



SEEING THE UNSEEN

In this activity, learners observe, record and classify litter found in their immediate surroundings. They reflect on how this litter found its way there, how it can make its way to the marine environment and how to prevent this from happening.

SUBJECTS

Mathematics, Science, Social Studies

LEARNERS' AGE

10-15 yrs

DURATION

Pre-visit: 60 minutes. Field work: 1-2 hours. Post-visit: 60 minutes

OBJECTIVES

- To practise observation, data collection, classification and chart-making.
- To reflect on how waste generation can be prevented at source.
- To propose actions, solutions and prevention.

INTERNET SOURCES

International Coastal Cleanup:

www.oceanconservancy.org/our-work/international-coastal-cleanup/

OSPAR Marine Litter Monitoring Survey Form:

www.ospar.org/documents/dbase/decrecs/agreements/10-O2e_beachlitter%20guideline_english%20only.pdf

ODEMA Aquatic Environment Wastes Observatory www.resodema.org

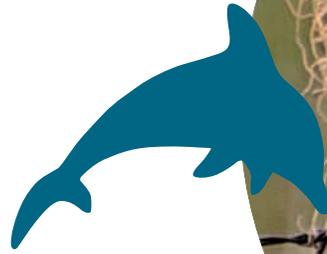
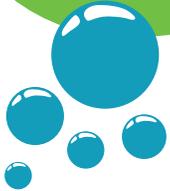
SECTION B

LAND & SEA
BASED SOURCES



**KNOW
FEEL
ACT!**

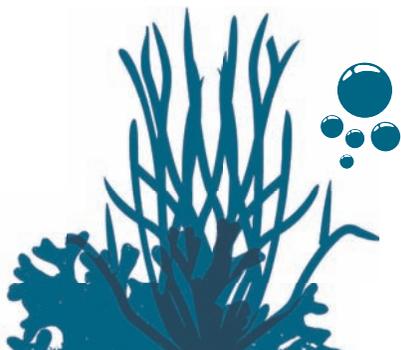
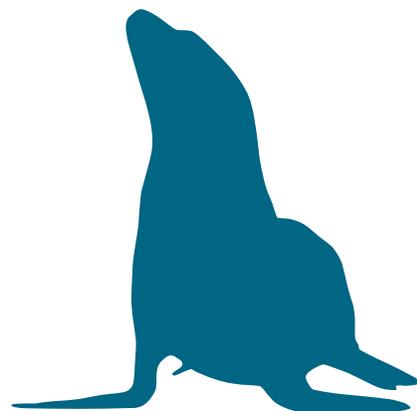
to Stop Marine Litter



Any waste material improperly disposed of, as well as any material improperly transported or stored has the potential to become marine litter. Marine litter comes mainly **from land-based practices**, such as:

- Inappropriate waste disposal at home, work, on the street, etc.
- Poor waste management at all stages: collection, transportation, treatment and final disposal.
- Untreated municipal sewage, released due to either lack of treatment plants or heavy storms.
- Poorly managed industrial waste which may contain scrap from the production process, packaging or raw material, plastic resin pellets, as well as untreated wastewater, etc.
- Tourism and recreational activities that fill beaches with cigarette butts, plastic bags, food packaging, beverage cans, cartons, toys, etc. Many beach goers leave behind much more than their footprints in the sand...

Litter from land-based sources finds its way to the sea via rivers, drains, sewage outlets, storm water outflows or when blown by winds or even swept with the tide.





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Sea-based activities can also be significant sources:

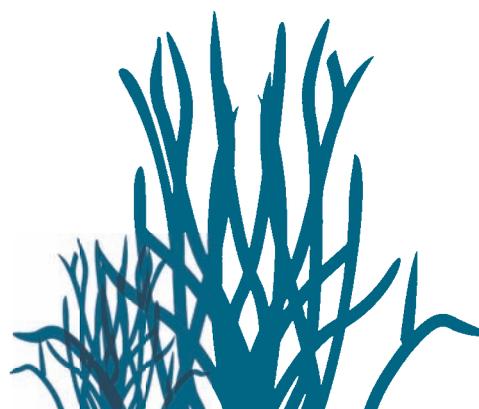
- Commercial fishing that disposes of fishing-related waste (fishing gear, nets, etc.), etc.
- Merchant and leisure shipping (large cargo ships, cruise liners, ferries, etc.) that disposes of sewage, lost cargo, etc.
- Recreational shipping (small boats used for fishing, yachting and water sports) that dispose litter items such as bottles and tins, sewage, fishing and sports gear, etc.
- Offshore oil and gas platforms that dispose of drilling equipment, pipes, storage drums, packaging items, etc.
- Aquaculture that dispose of net cages, construction materials, feed sacks, etc.

What is more, litter produced on board vessels often ends up in the sea. Poor management facilities on ships, in ports and marinas worsen the problem.

Marine litter is composed of a wide range and variety of materials, the majority of items falling into the broader categories of glass, metal, paper and plastic. National and international reports (e.g. UNEP Regional Seas, OSPAR) and scientific research consistently show that **plastic** items represent the most abundant type of marine litter within Europe and globally, typically consisting of approximately 75% of all items found.



Generally, the root causes of marine litter are connected to prevailing production and consumption patterns. The more we consume the more waste we produce. Failure to enforce legislation is also a significant factor but our indifference when it comes to the impact of our consumption and disposal choices plays a very important role!





Materials and Equipment

Map of local surroundings
Tape measure and rope for the field research

Instructions step by step

Start a class discussion about how we may not “see” litter around us, as we may have become accustomed to this sight. This activity enhances observation skills by honing in on this “unseen” litter, which, if not dealt with, can easily end up in the sea.

1. A nearby site, such as a beach, river bank or even an urban site is selected for investigation. A map is used to set the boundaries of the investigation site and divide it into sections.
2. Before going outdoors, learners study the Worksheet and make sure they understand the categories and how to record properly.
3. On the site, learners work in pairs to “scan” it:
 - a: For an urban / rural environment: each pair investigates a specific length of parallel roads that lead to a river bank (e.g. 100 m) or an entire city block.
 - b: For beaches or river banks: a rope and tape measure is used to make a grid on the site, e.g. 100 m long by 30 m wide. Pairs then form a line on one end and work along the grid, moving in parallel.

Before starting recording, learners should decide on the minimum dimensions of the items they will record, e.g. approx. 1 cm.

4. The pairs record the litter they encounter: one partner observes, identifies and calls out the litter types; the other tallies them on the Worksheet. They ask for help in case they cannot identify certain items.
5. Back in class, learners total the number of litter items found and present the data in the form of tables and graphs (bars or pie-charts). They can compare this data with that published by the International Coastal Cleanup.
6. Interesting results may be drawn by grouping data into different clusters, such plastic items; food related wastes; single use items; items originating from beach use, etc.
7. Learners discuss the recording method: Here, like in most surveys, calculations are based on *numbers* of items. How different would the data look if estimations were based on *weight*?
8. Learners reflect on the following questions:

What types of items are the most common? What is their source?
Did you find items you and your family use every day?
How could these litter items make their way to the sea?
Where could these litter items be next month / five years from now?
Can beach clean-ups solve marine litter problems? Why? Why not?
Are there any steps we can take to prevent waste generation in the first place?
9. Learners share their results with their school or community in the form of a poster, oral presentation, press release or web announcement.

