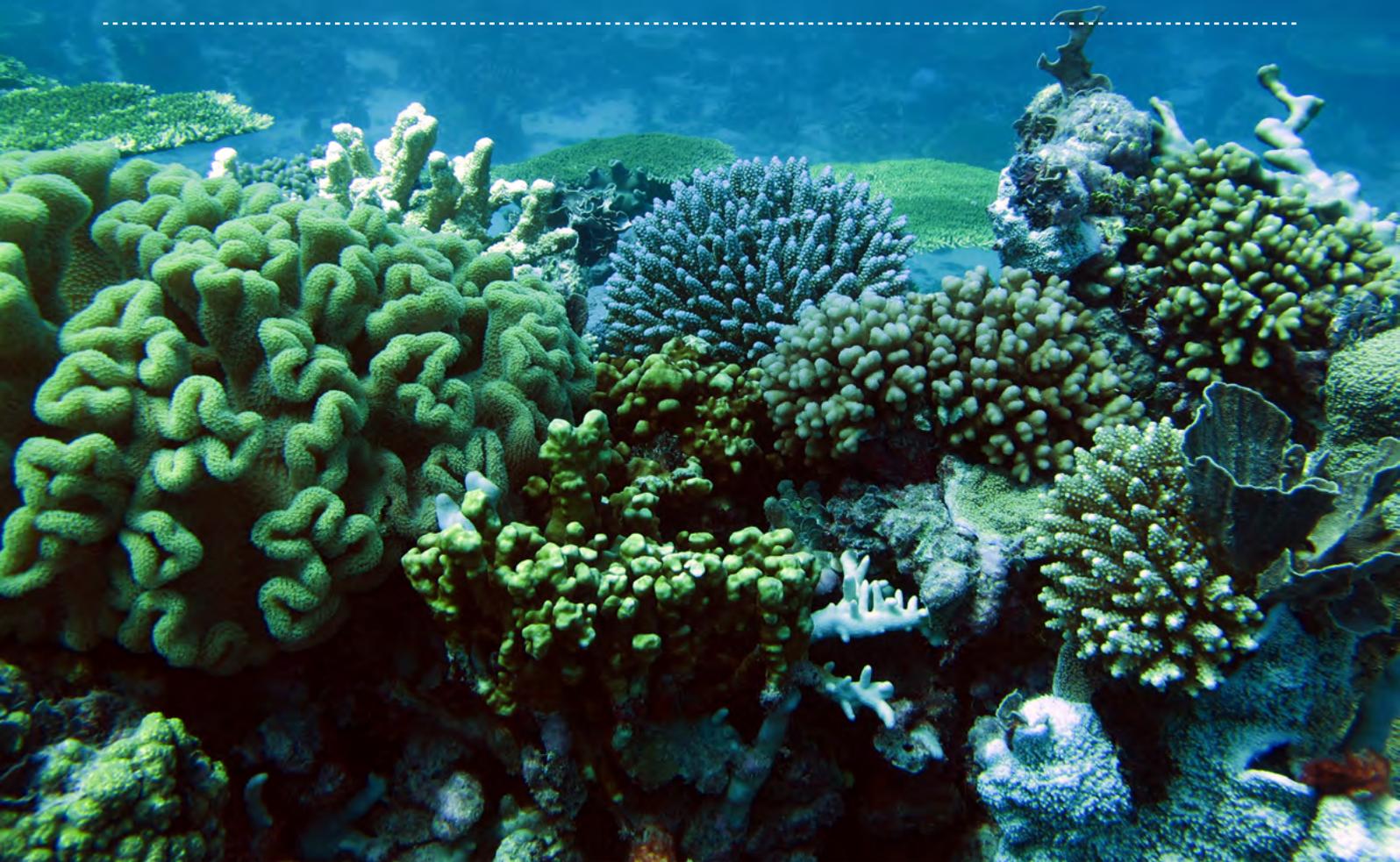

CORAL BLEACHING

ACTIVITIES TO PERFORM WITH YOUR STUDENTS

AGE LEVEL: 12-15 YEARS OLD

EDUCATIONAL BOOKLET AROUND THE EDUCATIONAL VIDEO CLIP: "CORAL BLEACHING EXPLAINED"
IN COLLABORATION WITH DR TULLIO ROSSI,
MARINE BIOLOGIST AND SCIENCE COMMUNICATOR



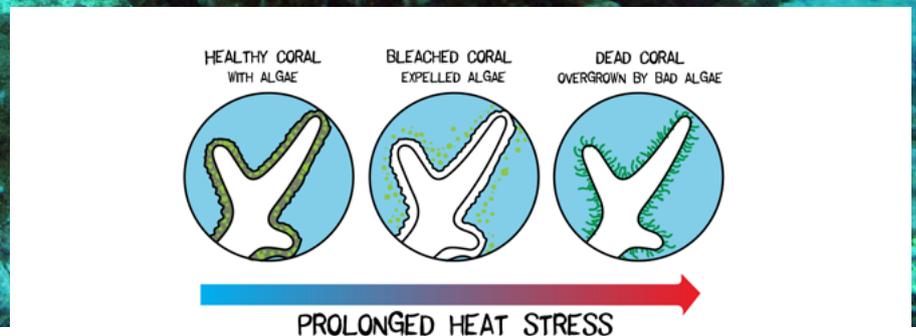
tara
PACIFIC



CORAL BLEACHING

ACTIVITIES TO PERFORM WITH YOUR STUDENTS AROUND THE EDUCATIONAL VIDEO CLIP: CORAL BLEACHING EXPLAINED
https://youtu.be/UyEw_Rl8mqM

While coral reefs cover less than 0.2% of the sea floor, they are host to almost 30% of marine biodiversity. Their good health is therefore vital to the diversity of the species they shelter, and for humanity. True indicators of the Ocean's health, a large part of coral reefs has been disappearing in recent years.



LEARNING OBJECTIVES

The main goals of this documentation are for students to:

- Explaining how human activity can change the organization and functioning of ecosystems, through the examples of climate change and coral reefs.
- Offering debates on the impacts generated by human activities on the environment, and identifying solutions for preserving or restoring ecosystems. These solutions need to be compatible with lifestyles that seek to better respect natural balances.

SUGGESTED CLASSROOM ACTIVITIES

GENERAL COMPREHENSION

Students are invited to **take the quiz** below, in groups or individually, to test their overall understanding of the video clip. A **crossword puzzle** will help them assimilate the associated key words.

Answers to quiz: 1c; 2b; 3b; 4c; 5c; 6b; 7b; 8a; 9c; 10a

Answers to crossword puzzle: 1-nutrients, 2-warming, 3-alga, 4-calcareous, 5-acidification, 6-symbiosis, 7-reef, 8-bleaching, 9-coral, 10-photovoltaic

CORAL AND ITS ENVIRONMENT



Discovering coral reefs

Students are invited to draw a picture (or create a composition using printing and cutting-pasting) of a reef including different types of corals and fish to illustrate the variety and diversity of life forms present in this ecosystem. Their creations can be assembled in a large fresco and exposed on the classroom wall.

Understanding the relationship between algae and coral

Algae and coral need each other to survive. Such an association is called "symbiosis".

Invite students to create a diagram or chart explaining the principle of symbiosis between these 2 organisms. For convenience, you may also propose that they connect the organism to its role in the symbiosis:

- Coral
- Algae
- Synthesize food through solar energy
- Provides a safe habitat for many species

What other examples of symbiosis do they know? (human intestine and bacteria, acacia and ants, plants and fungi, etc.)

LES BOULEVERSEMENTS DE L'OcéAN

Increasingly warm

In class, a simple scientific experiment can be conducted to understand the greenhouse effect, using Experiment no. 1 attached at the end of this file. Your students can supplement this session with online searches to understand the implications of climate change.

Increasingly polluted

In class, invite your students to reflect on what contaminates the oceans, and why this is a problem. You can organize or participate with your class in a beach-cleaning campaign.

Increasingly acidic

Engage your students in a discussion on the definition of acid and base. What acidic or basic foods do they know? (acidic: lemon, vinegar, etc.; basic: bananas, potatoes, etc.) Conduct simple experiments to understand how carbon dioxide makes seawater more acidic, and what the consequences are using Experiment no. 2, "Carbon dioxide and ocean acidification", attached at the end of this file.

Coral reefs in danger!

Taking inspiration from the video clip and additional online documentation, invite students to draw a coral reef as a victim of bleaching in an excessively warm ocean. As previously, put these drawings together in a large fresco and compare it to the one produced earlier, representing a healthy reef. Discuss the role of coral in relation to other reef species.

Invite your students to give a presentation on the TARA PACIFIC expedition. They can also find out about the first scientific explorations of the Ocean and discover who Captain Cook was.





A ROLE TO PLAY

How to reduce our own impact?

Together with your students, brainstorm on how to reduce greenhouse gas emissions in different contexts: at home, during leisure activities, when traveling, at school, etc.

They can make a short video about their actions and what they intend to do. Classes can also be divided into small groups to prepare presentations on pollution sources: meat industry / transportation / energy, etc.

Inform your family and friends

With your students, you can create different types of communication to share what they have learned with their entourage. This may include writing a short text, individually or in groups, an “advocacy for coral” to explain the issues concerning coral reefs and what each of us can do to help. You can even make a short animated film similar to the video clip “Coral Bleaching Explained”, with your own illustrations and words.

DISPLAY THE ACHIEVEMENTS OF YOUR STUDENTS AND YOUR PROJECTS!

Share **your students’ drawings, texts and videos**.

We will publish them on the Tara Expeditions website. Do not hesitate to send them to us specifying who the artists are!

Show the projects you have coordinated on coral so that other teachers can be inspired.

Contact us:
education@taraexpeditions.org

QUIZZ

1: CORAL IS...

- a- A motionless animal
- b- A colorful stone
- c- An animal that is also a plant and a mineral

2: HOW DO WE KNOW IF A CORAL IS YOUNG OR OLD?

- a- It becomes greyish as it grows old, like men
- b- It grows with age, like the rings of a tree
- c- It becomes more fragile and brittle

3: ALGAE AND CORAL LIVE IN SYMBIOSIS. WHAT DOES THIS MEAN?

- a- They help each other from time to time
- b- They help each other and wouldn't be able to live without the help of the other one
- c- They compete with each other

4: WHERE DOES CORAL GET ITS ENERGY?

- a- Directly from sunlight
- b- From surrounding food
- c- From the sugar produced by algae using solar energy

5: WHAT CHANGES ARE AFFECTING THE OCEAN?

- a- It is getting more polluted, warmer and less acidic
- b- It is getting cleaner, warmer and more acidic
- c- It is getting more polluted, warmer and more acidic

6: WHAT IS THE MAIN CAUSE OF OCEAN WARMING?

- a- More intense sun activity
- b- Emissions of greenhouse gases in the atmosphere
- c- Increased underwater volcanic activity

7: HOW DOES CORAL REACT WHEN SEAWATER GETS TOO HOT?

- a- It sweats a lot
- b- It expels the symbiotic algae
- c- It dies

8: WHAT HAPPENS WHEN A CORAL CEASES TO HOST ALGAE?

- a- It turns white and risks dying from starvation
- b- It sets up a new symbiosis with another living organism
- c- It dies immediately

9: WHAT DO SCIENTISTS ANTICIPATE IN THE FUTURE?

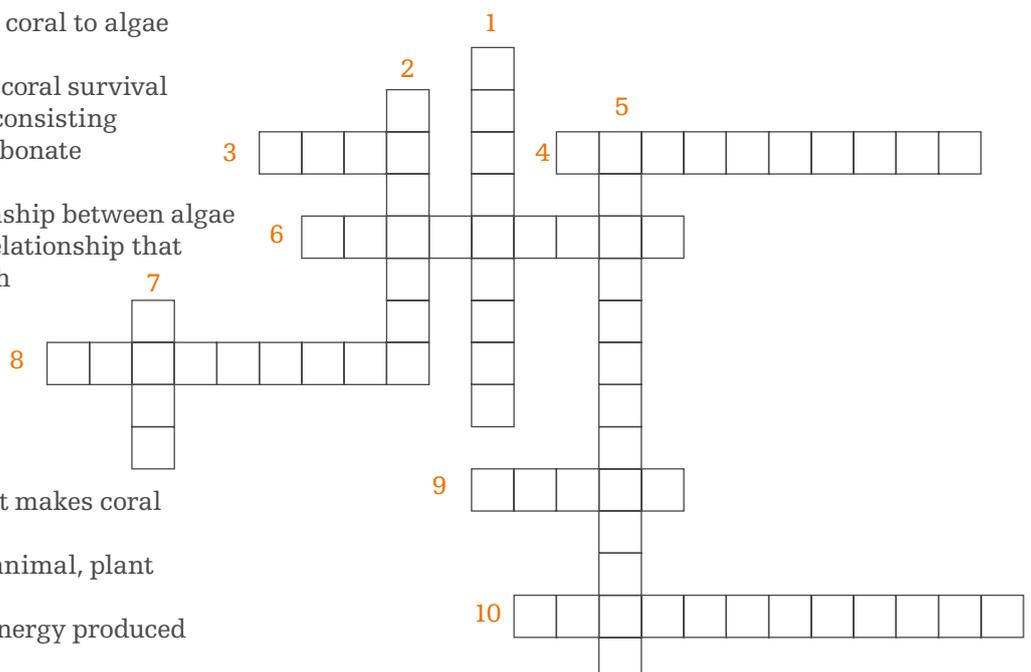
- a- Ocean temperature is going to decrease
- b- Ocean temperature is going to stay the same
- c- Ocean temperature is going to continue to increase

10: WHAT INDUSTRY PRODUCES THE MOST GREENHOUSE GASES?

- a- The meat industry is more polluting than the transportation industry
- b- The meat industry is less polluting than the transportation industry
- c- The meat industry is as polluting as the transportation industry

CROSSWORD

- 1- Nutrients provided by the coral to algae
- 2- Temperature rise
- 3- Marine organism vital for coral survival
- 4- Nature of coral skeleton, consisting essentially of calcium carbonate
- 5- Increased acidity
- 6- Term given to the relationship between algae and coral, a permanent relationship that results in benefits for both
- 7- Where coral grows
- 8- Describes the process that makes coral white
- 9- Marine organism that is animal, plant and mineral
- 10- Term used to describe energy produced by the Sun



EXPERIMENT: GREENHOUSE EFFECT

1. QUESTION

What is a greenhouse effect?

To answer this question, the Planet Sciences Association & ADEME propose the following experiment:

2. MATERIAL

- 1 transparent bowl
- 1 thermometer
- 2 glasses
- water

3. PROCEDURE

- 1- Fill the 2 glasses with the same amount of water
- 2- Place the glasses outside in the sun, and cover one of the glasses with the transparent bowl
- 3- After 60 minutes, measure the temperature of the water in the 2 glasses. Which glass contains the warmest water?

4. FURTHER INFORMATION

The transparent bowl acts like a greenhouse, allowing light rays to pass through and retaining the heat. Different gases in the earth's atmosphere play the same role: not only do they protect us but they also retain the sun's heat. Without these gases, the Earth's surface temperature would be -180C ! However, for several years, the quantity of atmospheric greenhouse gases has increased leading to climate disruptions. It is interesting to find out which gases have greenhouse effects and where they come from.

This experiment was provided by the Planet Sciences Association

SOURCE :

Fondation Tara Expéditions, Planète Sciences et l'ADEME
www.oceans.taraexpeditions.org/rp/effet-de-serre/

