

Concept 3

Marine Tetrapods: Reptiles, Birds, and Mammals

LEQ 1: What are the reptile representatives in the ocean?

- Reptiles are cold blooded animals that breathe with lungs, have scales, and lay fertilized eggs.
- Marine reptiles are found in warm tropical and temperate waters because they are cold blooded (cannot control their own body temperature and must rely on their surroundings to warm or cool them).

LEQ 1: What are the reptile representatives in the ocean?

- Giant saltwater crocodiles (Salties) generally live in brackish water, however they venture into the ocean and can live there for extended periods of time.
 - American crocodiles live in brackish water but do not venture into the ocean.

LEQ 1: What are the reptile representatives in the ocean?

- There are 7 species of Marine Turtles, all of which have been hunted to the point that they are endangered or threatened.
 1. Leatherback
 2. Green Turtle
 3. Loggerhead
 4. Hawksbill
 5. Kemp's Ridley
 6. Olive Ridley
 7. Flatback

LEQ 1: What are the reptile representatives in the ocean?

- There are 61 species of sea snakes.
 - They are related to cobras but have flattened tails adapted to swimming.
 - They can stay underwater for hours at a time.
 - They have adapted some of the most toxic venom of any snake.
 - Their fangs are at the backs of their mouths which makes it incredibly difficult for them to give a toxic bite to humans.

LEQ 1: What are the reptile representatives in the ocean?

- The only species of marine lizard is the marine iguana found in the Galapagos Islands.
 - They are herbivores, which is rare for lizards, feeding on algae.
 - They will dive into relatively cold water to find algae then return to the surface and lay on rocks to raise their body temperature.

LEQ 2: What are the major shore and pelagic birds in the ocean?

- Birds are vertebrates in the class Aves.
- All birds have the following characteristics:
 - Feathers
 - Forelimbs that are wings
 - Four chambered hearts
 - Lay internally fertilized eggs

LEQ 2: What are the major shore and pelagic birds in the ocean?

- Birds play many roles in marine ecosystems:
 - Predators that eat fish, crustaceans, and mollusks
 - They are prey to marine mammals and sharks
 - Supply guano (droppings) to the ocean which provide nutrients to the ecosystem

LEQ 2: What are the major shore and pelagic birds in the ocean?

- Marine birds show special adaptations that help make them better able to survive in and near the marine environment.
 - Webbed feet
 - Bills adapted to eat marine prey
 - Wings adapted for swimming and flying long distances over water.

LEQ 2: What are the major shore and pelagic birds in the ocean?

- Shore birds are commonly found along sandy or rocky shorelines, mudflats, and shallow waters.
- Shore birds are divided into 3 categories:
 1. Curlews
 2. Plovers
 3. Sandpipers

LEQ 2: What are the major shore and pelagic birds in the ocean?

- All shore birds share common characteristics:
 - Prefer wet habitats
 - Round heads
 - Bills designed to probe for food in sand, gravel, and water
 - Skinny legs designed to wade into the water without being knocked down by waves.

LEQ 2: What are the major shore and pelagic birds in the ocean?

- Pelagic birds spend the majority of their lives on open water, only returning to land to nest and breed.
- There are three main categories of pelagic birds.
 - Shearwaters
 - Albatrosses
 - Petrels

LEQ 2: What are the major shore and pelagic birds in the ocean?

- Pelagic birds have many common characteristics:
 - They are powerful fliers that can remain in the air for hours at a time gliding above the water.
 - This is why they have such large wingspans.
 - When they need to rest they float on top of the water.
 - This is why they have webbed feet.
 - Beaks designed to catch fish.

LEQ 3: What are the major marine mammal representatives in the ocean?

- All mammals share many characteristics:
 - Hair on their body at some point in life
 - Nourish young with milk made
 - Warm blooded
 - Give birth to live young
- Marine mammals face many challenges living underwater:
 - Need more oxygen
 - Need to hold breath longer
 - Increased water pressure
 - Need to move through water
 - Reduced sight and smell underwater

LEQ 3: What are the major marine mammal representatives in the ocean?

- Adapting to water challenges:
 - Need more oxygen than water can supply
 - Breathe air through nose or blowhole
 - Need to be able to hold breath for long periods of time
 - Protein in blood and muscles binds to oxygen to hold onto it longer.
 - Pulse rates slow as animals get deeper and blood diverts from non essential organs.

LEQ 3: What are the major marine mammal representatives in the ocean?

– Increasing water pressure

- Lungs and sinuses are flexible so that the pressure simply compresses them without pain.
- Lung tissue fills with blood to offset the pressure.

– Move through water

- Streamlined bodies
- Elastic skin that prevents turbulence around them

– Water reduces sight and smell

- Echolocation (natural sonar)
- Sensitive hearing
- Improved underwater eyesight, reduced above water eyesight

LEQ 3: What are the major marine mammal representatives in the ocean?

- There are 5 main groups of marine mammals:
 1. Pinnipeds
 2. Mustelids
 3. Sirenians
 4. Ursus
 5. Cetaceans

LEQ 3: What are the major marine mammal representatives in the ocean?

- Pinnipeds include seals, sea lions, and walruses.
 - Pinniped means flipper footed.
 - All pinnipeds live in the ocean but are able to come on land for long periods of time, using their flipper feet.
 - All pinnipeds are carnivores that eat fish.

LEQ 3: What are the major marine mammal representatives in the ocean?

- The two main differences between seals, seal lions, and walruses are ears and hind flippers.
 - Seals have no external ear flaps and cannot walk on their hind flippers.
 - They move on land by flopping around on their bellies.
 - Seal Lions have external ear flaps and can walk on their hind flippers.
 - Walrus have no external ear flaps and can walk on their hind flippers.

LEQ 3: What are the major marine mammal representatives in the ocean?

- Mustelids are sea otters which are part of the weasel family.
 - Sea otters are the smallest marine mammals.
 - Sea otters use fur instead of blubber (fat) to keep them warm.
 - Sea otters sleep in the water and dive to the sea floor to get crustaceans and echinoderms off the bottom.
 - They will use rocks to crack open the shells on their food, making them the only marine mammal to use tools.

LEQ 3: What are the major marine mammal representatives in the ocean?

- Sirenians include Manatees and Dugongs.
- Sirenians are the only herbivores of the marine mammals.
 - Manatees migrate between fresh and salt water. Manatees have round mouths and tails.
 - Dugongs live only in salt water. Dugongs have pointy mouths and tails.
 - Their only real predator is man. They were once hunted almost to extinction now they face threats from boat propellers.
 - Their closest land relative is the hyrax.

LEQ 3: What are the major marine mammal representatives in the ocean?

- Ursus are polar bears.
 - The polar bear is the largest land carnivore and the largest bear.
 - The polar bears are born on land but spend most of their life at sea, eating seals.
 - Polar bears have webbed feet to help them swim and thick fur over a layer of fat to keep them warm.
 - Polar bears have white fur to blend into their surroundings but black skin to absorb as much heat from the sun as possible.

LEQ 3: What are the major marine mammal representatives in the ocean?

- Cetaceans include whales, dolphins, and porpoises.
 - Cetaceans have fish like bodies and breathe air through a blow hole on the top of their heads.
 - They have large muscular tails that move up and down to propel them through the water.
 - They have thick layers of blubber (fat) to provide insulation from the cold water.
 - Cetaceans use echolocation to communicate and hunt.

LEQ 3: What are the major marine mammal representatives in the ocean?

- Cetaceans are divided into two groups:
 - Baleen whales that use a brush like fringe in their mouth to filter krill, zooplankton, and small fish from the water.
 - Toothed whales that have teeth and hunt for food as active predators
 - These include dolphins, and porpoises as well.
 - Dolphins include orcas (killer whales).
 - The narwhal has one long tooth coming out of the front of its head like a horn.

LEQ 3: What are the major marine mammal representatives in the ocean?

- Dolphins and porpoises are very similar to each other, however there are four main differences:
 - Porpoises have shorter beaks and more square shaped heads than dolphins.
 - Dolphins have cone shaped teeth and porpoises have spade shaped teeth.
 - Dolphins have curved dorsal fins and porpoises have triangular dorsal fins.
 - Dolphins are more talkative than porpoises.