

Let's Protect Our Seas and Coast

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Age 13-16

Learning Objectives

- Explain the importance of rich coastal biodiversity and its role in sustainable coastal management.
- Investigate and identify threats to biodiversity in coastal zones.
- Understand the impacts climate change and human activity have on the coastal, littoral, and marine zones.
- List protected areas and species in the coastal zone.

Introduction This lesson plan aims to raise awareness among students about sustainable coastal management. Topics include: threats to local coastal areas, related human impacts on climate change, and how coastal areas are being protected (in Turkey or your own country). Link knowledge about species living in these ecosystems with actions to protect them.

Structure

- Classroom Session 1 (40 minutes)
 - Introduction
 - Discuss and complete a concept map
- Classroom Session 2 (60 minutes)
 - Create a table of coastal zones
- Classroom Session 3 (60 minutes)
 - Read the article
 - Create posters of the protected areas of Turkey

Keywords

Sustainable coastal management, climate change, coastal biodiversity, coastal zones

Before the Lesson

- Get familiarized with the closest coastal areas: importance, strengths, and threats.
- Obtain and adapt all necessary resources: photos, worksheets, etc.

Required Resources Computers, smartphones, printer, smart board, Canva, YouTube videos; worksheets: concept map, coastal zones table, posters of protected areas of Turkey, evaluation sheets (self-assessment and "Who Am I").

Assessment

- Use the self-assessment form (Appendix 7) and "Who am I?" (Appendix 6) to assess student's knowledge of coastal species.
- Evaluate students' thoughtful completion of the Concept Map (Appendix 1.1-1.2) to assess their engagement with the subject and concepts.
- Use a formative assessment of students' active participation and reflection in group work during the lessons.

Dissemination

Display coastal species posters made by students in the hallway or common area in the school for others to see. Additionally, share the posters with others on a common platform (school website, social media, etc.).

Differentiation

Adapt this lesson plan to your own local and school contexts.

Use group work to emphasize each individual student's strengths, facilitate collaborative learning, and allow peer mentoring when possible for students who may be struggling.

Extension

Take a field trip to a local coastal area and do a trash clean up with students.

Visit a local aquarium and arrange for a professional to discuss endangered species with students.



1 Activity

Introduction Introduce the topic by showing some photos of coastal zones on the smart board. Use these photos to initiate discussion about prior knowledge of coastal zones, human impacts on them, and the ecosystems they contain.



Development

Use the coastal zones concept maps (Appendix 1.1-1.2) to guide the discussion about what students already know about the importance of these areas.

Explain and complete the concept map worksheet (Appendix 1.1).

Conclusion

Have students put themselves into pairs. Offer the guiding questions below to stimulate discussion about the results of their concept map worksheet:

- Why are coastal areas important?
- What are the values of coastal areas?
- What are the threats?

2 Activity

Introduction Show the video: "Coastal Wetlands Are a Critical Ecosystem for a Healthy Climate":



Development

Divide students into groups of 5 and ask them to reflect on the video using the following questions:

- What threatens biodiversity in coastal zones?
- What are the impacts of human activity in the littoral and marine zones?
- What are the impacts of climate change on coastal zones?
- What are the types of coastal habitats?
- Why is rich coastal biodiversity so important?

Ask students to fill in the coastal zones table (Appendix 3) according to the conclusions they drew in the discussion.

Conclusion

- Invite groups to share their tables with the rest of the class.
- Combine and display tables created by the groups into a common table on the smart board.
- Display the infographic that was created on Canva (Appendix 4.1-4.3).
- Summarize the topic and allow students time to complete any missing elements.

3 Activity

Introduction This activity is held in the school's computer classroom. An article about species in coastal areas (Turkish) is distributed to the students:

<https://merakliminik.tubitak.gov.tr>



In Turkish



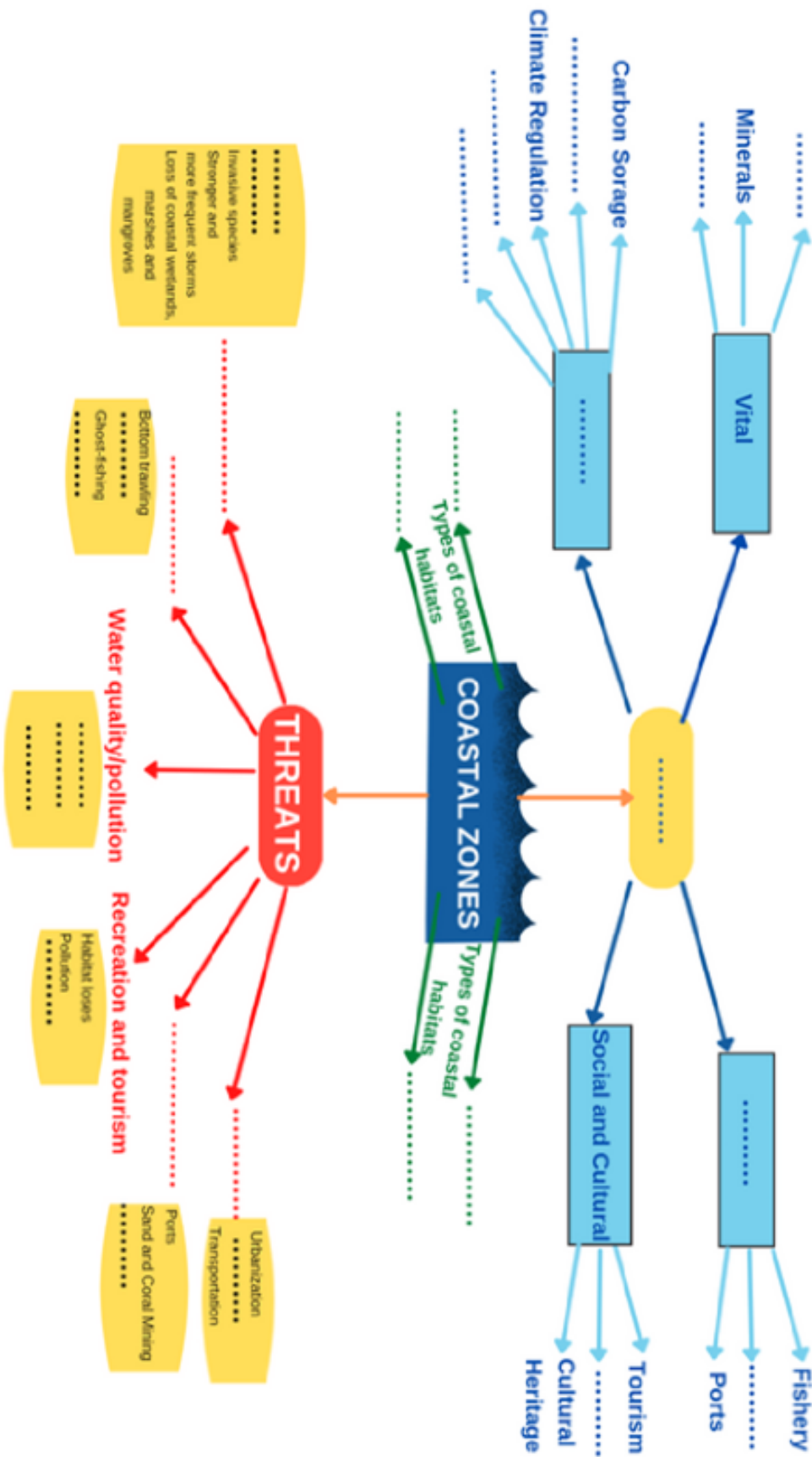
In English

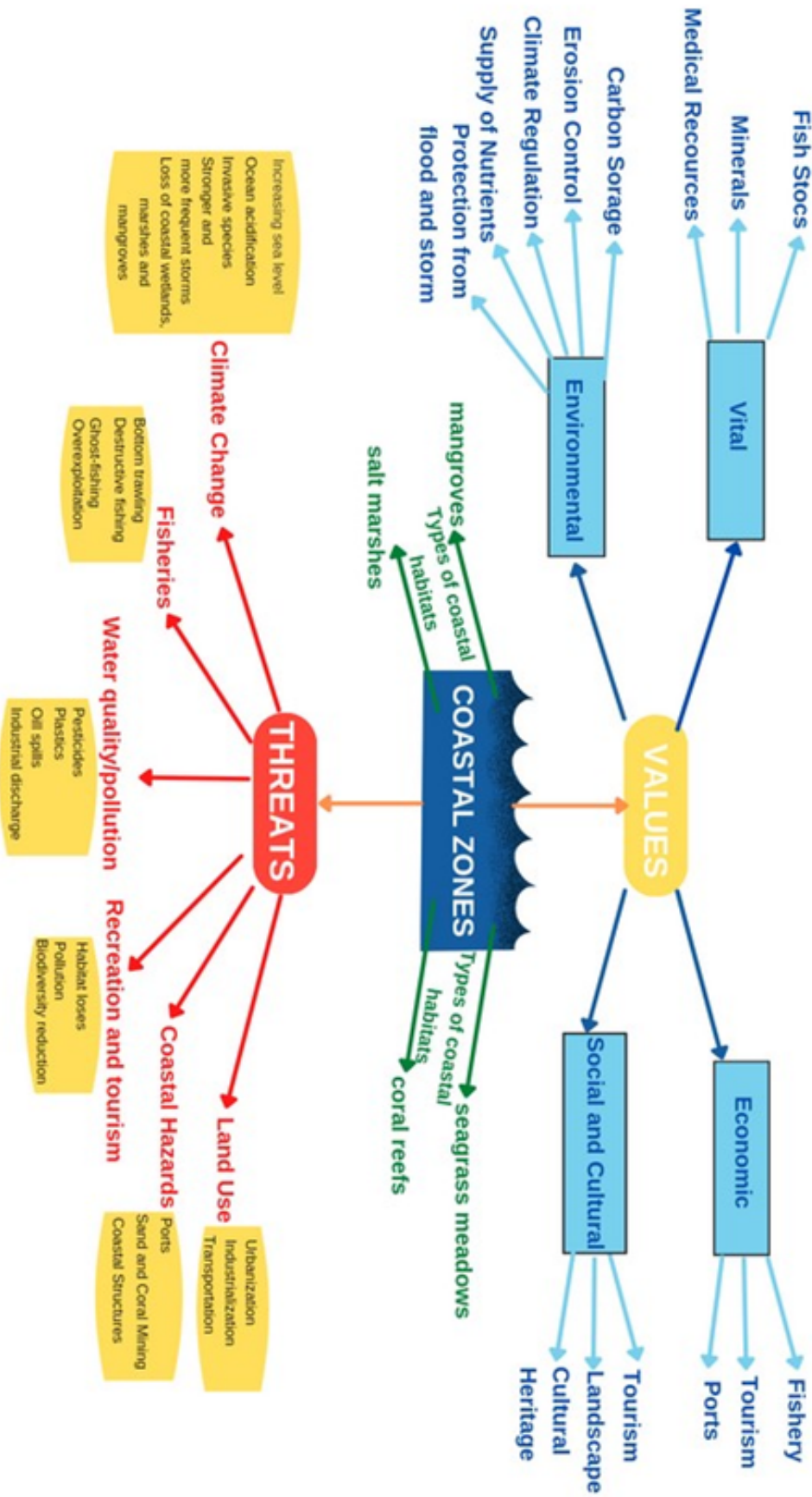
Development

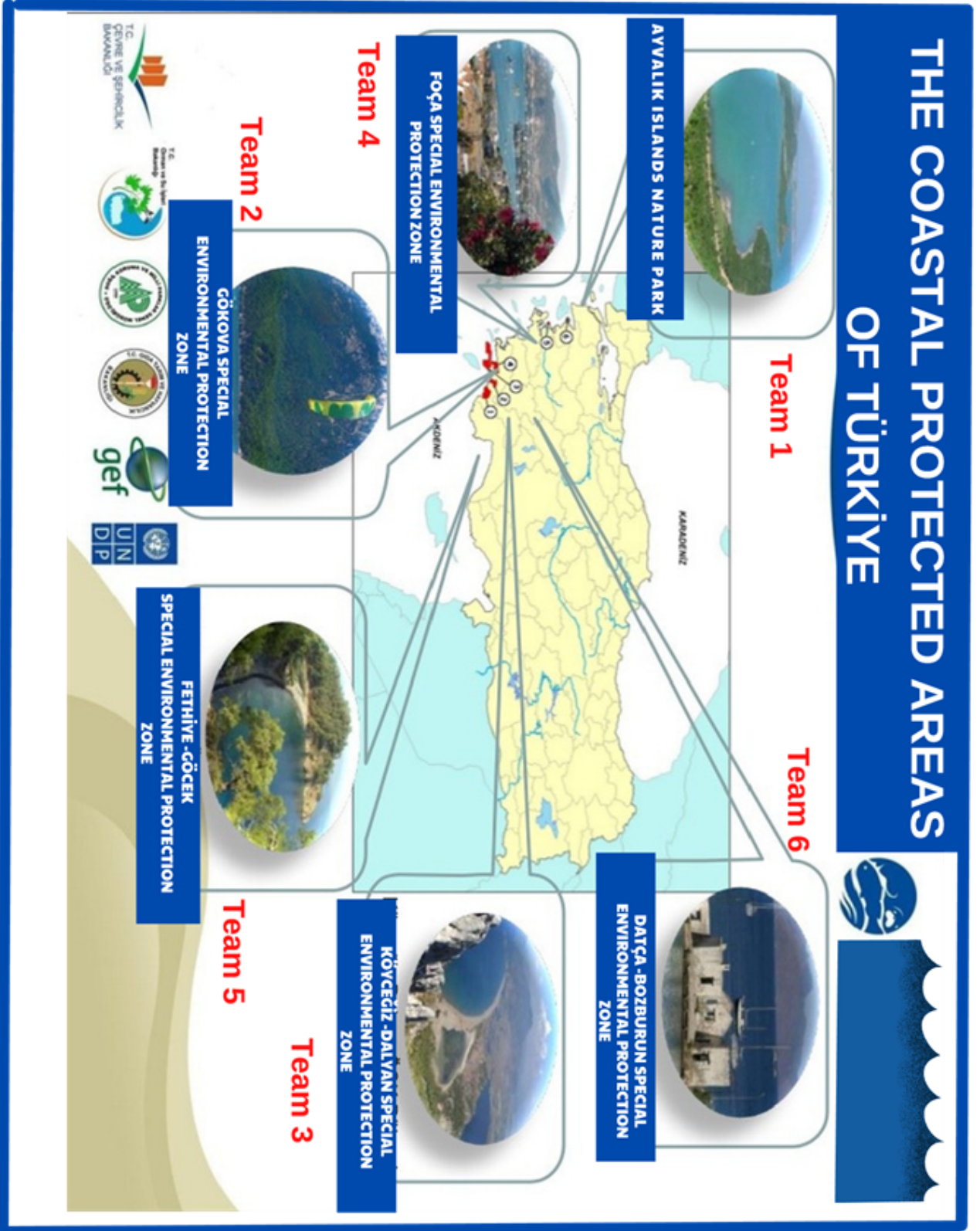
- Instruct students to read an online article
- Show a map and have students separate themselves into 6 teams (maximum 4-5 students per group).
- Assign each team one of the protected costal zones in your area to work on. (See Appendix 2 for coastal zones of Turkey).

Conclusion

- Instruct students to create a poster about the region they were assigned on Canva and also identify endemic and endangered plant and animal species.
- Share students posters on the school board for others to see (for examples of student posters see Appendix 5).









IMPACTS

THREATS	Impacts of Human Activities	Impacts of Climate Change
Water quality/pollution	Pesticides	Increasing sea level
	Plastics	Ocean acidification
	Oil spills	Increasing sea surface temperature
	Industrial discharge	Invasive species
Fisheries	Bottom trawling	
	Destructive fishing	
	Ghost-fishing	
	Overexploitation	
Land use	Urbanization	Loss of coastal wetlands, marshes and mangroves
	Industrialization	
	Transportation	
Coastal Hazards Hurricane, tsunami, erosion	Ports	Stronger and more frequent storms
	Sand and Coral Mining	
	Coastal Structures	
Recreation and tourism	Habitat loses	
	Pollution	
	Biodiversity reduction	

LITTORIAL AND MARINE ZONES
are important in terms of their values.

ENVIRONMENTAL

- Erosion control
- Protection from flood and storm
- Supply of nutrients
- Carbon storage
- Climate regulation

VITAL

- Fish stocks
- Minerals
- Medical resources

ECONOMIC

- Fishery
- Tourism
- Ports

SOCIAL AND CULTURAL

- Tourism
- Landscape
- Cultural Heritage

Coastal habitats—areas both along and close to marine shorelines—are vital ecosystems.

Conserving these habitats is vital for protecting shorelines, feeding and sheltering marine life.



Mangroves

Mangroves roots buffer coastlines from storm surges, tides, waves, and currents; make ideal nursery grounds for groupers, snapper, and some species of sharks; and provide protection for smaller fish from their predators.



Seagrass meadows

These critical habitats also serve as nursery grounds for many valuable fish and wildlife species, and play a key role in maintaining water quality.



Salt marsh

These unique coastal areas are often flooded by saltwater as tides come in and are home to a range of species from fish to invertebrates and birds. Many species of shrimp, crab, and fish also use these areas as nursery habitat, making marshes an important contributor to fisheries and local economies.



Coral reef

Coral reefs are home to numerous species. In addition to providing critical nursery and rich feeding grounds for a wealth of marine species, they also help to buffer coastlines from severe storms and flooding.



Student Poster - Example 1

AYVALIK ISLANDS NATURE PARK BALIKESİR



It is a unique region worth visiting in terms of cultural and archaeological values as well as sea creatures and natural diversity.



Various kind of waterfowl visit these shores in flocks.



142 fish species live in the marine area.



The hard coral living in the Aegean and Mediterranean is this region.

Worksheet



WHO AM I?

Information on the species living in the coastal areas of Turkey, which is endangered and in danger of extinction, is given below.

Match this information with the photos given below.

I am in the first place among the endangered species all over the world.

It is estimated that there are around 600 of us in the world and around 100 friends in Turkish waters.



I only go ashore to spawn. I bury my eggs in the holes I dig on the beach at night. I'm mostly seen on Mediterranean coasts in Turkey.



I've only been in 2 places in the world. Those who dive in Portofino in Italy and Ayvalık in Turkey can see me. My colour is red.



I live in Gebekum Fossil Dunes. I reproduce with onions. My species is under protection. My scent is very nice.



We are under protection as our numbers are rapidly decreasing in the world. Hunting of my species is prohibited. It is a mammal that lives in wetlands and sea coasts.



I am an endemic animal species living in the Göcek area in Turkey. My color is dark red and I have gray patterns on it.



SELF- ASSESSMENT

Name: _____ Class: _____

Surname: _____ Number: _____

This form has been prepared to evaluate yourself. Please tick the option that best reflects your work.(X)

SKILLS	GRADATION		
	Always	Sometimes	Never
I listen to other people's stories and suggestions.			
I follow the instruction.			
I encouraged my friends without hurting them.			
I have completed my homework.			
I asked questions when I did not understand.			
I supported my teammates in their work.			
I used my time wisely during my studies.			
I used different materials during my work.			

9. What did I learn at this activity?

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10. How did I help my friends in my group during this activity?

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11. Things I did best during this activity:

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COMMENTS:

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References

- Reddy, S. (2019) . Four Types of Coastal Habitats and Why They Matter Türkiye government websites: <https://tez.yok.gov.tr> "Ecological assessment and restoration of shores"
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