



This lesson will teach the students about the different effects that plastic may have on marine animals.

Students will learn about entanglement, ingestion, habitat destruction, chemical contamination, altered behaviour and microbes and disease transmission. There are some engaging videos in this lesson, so we recommend having audio and visual set up.

# PLASTICS AND THE ENVIRONMENT



Plastic can enter the marine environment through a number of different pathways.

More than 8 million tonnes of plastic waste enters the ocean each year, which equals around 1 rubbish truck per minute.

Plastic does not biodegrade, therefore it perseveres in the environment for a long time.

# PLASTICS AND MARINE LIFE



Plastic can have many negative effects on marine life.

What effects do you think plastics might have?

Examples: entanglement in nets, eating the plastic, using the plastic as a shell (hermit crab)

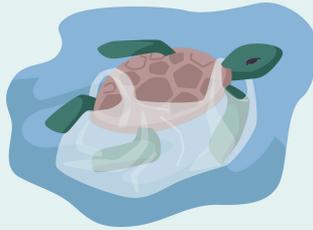
# SEA TURTLES AND PLASTIC POLLUTION



This video can be played to provide another style of learning for the students. Audio will be required, and there are no audio cues. The video goes for 2 minutes.

<https://www.youtube.com/watch?v=Lh6loYOoeNk>

# EFFECTS OF PLASTIC ON MARINE ANIMALS



We know that plastic waste and marine debris is interacting with marine animals.

We should have already begun to hear from the students how they believe this may be effecting the animals. We will now go through each of the main ways that animals can be effected.

# ENTANGLEMENT

MARINE LIFE CAN GET CAUGHT AND TANGLED IN PLASTIC

THIS LIMITS THEIR MOVEMENT AND CAN STOP THEM FROM BEING ABLE TO HUNT AND AVOID PREDATORS



A common way that marine animals can be hurt by marine debris is when they get tangled in it. This is likely one of the most well known problems of marine plastics and ghost nets.

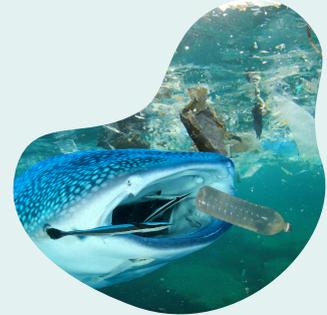
An example includes when 6-pack rings get caught around the neck of marine animals. Over time this alters their behaviour so they cannot swim or behave like they usually do, eventually either starving or being preyed upon.

Another example is that of sharks, many of which need need to move to breathe, as this pushes the oxygen rich water across their gills. If tangled in plastic and unable to move, they can suffocate.

# INGESTION

WHEN MARINE LIFE EAT PLASTIC

THE PLASTIC THEY CONSUME FILLS THEIR STOMACH, LEAVING NO ROOM FOR REAL FOOD AND CAN LEAD TO STARVATION



Many animals mistake plastic as food sources so eat it by mistake.

An example of this is when turtles mistake plastic bags for jellyfish.

Large filter feeding animals such as whales can also inhale the plastic waste when consuming krill or other food sources.

Over time, the plastic waste can fill the stomachs of these animals, leaving them no room for real food, and eventually starving to death.

# HABITAT DESTRUCTION

PLASTIC CAN INTERFERE WITH NATURAL HABITATS

PLASTIC COVERING THE OCEAN FLOOR CAN INHIBIT SPECIES THAT REQUIRE HARD SURFACES TO ATTACH AND GROW ON



Plastic waste has been documented to interfere with ocean habitats, causing the destruction, or change in normal layout.

Plastic waste presents a significant risk to coral reefs. Pathogens can hitch a ride on these floating trash islands, while abrasive debris may cause physical damage to the corals, opening the door to infections. Furthermore, if the sunlight is blocked by plastic detritus, conditions may become low in oxygen, causing dangerous bacteria to grow.

Over time plastic can also cover the ocean floor and other animals and plants begin to grow on top of them, making it very difficult to remove.

# CHEMICAL CONTAMINATION

CHEMICALS FOUND IN PLASTIC CAN BE HARMFUL FOR MARINE LIFE

THE CHEMICALS CAN EFFECT SEA LIFE WHEN INGESTED OR THROUGH LEACHING



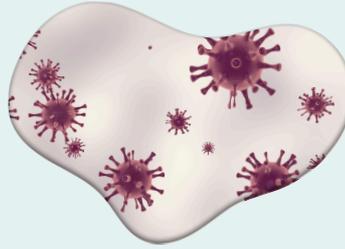
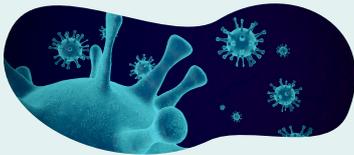
When ingested, plastics can release toxic chemicals into marine animals bodies. Many plastics contain harmful substances like PFAS (bisphenol A (BPA) and phthalates), which can disrupt endocrine systems, impair reproductive health, and cause other health issues.

As plastics degrade, they release various chemicals into the marine environment, potentially altering the chemical composition of water and sediment. This can affect the health of marine ecosystems, impacting food chains and habitats.

# DISEASE TRANSMISSION

PLASTIC CAN SPREAD DISEASE

BACTERIA ATTACHES TO PLASTIC SURFACES, WHICH FLOAT THROUGH THE OCEAN



Plastics can carry harmful bacteria, viruses, and parasites, which marine animals may ingest or come into contact with.

Animals stressed or injured by plastics may have weakened immune systems, making them more vulnerable to diseases.

Plastics can carry invasive species and their associated diseases to new areas.

# ALTERED BEHAVIOUR

PLASTIC DEBRIS CAN ALTER FEEDING, MOVEMENT AND PREDATOR-PREY INTERACTIONS



**Disrupting Feeding:** Marine animals may mistake plastics for food, leading to malnutrition and toxicity.

**Impeding Movement:** Plastics can entangle animals or obstruct their movement, affecting migration and behavior.

**Disturbing Predator-Prey Dynamics:** Plastics alter habitats, impacting how predators and prey interact, which can disrupt natural behaviors and relationships.

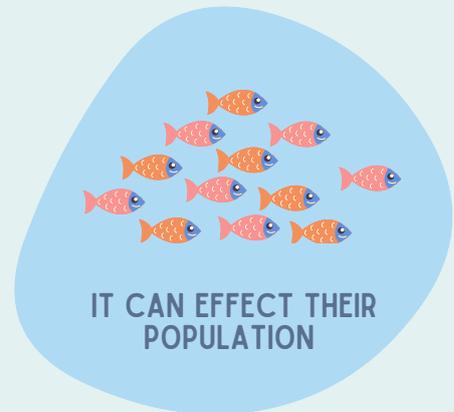
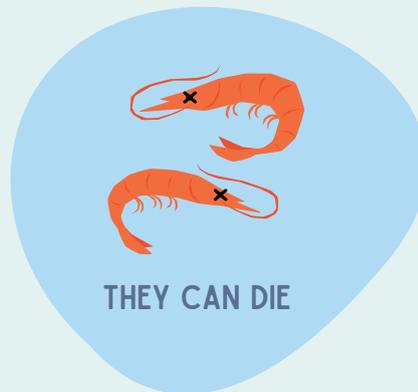
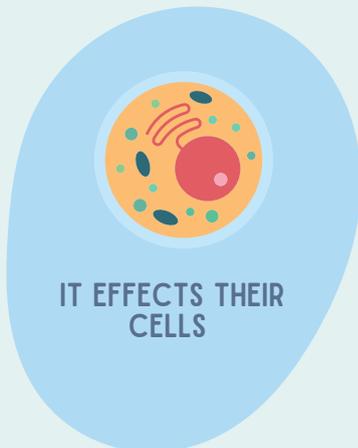
# IMAGINE BEING STUCK IN A PLASTIC BAG



This video can be played to provide another style of learning for the students. Audio will be required, and there are no audio cues. The video goes for 1 minute and 30 seconds.

<https://www.youtube.com/watch?v=yaDx-WJAsaE>

## MICROPLASTICS CAN CAUSE ISSUES TOO...



It is not just large bits of plastic that can affect marine animals. The microplastics can also have negative effects.

Microplastics can cause physical damage to cells, leading to inflammation, stress, and impaired function.

Ingested microplastics can cause internal injuries, blockages, and toxicity, potentially leading to death.

Widespread microplastic contamination can reduce reproduction rates and survival, impacting entire populations and disrupting ecosystems.

# MICROPLASTICS IN SEAFOOD



This video can be played to provide another style of learning for the students. Audio will be required, and there are no audio cues. The video goes for 1 minute and 40 seconds.

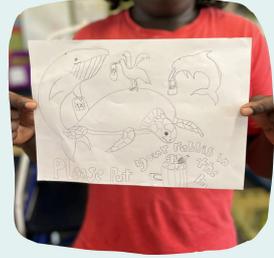
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# ART PRACTICAL

DRAW OR PAINT SOMETHING  
INSPIRED BY 'KEEP OUR  
OCEANS CLEAN'

OR

USE PLASTICS TO  
CREATE A COLLAGE



The art practical is open to any creative tools.

Here we have suggested drawing or painting something related to 'keep our oceans clean'.

The plastic collages can be done with plastic collected during beach cleans, or plastic collected from home.

There is an activity sheet explaining in further detail included in the lesson pack.

# DISCUSSION POINTS

**ANY TROUBLE SHOOTING NEEDED? ARE THE PLASTICS COMING OUT OF THE MACHINES AT THE RIGHT TEMPERATURE?**

**ANY NEW IDEAS FOR MOULDS?**

Some discussion points with students could involve trouble shooting any uses with the machines. Are the plastics coming out at the right temperature and filling the moulds?

What other new moulds would students like to see?