



**KNOW
FEEL
ACT!**
to Stop Marine Litter



NOTES FOR THE EDUCATOR

This section provides clarifications, pedagogic guidelines and tips to the educator that wishes to apply some or all of the activities in this material.

Overview

The material “Know Feel Act! To Stop Marine Litter” has been prepared to as a tool to raise awareness and promote responsibility on the issue in European youth and beyond. Based on the principles of Education for Sustainable Development (ESD), it addresses questions from an environmental, societal, cultural and economic point of view and can be used both within and outside formal education systems.

The material has been produced in collaboration with a team of 20 partners, and will be applied in the 15 participating MARLISCO project countries. Given its far-reaching nature, the material cannot meet every partner’s specific educational needs. Practitioners applying it can and should adjust it to best fit in their realities. They are welcome to use parts of it, enrich it, change the order of

activities, add on or simplify worksheets as they see fit. The author’s aspiration is for educators to use the material as a tool to encourage observation, curiosity, imagination, creativity and action skills in their learners. Discussing the very real challenges of marine litter will also help start new conversations on more subtle topics such as current production models in modern, over-consuming societies. Ultimately, it will contribute to developing a more informed, critical and active citizen.

Target Audience

The material is designed for educators and learners of the middle and secondary school level between the ages of 10-15. The material can also be used by non-formal educators including those working in NGOs, aquariums, coastal parks, etc.



lesson plans

for middle level
students



Terminology Clarifications

Is this an educational “material”, a “tool”, a “pack” or something else?

The authors consider that the term “educational material” best applies here. Yet, occasionally, the terms “tool”, “kit”, “pack”, “publication” or “resource” are interchangeably used.

Marine litter vs waste vs trash, etc.

The term “marine litter” is used throughout this material and refers to “any persistent manufactured or processed solid material discarded, disposed of or abandoned in the marine and coastal environment”. Depending on the context, the synonym terms “waste”, “trash”, “rubbish” and “garbage” may also be found in the text. The term “debris” which is favoured by the Americans is not so common here.

Educators and learners vs teachers and students

Since the material is designed to be applied not only in the formal sector (schools) but also in the non-formal sector (out of school education), the terms “educator” and “learner” are preferred over the terms “teacher” and “student” to accurately reflect the wider target audience. Depending on the context, the terms “facilitator”, “instructor”, “trainer”, “target audience”, “players”, can be found as well.

Lesson plans vs activities vs games

The educational material is mainly comprised of lesson plans, each having specific objectives for learners, step by step instructions, etc. However, there are also activities within the material, which have a looser educational approach than lesson plans, and aim to facilitate the premise for a discussion to take place, a game to be played, or exercises to be carried out. Games are also included as quick and simple means to spur the interest of learners.

Objectives

The materials’ objectives for both learners and educators are:

- to know the different types of common marine litter and their characteristics;

- to explain the sources, causes and the impact of marine litter as well as any regional variations;
- to understand the attitudes and behaviours associated with littering so as to best confront them;
- to make informed decisions and be motivated to take action against marine litter;
- to investigate current tools and policies on marine litter issues.

Themes and Structure

The contents of the material are developed in four sections to cover the following themes:

- (A) Introduction on different types and characteristics of marine litter;
- (B) Main sources of land and sea-based marine litter;
- (C) Impact on ecosystems and livelihoods;
- (D) Potential solutions: individuals and groups at local, national and international levels.

These four sections are comprised of several activities to cover the theme in question. Each activity contains some background information on the issue tackled, materials and step by step instructions on how to carry out the activity, as well as a supplementary Worksheet to be filled out by the learners.

The educational material is comprised of the following components:

- an introductory section outlining its scope and content
- 17 lesson plans (or activities) each including the learning objectives, estimated duration, background information step-by-step procedure to complete the activity, practical suggestions and references.
- 17 worksheets for each activity to be completed by the learners
- a how-to-use section with guidelines and suggestions on methodology for educators

Evaluation

The Worksheets in the material comprise the main evaluation tool of the learning process. The authors avoided overloading worksheets with many or complicated questions and kept them within a page or two (one sheet) to facilitate their reproduction. Worksheets are where learners record their observations, ideas, suggestions, etc. and at the same time keep track of their own learning.

The evaluation box

This is a direct mini-evaluation done by the learner. It is found in all activity worksheets and contains the same set of questions. It only takes a couple of minutes for learners to note what they considered to be the most and least interesting aspects of the activity they just completed, as well as the difficulties they encountered. An assessment of the evaluation boxes (e.g. collected from the entire class) can provide valuable information to the educator for the next implementation of the activity.



What is a learner's "insight"?

The last question in the evaluation box invites learners to describe a personal "insight" they had during the activity: a specific, profound realisation about something or someone, including themselves. With this question learners are asked to reflect on eye-opening aspects of the activity and on elements of self-discovery. Examples of learner insights are: "the time it takes for some types of litter to degrade was shocking to me"; "I discovered I come up with better ideas when I am part of a team than when I work alone"; "when I tried to convince my brother to stop littering I realised I am perfectly capable of defending an argument", etc.

Tips and guidelines for specific activities

A1 Identification and Classification of Marine Litter

- Games are a good way to engage students and serve as a lead-in to the definition tasks.
- Litter can be classified by: material (plastic, metal, tetra-pack, etc.), colour, shape, size, recyclable vs. non-recyclable, sources (food consumption, smoking, fishing and water sports, etc.), impact, etc. Learners may also contribute by identifying their own new, diverse classifications.
- Terminology: trash or garbage refers to any type of generated waste. If waste is improperly disposed of, it can then become litter.
- Sentence starters or writing directions could help the younger or less able students develop the definition required in Task B.
- A 'spider-net' or 'issue web' is a simple concept map learners generate. As brainstorming takes place all ideas are noted without intervention and a series of 'satellite words' branch out around the central word, interconnected in a meaningful way. Brevity and using single words is the key to creating a good issue web.
- Task B can also be delivered with a 'vocabulary sheet': the phrase Marine Litter is placed in the centre of a sheet and four boxes are placed in each corner. Learners draw it in one, write words they associate with it in another, write the definition in the third and use it in a sentence in the fourth.
- Depending on the time available, the discussion about family activities that generate marine litter and how this can be prevented could be extended.
- Keeping a collection of different examples of marine litter in a box in a classroom will come in handy in many circumstances, as several activities in this pack call for the use of actual litter items.
- For safety reasons educators provide litter items after having thoroughly rinsed/washed them. Potentially harmful objects such as broken glass or metal must be avoided. Alternatively educators may ask

students to bring waste from home by sending the following note to parents. This is also a good way to involve families in school life and projects.

Dear Family,

Tomorrow we will be learning about recycling in class and we need some examples of waste. We need any type of packaging or containers that you normally discard. Assist your child with opening, emptying, rinsing and drying the containers. Please send them to school with him/her tomorrow.

Thank you for your assistance.

Sincerely

A2 Experimenting with Litter Items

- The most buoyant types of litter are made from plastic and some types of rubber. Paper and wood float at first but tend to sink once they become saturated. Objects made from glass, metal and some types of rubber will sink unless air is trapped inside. Cloth items also tend to sink.
- Paper as well as some types of rubber, plastic and cloth can be carried by the wind. Of course, during periods of high winds almost any kind of trash (including heavier items) can also be blown into the sea.
- For Experiment C: Avoid sterile tap water and use sea or pond water instead. Important signs of degradation are changes in an item's shape, colour and size, as well as the loss of its ability to withstand being pulled apart (this should be evaluated at the end of the experiment). For this experiment a minimum of 8 weeks is required, but the longer the experiment lasts the more obvious the degradation will be.
- Educators who cannot integrate Experiment C in their schedule could do the experiment themselves some months in advance and capture the degradation process by taking photos and/or videos every week. In class they can show these photos and/or videos and what is left of the items.

A3 Tracking Marine Litter

- How to draw a large map: Find an e-map of the area you wish to outline. Using an overhead projector, project the image onto paper or poster board taped to a smooth wall surface. Centre the image and try to cover as much of the paper surface as possible. Ask learners to copy over the outline, making sure to include landmarks and elements relevant to marine litter (e.g. river deltas, coastal zones, ports, landfills, industrial pollution hotspots, etc.).
- If understanding the concept of ocean currents proves difficult for younger students, you could remind them of the animated movie Finding Nemo where they are depicted as high-speed seaways transporting animals, food and waste.

- Based on the true story of the lost rubber ducks the US EPA developed “Ducks on the go / Where did they go?” for grades K 3-5. It is a learning module with a storybook and 3 classroom activities.

A4 Guessing the Top 10

- Learners may be better stimulated to generate ideas about what items could be in the Top 10 list, after visiting an unattended beach where they can see for themselves the types of litter found there. Alternatively they could visit the supermarket and take note of items that potentially may end up as marine litter. A shorter list, e.g. a Top 5 list, can be compiled by younger students.
- To engage mature students and adults you could start a “take3cleanbeach” instagram account. The “take3cleanbeach” initiative encourages people to make a difference by taking 3 litter items every time they leave a beach, waterway, park, or any location.
- If learners do not have Internet access, you should print data from the suggested internet sources in the form of a handout.
- Compare the different data lists and try to extract different conclusions. For example, comparing current lists (B) to past ones (C) will encourage class discussion on how modern consumer societies have evolved.
- When drawing conclusions, focus on qualitative assessments based on comparing the different lists and take important developments into consideration such as legislation, economic factors, etc. rather than focusing on “absolute numbers”. Also focus on types of litter that could have been generated by the learners themselves e.g. food and beverage packaging and how these could have been prevented.

B1 Seeing the Unseen

- Keep the following factors in mind when selecting a site to investigate: distance from school, safety, accessibility, available time, class size, etc.
- Safety precautions: In this activity learners do not pick up litter - they only record and take photos of what they observe. Ensure they disinfect their hands after the exercise.
- The Data Collection Form used in the worksheet is from the International Coastal Cleanup (ICC) of the Ocean Conservancy. Using this form or any other existing protocol builds organisational skills and allows for the collected data to be used in international databases. Overly detailed and lengthy forms should be avoided as their complexity may cause confusion, anxiety and frustration.
- For more detailed research use the OSPAR Marine Litter Monitoring Survey Form instead of the ICC Form. Another option is the ODEMA form.

B2 The Root Causes of Marine Litter

Begin or end this activity by playing the “Who is more BLUE” game (give examples of green/blue behaviours (= good for the environment and the sea) vs less green/blue behaviours (= bad for the environment and the sea). Compare and discuss answers.

B3 Diving Deeper: Critical Thinking and Media Literacy

- It is advisable to analyse case studies relevant to the learners’ realities: A good source of real scenarios can be found in the environmental sections of local media. The MARLISCO “Best Practices” section in www.marlisco.eu is another option.
- To avoid bias, expose learners to as many differing viewpoints as possible by using articles from diverse sources on the same topic. In the case of the sperm whale, for example, it will be interesting to see how the topic is covered by the Spanish press.
- Typical stakeholders linked with marine litter issues include beach goers, governmental and municipal authorities, local professionals, residents, etc. In the case of the Spanish sperm whale both local and more distant stakeholders appear to play an important role.
- Another way to make learners, especially older ones, engage in text analysis is to let them take on the role of the teacher. Without providing them the Worksheet, divide them in groups of five or six in and ask them to develop a list of questions for analysing the article - that will be included in the Worksheet. The different approach taken by each group is analysed at class level.
- Extension for older learners: Discuss pluralism and objectivity in the media. Learners reflect on the prominence of environmental topics in the media; their public appeal, potential impact and media slant - are they considered ‘soft’, ‘biased’, ‘political’ or ‘conflicting’, etc.?

B4 Taking Inventory of Our Habits

- This activity may be limited to discussion and commentary on the findings presented here or it may extend to developing an important survey which would be of value to the learners themselves but also of wider interest given the results it will generate, if properly carried out.
- Extension: Based on their survey findings, learners may organise an awareness-raising activity targeted to their peers and/or their local community.



C1 All Tied Up

- As the proposed activity requires physical contact, knowing what is permitted and/or socially acceptable in your country. In some countries health and safety regulations are stricter than in others; carrying out the activity may not be possible everywhere. Begin by explaining to learners what they will be doing. An analogy such as the fly and the spider web can help: the web is invisible to flies and the harder they try to escape, the more entrapped they become.
- Pictures and videos depicting entanglement can be disturbing for children. As an alternative, younger learners can be provided with stuffed animals to explore this distressing situation and then elicit their impressions.
- To introduce the threat of entanglement and ingestion in a more palatable way have the learners play a game of tag. An open space is required and at least ~20 players separated in two groups: the wildlife team (each player is a different species, e.g. seal, starfish, albatross, etc.) and the litter team (each player is a different litter item, e.g. plastic bag, net, tyre, paper cup, etc.). The open space represents the sea and when the educator gives the signal the wildlife team runs for its “nest” trying not to get caught by the litter team members. Every time an animal is “caught” by litter they have to explain how the specific animal is threatened by the specific litter item. Repeat the game by changing the teams. Ideally, use stickers, hats, or other distinctive paraphernalia for each team.
- Extension activity: Interviews can be conducted using different approaches: from a structured interview with a predetermined set of questions to an unstructured open, free-flowing discussion. In any case, questions or discussion themes must be prepared beforehand. Interviewing is a recommended learning method for approaching “experts” on a theme.

C2 Animal Tales

- With younger learners you may wish to complete TASK C only. Provide learners with prepared flash cards to elicit initial thoughts and first impressions. Example texts for the cards:

SEA LION: I like to play in the water and I am curious about new things. I like to investigate objects floating on the ocean’s surface. My nose is perfect for poking into things ...

FISH: I swim into holes and hover near objects that provide shelter from bigger fish. If a lot of smaller fish are gathered together, I may swim closer to try and eat them ...

SEA TURTLE: I am a turtle that lives in the sea. One of my favourite treats are jellyfish that float near the water’s surface...you can see right through them! I often confuse floating plastic bags with jellyfish ...

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- The texts of the flash cards that are developed by the learners should be brief (approx. 150 words) but with scientifically sound facts. Another option is to ask learners to write little poems on the cards.
- Older students should be thorough in their research and analyse in their essay all those characteristics of the animal that make it susceptible to threats of entanglement, ingestion, pollution in general, etc.
- End the activity by emphasising that any animal living in the sea or along the coast can be affected by marine litter.
- Extension activity: Visit an aquarium or nature reserve. Contact them in advance and request a guided tour focusing on the problems that marine litter poses for endangered and threatened marine species.

C3 How Harmful Is It?

- Before setting off to complete the table, make sure learners interpret the scaling of the terms “rarely harmful”, “harmful” and “extremely harmful” in the same way, through giving them an example.
- Surely, the learners’ outcome does not reflect objective data, but their opinions. Still, these basic ratings help them to explore diverse ways litter can harm marine and coastal communities. Remember, the fundamental point is that although certain types of litter may have greater effects than others, all marine litter items have the potential to cause harm to these different communities.
- The activity can be carried out also by applying progressively expanding group work. Initially learners form pairs each examining one horizontal cluster of the worksheet (i.e. either Animals, or Humans, etc.). Then the pairs working on the same cluster come together making larger groups. They compare results and calculate their cluster averages. The cluster averages are noted on board and results are discussed in class.





- Start the activity by explaining the different levels of governance: local, regional (sub-national), national, regional (e.g. EU, UN level) and global.
- End the activity with a general overview of the international policy tool that was studied. You may wish to ask questions to stimulate class discussion such as: Based on your readings, do you believe the problem of marine litter would be worse without this policy tool or not? Do you think the tool is being effectively enforced? Does it reach its potential?
- A possible follow up activity could be for learners to hold a public hearing on the issue, create an awareness-raising poster to be placed in shop/school windows, or a flyer for distribution, etc.

C4 Can We Afford Marine Litter?

- At least 72 case studies from across Europe which are considered as “best practices” in combating marine litter can be found on the MARLISCO website (www.marlisco.eu). Learners are invited to select one and analyse it.
- For each potentially damaging effect of marine litter, learners should set a reasonable “cost” following the rationale of the Shetland Islands. Afterwards, they should also identify appropriate and workable solutions.
- As a follow up learners can make a poster illustrating the main consequences and related costs of human activities on marine litter for the case of the Shetland Islands.

D1 Policy Tools to Fight Marine Litter

- Exploring to what extent a policy tool is applied in a country or region is not always an easy task. There are few laws that are specific to marine litter. Usually it is tackled within a broader law regarding e.g. solid waste management or the protection of the marine environment. Because marine litter is a relatively new highlight in the international and national agendas, there are few strategies, action plans and monitoring schemes in place. The role of civil society in raising awareness, organising consultations, monitoring policy implementation has been crucial. The biggest problem is weak law enforcement.
- For some learners, especially younger ones, finding and comprehending legal texts is rather difficult. Consider doing this research yourself and preparing simpler, shorter texts making it feasible for learners to analyse them.
- This activity offers the opportunity to talk about the difference between signing and ratifying international conventions. Most people are not aware of the administrative and legal requirements of conventions. Learners will be better equipped to organise themselves and be effective in exerting pressure on legislators to ratify conventions and enforce the provisions they have signed.

D2 Envisioning the Future

- This activity should be carried out when the pressure of time and daily schedules are not an issue to allow learners to engage in a meaningful way.
- Envisioning exercises help people imagine their possible (“business as usual” model) as opposed to their preferred (“ideal”) futures and discover beliefs and assumptions that drive their visions. The process enables them to practice personal reflection (by asking themselves ‘Why do I believe this? What has influenced me?’), to prioritise (by expressing their vision using 3 words), and to strengthen negotiation and communication skills. Most importantly envisioning leads to a sense of direction and serves as a strong motivator for people to modify choices and behaviours.
- It is likely learners will have diverse interpretations and visions of what constitutes a “sustainable coast”, for example. One learner may envisage an isolated beach with minimal human presence while another, a busy marina with lots of people, boats and economic activity. Learners should be encouraged to reflect on the core values and assumptions underlying their views. They should also think about differences and similarities amongst their visions.

D3 Opportunity for Change

This activity is based on discussions that may touch upon personal values and character traits. For this reason, the approach should be rational and “truth-seeking” rather than exploring personal psychologies. Maintain an environment of trust within the group so that learners feel secure in expressing themselves and do not feel judged. Also avoid indoctrination.



Tips on Making Habits – Breaking Habits

- Acting without thinking - known as “automaticity” - is a driving force behind what forms habits. These automatic actions can take up as much as half our waking hours! In fact, the more automatic the action, the less we are able to acknowledge and respond to it. As a result, we barely notice these automatic actions, such as drinking coffee from the same mug, washing hands before lunch, locking the door when we enter home, keeping a glass of water next to our bed at night, etc.
- These automatic actions or habits take place in a certain context: we tend to do the same things in the same circumstances. For example, we buy a muffin from a particular coffee shop on the way to work; we eat a snack during a specific school-break; we go jogging every Saturday morning. The coffee shop, the school break or our free Saturday mornings unconsciously remind us of long standing patterns of behaviour, which we then enact, in exactly the same way as before. “Context” also refers to people: Whether we realise it or not, those around us influence our behaviour, sometimes for better, sometimes for worse. For example in a family environment where members carry their trash with them till they can properly dispose of them in a natural, almost automated manner, it is highly unlikely that any one family member will not do so.
- The saying “old habits die hard” means that the older the habit, the more difficult it is to change. Even if someone consciously decides to break an old habit for a new one, it takes strong will, commitment and deliberate, repeated practice for him/her to ultimately exhibit some kind of behaviour automatically as a new habit.
- Periods of life transitions e.g. moving house, changing school, having a new member in the family, provide good opportunities for change because in these periods our habits are interrupted anyways.

D4 Joint Action

- After the clean up, encourage learners to “adopt” the water-site as a class. This involves regular site visits, keeping it clean and informing the local community on the site’s value, the impact of marine litter and how to best keep the site clean.
- Possible Extension Activity: Based on the closing discussion, learners become pro-active to bring about change in their school (for example, improve separation for recycling, reduce the amount of waste ending-up in the bins, etc.). They should think of ways to motivate and engage the entire school community in their effort.

D5 Going Public!

- Awareness-raising campaigns provide a range of opportunities to take school activities outside the classroom. By “transmitting” messages to families and the local community, learners develop stronger communication and cognitive skills and can put their knowledge, ideas and creativity into practice. Actually, such activities unveil skills and talents that are not often used in the classroom. Furthermore, these types of outreach activities also encourage students to work as part of a team and to reinforce a sense of personal stake, responsibility and self-efficacy.
- Tips for Task A: Some aspects that may result from the learners’ analysis of visual messages are: simplicity in design; having a single straightforward message; a humorous approach or a combination of humour and tragedy; a dose of irony; using a really shocking image; appealing to health & safety risks for people; use of contradiction; a clever slogan; the absence of texts, etc.
- Tips for Task B:
 - If learners decide to design a campaign around a visual tool (e.g. a poster) they should be encouraged to consider the above aspects (simplicity, humour, etc.). Alert them about copyright issues if they use photos they do not take themselves (sourced from the internet or elsewhere).
 - Learners must be specific in identifying the target group: the more clearly they can describe it, the more likely they are to design a campaign around their needs, and more likely to bring change with the campaign.
 - Learners must be specific in the campaign objectives: It is better to start with a target that would be achievable for the learners (e.g. minimisation of school waste). After they achieve this they could work enthusiastically towards more challenging targets (e.g. minimisation of neighbourhood waste).
 - In case learners may decide to organise a competition a good way to involve local media and authorities is to invite them to be on the judging committee or take part in the award ceremony.
 - The documentation of the campaign must be accurate and valid. It should deliver the message using simple, factual knowledge without exaggeration or embellishment. Learners can refer to success stories in tackling Marine Litter from other regions or countries without being afraid to mention failures.





Bibliography

- Baker R., "Getting started with Global Citizenship: A guide for new teachers" Global Citizenship Guides, OXFAM, UK, 2008
- Butterworth A., Clegg I. & Bass C., "Untangled: Marine debris: a global picture of the impact on animal welfare and of animal-focused solutions", WSPA, 2012
- CLEAN UP GREECE, HELMEPA & MIO-ECSDE "Public Awareness for the Management of Marine Litter in the Mediterranean", CLEAN UP GREECE, HELMEPA & MIO-ECSDE, Athens, 2007
- C-MORE "Science Kits on Marine Debris", Center for Microbial Oceanography: Research and Education (C-MORE), ongoing project
- Cowan A.M., "Marine Debris: A Legacy of Litter: what effect is the accumulation of marine debris having on the world's marine ecosystems?" National Geographic Education, 2010
- European Commission DG Environment "Feasibility study of introducing instruments to prevent littering", Final Report, Risk & Policy Analysts Limited, 2013
- European Commission DG Environment flyer "Marine Litter: Time To Clean Up Our Act", European Union, 2010
- Harper J. "All the way to the ocean", USA, 2006
- Hatheway B. & Henderson S., "Ducks in the Flow; Where did they go?", Eastern Michigan University & University Corporation for Atmospheric Research, 2008
- Kershaw P., Hartley B., Garnacho E., Thompson R., "Review of the current state of understanding of the distribution, quantities and types of marine litter", MARLISCO project, 2013
- Mouat J., Lopez Lozano R., Bateson H. "Economic Impacts of Marine Litter" KIMO, 2010
- NOAA, Sheavly Consultants, Virginia, "Understanding Marine Debris: Games and Activities for Kids of All Ages" National Oceanic and Atmospheric Administration, USA
- NOAA, "Turning the tide on trash" A Learning Guide on Marine Debris, National Oceanic and Atmospheric Administration, 2007
- Scoullou M., Papadopoulos D., Alamei A. & Malotidi V., "Waste in our life - Learner's book", educational material, MIO-ECSDE, Athens, 2007
- Teuten El. et al., "Transport and release of chemicals from plastics to the environment and to wildlife", Phil Trans R Soc B, 364: 2027-2045, 2009
- Thompson R., Swan S.H., Moore C.J., Vom Saal F.S., "Our plastic age" Phil Trans R Soc B, 364 (1526): 1973-1976, 2009
- UNEP "What can we do about marine litter," Brochure, UNEP-Regional Seas Programme
- UNESCO "Education for Sustainable Development in Action", Learning & Training Tools No 4, UNESCO Education Sector, 2012

