MED OF PLASTIC
EXECUTION

GOALS

- Learn more about the biological and ecological issues of the Mediterranean Sea
- Raise awareness of our environmental impact
- Encourage esponsibility for environmental issues
- Deduce consequences from a set of premises
- Discuss possible solutions
- Learn to create connections between one's knowledge and current issues (especially environmental issues)
- Stimulate curiosity to increase children's drive for knowledge

WHERE

In the classroom

TIME

About 2-3 Hours

TOPIC

Hotspot in the Mediterranean Sea: fragility and emergencies related to plastic pollution

LEVEL OF PHYSICAL ACTIVITY

Low

BASE CONCEPT

Resource of inestimable value, but in a delicate balance, for which anthropic activities could determine its destiny, the Mediterranean Sea has always represented the home, life and death for thousands of peoples throughout history and now it is up to us to protect it and preserve it. The most imminent threats to date are excessive and illegal fishing, pollution from plastic and chemical contaminants, the ever-increasing maritime traffic, the invasion of alien species and the acidification of the waters.
These are all phenomena that affect biodiversity and the delicate balance on which the *Mare Nostrum* ecosystem is based.

HOW YOU DO IT?

1. Participants will play in teams (4 maximum) using the 'MED of plastic' board. The scoreboard is available both in pdf, printable in A4 or A3, and in digital and interactive format on the home page of the "The sea in the classroom" kit. The goal is to undertake a complete tour of the Mediterranean by following the arrows of the currents and engaging in tests that will allow to acquire important information for the conservation of the Mediterranean Sea and the fight against plastic pollution. Each team must record the information in their "logbook".

2. The point of arrival and departure is the Strait ofGibraltar. The teams advance by rolling the die and moving with their pawn. When advancing, those who end up at acrossroads between currents will have to pass a test (flash question) which, if not passed, will lead to the "wrong current". The team will therefore have to find the right direcion by following a longer road. The points marked with a number in a red circle are "hotspots" and for each of these the team will have to face an environmental problem, linked to plastic pollution. If the test is not passed within the time limit, the team will stand still for one turn. Following each test, the team will have to mark the information acquired in their "logbook".

3. The teams must meet in the Strait of Gibraltar after having completed a complete tour of the Mediterranean and having compiled the "logbook" with notes on the problems encountered and their proposed solutions.

4. At the end of the game each team will present a summary of their crossing and the teacher will be able to take note of it to use the information in the following days/weeks for the elaboration of the conservation plan of the Mediterranean which will allow the change of course necessary for its protection!

KEY OF THE BOXES:

- Step boxes (count as one step).
- Current junction boxes (flash question: see list provided, you can choose as you like).
- Hotspot boxes (criticality: activity on the hotspot issue, choose the corresponding activity from the list provided).
- Wind box (allows you to skip a current gap and move to the closest current).

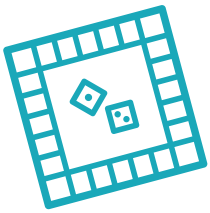
WHAT DO I NEED

PAWNS

HOURGLASS
(or mobile phone stopwatch) of 1 minute

SHEETS WITH QUESTIONS

LOGBOOK



GAME BOARD
(download from the homepage of the "The sea in classroom" kit)

DIE

Funded by

ITALIAN AGENCY FOR DEVELOPMENT COOPERATION

Implemented by

OIKOS

In partnership with

FARAH SOCIAL FOUNDATION

CHARITABLE CHALDEAN SOCIETY OF LEBANON

ANNEXES

FLASH QUESTIONS

1. Does “plastic” exist in nature?
2. How many seas are there in Italy?
3. How many tentacles does an octopus have? [multiple choice: 10 ;8 ;6]
4. What is Sea Cucumber?
5. How do fish sleep?
6. Do fish drink?
7. What is the biggest fish in the world?
8. What are shells?
9. How do sea turtles reproduce?
10. Is coral an animal or a plant?
11. Sharks don't see well. True or false?
12. What is an MPA? [multiple choice: Marine Protected Area, Mediterranean Area for Plastics, Plastic Eating Animal]
13. How much of the plastic released into the environment ends up in the sea? [multiple choice: 80 ;%40 ;%5%]
14. How many species of sharks are there in our Mediterranean? [multiple choice: about 2000; about ten; about 80 (86)]
15. What is PET? [multiple choice: a blood test; a component of PCs, plastic with which bottles are made]

Medium

1. Under the microscope, plastic is ... [multiple choice: a chain of individual elements; a single block of material; made in layers]
2. Which seabirds are most at risk from plastic pollution? [multiple choice: shearwaters; cormorants; kingfishers]
3. Where do microplastics come from?
4. What is meant by plankton? [multiple choice: microorganisms; organisms that cannot swim; what whales eat]
5. When was plastic invented? [multiple choice: mid-1800s; early 1900s; 50 years ago]
6. What was the first use of plastic?
7. Where does red coral live? [multiple choice: in the shade; on the sand; near the surface]
8. Where is the Pelagos Cetacean Sanctuary [multiple choice: in the Adriatic Sea; in the Ionian Sea; in the Ligurian-Tyrrhenian Sea]
9. How many species of cetaceans are present in the Pelagos Sanctuary? [multiple choice: 6 ,8 ,10]
10. Which are the most polluting cities for plastic between: Barcelona, Rome, Bari?
11. Coral is a “colonial” organism. What does it mean?
12. What is fishing for litter (literally fishing for pollution)?
13. Every year the Po pours into the sea: [multiple choice: 1350 t of plastic; 500 kg of plastic; 1 million t]
14. In Italy, how much waste is sent for recycling each year? [multiple choice: 1 million t; 10t; 5000t]
15. What are tides caused by?

ANNEXES

ANSWERS TO THE FLASH QUESTIONS

Easy

1. NO.
2.6: Adriatic Sea, Ionian Sea, Sicilian Sea, Sardinian Sea, Ligurian Sea, Tyrrhenian Sea.
3. It is an echinoderm: Multiple choice: 6;
4.a relative of sea urchins.
5.It depends, but all with their eyes open, they don't have eyelids!
6. Yes, and how much and how depends on whether they are fresh or salt water. In salt water they tend to lose water by osmosis and compensate by taking in a lot of water, in fresh water the opposite.
7. The whale shark.
8.They are the "calcium carbonate houses" of mollusks.
9. Just say eggs.
10. An animal.
11. False.
12. Marine Protected Area, diterranean Area for Plastic, Animal Eats Plastic.
13. 80 ;%40 ;%5%.
14. around 2000; about ten; about 80 (86 to be exact).
15. A blood test; a component of PCs, plastic with which bottles are made.

Medium

1. A chain of individual elements; a single block of material; made in layers.
2. shearwaters ; cormorants; kingfishers.
3. Especially from clothing fibers, cosmetics and small plastic fragments which degrade in size.

4. Microorganisms; organisms that cannot swim; what whales eat.
5. In the mid 1800s; early 1900s; 50 years ago.
6. For shirt cuffs and collars and billiard balls.
7. In the shade; on the sand; close to the surface.
8. In the Adriatic Sea; in the Ionian Sea; in the Ligurian-Tyrrhenian Sea.
9. 6 ,8 ,10.
10. Barcelona, Rome, Bari.
11. It is a colony made up of many small individuals called polyps.
12. Fishermen will be able to bring the waste they find in the sea and help clean up the marine environment. Before the SalvaMare Law they risked being accused of illegal transport of waste!
13. 1350 t of plastic; ; 500 Kg of plastic; 1 million t.
14. 1 million t; 10t; 5000 t.
15. From the moon.

ANNEXES

HOTSPOT TESTS

The kids will have to guess the theme of the hotspot through mimes, drawings and riddles. The teacher shows one of the opposing teams the theme of the box and assigns a game mode (e.g. mime or drawing). The operator will illustrate to the students the contents relating to that problem and together they will fill in the "logbook" with the possible applicable solutions.

hotspot list

For further information on individual topics, see the "Critical issues in the Mediterranean" tab in the "What science says" section of this site).

1. **Algiers: polluting cities/birds/wintering area for shearwaters**
   Algiers is one of the most polluting cities in the Mediterranean with 12.2 kg/km/day of waste dispersed along the coast. It is also one of the most important wintering areas for Shearwaters, the bird most affected by plastic pollution.
2. **Coasts of Tunisia: tourism/sharks/fishing**
   The coasts of Tunisia are overwhelmed by tourism, and this creates pressure on the environment and on economic activities, including fishing, which represents one of the most important sources of plastic pollution. There are no conservation measures in this region for sharks, which are heavily impacted by fishing and plastic pollution.
3. **Nile: river mouths/microplastics**
   Like all major rivers, the mouth of the Nile represents one of the areas with the greatest release of plastic into the sea, and as such it has a strong release of microplastics, both from the physical degradation of waste and from urban discharges.
4. **Tel Aviv: polluting cities**
   Tel Aviv is one of the most polluting cities in the Mediterranean with 21 kg/km/day of waste littering the coast in 2016
5. **Cilicia: river mouths/plastic arrival at sea**
   Cilicia: river mouths/plastic arrival at sea
   The Cilicia region of Turkey dumped 31 kg/km/day of waste into the Eastern Mediterranean in 2016.
6. **Po: river mouths/arrival of plastic at sea/birds/fishing**
   The Po delta represents the area with the greatest plastic release in the Adriatic with 18 kg/km/day of waste in 2016. Fishing is widely practiced in the area and represents one of the most important sources of plastic pollution. Despite this, the Po delta is an important nesting and passage site for aquatic birds.
7. **Adriatic coast: tourism/arrival of plastic at sea/fishing**
   Tourism in this area puts a lot of pressure on the environment. Fishing, a widespread activity, is one of the most important sources of plastic pollution.
8. **Dune Costiere Regional Natural Park, from Torre Canne to Torre S. Leonardo (Ostuni, Bari): priority habitats**
   Important area with priority habitat of Mediterranean salt steppes.
9. **Reggio Calabria: turtle nesting**
   Important nesting site for the Caretta caretta sea turtle.
10. **Isola delle Correnti: seagrass bed/sharks**
    Seabed affected by an important presence of Posidonia oceanica. . The sea area between the Tunisian coasts and the southernmost tip of Sicily is known for the presence of sharks. It is a probable breeding site for species such as tiger sharks (pups have been caught in this area).

11 Amalfi Coast/Ponza: coral/plastic-eating jellyfish/peach

The Amalfi coast is an important site for red coral (endemic to the Mediterranean). In Ponza,the "plastic-eating jellyfish" have been sighted and studied.

12 "Plastic island"/microplastics

The area between the Island of Elba and Corsica is affected by a temporary "plastic island" which is periodically formed and destroyed according to the currents.

13 Sardinia: Red coral/microplastics

Red coral is an endemic species of the Mediterranean Sea; it is a colonial species whose single individuals, the polyps, are suspensory, they feed on what the current carries. Because of this, the microplastic present ubiquitously in all seas can be assimilated by these animals with even serious consequences for the health of the colony.

14 Sardinia: Posidonia/birds

In tourist places such as Sardinia, the presence of Posidonia on the beaches is often considered a problem; unwelcome to the sight of tourists nd often contaminated by plastic waste, it is often removed because it is itself considered waste. At the banquettes (as accumulations are defined) of Posidonia, in fact, scholars have recognized a function in the protection of beaches from erosion and as a place of reproduction and spawning by the sea for a large variety of organisms. They have a protective function for the dune systems and their removal costs the simultaneous "necessary" removal of a part of the same sand which therefore decreases year after year. However, today there are protocols for the management and treatment of beached Posidonia, its cleaning of waste and ex situ storage or in situ restoration.

15 Ligurian coasts: Pelagos Sanctuary/posidonieto

Sea area affected by the area of the Pelagos Cetacean Sanctuary and areas with *Posidonia oceanica*.

16 Pelagos sanctuary/Pinnanobilis

Sea area affected by the area of the Pelagos Sanctuary and sites with the bivalve mollusk *Pinna nobilis*.

17 Balearic Islands: Pinna nobilis/posidonieto

The Balearic islands are affected by vast areas of real Posidonia "forests" that are now in serious danger (especially the seabed between Ibiza and Formentera). The main causes? Pollution and climate change which, as we have seen, are also closely linked to the plastics industry.

18 Barcelona: polluting cities/tourism

Barcelona is one of the most polluting cities in the Mediterranean with 26 kg/km/day of waste dispersed along the coast in 2016; this aspect is also strongly linked to the important tourist presences.

19 Valencia: polluting cities/rivers

Valencia is one of the most polluting cities in the Mediterranean with 13 kg/km/day of waste dispersed along the coast in 2016; this figure is certainly linked to the presence of a large river, the Turia, which flows into the urban area.

salam

OIKOS

LOGBOOK

NAME OF THE CREW _____

NAME OF THE BOATSWAIN _____

1 _____
2 _____
3 _____
4 _____
5 _____
6 _____
7 _____
8 _____
9 _____
10 _____
11 _____
12 _____
13 _____
14 _____
15 _____
16 _____
17 _____
18 _____
19 _____

NOTES AND IDEAS