



Marine Environment - Information Guide

General notes for delivery of educational content:

- A. Opening - defining of the subject
- B. Presenting the problem (through discussion or advocacy) + human activity
- C. How it affects us and the environment (over the short and long term)
- D. Existing solutions + suggestions for solutions on a personal level

Duration: about 12 minutes

Duration (min)	Topic	Content
1	What is the Marine Environment?	<p>The marine space (oceans and seas) covers about 2/3rd of the Earth's surface. Most of us are used to refer the sea as "the big blue", but usually emphasize just the sea surface. In fact, oceans and seas are complex and variegated ecosystems (i.e. coral reefs, dunes, rocky reefs, to name a few). Just as the landscape is composed of diverse landforms and niches, so are the seas (and oceans). But we must also think of the water column: the water surface, body of water and the ocean floor (also known as seafloor or seabed). Each have different environmental conditions that support different organisms.</p> <p>Marine organisms are divided into three groups: Plankton that float in the water and are unable to swim against the current. Nekton swim in the body of the water and include: fish, sea turtles, octopi, marine mammals and more). Benthos that live on, in, or near the seabed.</p>
1	The importance of the Marine Environment	<p>As in other ecological ecosystems, the marine ecosystems support us with Ecosystem Services, of which some are better than others. Direct human's services/utilization may include: fishing and fish agriculture (food sources), pearl hunting, trade, and traffic routes, sport (swimming, surfing, running on the beach...), harvesting energy (waves, wind turbines, gas and oil rigs), leisure and recreation (leading to tourism), sewage discharge and waste disposal (happened in the past, nowadays it's illegal in Israel).</p> <ul style="list-style-type: none">• Other services and utilities: Food source (e.g. seaweed farming)• Oxygen source – between 50-80% of the atmospheric oxygen is a result of biological activity in water bodies• Regulation of temperature (nearshore), due to water's excellent thermal conductivity.



Duration (min)	Topic	Content
4	Threats (the problems)	<p><i>Guidance notes: start with a discussion, make sure all subjects have been mentioned, emphasize problems with plastic and disposable products.</i></p> <p>As with every other environment, the marine environment is under developmental pressure. Now days we have the gas rigs and marinas. In addition, there is an increase in sea traffic (tourism, commerce, leisure and sport), developmental pressure on the coastal environment (ports, industries, residential neighborhoods, urban development, etc.).</p> <p>These are obvious pressures brought on by humans, but indirect pressures exist such as: over-fishing, sewage discharge via streams and rivers, waste effluent from the sea from land (by the wind, rivers, or tourist waste), ship ballast, and/or craft abandonment.</p> <p>Nowadays, most of the public discussion refers to two problems:</p> <p>1) Ocean acidification, which is a direct result of global climate change: briefly, one reason for temperature rising is increase of atmospheric CO₂ (greenhouse gas), as this molecule dissolves in water it reacts with the water and forms carbonic acid, and leads to water acidification.</p> <p>2) Plastic waste, which encompasses both plastic and disposable products:</p> <p>A) The volume of waste from 'one use only' plastics is increasing. Solutions deemed compostable, cannot actually decompose, and require very specific processing conditions. Therefore, it is not better than plastic (most are familiar with pictures of the various sea creatures whose bodies are full of plastic).</p> <p>B) Plastic breaks down into small pieces, called microplastics (even further, microscopic particles called nanoplastics have also been identified already), these bioaccumulate in the animal's bodies and, eventually, into humans who consume them.</p> <p>The problem of waste at sea (and on beaches) is a problem of: aesthetics, ecology (animals mistake it for food, for example the jellyfish and a plastic bag are lookalike), and health (the health consequences of plastic pieces in our bodies are not yet known, but it is a substance that our body cant' break down. There is enough photographic evidence of animals that died of hunger due to a stomach full of waste.</p>



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3	What to do? (solutions)	<p><i>Guidance notes: start with discussion, emphasize the solutions available to the everyday human.</i></p> <p>The solutions to these problems are integrated. There are solutions at the political level, through legislation and international conventions. For example, specifying a time when fishing is permitted in order to keep fish population size sustainable, or when fishing is allowed in order not to harm it, a law to prevent marine pollution, and laws to limit pollutant emissions.</p> <p>And there are private solutions that each of us can do: reducing the consumption of imported products (thus reducing the movement of crafts at sea and reducing the problems they cause), buying reusable products instead, and making sure to collect the waste and not leave it behind, even if you did not litter.</p> <p>Maintain interest and become an activist. Even at an individual level, people can influence the state and political and economic bodies. All that is needed is to open your eyes, identify that there is a problem and warn others about it. Of course, one has to keep on top of the discussion (and sometimes take action), but overall initiating a discussion and reporting the issues is the biggest help.</p> <p>Another important solution is the designation of Marine Protected Areas, which provide a safe space for living creatures - where human activity is limited. A nature reserve is an designation made by the state, but the individual can and should take part in the promotion, expansion and declaration of the reserves. This is important to allow nature to operate without our influence, while still providing ecosystem services for us.</p>



Guide help page

- About 2/3rd of the Earth's surface is covered with water.
- The sea has been used by humans since the dawn of time.
- Direct human's services/utilization may include: fishing and fish agriculture (food sources), pearl hunting, trade, and traffic routes, sport (swimming, surfing, running on the beach....), harvesting energy (waves, wind turbines, gas and oil rigs), leisure and recreation (leading to tourism), sewage discharge and waste disposal (happened in the past, nowadays it's illegal in Israel).
- The Mediterranean coastline in Israel stretches along 196 km, the Gulf of Eilat 14 km, the Sea of Galilee 56 km.
- The territorial waters of Israel is 12 miles (22 km) from the coastline and covers an area of 5,000 km².
- The exclusive economic zone (EEZ) of Israel is up to 200 miles (370.4 km) from the coastline and covers an area of about 21,000 km².
- The seas and oceans provide system services for humans: source of oxygen and food, regulation of temperature differences (nearshore).
- The oceans are an important oxygen source, between 50-80% of the atmospheric oxygen are a result of biological activity in water bodies.
- The global economic value of marine ecosystem services is estimated to be \$49.7 trillion per year. By comparison, the total gross domestic product (GDP) of the European Union is estimated to be \$16.3 trillion.
- When protecting the oceans and seas, one should adhere to a holistic approach and keep in mind that everything is connected. One example is the extensive mining of mangroves in Thailand which has led to frequent floods and tidal waves (tsunamis) on beaches, as well as changing the local ecosystem dependent on mangrove roots.
- Conservation of the marine environment is done in several directions, simultaneously:
 - Cleaning and reducing waste effluent before it reaches the water body
 - Smart fishing (altering quantities, size, periods, methods to avoid bycatch)
 - Declaration of protected zones, i.e. marine protected areas, where human activity is restricted
 - Sustainable development of technologies at sea
 - Implement legislation and enforcement for all issues
 - International conventions and international policing
- The marine environment is not uniform. It is a diverse environment and each area has its characteristics that differ in depth and water column, rock, seabed infrastructure, flora and faunal diversity (and interactions), light levels, dissolved oxygen availability, currents, temperatures and other ecological environmental characteristics.
- At the 2002 World Summit on Sustainability, the IUCN called for the declaration of protected areas in the maritime space.



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- In 2003 at the G8 conference, a target of 20-30% protected areas was announced to be due by 2012.
- In 2006, the UN declared a target of 10% protected areas in the maritime space by 2010.
- Only about 5.3% of the seas and oceans are defined as declared protected area.
- About 3% of the Mediterranean Israeli territorial water is protected as a declared MPA (3.2% if the Red Sea is included).
- Most of the maritime space is not under the authority of any state, and thus becomes an open space for activities that are neither ecological nor sustainable.
- Overfishing and pressure on fishery lead fishermen to sail outside the exclusive economic zone (EEZ), and beyond to international waters.
- Since most of the maritime space does not belong to any country, this space is also ecologically neglected.
- In the Pacific Ocean, there is a waste island (also known as the Pacific vortex) - waste that has reached the sea from various locations and was swept away by currents. It accumulated into a large spherical island with an estimated area of 700,000 square kilometers (Texas) and 10 million square kilometers (United States).
- Protection of the Coastal Environment Law, 2004 (abbreviated as the "Coastal Law") is an Israeli law that aims to protect the shores of Israel, and the adjacent area by sea and land.

The objectives of this law are:

- to protect the coastal environment and its natural heritage, to rehabilitate and preserve them as a resource with inherent value, and to prevent and reduce harm as much as possible;
 - Conserve the coastal environment and beaches for the benefit and enjoyment of the public, and for future generations;
 - Establish management principles and restrictions, for sustainable development and use.
- The law stipulates it is prohibited to construct anything within 100 meters from the water line, and includes a special and meticulous approval procedure for any construction or fundamental changes within a range of 300 meters from the shore.
 - The Barcelona Convention is intended to protect the Mediterranean Sea from water pollution. It was renewed in June 1995 to include a convention for the protection of the marine environment and the shores of the Mediterranean. In April 1978, the State of Israel ratified the Convention.

Issues covered by the Convention:

- Sustainable management of marine and land resources in combination with socio-economic issues (sustainable development);
- Prevention of pollution of beaches and the sea on a continuous or one-time basis;
- Protection of heritage, wildlife, and landscape in the marine environment;
- Promoting mutual assistance between states;
- Promoting quality of life.