LESSON 4

How do humans use coral reefs?

Age 14-16

60 minutes

Curriculum links

- Bio-diverse ecosystems are under threat from human activity.
- How people use ecosystems and environments.

Resources

Slideshow 4:
How do humans use coral reefs?

Student Sheet 4a:
Coral reefs goods and services information

Student Sheet 4b:
Goods and services table

Video:
Welcome to Timor-Leste

Subject Update:
Learn more: Human activity on the reef?

Subject Update:
Learn more: How ecosystems (E7) and G7 economies compare

Lesson overview

This lesson will look at how the goods and services of a coral reef are used globally and within Timor-Leste. With a study of the economic value of the coral reef and developing an understanding of how that economic value is calculated. This lesson will also develop an understanding of what is meant by different services provided by the coral reef.

Lesson steps	Learning outcomes
1. Introduction to the lesson (5 mins) Students to review the learning objectives.	• Understand the wider context and learning outcomes
2. Ecosystems economic value (5 mins) Students guess which ecosystem has the greatest economic value.	• Describe the economic value of the coral reefs
3. Comparing the value of tropical rainforests to coral reefs (15 mins) Students to draw a pie chart using the instructions on the board. Students to describe the pie chart and findings compared to their original ideas.	• Draw a graph that compares the economic value of coral reefs to other ecosystems • Describe the economic value of the coral reefs
4. How economically valuable are coral reefs? (20 mins) Students to compare the goods and services provided by coral reefs. Following that students will draw a bar graph showing the value of the goods and services provided by the coral reef.	• Explain the economic value of the coral reefs • Draw a graph that compares the economic value of coral reefs to other ecosystems
5. How are coral reefs used in Timor-Leste? (5 mins) Students to watch the video and add notes to the table. These notes are focused on how the coral reef in Timor-Leste is used.	• List the ways humans use the coral reefs globally and in Timor-Leste
6. Summarise learning (10 mins) Students to write a paragraph arguing whether or not coral reefs should be protected.	• Reflect on learning

Step	Guidance	Resources
1 5 mins	Step 1 introduces the students to the lesson. · Choose students at random to read out the learning objectives. · Select different students to answer questions related to the previous lesson such as: name a abiotic factor of a coral reef ecosystem. What are detritivores? Name an example.	**Slideshow 4:** Slides 1-2
2 5 mins	Step 2 looks at the value of different ecosystems per hectare. · Ask the students to explain which ecosystem they think will have the highest value (most may say tropical rainforests as it is the most widely discussed within the media). · Show the infographic to students that shows the value of the different ecosystems per hectare. · Select students to express their opinion about the significant value of coral reefs compared to the amount they are discussed within media (TV, films, news articles). · Remind students that the info-graphic shows the value of ecosystems per hectare, so the value of coral reefs are huge as they are incredibly important (as we shall see later in the lesson) but they are a very small ecosystem. · Covering less than 1% of the worlds' ocean.	**Slideshow 4:** Slides 3-4
3 20 mins	Step 3 the students will compare the total economic value of different ecosystems. · For students to draw the pie chart they will need a calculator to work out the degrees of each ecosystem. Use the information on the slide 6 to support students. · When students have finished, they need to describe what the graph shows. In their descriptions they should answer the following questions: What ecosystem has the highest total value? Which ecosystem has the lowest total value? Where the results surprising? Why?	**Slideshow 4:** Slides 5-7

Step	Guidance	Resources
4 15 mins	Step 4 will focus on the goods and services provided by coral reefs. · Students to compile a list of the ways coral reefs are used. Pick students to share their ideas with the class. · Go through the different services provide by coral reefs from the slideshow, it is important students understand the difference between the different services and what the services actually provide. · Hand out the information sheets. · Students use the information from slide 9 and Student Sheet 4a to complete the table. · Explain to the class that the aim of this task is for students to further develop their knowledge and understanding of the value of different ecosystems, but in this task we are going to focus on comparing the value per hectare of coral reefs to the value per hectare of tropical forests. · Go through the table on Slide 11 (also on Student Sheet 4a). Identify the services provided and sub categories ensuring students understand what the different sub categories actually include. · Genetic resources are - any material of plant, animal, microbial or other origin containing breeding lines. · Genetic diversity is - refers to the genetic mix within species in the ecosystem. · Go through an example compare the value of the service provided by coral reefs and tropical forests - e.g. raw materials (limestone from coral reefs, trees from tropical forests), coral reefs - $21,528 per hectare compared to tropical forests - $84. · Students to draw a bar graph comparing the value of the different services in tropical rainforests to that of coral reefs. · Make it clear to students they are only comparing the value of the 4 categories; Provisioning services, Regulating services, Habitat services and Cultural services. Students to add the total for each category and plot that on the bar graph. · Higher ability students can draw a bar graph and plot each sub category if you think they will have enough time. · When students have finished they should describe and explain the graph, comparing the value of goods and services found in the coral reefs and tropical forests. They should include acknowledgment that as this value is per hectare that skews the numbers as coral reefs are significantly smaller than tropical forests. Students should include their opinion within the description, are they surprised by the results, why/why not?	**Slideshow 4:** Slide 8-12 **Student Sheet 4a:** Coral reefs goods and services information **Student Sheet 4b:** Goods and services table **Subject Update:** Learn more: How ecosystems (E7) and G7 economies compare

Step	Guidance	Resources
5 5 mins	Step 5 is a chance to look at how coral reefs are used in Timor-Leste. · Play the video Welcome to Timor-Leste. Students make notes of how corals reef are used in Timor-Leste e.g. Habitat services - huge variety of coral in Timor-Leste (Rainforest of the sea) · Previsioning services - provides food and income to many inhabitants of Timor-Leste.	**Slideshow 4:** Slides 13-14 **Video:** Welcome to Timor-Leste
6 10 mins	Step 6 decision making exercise. · Students to decide whether they would protect the coral reefs. They will write a paragraph stating their decision, using evidence to back up what they are saying and then explaining their point. · If unable to complete during the lesson, set for homework.	**Slideshow 4:** Slide 15