

Marine Litter Decomposition Timeline

Overview

This activity introduces investigation into how long different materials last in the marine environment before they 'decompose'. It encourages participants to consider what impact common materials have on the ecosystem and habitats if they were to be littered and end up in the sea. Participants should first guess how long the items last and order them into a timeline, discussing the reasons as a class or in groups. They can then research the answers or use the table on the reverse of this worksheet. It is important to highlight that the materials never break *down*, they only break *up* into smaller pieces.

Resources

A physical example of the different materials must be collected before the activity. For the materials that are **unsafe** to use, an image example is provided on this worksheet which can be printed and cut out.

Material	Example items
Aluminium can	Single-use drinks can
Biodegradable plastic	Food compost caddy bag
Cardboard	Cereal box; packaging box
Cigarette butt	IMAGE ON REVERSE
Food waste	IMAGE ON REVERSE; apple core; banana peel
Glass	Glass milk bottle; drinks bottle
Natural fabric	Cotton clothing
Paper	Printer paper; paper towel; tissue
Plastic bag	Single-use shopping bag
Plastic bottle	Single-use drinks bottle
Plastic-based netting	Fruit netting bag; fishing net; polypropylene rope
Polystyrene	Polystyrene cup; food container; packaging
Sanitary and personal hygiene	IMAGE ON REVERSE; Wet wipe; period products
Synthetic fabric	Polyester clothing; sports clothing
Tin can	Food can
Vape	IMAGE ON REVERSE
Waxed carton	Juice; long-life milk
Wood	Wooden cutlery; pencil; pallet

Instructions

Step 1: **Create a timeline.** Using whiteboards or sheets of paper, make a timeline of key time periods below:

1 day	1 week	1 month	1 year	10 years	100 years	1000 years	10 000 years	Forever
-------	--------	---------	--------	----------	-----------	------------	--------------	---------

Step 2: **Collate the materials.** Spread out all the items on the table.

Step 3: **Start discussing.** As a class or in groups, discuss each item and why they might be quick/ take a long time to decompose. Consider what they are made of and how they are made.

Step 4: **Order the items.** Place each item along the timeline. They do not need to match with the time period in step 1 (i.e. they could be 5 months, 50 years or 500 years etc)

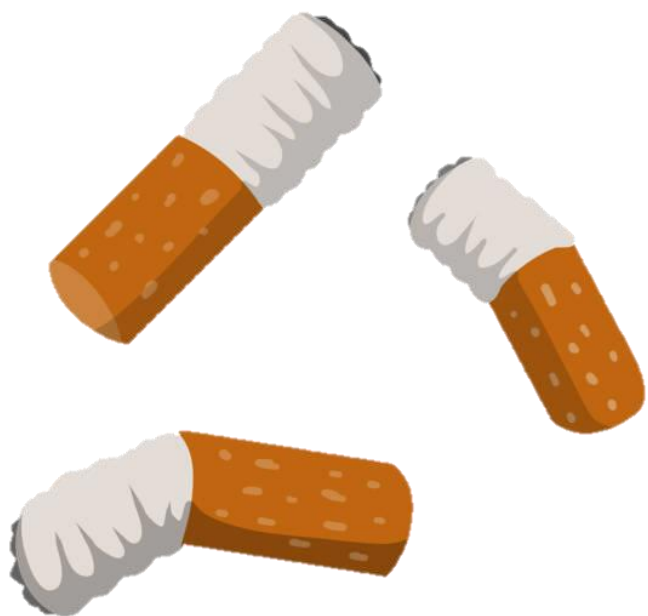
Step 5: **Discuss your reasons.** As a class, discuss your reasons for why you ordered the materials.

Extension/ Discussion

- What impact do each of these materials have on the habitats and wildlife?

When plastic breaks up into smaller pieces it can be mistaken for food such as plankton by marine animals. Bottle rings, netting and rope can entrap marine animals.

- Which of these items could be replaced by a sustainable alternative?



Answers

The table below gives an approximate length of time that each material takes to degrade in the marine environment.

Degradation rate can be dependent on external factors, such as the type of product (for example a thin polystyrene cup, compared to a block of industrial polystyrene packaging), environmental conditions (sunlight, salinity etc) and location within the environment (floating on the surface, submerged, or sunk to the seabed).

These factors can also be used as discussion points after pupils have completed the task e.g.:

- Which materials can be made into different products? How would these influence the decomposition rate?
- How would sunlight influence the decomposition of plastic?
- Why would where the litter is located affect how long it takes to degrade?

Material	Time to degrade
Paper	2 – 3 weeks
Food waste	3 – 5 weeks
Cardboard	1 - 3 months
Natural fabric	2 - 3 months
'Biodegradable' plastic	3 - 6 months
Waxed carton	5 - 8 months
Wood	10 months - 1 year
Cigarette butt	1 – 5 years
Plastic carrier bag	10 – 20 years
Synthetic fabric	20 – 50 years
Polystyrene	50 years
Tin can	50 years
Batteries	100 years
Aluminium can	200 years
Plastic-based 'bathroom' products	300 – 500 years
Plastic bottle	400 – 500 years
Plastic-based netting/ rope	600 years
Vape	1500 years
Glass	1 000 000 or Never