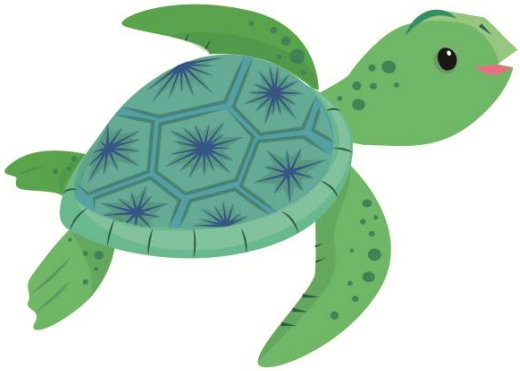
EXPLORING OCEAN PLASTICS

Bringing Galapagos into your home and school: A learning resource from Galapagos Conservation Trust

Join us on an ocean journey! Learn how you can help make them a safer and happier place to be for marine life. Explore the life of plastics - how they are a part of our lives and how making a few changes will enable you to live a more sustainable and environmentally friendly life.



This is Tico the turtle, a character from our storybook *Marti the Hammerhead Shark: A Galapagos Journey.* She will guide you through these home learning resources. You can find our Marti Guided Reading Sessions for Teachers, Parents and Carers here.

Galapagos Conservation Trust DISCOVERING GALAPAGOS

ACTIVITIES

Activities form part of plastics focused project suitable for KS2 learners.

An introduction to ocean plastics:

Why do we love our oceans? How do we feel when we see beaches covered in rubbish? Find out about perils of plastics.

Let's go on a plastic hunt:

Are we waste wise? Use our plastic audit to find plastics in your home. Looking at labels – to recycle or not to recycle?

Perils of plastic in the ocean

What happens to plastic in the oceans and what impact does it have on marine animals? Design a game of plastic peril.

A journey to the ocean:

Get creative and write your own story or cartoon about a journey of plastic to the ocean.

Tick tock, tick tock...The lifespan of plastic:

Be a scientific investigator and experiment to see how long plastic lasts for. What will your results show?

Reduce, reuse, recycle, repurpose, rethink:

Design your own persuasive poster to encourage the 5 R's. Make and create inventive new uses for plastics.

An introduction to ocean plastics

ACTIVITY ONE

Overview:
Through discussion, we share ideas about why we love our oceans and how we feel when we see them covered with litter. We think about what we may already know about plastic pollution and find out about sources of marine debris.

New vocabulary:
marine debris, plastic pollution, source, environment

Learning targets:
Understand the term plastic pollution
Research sources of marine debris

What you need:
large sheet of paper, image of beach, internet links

Activity description:

Let's talk:
'Why do we love our oceans?' Use this question as a prompt to share what we love and enjoy about the ocean. What experiences do we have of being there? Think of a few words to explain how it makes them feel. Draw/write their thoughts on paper if wanted.

Moving on:
Share the term **'Plastic pollution.'** What does this mean to them? What do they already know? Have they any experience of it? Using a large sheet of paper explain they will use this as a 'learning journal' which they can add ideas/questions/things they have learned throughout the activities. Perhaps use different colours for each session. Write or draw their response.
Show them the image of the beach covered in rubbish.
What can they see? How do they think the rubbish got there? Where do they think it is? - *It is an island in the middle of the Pacific Ocean. Show them the Pacific on a map or globe if you have one handy.*
You may also want to look at a beach image here (1) How does it make them feel? What behaviours and actions can we change so this doesn't happen?

Watch the following video from Greenpeace and share read this short text from the Whale and Dolphin Conservation Kidzone page to help further their understanding by answering some key questions. These can perhaps be shared beforehand or written on post-it notes.

- How much rubbish enters the ocean every minute?
- How does it get there? List three ways rubbish and plastic enters the ocean.
- Which animals can be affected by plastics in the ocean?

Keep going:
If you want to explore how rubbish circulates around the world's oceans, this fun video explains 'ocean gyres' and the mystery of the rubber ducks in 'ducks overboard!'

Full internet links: https://www.youtube.com/watch?v=Our5CZz5qoU
http://www.wdcs.org/wdcskids/en/story_details.php?select=1175
https://www.bing.com/videos/search?q=plastic+ducks+in+ocean+gyre&&view=detail&mid=F1EB5669322DCB02C039F1EB5669322DCB02C039&&FORM=VRDGAR
https://www.bbc.co.uk/news/uk-england-tyne-53182149

Let's go on a plastic hunt: Are we waste wise?

ACTIVITY TWO

Overview:

In this longer session, we explore plastic use in our homes. Using a 'plastic audit,' we see how waste wise we are and consider our use of single-use plastics. By exploring package labels we identify which things can be recycled. Our 'Keep going' activity uses role-play to explore impacts and solutions and includes some data analysis ideas.

N.B. This session will require a week to complete due to plastic audit.

New vocabulary:

audit, analysis, single-use plastics, recyclable, non-recyclable, impacts and solutions.

Learning targets:

Analyse plastic use in the home
Understand and explain the term single-use plastics
Explore labelling used on packaging

What you need:

audit sheet, package labels
paper 'learning journal'

Activity description:

Let's talk:

'Are we waste wise?' Use this question to discuss waste that we throw away every week in the home. How much and what type of things will go into the bin for landfill? What sort of things do we put in the recycling bin? Is there anything we could change to reduce the amount of rubbish we produce? If you have a compost bin or area, think about why they are also important.

Moving on:

Let's go on a plastic hunt! Make a list or collect different plastics that we have around the house. The kitchen (fridge, store cupboards) and bathroom (cabinet, cupboards, shower containers) are a good choice. Look at the items you have collected and write or put to one side those which are **single-use plastics** (plastics used only once before thrown away or recycled)
Q - Why do they think these are such a problem to the environment?

Have a look at the plastic home audit table and talk about how we will monitor and fill in the sheet. You can even weigh items at the end of each day to calculate the amount of plastic produced. During the week, keep a sample of plastics that are recyclable and non-recyclable.

To recycle or not to recycle? How do we know? Look at a few kitchen and bathroom containers/packages and the labels you may find on them. Some can be confusing. Some have no labels on at all. This useful link shows a range of labels and what they mean, and if you scroll down it has a useful child-friendly video to watch. They also explain bathroom products on this page.

Post audit: Have a close look at the audit sheet from the week and the sample of recyclable and non-recyclable plastics.
*Are they surprised/shocked by how much rubbish is thrown away?
*Which types of plastics were most commonly thrown away?
*If you weighed your plastics, add up the total amount for the week. How do they feel?
*Now look closely at which plastics are single-use and try to categorise them into wrappers, food containers etc.

ACTIVITY TWO

Talking point: Q - Are there any changes we can make to reduce the daily/weekly amount of rubbish produced?
Recently, a report found only half of supermarket packaging can be recycled. Looking at packaging from the audit, how does that make them feel?

Keep going:

Role-play scenarios: Have a look at some of the role-play suggestions outlined on the next page. Read out the scenarios one at a time. You could take turns doing this. The other person can respond by thinking about:
*Where did the rubbish/debris come from, i.e. its source?
*What could have been done to prevent it from ending up in the marine environment?
*What behaviour change is needed to stop this happening?
*What is the impact of this scenario on the environment/marine life?

You may want to think of your own scenarios, perhaps from your own experiences.

Let's delve into the data!
Take a closer look at your results and have a go at presenting them mathematically. Consider the following idea to present and analyse:

Data idea 1:
* Using your results for the number of pieces of plastic thrown away each day, complete a tally chart and bar graph showing items thrown away for each day.
*Decide on a title for the chart and axes labels.

Underneath the bar chart, calculate and write:
*The total amount of items thrown away that week.
*The total/average number of items thrown away each month/over a year. *If you weighed the plastics, this can also be calculated and added.*

Or:
Data idea 2:

*Use your results to present a different tally chart and bar graph showing the numbers of different types/categories of plastics.
*Decide on a title for the chart and axes labels.

Underneath the bar chart, identify and write:
*The most and least common types of plastics.
*Identify any which are single-use. Is there a correlation/link between single-use plastics and the most or least common type thrown away?
*Identify those which can be recycled.

To finish:

Add any more ideas onto the 'learning journal.' There may be quite a lot to add this week!

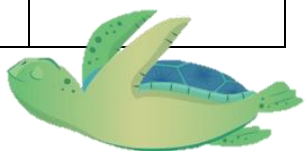
Full internet links https://www.recyclenow.com/recycling-knowledge/packaging-symbols-explained
https://www.recyclenow.com/recycling-knowledge/recycling-bathroom
https://www.telegraph.co.uk/news/2019/06/21/half-plastic-supermarket-packaging-cannot-recycled-survey-finds/

Resource 1:

Plastic awareness challenge

An audit of plastics in the home

Day	What plastic did you throw away?  e.g. cling film, straws, drinks bottles, fruit/vegetable tray, wrappers from food, cards, etc.	Number of items No matter how small!	Weight of plastic
Monday			
Tuesday			
Wednesday			
Thursday			
Friday			
Saturday			
Sunday			



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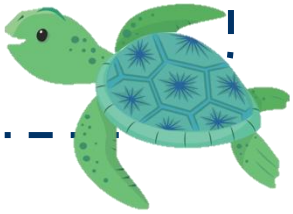
Resource 2:

Suggested role-play scenario ideas

A group of people have a picnic on the beach, leaving mixed food wrappers behind.

Cigarette stubs are discarded in the sand next to an empty packet.



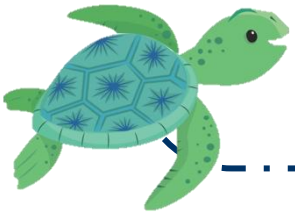
Facial wipes used to clean off make up are thrown down the toilet.

Cotton bud sticks made of plastic are flushed away after use.

Micro-beads from facial wash products wash down the drain in the water.

Lost ghost nets drift in the sea towards the rocky coastline.

Floats become separated from broken fishing lines.



A plastic water bottle is thrown through the window of a car near a local river.

Rubbish spills onto the ground from an overflowing bin in the town.

Sources in clockwise direction from top left:
Beach visitors/tourists; Sewage related debris; Fishing activity; Daily activities.

Perils of plastics in the ocean

ACTIVITY THREE

Overview:

This is a two-part activity where we begin by exploring more about the source and journey of marine debris. We go on to investigate the density of materials, what happens when they enter the ocean and their impact on marine animals.

New vocabulary:

marine debris, buoyancy, density, neutrally buoyant, float, sink, surface, benthic zone, pelagic zone, piscivore, omnivore, carnivore, ecosystem

Learning targets:

Explore and explain why materials float or sink
density of
Make predictions for an experiment
Consider the impacts of plastics on marine animals and relate it to feeding strategies and habitat

What you need:

large containers, the

plastics information sheet, samples of plastics, internet links, recording sheet

Activity description:

Let's talk:

What types of litter are found on our beaches and coast? Use this question to discuss their experiences and what they already know.
Have they experienced taking part in or know about beach cleans? Have a look at the results from the 2024 Marine Conservation Society 'Great British Beach Clean'
Look at the PDF report and discuss findings.
Q - How far do they think some of the debris had travelled? E.g. items that have been flushed down the toilet, carried by waterways (such as streams and rivers) or blown in off the street.

Moving on:

Part 1: Float or sink? Let's investigate:
Explain that when plastic enters the ocean, it will either float, sink or stay neutrally buoyant (remain at a certain depth without rising or sinking.) The density of materials will affect how buoyant they are. If plastic is denser than seawater, it will sink, if less dense it will float. If the density is the same as the seawater, it will remain neutrally buoyant.
We are going to use this investigation to consider how marine animals are affected by ocean plastics.

Collect a sample of plastic items that you have in and around the house. They may include:
Plastic bag
Empty plastic bottle with the lid on / Plastic bottle with the lid off
Straw
Cotton buds
Fishing net (or garden netting will have a similar result)
Plastic knives or forks
Sweet/crisp wrappers and packets
Empty food container
Old pen/felt tip

ACTIVITY THREE

Make predictions: If we place these items in water, which will sink, float or stay neutrally buoyant? Why? Write predictions in a simple table to record ideas.

Test it!? Using a large container of saltwater (big enough to submerge items in) test each item by submerging it and observing what happens. *If you have an empty bottle without a lid, squeeze it so that it fills with water.*
What happens? Record results.

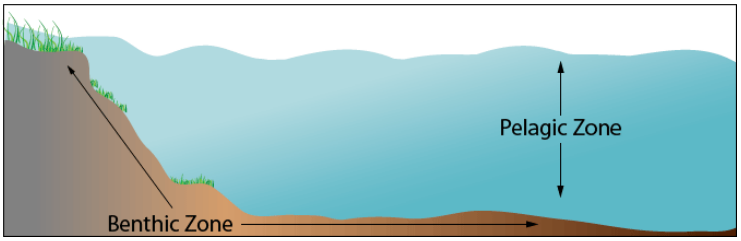
What did the results show?: Which floated? Which sank? Why? Why did the empty bottle with the lid on float? Which, if any, items sank? What does this mean about their density? Were their predictions mostly correct?
Q – What animals may be affected by the different items we have investigated? (*this will be investigated further in next activity)*

Room to extend: Test the same items in freshwater. Compare and explain the results.

Part 2: Delving deeper – Looking closely at marine wildlife

Remind yourselves of the impact of plastics on marine wildlife by reading this page from Kids National Geographic.

On a large sheet of paper, draw and a simplified diagram of the water column in the ocean to show the different zones: surface, pelagic and benthic zones.



Explain that marine animals will feed in different zones of the ocean. Some of these animals will also be land-based.

Now have a look at the information cards of animals and their feeding strategies and diet (cut the cards so they can be sorted separately)
You may want to take it in turns reading the information on each card. Sort them into animals which feed in each zone: surface, pelagic, benthic. Some may feed in more than two zones. If you have drawn it, you can place the cards in the correct zone on the picture.

Q's – Which types of plastics could affect each of the animals we have looked at? How and why? (for example, is it likely to become entangled or trapped, ingest plastics either directly or from eating another animal that has ingested plastics?)
Surface feeders such as the albatross and petrel can ingest floating plastic debris including bottle tops, straws and cotton buds. They can become entangled in fishing gear and lines. Pelagic feeders such as turtles ingest plastic bags and packets, mistaking it for food. Tiny zooplankton consume plastics that have broken down into **microplastics**. Fish that feed on zooplankton will then, in turn, be eating the microplastics consumed by the zooplankton, sea lions and penguins will eat the fish, and so on, showing how the plastic can be passed on through the food chain. Benthic feeders can also consume microplastics on which they graze or feed.

What may happen to the animal? If the animal is marine and land-based, how can marine plastics be transferred to terrestrial (land) ecosystems?

Birds that ingest plastics from the surface or pelagic zones return to nests to feed their chicks. The ingested plastics will form part of the food they regurgitate to feed them. They sometimes also use plastics as nest-building material.

Keep going:

Game for it? Design a game, for example, 'Turtle Race,' where players have to take their turtle on a journey through the ocean to arrive safely on the beach it nests on. They could use sets of 'danger' cards when players land on certain squares, making them go back x number of squares, etc. (dangers could be eating a floating plastic bag it thought was a jellyfish, fin entangled in plastic netting, confused in an area where tourists using jet skis, etc.) and 'getting ahead' cards that allow turtles to move x number of spaces forwards (such as a bloom of jellyfish allows them to eat well and have the energy to swim harder, strong ocean currents help them on their journey, etc.)

To finish:

Add any more ideas onto the 'learning journal.' There may be even more to add this week!

Terms and further information:

Buoyancy: In this case - the ability or tendency to be able to float on a liquid.
Density: The density of an object or substance is its mass divided by its volume. The more dense an object or substance is, the **heavier** it feels for its size.

Density of plastics in the marine environment

When plastics enter the marine environment, some of it will float, some will sink, and some will remain neutrally buoyant.
One factor that affects both buoyancy and position of plastic in the water column is its **density**. Density can be explained as the relation of a material's mass to its volume.
If marine plastics have a lighter density than seawater they will float, those that have a heavier density will sink.

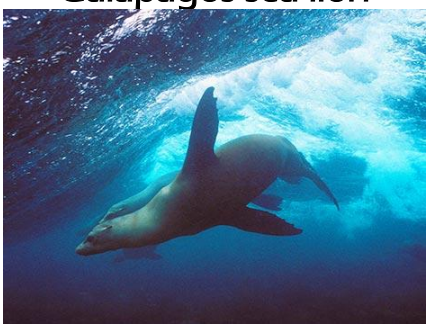
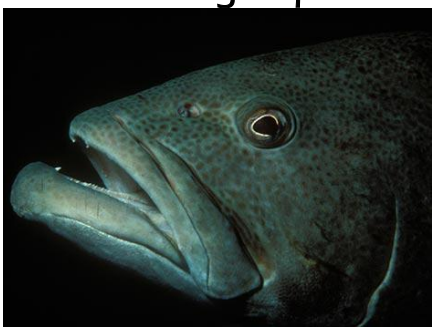
A comparison of the density of different plastic materials compared to seawater can be seen here: https://www.statista.com/statistics/595434/plastic-materials-density/

The density of saltwater is higher than freshwater, as the dissolved salts add to its mass. As objects float better on a denser surface, they will float better on seawater than freshwater.

Depending on their density and position within the water column, plastics will directly affect marine animals that feed and inhabit different zones.

Full internet links: Great British Beach Clean 2024: The results | Marine Conservation Society
https://kids.nationalgeographic.com/explore/nature/kids-vs-plastic/pollution/

Feeding strategies of animals

Galapagos sea lion  © Godfrey Merlin	**Feeding zone:** Mostly pelagic **Feeding strategy:** Catches prey with mouth while swimming **Diet:** Piscivore - mainly sardines but also other fish, octopus and crustaceans
Bacalao grouper  © Jack Stein Grove	**Feeding zone:** Pelagic and benthic **Feeding strategy:** Extends large mouth to rapidly consume prey. Can ambush attack **Diet:** Primarily a piscivore feeding on smaller fish, but also shrimps and crabs
Storm petrel  © Professor W.G. Hale	**Feeding zone:** Surface **Feeding strategy**: Flutters over the water surface, pattering its feet, wings held in a 'v' shape **Diet:** Piscivore - small fish, squid and zooplankton
Waved albatross  © David Horwell	**Feeding zone:** Surface **Feeding strategy:** Make shallow dives and can forage on the surface. Uses beak to catch prey **Diet:** Piscivore - fish, squid and crustaceans

Zooplankton  © Wikipedia	**Feeding zone:** Pelagic Feeding strategy: A range of strategies including filter, drifting and suspension feeding. Filter feeders use their legs to create a flow of water past their mouths, where they filter out food. Diet: Phytoplankton
Green sea urchin  © Simon Pierce	**Feeding zone**: Benthic **Feeding strategy:** Grazes with a unique jaw-like structure, where tips are extended from the mouth **Diet:** Omnivore - Algae and other marine plants, but will also feed on decomposing matter including fish
Sea cucumber  © flickr.com	**Feeding zone:** Benthic **Feeding strategy:** Feed with tube feet that surround their mouths **Diet:** Omnivore - Scavenge, feeding on algae, aquatic invertebrates and waste particles
Scalloped hammerhead shark  © GNP	**Feeding zone:** Pelagic and benthic **Feeding strategy:** Have electroreceptors on head which detect electric signals from prey. Can be seen on the seafloor, stalking prey **Diet:** Carnivore - fish, lobsters, shrimps, crabs, other sharks and stingrays

Galapagos green turtle  © Derek Haslam	**Feeding zone:** Pelagic **Feeding strategy:** Bite off food pieces and swallow them whole while grazing and swimming in the water column **Diet:** Omnivore - seaweed, seagrasses, algae, jellyfish, crayfish and crabs
Blue-footed booby  © Sally Wellman	**Feeding zone:** Surface and pelagic **Feeding strategy:** Dive into the water to feed, they can spot prey on the wing, plunging headfirst into the ocean from a height of up to 30 metres **Diet:** Piscivore - sardines, anchovies, mackerel and squid
Galapagos penguin  © Jonathan Green	**Feeding zone:** Pelagic **Feeding strategy:** Can swim at speeds up to 35 km per hour to catch prey in their beaks **Diet:** Piscivore - eats small fish and squid
Galapagos reef octopus  © inaturalist.org	**Feeding zone:** Benthic **Feeding strategy:** Prefer to feed at night, sometimes using jet-propelled movement to catch prey with its arms and suckers. Have a powerful 'beak' on their mouths **Diet:** Omnivore – mainly crustaceans, polychaete worms and other molluscs

A journey to the ocean

ACTIVITY FOUR

Overview:
Through the process of storytelling, students will demonstrate their understanding of the causes of marine pollution and its consequences. Their narrative about a chosen object will explore its 'life' from its source to destination and consider how behaviour change can prevent marine pollution.

New vocabulary:
journey, debris, source, behaviour, consequence, interaction, impact, action, solution

Learning targets:
Write a narrative/story of the journey of an object from its source to ultimate destination as an item of marine pollution.
Consider impact of actions and behaviour.

What you need:
object stimulus, paper
internet links

Activity description:
Let's talk:
Discuss and review prior learning and knowledge of marine pollution.
Key question: How does debris enter the marine environment?

Most enters by:
Debris discarded by people
Landfill sites
Through drainage/sewage systems
Fishing activities
Ships and other ocean vessels

N.B Consider your local area. If you live inland, away from coastal areas, you may want to talk about how debris ends up in the ocean. One way is through a water source such as a stream or river. Using an atlas, map, or internet search, find the nearest river to where you live and follow it from source to where it reaches the sea. This shows that even actions we take inland have consequences on our marine environment.
You may also want to check their understanding of how items that get washed down plugholes or flushed down the toilet actually end up in the ocean – why does this happen? What is the journey from sink to ocean?

Moving on:
Tell your story of a journey to the ocean:
Go back to the diary/audit you did at home. Review some of the items that would either go to landfill or to be recycled.
Explain that they will choose one of these items for their story to describe the journey of the object from their home to the ocean. By choosing the item for themselves, their story will take on more of a personal and creative feel.

ACTIVITY FOUR

To help plan and shape their narrative, they may want to think of the following points to start:
*Where do you think the object comes from and what is it made of?
*Who used the object and what was it used for?

Then use these points as a basis to develop their story, including the following:
Look at the questions below and think about each one as you begin to shape your plan. They could make some notes to help write your story. They don't need to answer the questions directly in the story but use them **as a guide** in their writing.

*How did the object reach the ocean?
*What human actions or behaviour led to the object becoming marine debris?
*If your object had contact with marine life, how would you describe this contact and what species do you think were involved?**
*What human actions or behaviour could have prevented the object from entering the ocean?
*What impact could the object have if it stays on the beach or in the ocean?

*** For example, ingestion by a marine animal, being transferred to a terrestrial environment for nest building or being fed to chicks. Perhaps it became entangled around or trapped an animal or became a surface on which marine life could grow. It may even have become a new home for an animal seeking shelter.*

Use the following stages to help plan and shape the story.

Their story can be presented as a cartoon strip with narrative or speech bubbles included for each section, or as a script with or without images.
It can be written in the third person or first person from the viewpoint of the object itself.
Facts that have been learned during their studies can be added on if chosen.

N.B You may want to watch this video with clever narration that tells the story of a plastic bag's journey to the ocean here for stimulus or read the story 'Somebody Swallowed Stanley,' by Sarah Roberts to help prompt ideas for your story. You can listen to the book being read here.

Keep going:

Share your creations:

Share your stories with us so we can celebrate your work with other students and schools and become a part of the voice against marine pollution.
Full internet links: https://www.youtube.com/watch?v=GLgh9h2ePYw
https://www.youtube.com/watch?v=LXxKz_IN3J0

Tick tock, tick tock... The lifespan of plastic

ACTIVITY FIVE

Overview:
In this session, we further explore the issue of plastic pollution by investigating the lifespan of plastic.
We set up an investigation and test our scientific skills and understanding to explain the results.

New vocabulary:
decompose, breakdown
landfill, fair test,
prediction, observation

Learning targets:
Understand the lifespan of plastic and its implications on the environment.
Use scientific skills to set up an experiment.
Analyse and explain the results.

What you need:
images and words on cards,
items for experiment,
accessible area for study,
line, pegs, internet links

Activity description:
Let's talk:
Tick tock, tick tock...How long does plastic last?
Have a look at some things we throw away either into compost bins, for landfill or recycling. Examples could include items such as a teabag, apple core, banana skin, newspaper page, plastic bag, plastic bottle, glass jar, tin can and so on.

Q – If all these ended up in landfill (or some in your compost heap) how long do they think they will remain there for? Will they always be there or will they decompose or break down? Check understanding of decompose:
Decompose: to decay, or to cause something to decay. Def: Cambridge Dictionary

Order them from the shortest decomposition times to the longest. This can be done by writing the items on paper or using the actual items to order. Do they have any idea how long it may take for each item? Have a guess and jot it down.
Q –Which materials did they think would take the longest to decompose or break down? Why would things such as fruit or vegetables take less time to decompose than other items that are man-made? (clue – natural or organic materials)

Share these examples. How do they feel about the lifespan times?:
Plastic bottles: 70-450 years
Plastic bag: 500-1000 years
Tin can: around 50 years
Leather shoes: 25-40 years
Cotton: 1-5 months
Milk packet (tetra) covers and drink packets: 5 years
Nylon clothes: 30-40 years
Glass bottles: 1,000,000 years
Hairspray bottle: 200-500 years
Glass bottle; 1-2 million years
Aluminium can: 200 years

Q – Why do most plastics not decompose?

This video on the lifecycle of a plastic bag may be useful to watch.

Moving on:

Let's get scientific and experiment!

Q – How can you design an experiment to compare decomposition times of materials? What do you need to consider?

For example:
In large containers of soil or an accessible part of the garden, they may want to bury items such as an apple core, vegetable peelings, tea bag, paper bag, plastic straw, single-use coffee cup and lid, plastic bottle, etc. Put wooden markers by each one to identify where it is.
It will take a few weeks for even the shortest-term items to begin to decompose but shows us how long things can last for in the environment, also how changes in conditions (e.g. rain) can make a difference. If possible, dig out **every one or two weeks until you wish to finish** and look at how items are or are not decomposing.

If you want to be super scientific use the following prompts to help plan your experiment:
The experiment can be carried out and recorded using prompts below or more simply by using some of the prompts as key discussion points as you go through the investigation.

Planning and questioning:

Investigation question – What are you trying to find out? What are you testing?

*What is a fair test? *In a fair test everything needs to be the same apart from the thing you are testing. In this case, the conditions for the test need to be the same, and only the object changes.*

*What variables are you going to change? *Or* What will you change?
The objects you are choosing to test to see how they decompose.

*What variables stay the same? *Or* What will you keep the same?
The place you choose to bury the items, the depth they are buried at, exposure to same weather conditions, similar size (as much as possible,) time buried for.

*What will you measure/observe?
Which objects are/are not starting to decompose. What is happening to them when they start decomposing? What can they see? How long does it take for this process to start?

*Your prediction – what will happen and why? Use scientific vocabulary to explain.

ACTIVITY FIVE

Exploration and investigation:

Make informal observations and exploratory notes /diagrams: Perhaps set it out in weekly or monthly observations?

What are you trying to find out?

How can you record our observations? Is there a scientific way of doing this?

What would happen if...?

Interpretation and evaluation:

What do your results show?

Have you answered the investigation question?

Are results what you had expected? Were your predictions correct?

Give reasons for the results using scientific language.

How can results be presented? Using a table, timeline of degradation images?

Could you improve the investigation? If so, how?

Is there a way to obtain more accurate results?

Why may time be a problem in this investigation?

Keep going:

Using your results or from more research, make an actual 'timeline' of decomposition times, using pictures or drawings of common items we throw away.
It could be set out as a 'washing line' images, perhaps using discarded fishing line and wooden pegs!

To finish:

Add any more ideas onto the 'learning journal.'

Full internet links: https://www.youtube.com/watch?v=wyQCFBIs_a8
https://science.howstuffworks.com/science-vs-myth/everyday-myths/how-long-does-it-take-for-plastics-to-biodegrade.htm

The 5 R's – Reduce, reuse, recycle, repurpose, rethink!

ACTIVITY SIX

Overview:
After working out our 'plastic footprint' this activity reminds us of the impacts of plastic pollution on the environment. We go on to explore how we can make a positive difference by incorporating the 5 R's into our daily lives and get creative by designing and repurposing plastic for another use.

New vocabulary:
reduce, reuse, recycle, repurpose, rethink.

Learning targets:
Consider how we can reduce the amount of plastic we use through changes in behaviour and choices we make.
Show understanding of the 5 R's.

What you need:
paper, materials for upcycling project, paper 'learning journal,' internet

Activity description:
Let's talk:

Q's to discuss: *What can we do to reduce the impact of plastics on the environment?*
What are, and why are single-use plastics so harmful to the environment?

Moving on:
Review what happens when plastic and debris gets into the environment and oceans.
You can use this video that explains the different 'journeys' of 3 plastic bottles from how they are made to their final destination (some of the language content is tricky, but the imagery helps explain the story)
Q - Which bottle has a better outcome for the environment?

Part 1: What are the 5 Rs?
Q - As well as recycling, what other things can we do?
What are the 5Rs? Reduce, reuse, recycle, repurpose, rethink!
Discuss and share ideas about each one. You may want to use these prompts to help:

*What items do we **recycle**?
*Where can we recycle them?
*What colour bins/containers are used for different items?

You may want to have a look at the Terracycle website and perhaps be amazed at the items you can recycle such as toothpaste tubes, cat food pouches, crisp packets and more.

*As well as recycling, what other things can we do? What items can we **reuse** and how? Do we have durable bags that we reuse for food shopping? Can clothes and materials be recycled for charity? Can we reuse postal packaging when we next send something? We will go on to explore this further later.
*What plastics can we **reduce** using? Think about single-use plastics (e.g. water bottles, coffee cups, food wrapping, plastic bags etc.)
*How can we **rethink** our plastic use? What actions can we take to reduce plastic pollution?

Think of 5 and make a promise:
Think of 5 behaviour changes that will make a difference in the amount of plastic they or your household use. The promise can be an individual or a shared one. Think about wording it in a positive way:
For example – **I will** carry my reusable drinks bottle with me and will stop buying single-use drinks in bottles.
I will carry a reusable straw and cutlery in my bag on trips out, so I don't have to use single-use plastics.

Make a promise poster to stick somewhere in the house or in a diary or workbook as a reminder. Maybe have a chart, so when each action has been completed 5 or 10 times there is a *'non-plastic'* reward!

Part 2: Design challenge - Repurpose some plastics!
Look through some of the plastics that are sent to be recycled in your household. Maybe they could choose an item they would like to design and repurpose or use the following for ideas:

*Design and repurpose household containers for plant pots, pencil holders, bird feeders, jewellery, etc

ACTIVITY SIX

*Use eco-friendly bought cotton bags, design and paint their own eco messages to stop the use of plastic bags (i.e. single-use plastics) for shopping.

Other ideas:
Make a recycled bird feeder with the RSPB
Make a cloche
Make a tyre planter using these fabulous ideas – maybe try and grow native wildflowers to attract pollinators.

Keep going:

Share your creations:
Share your repurposing creations with us to inspire others in how we can all make a difference to help reduce plastic pollution.
Use your products to sell at a local fair to raise money for a chosen charity.

To finish:

Add any more ideas onto the 'learning journal.' Perhaps sketching ideas and designs for the repurposing project or jotting ideas on other items we can recycle from home.
Share your journals with others and your personal achievements on our exploring ocean plastics journey.

We would love to share your work too, so please contact us at projects@gct.org

Full internet links: https://www.youtube.com/watch?v=_6xlNyWPpB8
https://www.terracycle.com/en-GB/brigades
https://www.rspb.org.uk/fun-and-learning/for-kids/games-and-activities/activities/make-a-recycled-bird-feeder/
https://www.gardengatemagazine.com/articles/how-to/plant/how-to-make-a-soda-bottle-cloche/

GLOSSARY OF TERMS

benthic zone: the zone or area at the bottom of freshwater or marine areas, in this case the bottom of the ocean.

buoyancy: the ability of something to float on a liquid. Some materials are more buoyant i.e. float better, than others.

carnivore: an animal that feeds on other animals.

decompose: when an organic material becomes rotten and breaks down.

density: density of an object or substance is its mass divided by its volume. The more dense an object or substance is, the **heavier** it feels for its size.

ecosystem: all the plants and animals that live in a particular area and the relationships between them and the environment.

ghost nets: fishing nets that have been lost or left in the ocean from fishing activity.

impact: a noticeable effect or influence.

landfill: a site where waste materials from human activity are buried.

marine debris: rubbish or litter in the ocean environment.

marine pollution: a combination of chemicals and debris that are washed or blown into the ocean. Most marine pollution comes from land sources.

neutrally buoyant: being able to stay at the same depth in the water without rising or sinking.

non-recyclable: materials that are not able to be recycled or made into other products.

omnivore: an animal that feeds on plants and other animals.

pelagic zone: the whole water column (or area) from below the surface down to the benthic zone.

piscivore: an animal that feeds on fish.

repurpose: to be able to change or adapt something for a different use.

recyclable: materials that can be used again, usually after being processed in some way, such as toilet paper and greetings cards made from recycled paper.

single-use plastics: plastics that are only used once, such as straws, coffee cups and food packaging.

source: a thing or place which something comes from.