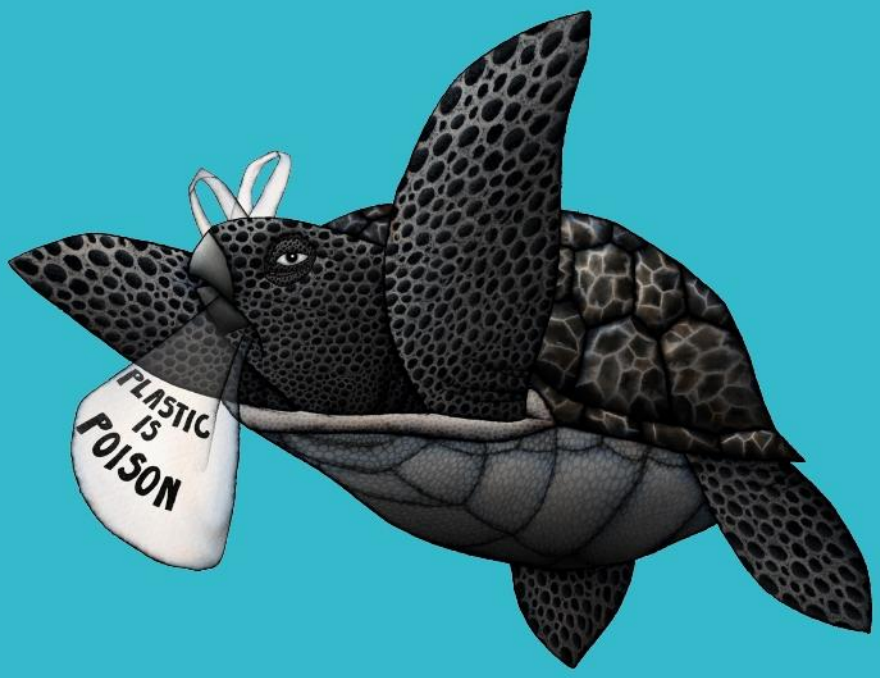
Global Ocean
UNITED KINGDOM

PLASTIC NOT FANTASTIC

THE STORY OF PLASTIC POLLUTION IN OUR OCEANS



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TEACHERS

RESOURCE PACK

GLOBALOCEAN.ORG.UK

HOW TO USE THIS RESOURCE PACK

Global Ocean is a marine conservation charity based in London intent on spreading the word on plastic pollution in our oceans. We have produced this 'Plastic Not Fantastic' resource pack in order to encourage children to engage in a number of fun and thought provoking activities to learn more about the growing problem of plastic pollution. We hope that the information and tasks provided will raise awareness on this key issue, whilst increasing children's knowledge of recycling and reducing their plastic waste.

This pack aims to inform children about:

- How plastic reaches the oceans and affects marine habitats
- The impact of plastic pollution on marine species
- The dangers of plastic entering the marine food chain
- The negative implications on human health

The activities in this pack include various arts and craft ideas that can be adapted to your own school's curriculum or initiatives, or even to your local council regulations on recycling. While we recommend trying out all the following activities, each can also be carried out independently. We also encourage getting children to take these ideas home with them. We hope you enjoy sharing these resources and activities with your class, family and friends!

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INTRODUCTION TO PLASTIC POLLUTION

Ideas of your own

Over the last 50 years, plastic products have become almost irreplaceable in our lives and are used in huge quantities across the world. 8% of the world's crude oil is used for producing plastic in thousands of different forms for human beings.

As this substance is very cheap and versatile around 50% of the plastic items we produce are single use products and subsequently get thrown away almost immediately. Plastics do not biodegrade, they photodegrade; this involves plastic breaking down into smaller and smaller pieces under the exposure of the sun's ultraviolet rays but never ceasing to exist in their most basic form. This means, with the exception of the small amount that has been incinerated, virtually every piece of plastic ever made still exists in some shape or form.

AROUND 50% OF THE PLASTIC ITEMS WE PRODUCE ARE SINGLE USE PRODUCTS THAT WE THROW AWAY ALMOST IMMEDIATELY!

PLASTIC POLLUTION FACTS

44% OF SEABIRDS
43% OF OCEAN MAMMALS
AND 86% OF SEA TURTLES
INGEST OR BECOME TANGLED IN THIS MAN MADE MATERIAL

THE JOURNEY OF PLASTIC

1

Human beings have been dumping plastic in the oceans without considering the consequences for over 40 years. Although direct dumping is now banned, plastic often ends up in the oceans through a number of sources. It can be blown or washed out to sea along the world's coastlines, or dumped and spilled overboard from ships, or even carried to the sea via rivers and other waterways. This has led to an immeasurable amount of plastic in the world's oceans.

Studies over the past few decades have suggested that millions of square kilometres of ocean surface are covered with floating garbage patches. Plastic materials and litter become concentrated in certain areas called gyres as a result of ocean currents. There are now 5 gyres in our oceans, the largest being the North Pacific Gyre which has been estimated to be almost 6 times the size of the UK.

As most plastic floats naturally, these garbage patches can move over thousands of kilometres across the world, making it a global issue.

NORTH PACIFIC GYRE

SOUTH PACIFIC GYRE

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NORTH ATLANTIC GYRE
INDIAN OCEAN GYRE
SOUTH ATLANTIC GYRE
GYRES HAVE A HIGHER % OF PLASTIC THAN THE REST OF THE OCEAN, MAKING A THICK PLASTIC SOUP
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IMPACT ON MARINE LIFE

The primary impact plastic has on the ocean is the number of ways it can harm wildlife by:

- Clogging up underwater environments and destroying habitats
- Animals confusing plastic for food
- Marine mammals getting tangled in debris
- Toxins leached from plastics poisoning species when ingested

For example, turtles often confuse plastic bags for jellyfish, while seals and dolphins get trapped in fishing lines and shipping materials.

In 2010 a minke whale was found with 300 plastic bags in its stomach, while many seabirds suffer from choking on plastic debris. This can have serious implications on their digestive systems and result in death.

Seahorses anchor themselves to natural plants on the seabed but can confuse plastic bottles for suitable anchors, leading them to potentially drift away from their home range.

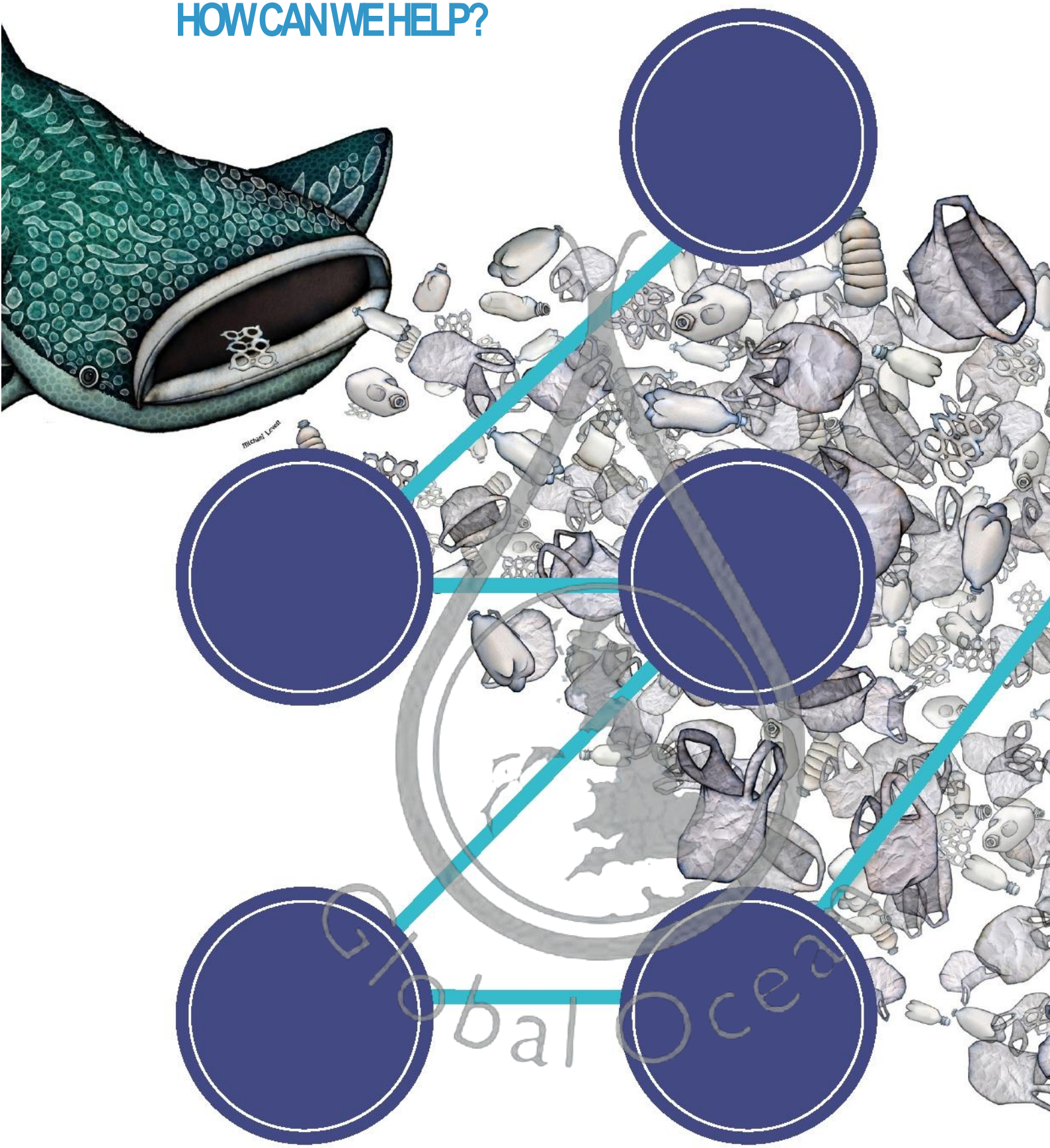
THE TOXIC CYCLE OF PLASTIC

Upon entering the oceans plastics begin to photodegrade and react with the sunlight and seawater causing toxins (PCBs and BPA) to be released into the water. These poisons enter marine food chains through ingestion by smaller animals that are preyed upon by larger animals, allowing the toxins to become more and more concentrated up the food chain. This process is called bioaccumulation.

The toxins reach our plates at levels dangerous for human consumption and end up having a negative effect on human health. For example, BPA has been linked to obesity and cancer levels in human populations.

This cycle highlights the need to consider the importance of plastic recycling and reuse in every day life. Our planet cannot withstand the current levels of plastic production and subsequent waste.

HOW CAN WE HELP?



06
CHANGE THE WAY YOU SHOP
08
BUY SECOND HAND AND RECYCLED
07
CHANGE THE WAY YOU COOK
09
SAY NO TO SINGLE USE PLASTICS
10
EDUCATE OTHERS
SIMPLE THINGS WE CAN DO TO MAKE OUR OCEANS CLEANER

SAVE YOUR FISH!

FISH EAT PLASTIC IN THE OCEAN AND IT POISONS THEM!

SUGGESTED AGE GROUP: 3-5 YEARS

Plastic has been getting into our oceans for many years and can harm fish and other marine animals. To demonstrate how you can do your bit to help, why not try this fun activity and save your fish from an ocean full of plastic.

YOU WILL NEED

- 10 pipe cleaners
- A few small pieces of plastic (bottle tops or cut up bottles)
- Two pieces of blue paper
- A stick or short pole
- A piece of a string
- A magnet

WHAT TO DO

- Cut the edges of the blue paper into wavy shapes and draw some lines onto them so they look like the sea.
- Cut the pipe cleaners in half, and fold them into a loop, twisting the ends around each other to make a tail - you should end up with something in the shape of a fish!
- To make your fishing rod, tie one end of the string around the end of the stick and the other end to the magnet.
- Scatter the fish and the pieces of plastic onto one of the blue pieces of paper - this is the dirty plastic ocean.
- Use your fishing rod to pick the fish up out of the plastic ocean and set them free into the clean empty ocean!

*DISCUSS WHY PLASTIC IN THE OCEAN IS BAD FOR THE FISH?

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BE A MARINE SUPERHERO!

EVERYONE CAN PLAY THEIR PART IN THE REDUCTION OF PLASTIC WASTE

SUGGESTED AGE GROUP: 3-8 YEARS

Even children are able to contribute to reducing, reusing and recycling plastics. This is also an opportunity to 'creatively recycle' by reusing plastics instead of the suggested felt, and spreading the message of plastic pollution. Be a superhero against plastic pollution!

YOU WILL NEED

- Felt
- Felt glue
- Ribbon/string
- Pens/pencils/paints
- Any other bits you want to use to brighten up your mask!

WHAT TO DO

- Draw its outline onto two pieces of felt.
- Cut around these - get some help from your teacher if you need to.
- Glue a piece of ribbon or string to either side of one of these pieces, which you'll later use to tie your mask on.
- Put plenty of glue all over this piece and stick the other piece on top, trapping the ribbon in between.
- You can then use more pieces of felt to add detail to your mask, like eyes and patterning, as well as glitter or other crafts materials to make it stand out even more!

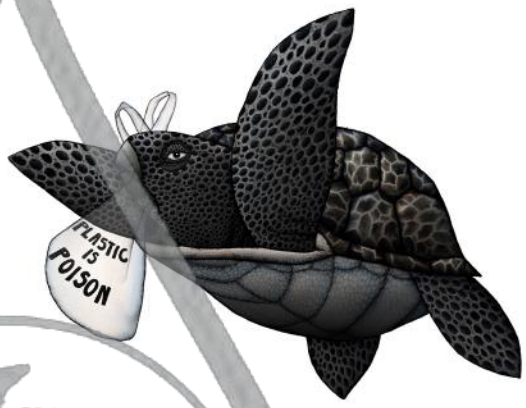
*DISCUSS HOW THE CHILDREN CAN REDUCE PLASTIC POLLUTION IN THE OCEANS.

RECYCLED PLASTIC COLLAGES

EVERY YEAR, 663 SPECIES AROUND THE WORLD ARE HARMED BY PLASTIC

SUGGESTED AGE GROUP: 6-8 YEARS

Think about recycling plastic creatively and turning it into an art project. Bring in some plastic you can creatively recycle from home. Using these plastics, make a collage of a marine animal with a message about how plasic pollution harms them.



YOU WILL NEED

- Plastic objects you were going to throw away. (bottles, bottle tops, wrappers from magazines or anything else you have)
- Glue/pens/paints/scissors
- Marine animal outlines on A4 paper

WHAT TO DO

- Choose one of the marine animal outlines.
- Use plastic you have recycled and paints or pens to fill in the shape of the marine animal.
- Add all the marine animals together on one large piece of paper.
- Decorate the paper to show an underwater ocean scene and add a message to this from your marine animal such as:
  'Plastic bags are bad for my health!'
  'I can't eat plastic'
  'Please don't feed me your plastic bottles'
  'Would you like plastic bags filling up your home?'
- Get your teacher to stick all your images together for a wall display.

*DISCUSS HOW PLASTICS AFFECT MARINE HABITATS.

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DOES PLASTIC EVER GO AWAY?

UP TO 90% OF FLOATING MARINE DEBRIS IS PLASTIC

SUGGESTED AGE GROUP: 6-12+ YEARS

Plastic can take over a1000 years to decompose and so never really leaves our oceans. This experiment should encourage the children to find natural alternatives to everyday materials, for example decomposable cutlery and special biodegradable plastic.

YOU WILL NEED

- x5 containers with lids
- Water (sea water if possible)
- A vegetable (like a piece of carrot)
- A fruit (like an apple core)
- A piece of paper (just a small one)
- A piece of metal (like the ring pull on a canned drink)
- A piece of plastic (like a bottle top)

WHAT TO DO

- Put the vegetable, fruit, paper, metal and plastic in a container each.
- Add the water or seawater to each container and seal it.
- Put the containers on the windowsill where they get as much sun as possible.
- Watch these over the course of the year and think about what effects they might have on animals in the sea. Keep a diary every week or two of what the items look like, and how much they've broken down (you can probably throw the fruit and vegetables away quite quickly). At the end of the year have a big class discussion about what you have found and what the effect of plastic can be on marine animals and habitats.

***THINK ABOUT ALL THE THINGS THAT HAVE HAPPENED IN THE PAST 1000 YEARS.**

THE RE-USABLE BAG

USE A BAG FOR LIFE AND END A TURTLES STRIFE!

SUGGESTED AGE GROUP: 3-12+ YEARS

It is easy to reduce your single use plastic consumption with a reusable canvas bag. Instead of using plastic bags which you then throw away, encourage your mum or dad to use a canvas bag or Bag For Life instead. Decorate your own re-usable canvas bag!

YOU WILL NEED

- A plain canvas bag
- Fabric paints
- Big potatoes cut in half to dip in paints
- Potatoes with fish shape cut into them.

WHAT TO DO

- Older children can decorate as they wish and add a slogan too.
- For younger children use the potatoes to make the main body of turtles. Then use your fingers dipped in paint for the head, arms and legs. Use the fish shaped ones in different colours to decorate the bag.
- You can create any underwater scene on your bag to remind you why you are using it, to help the oceans.

*DISCUSS HOW PLASTIC CAN BE RECYCLED AND RE-USED IN A VARIETY OF DIFFERENT WAYS.

DESIGN A RE-USABLE BOTTLE

BOTTLE RE-USE CAN HELP DOLPHINS LIVES IMPROVE!

SUGGESTED AGE GROUP: 8-12+ YEARS

You now know that instead of using plastic bottles for water, we can also use aluminium bottles. Can you Design-a-Bottle to make sure people want to reuse their bottles rather than just throw them away? For example, adding pockets on the bottle for storing small items? Adding a strap to make it easy to carry? Changing the colours of the bottle to make them prettier? Being able to add pictures to each bottle to make it personalised? Use your imagination and get creative!

BECOME A RECYCLING RANGER

EVERYONE CAN PLAY THEIR PART IN THE REDUCTION OF PLASTIC WASTE

SUGGESTED AGE GROUP: 3-12+ YEARS

Create a box as a class to use for plastic materials you can recycle. In class, when you have plastic to throw away, place it in the recycling box in class. Every few weeks ask your teacher to take it to the recyling bins. You could encourage your parents to recycle pastic at home too.

YOU WILL NEED

- A large cardboard box
- Plastic to be recycled from home or the classroom
- Large piece of paper and pen

WHAT TO DO

- Together, decorate the box using plastics you were going to throw away.
- With your classmates and teacher, come up with a list of ways you can recycle plastic or help stop plastic pollution.
- Write this on the piece of paper and place this next to the recycle bin you create to remind you of other ways to help stop plastic pollution.

***SHARE THE IDEAS YOU CAME UP WITH IN CLASS AT HOME AND SPREAD THE MESSAGE OF WAYS TO STOP PLASTIC POLLUTION.**

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GET CREATIVE & TAKE ACTION

EDUCATE OTHERS FATHERS, MOTHERS, SISTERS & BROTHERS

SUGGESTED AGE GROUP: 8-12+ YEARS

Tell your friends and families about plastic pollution and the effect on the oceans. Create a poster or flyer with the below information, then photocopy it and share it amongst friends and family.

When you think about plastic pollution and recycling, remember to think about your:

ONLY DRINK TAP WATER IF YOU CAN

CONTACT THE LOCAL COUNCIL TO BAN SINGLE USE BAGS

ENCOURAGE RECYCLING, USE CANVAS BAGS & RE-USABLE BOTTLES

ARTISTICALLY RECYCLE YOUR PLASTIC

NOTIFY YOUR FRIENDS AND FAMILY ABOUT PLASTIC POLLUTION

START A RECYCLING SCHEME WITH YOUR CLASS

***DISCUSS WAYS TO SHARE THE MESSAGE IN YOUR LOCAL COMMUNITY.**

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THINK ABOUT THE FUTURE

EDUCATE OTHERS FATHERS, MOTHERS, SISTERS & BROTHERS

SUGGESTED AGE GROUP: 8-12+ YEARS

There are plenty of alternatives to every day plastics and we are capable of reducing our waste on a daily basis. Why not try out some of the ideas below and see how YOU can help the health of our oceans.

CHALLENGE ONE

Global Ocean would like to CHALLENGE YOU to try and have a PLASTIC FREE LUNCH.

DAY 1 - Collect all the plastic packaging from your normal lunch and snacks for one day.

Day 2 - Bring in your normal packed lunch and snacks without any plastic packaging.

Day 3 - Compare the amount of plastic you have collected from both days.

How easy was it to have lunch without plastic packaging?
Do you think you could do this every day?
Can you think of ways that your local supermarket could reduce their plastic packaging?

BONUS - Visit your local supermarket, either with your class or your parents, and make a note of all the food items in plastic containers. Think about alternatives and discuss with your class!

CHALLENGE TWO

Stick up the Recycled Plastic Collages or Posters you have created around your school or public areas and inspire change. Make sure your poster has a clear message on the dangers of plastic in our oceans!

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***DISCUSS WHICH PLASTICS YOU COULD REUSE ON A DAILY BASIS, RATHER THAN THROWING AWAY.**

WHAT ELSE CAN YOU DO?

EDUCATE OTHERS FATHERS, MOTHERS, SISTERS & BROTHERS

SUGGESTED AGE GROUP: 8-12+ YEARS

There are plenty of alternatives to every day plastics and we are capable of reducing our waste on a daily basis. Why not try out some of the ideas below and see how YOU can help the health of our oceans.

WRITE

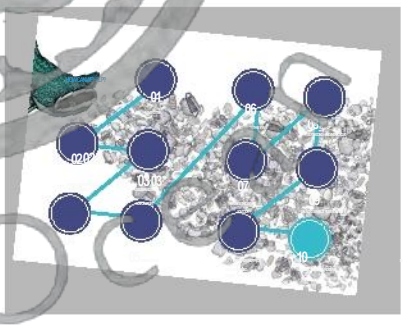
Write a letter to your local supermarket explaining why it is important for them to try and reduce their plastic packaging for food. Suggest alternatives to packaging fruit and vegetables and other food items.

DISCUSS

Why not invite your local Member of Parliament to discuss their views on plastic pollution. How is your local council contributing to the recycling and disposal of plastics and ask them CAN THEY DO MORE?

DESIGN

How about making jewelry to remind people to think about their OCEANS? Remember to show off your tote bag or reusable water bottle with pride - you are doing something great for the environment! Design posters to spread a key message about how we can use less plastic everyday and reduce plastic pollution in our oceans. Look at the poster on page 10 & 11 for inspiration!



***DISCUSS OTHER WAYS TO SPREAD THE MESSAGE OF PLASTIC POLLUTION AND HELP MAKE A DIFFERENCE TO TO THE CEANS.**

SUGGESTED IDEAS FOR OLDER STUDENTS

SUGGESTED AGE GROUP: 12+

Teachers and parents can use the below resources to help themselves and older children learn more in depth about the subject of plastic pollution.

THE SCIENCE BEHIND THE FACTS

Many papers have been published that focus on the more complicated issues linked to plastic pollution. The two papers outlined below demonstrate the effects plastic can have on our oceans. Encourage your older students to do independent research into this topic. This could be used as an opportunity to practice summarizing information from more complicated sources.

A Comparison of Plastic and Plankton in the North Pacific Central Gyre - Moore, Moore, Leecaster and Weisberg -Marine Pollution Bulletin 42 (12), 1297-1300
The aim of this study was to examine the potential for ingestion of plastic particles by marine filter feeders. Researchers took surface samples using a mesh net at 11 random sites in the North Pacific Ocean Gyre system. The study proved that a huge threat exists to filter feeders, as they are unable to distinguish between plastic particles and plankton.

The Pollution of the Marine Environment by Plastic Debris: A Review - Derraik - Marine Pollution Bulletin 44, 842-852
In 1974, a high-ranking member of the plastic industry (Fergusson), said that "plastics litter is a very small proportion of all litter and causes no harm to the environment except as an eyesore". Clearly he had no idea of how much the plastic industry would expand over the next 40 years and how much harm its products would do to the environment worldwide. Plastic now makes up most of the marine litter worldwide, accounting for between 60% and 80% of total marine debris.

PLASTIC RESEARCH IN THE FIELD

The United States is currently at the forefront of the campaign against marine plastic pollution. Algalita (algalita.org), one of Global Ocean's partner organisations, conducts extensive research in the field. The following US resources are available to supplement your knowledge on this topic.

MAPPING PLASTIC MARINE POLLUTION

This exercise allows you to explore plastic pollution research in the North Pacific Ocean from the comfort of your classroom. Using Google Earth you can explore the routes of Algalita's research vessels and see for yourself what they find along the way. All the resources you'll need for this exercise, including lesson plans, activity sheets and the voyage files, are available from the following link: algalita.org/education/MappingPlasticPollution.htm

HELP US END PLASTIC POLLUTION AND KEEP THE OCEANS CLEAN AND PRISTINE FOR GENERATIONS TO COME...

If you would like to learn more, visit the Global Ocean website or like us on our Facebook and Twitter pages for access to more resources, up to date information and upcoming events on this essential topic, as well as contributions from some great partner organisations who support our message.

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