

Tracking our Trash

A leading cause of marine debris is thoughtlessness – people making the poor decision to litter.

Background

New Zealanders throw away 3.6 million tonnes of rubbish each year. This is equal to 400,000 buses of rubbish, or more than 1000 buses of rubbish per day! (Bus weight of 9 tonnes). Considering that no one in NZ lives more than 130 km from the sea – what is the likelihood that some of this rubbish will end up in the sea?

In addition to being unsightly, rubbish is a hazard to boats and divers and it poses a real threat to marine wildlife. Plastics, which generally make up about 60 percent of rubbish, are the worst offenders. An estimated 100,000 marine mammals and turtles around the world are killed annually by plastic rubbish. They can be trapped and strangled by fishing line, netting, rope and bait box packaging bands. If muzzled by plastic litter, they can starve to death. Plastic is also mistaken for squid or jellyfish and eaten by marine animals.

Animals particularly at risk

Marine mammals (seals, sea lions, whales, dolphins, porpoises)

- almost half of all marine mammal species have been found entangled in fishing nets and line and some have been found dead from suffocation or starvation after having ingested marine litter like plastic bags and plastic sheeting.
- approximately 100,000 are killed each year.

Seabirds

- frequent victims of abandoned fishing nets. Many birds are entangled in six-pack rings and 111 different species of seabirds are known to ingest plastics.
- anywhere from 700,000 to 1 million seabirds are killed by entanglement and ingestion each year.

Fish and crustaceans

- lobsters and crabs are frequently caught in lost or discarded fishing gear through ghost fishing (nets and traps). Fish can also ingest plastic pellets.

Sea turtles

- entanglement may occur but ingestion is the main issue as plastic bags look like their favourite food, jellyfish.

Corals

- killed when discarded fishing gear and nets drag along the ocean floor. As coral reefs provide a home for lots of other animals, these species are also affected.

Did you know up to 90% of marine rubbish found on coasts worldwide is related to purchased drinks – caps, straws and all the other packaging?

Animals who swallow plastic items can starve to death because it can accumulate in their digestive tract and make them feel “full” which stops them looking for real food.

Objectives:

To understand how marine debris can affect the local marine environment and raise the community's awareness of how they are responsible.

Curriculum Links:

Science/Living World –
Achievement Objectives 3.3, 4.4, 7.4
Biology – Achievement Objectives 7.3, 8.3
Social Studies/Place and Environment –
Achievement Objectives 2.1
Social Studies/Resources and Economic Activity –
Achievement Objectives 2.1, 3.1

What You Need:

Rubbish sacks
Gloves (optional)
Card and other materials to make the display

Method

1. Take your class on a field trip to pick up rubbish. This could be to the beach, school grounds, town centre, area around a river or stream. (With younger groups you could try a rubbish relay, where each team sends out one member at a time to find a piece of rubbish. The team with the most rubbish after a set time period wins.)
2. Discuss how this rubbish could have been transported to the ocean.
3. Sort through the rubbish, identify and quantify the different components and find out how long it would take the different items to break down in the sea.
4. Decide how harmful each type of marine rubbish would be if it came in contact with marine animals, people, boats and places (see table).
5. **Visit the NZ Marine Studies Centre and Royal Albatross Centre** to find out which local marine species are vulnerable and how they could be affected.

Results

1. Visually present the data collected in a table or graph form
2. Create a display with the rubbish and the biodegradation time line data to inform the public of how their actions are killing life in the sea.
3. Put up the display either in the area where the rubbish was collected or an area where it will be viewed by large numbers of people.

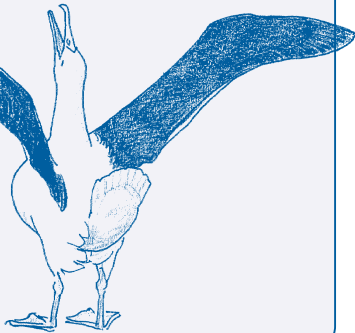
For Example:

Item	# Collected	Harm Rating (1=rarely, 2=sometimes, 3=very harmful)			
		Animals	People	Boats	Places
Fishing net	2 sm pieces	3 (entanglement)	2 (divers could get tangled in large pieces)	3 (net could wrap around propeller)	1(unsightly)

Discussion

1. How might you measure what impact your display has had? (Do a second collection one or two months later, compare your results with the original data to see if your display may have resulted in changed behaviours).
2. Brainstorm ideas about how we can change our behaviour to reduce the amount of marine rubbish.
3. As a group, prepare an action plan to change people's behaviour.

Plastic items regurgitated by the Northern Royal Albatross at their Taiaroa Head nests include squid lures and plastic fishing floats. A hair curler and blue bait box packing tape were found in the stomach of a petrel that washed up on one of the Otago Peninsula beaches.



Suggested Activities

1. **Visit the NZ Marine Studies Centre** to increase your knowledge of local marine life and question staff about the impacts of rubbish on local marine species.
2. **Visit the Royal Albatross Centre** to learn about local seabird species and find out how marine rubbish affects albatross and other seabirds.
3. Log on to www.reducerubbish.govt.nz to do the following:
 - *Rubbish Check-up* to see if you're really doing all you can
 - Take the pledge and enter the *Reduce your Rubbish Challenge*
 - *Suggest a Tip* to reduce rubbish and have it posted on the site.
4. Adopt-a-beach (or park, street, shopping area) and take responsibility for keeping it litter-free by collecting rubbish regularly.

Marine Debris Biodegradation Time Line	
Item	Time to Degrade
Paper towel	2-4 weeks
Newspaper	6 weeks
Cardboard box	2 months
Waxed milk carton	3 months
Apple core	2 months
Cotton gloves	1-5 months
Cotton rope	3-14 months
Wool gloves	1 year
Plywood	1-3 years
Painted wooden sticks	13 years
Photo-degradable beverage holder	6 months
Plastic beverage holder	400 years
Plastic bags	10-20 years
Plastic bottle	100 years
Glass bottle and jars	undetermined
Disposable nappies	50-100 years
Tin can	50 years
Aluminium can	200 years
Monofilament fishing line	600 years

(Mote Marine Laboratory, 1993)

In April 2003, scientists from the Portobello Marine Laboratory were out in the boat counting seal pups around the Otago Peninsula when they came across a seal pup tangled in a net. The net had large holes, and the pup had wrapped the net around its neck 15 or 20 times. It was getting very tired and could hardly swim, so it didn't put up much of a fight when Bill and Debbie started to cut the net off. Once freed, the seal pup swam slowly to shore, where it pulled itself up onto the beach to recover. This seal pup was very lucky, but many are not. Nets left by fishers drift around in the sea, catching marine animals for a long time - how long would it take a monofilament fishing net to break down in the sea?

