An ESP Course to the Students of Marine Sciences

Unit 4: Ocean Wildlife and Pollution

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Key Vocabulary

global warming

deposit

algae

bacteria

phytoplankton

dig

reptile

amphibian

cell

mammals

vertebrates

coral reefs

ecosystems

overfishing

fertilizer

sewage

threaten

Brainstorming: Life underwater

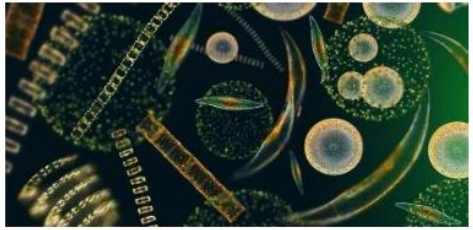
Do you have an idea about the diverse species live underwater? Have you heard of the term 'endanger'? Work in groups to make a list of underwater species you know and try to guess which ones are endangered.

4.1. Deep Ocean Wildlife

The oceans are home to almost every type of living thing, from tiny **single-celled algae** and **bacteria** to sea snails, octopuses, crabs, reptiles, birds, and **mammals**, as well as thousands of **species** of fish.

4.2. Zones of Life

Life in the oceans is very different at different **depths**. In the **sunlit zone**, there are plenty of **seaweeds** and **phytoplankton** (microscopic sea plant). They provide food for animals, which in turn are eaten by other animals. The sunlit zone contains many different kinds of fish, **whales** and **dolphins**, **jellyfish**, and **shellfish**.



In the **twilight zone**, it is too dark for plants to grow. Some animals swim up closer to the surface at night to **feed** on **plankton** or plants. The rest are **hunters**. Twilight zone animals include various kinds of **squid**, **shrimp**, whales, and fish, including several types of **fierce** shark.

4.b. Classify the following animals according to the zone of living:

squid whale dolphin shrimp jellyfish shark shellfish

Sunlit Zone	Twilight Zone

4.3. Fish

Fish have been on the Earth for over 500 million years – long before even the dinosaurs roamed the planet. There are over 25,000 species – more than all the species of **amphibians**, reptiles, birds and mammals combined.

Here are some facts about fish:

1. All fish are **vertebrates** (have a backbone) and most breathe through **gills** and have **fins** and **scales**.
2. Fish are cold-blooded, which means their internal body temperature changes as the surrounding temperature changes.
3. Fish have a specialized sense **organ** called the **lateral line** which works much like radar and helps them **navigate** in dark or murky water.
4. The largest fish is the great whale shark which can reach fifteen meter in length. The smallest fish is the Philippine goby that is less than 1/3 of an inch when fully grown.

The biggest ocean animal

The blue whale can grow up to 30m long and weight up to 136,400 kg, is the biggest ocean animal.

The Philippine goby fish

4. c. Group Work: Complete the following with the correct choice:

1. Fish species are _____ than all the other marine species. (diverser, the diversest, more diverse, most diverse)
2. Twilight Zone is _____ the Sunlit Zone. (deeper than, the deepest, more deep than, the most deep)
3. The great whale is _____ animal in oceans. (larger than, largest than, the larger, the largest)
4. The Philippine goby is _____ of all other fishes. (smaller than, smallest than, the smaller, the smallest)
5. Ocean water in the poles is_____ than the water of the equator. (the denser, denser, more dense)

4.4. Coral reef

Coral reefs are some of the most **diverse ecosystems** in the world, **housing** tens of thousands of marine species. About one-third of all marine fish species lives part of their lives on coral reefs.

Coral reefs are found all around the world in **tropical** and **subtropical** oceans. They are usually found in shallow areas at a depth of less than 50 m. However, some coral reefs extend even deeper, up to about 137.16 m deep.

A Reef Complex in Iraqi Waters Discovered for the First Time

(*Scientific Reports* by Thomas Pohl *et. al.*)
www.nature.com)

Joint **expeditions** performed by scientific **scuba** divers from Marine Science Centre (MSC) Basrah (Iraq) and Scientific Diving Centre (SDC) Freiberg (Germany) carried out in September 2012 and in May 2013, revealed the existence of a true live coral reef in Iraqi coastal waters for the first time ever.

These reefs are settled on **sandy** ground in **relatively transparent** water. The newly discovered reef at the mouth of the Shatt al-Arab is located at greater depths in a zone of **low visibility**, and rapidly changing conditions (temperature and salinity) due to strong currents.

4. d. Work with your group members to choose the suitable word:

1. The _____ of ocean species is immense. (diverse, diverses, diversity)
2. Scuba _____ from MSC Basrah and SDC Freiberg discovered the coral reef in Iraq. (dive, dives, divers)
3. They proved the _____ of coral reef in Basra coastal waters. (exist, exists, existence)
4. If the water is transparent, ocean animals will be _____. (visible, visibles, visibility)
5. Divers_____ the coral reefs in Iraq. (discover, discovered, discovery)

4.5. Ocean destruction

Many different environmental problems are damaging the seas and oceans. To start with, they are being polluted by substances such as farm **fertilizers**, chemicals used in factories, and **sewage** from towns and cities. These run into rivers and flow into the oceans. Chemicals such as mercury can poison marine life, such as corals, or build up in animals' bodies and poison the animals that eat them. **Litter** is another type of pollution. Plastic garbage from ships collects in the oceans, where it is eaten by some animals, such as **albatrosses**. It can choke them or block their stomachs.

4. e. Group Work: Change the following active sentences into passive:

1. Many environmental problems are damaging the seas and oceans.
2. Farm fertilizers and chemicals pollute the ocean
3. Mercury can poison marine life.
4. Albatrosses may eat plastic garbage.
5. Phytoplankton provide food for animals.

5.6. Overfishing

Overfishing means catching so many fish that some species can become **endangered**. In the past, overfishing mainly affected shallow-water species. But modern sonar and trawling technology allowed fishing boats to find and catch **shoals** of deep ocean fish, such as the orange roughy fish which lives at depths of about 1,400 m.

Some Endangered Animals

Leatherback Turtles

Southern Sea Otters

scalloped Hammerhead Shark

4.7. Damaging the ocean floor

In addition to catching too many fish, trawling equipment, which works by **dragging** nets along the ocean floor, can damage it and tear up coral reefs. Reefs are not just found in warm, shallow seas- there are also cold-water coral reefs on the deep ocean floor.

4.8. Warmer oceans

The oceans are also **threatened** by environmental changes, such as **global warming**. Warmer water temperatures can kill some types of coral, for example, and make hurricanes more common and more severe.

4.9. The trouble with tourism

Tourism means visiting a place for **leisure** or enjoyment. Many tourists are drawn to wild, "untouched" areas, especially near the seas and oceans, where they can **escape** from city life. The trouble is, tourists need hotels, restaurants, and transportation, and these create pollution, which can affect ocean habitats and wildlife.

4.10. Commercial exploration

Oil and mineral companies **dig** under the ocean floor to look for useful mineral **deposits**. If they find deposits, they set up **rigs** and **mining operations** to extract them. In some cases this can damage the deep ocean floor and its **ecosystems** by breaking up reefs, disturbing wildlife, and **releasing** dangerous **substances** into the water.

4. f. Group Work: Classify the following words into the below categories:

global warming, net, leisure facilities, oil spill, trawling equipment, fish catch, transpiration, oil drilling

Overfishing	environmental changes	tourism problem	commercial explorations

4. g. Pair Work: Complete the following sentences:

1. Tourism helps people to _____ from city life. (escape, escapes, escaping)
2. Nets are _____ to ocean species. (danger, dangerous, endangered)
3. Nets are _____ by trawling equipment. (drag, drags, dragged)
4. Corals _____ by warmer temperature. (can kill, can be kill, can be killed)
5. Some ocean species become _____ because of pollution. (danger, dangered, endangered)

4. h. Group Work: Complete the following sentences from the words in brackets.

(global warming, mining operations, tourism, trawling equipment, pollution, coral reefs)

1. _____ can damage the ocean floor.
2. There are _____ in both warm and cold seas water.
3. Environmental changes like _____ can kill some types of coral.
4. Visiting a place for recreation is called _____.
5. Hotels, restaurant, and transportation cause _____.
6. _____ can disturb wildlife and release dangerous substances into the water.

Vocabulary focus	
tiny : very small	joint : cooperative
plenty : many	expedition : mission
perform : conduct	relatively : almost
transparent : visible	garbage : waste
transparent X invisible	diverse : different
allow : permit	leisure : recreation

▶ Structure Spot: Comparative and Superlative

Adjectives and adverbs can show degrees of quality or amount with the endings –er and –est or with the words more and most or less and least.

The Form of Comparatives and Superlatives		
Comparative	(short adjective + ***-er***) ***more***(long adjective)	***than***
Superlative	(short adjective + -est) ***the*** (most + long adjective)	***in, of, that, ..***

Presentation: Marine Pollution

Work in groups to prepare for a presentation about Marine Pollution. Give a brief introduction to the presentation, then ask your colleagues to present their parts. You may include videos in your presentations.

WRITING BOX

Write a short paragraph about pollution.
Try to find out the reasons of pollution, then try to find the best solution for this stage.

Glossary

algae /ˈæl.giː/ very simple, usually small plants that grow in or nearwater and do not have ordinary leaves or roots

amphibian/æmˈfɪb.i.ən/ an animal, such as a frog, that lives both on land and in water but must produce its eggs in water

bacteria /bækˈtɪə.ri.ə/ a type of very small organism that lives in air,earth, water, plants, and animals, often one thatcauses disease

cell /sel/ the smallest basic unit of a plant or animal

coral /ˈkɒr.əl/ a substance like rock, formed in the sea bygroups of particular types of small animal, often used in jewellery

coral reef/ˌkɒr.əl ˈriːf/ an area of coral, the top of which can sometimes beseen just above the sea

deposit /dɪˈpɒz.ɪt/ a layer that has formedunder the ground, especially over a long period

dig /dɪg/ to break up and move soil using a tool, amachine, or your hands

ecosystem/ˈiː.kəʊˌsɪs.təm/ all the living things in an area and the way they affecteach other and the environment

endangered/ɪnˈdeɪn.dʒəd/ animals or plants that may soon not existbecause there are very few now alive

fertilizer /ˈfɜː.tɪ.laɪ.zər/ a natural or chemical substance that is spread on theland or given to plants, to make plants grow well

global warming/ˌgləʊ.bəl ˈwɔː.mɪŋ/ a gradual increase in world temperatures causedby gases such as carbon dioxide that are collecting in the air around the earth and stopping heat escapinginto space