right by placing the correct letters in the spaces:

(1) d Tucking in neck & flippers	(a) keeps penguins warm by huddling or grouping together.
(2) g "Tripod" stance	(b) helps to keep the body temperature at 38 ° C.
(3) b Warm blooded	(c) is a method used by the jackass penguin to keep warm.
(4) f Overlapping feathers	(d) reduces the body's surface area and helps conserve heat.
(5) e Thick layer of fat	(e) is a stored food and water source as well as a layer of insulation.
(6) a A rookery	(f) acts like shingles and helps keep out the cold, freezing water.
(7) c Digging tunnels	(g) allows only a small part of the body to touch the cold ground.

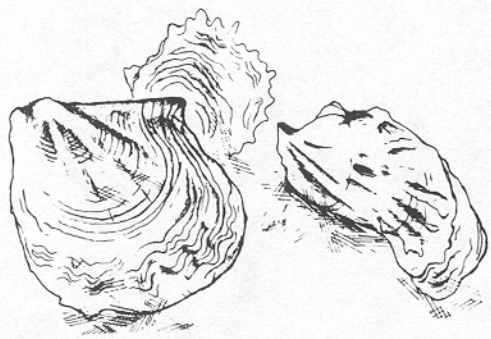
6. If penguins are chased by predators on land what method do they use for getting away fast?
   "Tobagganing" (sliding along on their belly and kicking with their feet).

7. How do penguins breathe when they are swimming?
   They take a breath of air as they come to the surface while "porpoising" and when they leap out of the water.

8. Why do some penguins make their nests out of rocks?
   In order to keep the eggs from rolling away.

9. What are three kinds of food that penguins like to eat?
   Shrimp (Krill)
   Small fish
   Squid

10. What are some natural enemies of penguins?
    Sharks
    Seals
    Killer whales
    Skuas, because they will eat the eggs and the baby chicks.



TREASURES FROM THE SEA - MOLLUSKS

Answers to Treasures From the Sea Questions

1. What is meant by the word "univalve"? "Bivalve"?
   "Univalve" is a single shelled mollusk such as a conch, whelk, abalone and cowry.
   'Bivalve" is a double shelled mollusk such as an oyster, mussel, scallop and turkey wing.

2. How are sea shells used commercially?
   Sea shells are used for ornamental purposes. Making "pearl handled" knives, necklaces, buttons, etc.
   They are used in making ashtrays, dishes, soup bowls and cups.
   The American Indian used the elephant tusk shell for "Wampum" (money).
   Sea shells are sold to tourists as decorative items and curios.

3. What is the difference between a natural and a cultured pearl?
   A natural pearl is formed in a mollusk without the aid of humans.
   A cultured pearl is formed due to the introduction of a foreign particle into the mollusk by humans.

4. What standards are used to value the pearl?
   Diameter (size), shape and coloration.

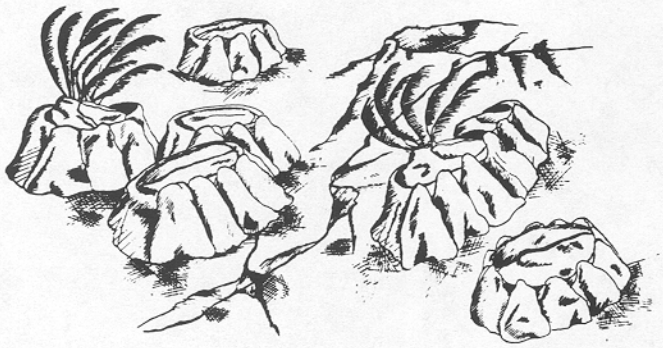
5. What forms the nucleus of the natural pearl? Cultured pearl?
   Eggs from marine worms or grains of sand may form the nucleus in natural pearls.
   Beads (2-7mm. in diameter) formed from freshwater mussels in the Mississippi River make excellent nuclei for forming cultured pearls in oysters.

6. What environmental changes are being brought on by man that are beginning to seriously affect the future of pearls and oyster farming?
   Pollution can destroy oyster beds. Also when an upset in the balance of nature occurs, predation may increase to destroy oyster farming pearls.

7. How does a pearl form inside an oyster?
   The thin, fleshy, mantle secretes calcium carbonate in layers around the foreign particle (sand, eggs, etc.). The layers build up forming a spherical mass of calcium carbonate and conchiolin. This spherical mass is called a pearl.

8. How are pearls used today in jewelry?
   As settings in rings, ear-rings, necklaces and bracelets.

9. Why are oysters cultivated "vertically"? What advantages does this method have over "bottom" cultivation?
   Vertical cultivation is used so that more oysters can be grown per given area.
   It keeps predation down. By growing oysters suspended over the bottom, predators such as starfish are unable to get to them.



CARIBBEAN/ATLANTIC COAST TIDE POOL

Answers to Tide Pool Questions

1. How is the Caribbean or Atlantic coast tide pool formed and why is it one of the harshest habitats on earth?
   Pockets formed by rocks capture water when the tide goes out, forming tidepools. It is harsh because the temperature and salinity change very abruptly over a short period of time.

2. Describe the action of the tube feet of the sea urchin and how they are used for locomotion. What is the sea urchin's primary method for defense?
   The sea urchin's tube feet are fleshy, extendable, little tubes which cover the surface of the urchin. The tube feet work on a hydraulic system utilizing sea water as the fluid. The tube feet stick way out past the spines and suck onto some type of hard substrata (rock, shell, etc.).
   The long, pointed, hollow spines are the sea urchin's main form of defense.

   Describe how a fish such as the triggerfish might catch and eat a sea urchin.
   A fish with a pointed snout and strong teeth, like a triggerfish, can hold onto the spines of the urchin, swim upward and drop the urchin upside-down. The fish can then attack and eat the softer under-side of the sea urchin.

3. California's Pacific Ocean beaches are cooled by the water flowing south from Alaska. Why do we find warm water (around 72 ° F) in the Atlantic coastal areas?
   Westerly moving surface water near the equator in the Atlantic Ocean is warmed by the sun's radiant energy. By the time the water reaches the Caribbean and Atlantic coastal areas it is quite warm. This warm water which moves toward the north along our coast is known as the Gulf Stream.

4. Where does the sea cucumber get its name and what is its primary method of defense?
   Sea cucumbers look similar to the vegetable, cucumber, hence their name.
   The sea cucumber can shrink up into a small ball when provoked. It can also expel its internal organs which usually deters most predators.
5. Discuss how the croaker fish got his name.
   The common name "croaker" comes from the noise that the fish can make. Special muscles attached to the fish's air bladder vibrate and the air bladder, acting as a resonance chamber, produces a croaking sound.
6. Where does the hermit crab make his home?
   The hermit crab makes its home in old shells of snails, conchs, whelks, etc. The hermit crab does not kill the animal inside the shell but finds a shell of a mollusk that has died. Sometimes two hermit crabs will fight for the same shell.

CORAL REEFS

Answers to Coral Reef Questions

1 Where do we find coral reefs and what environmental factors are necessary for their formation and survival?
   Coral reefs are most often found off the east coast of continents between latitudes 22 North and 22 South. The east coast of continents is where warm currents are found. Some species of coral can be found in colder waters but they don't form large reefs as do warm water corals. Corals require clear water which is warm. The temperature needs to be fairly constant and not lower than 68 ° F. They also like to grow where the bottom is hard and rocky.
2. The coral reef has often been called a "living apartment complex". What animal is responsible for the coral formation and explain how this building process takes place.
   The small, soft-bodied, polyp of the coral secretes calcium carbonate (limestone). The calcium carbonate builds up and forms the hard skeleton of the polyp colony.
3. Why is the coral reef considered to be one of the sea's greatest "nurseries"?
   Coral reefs provide protection and food for many different kinds of newborn animals which live in the ocean.
4. What factors threaten the future of the coral reef? How is man both helping the reef and damaging the reef?
   Dredging, filling, pollution, channelization, diving, boat anchors, coral collecting and lobster fishing all threaten the future of the coral reef.
   Man is helping the coral reef by providing off-limit underwater parks to spear-fishermen, coral collectors, etc. Man is also realizing the effect of dredging and is starting conservation programs to save reef areas.

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