



PRIMARY SCHOOL TEACHERS

Take 3 for the Sea

HANDBOOK



Primary School Teachers Handbook



This handbook has been developed to help Primary School teachers to explore marine litter, plastic pollution and single-use plastics with their classes. It provides information on the topics and suggests activities to carry out with your classes to further explore these.

Take 3 pieces of plastic with you when you leave

Take 3 for the sea is a simple idea: take three pieces of plastic or litter with you when you leave the beach, waterway or... anywhere! If you can't get to a beach, then a litter pick anywhere will help to improve your environment.



We enjoy our beaches all year round, not just in the summer. Some of the more remote beaches can be worst effected by litter; the more popular beaches get cleaned regularly by hard working community groups. Plastic pollution can not be ignored. It is time for each one of us to act by bringing three pieces of litter with us from the beach, stream, countryside or wherever you happen to be. Remember, all litter can eventually make its way to the sea, so any cleanup makes a change for the better.

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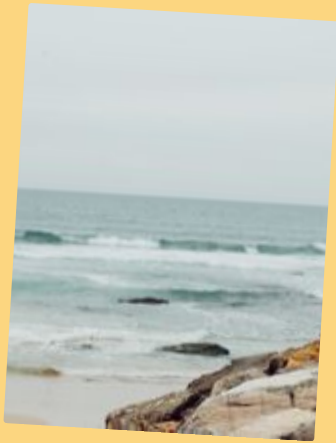
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Introduction



What is Take 3 for the sea?

Take 3 for the sea is a simple idea: take three pieces of plastic or litter with you when you leave the beach, waterway or... anywhere! If you can't get to a beach, then a litter pick anywhere will help to improve your environment.



You can share your efforts on social media using [#take3forthesea](#). Why not encourage your community to take part too? This is a global initiative so why not link with other communities around the world working towards a common goal?



A Big Beach Clean takes place around Ireland each year. In 2019 it takes place 20th - 22nd September. Join us in taking care of our marine environment.





The problem with plastic



Why focus on plastic?

Plastic pollution is plastic where it shouldn't be. Its in the sea and on the beach, causing harm. We are using plastic more than ever; its durable, cheap to make and useful. Current estimates suggest that 8 million pieces of plastic enter the oceans every day. Plastic pollution is killing wildlife and threatening our oceans.



Plastic is designed to last forever but is often used only once. Poorly managed plastic leaks into the sea. It is important to remember that the ocean is downhill from everywhere.



Over 8.3 billion tonnes of plastic has been made since its mass production began in the 1950s. Only 9% of this plastic has been recycled, the other 91% sits in landfill, floats in our oceans or has been burned.



We regularly use plastic in our everyday lives. Some plastics we can reuse or recycle but others are designed for only one use. In fact, more than 40 percent of plastic is used only once before it is thrown away, where it lingers in the environment for a long time.

Plastic often breaks down into smaller and smaller particles, called microplastics, which can be ingested by both animals and people.



We enjoy our beaches all year round, not just for the summer. Some of the more remote beaches can be worst effected by litter; the more popular beaches get cleaned regularly by hard working community groups such as Tidy Towns. Plastic pollution can not be ignored. It is time for each one of us to act by bringing three pieces of litter with us from the beach, stream, countryside or Greenway to work towards a plastic free coast, together. Always remember to be water safety conscious - check out <https://www.watersafety.ie/> for tips and advice before carrying out a clean up near water.

Fortunately, there are lots of little things that we can all do to help—like stop using plastic bags, straws, and bottles, recycling when we can, and disposing of waste properly.

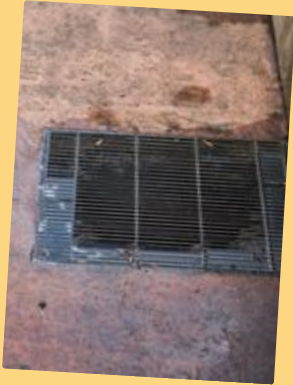
Did you know...

There is now one tonne of plastic for every person on Earth - over half of which has been produced in the last 13 years.

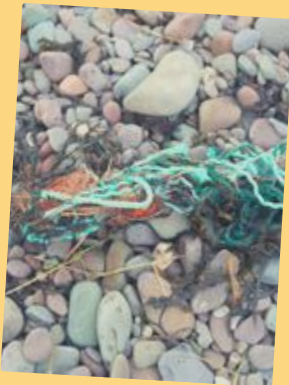


Sources of Marine Litter

Approximately 10 million tonnes of litter end up in the world's oceans and seas each year. It can include materials that are carried out to sea from land, rivers, drainage and sewerage systems, or the wind (European Commission, 2013). This is why it is so important to clean up any litter that has been dropped on the ground - it often makes its way into the sea.



THE TERM "MARINE LITTER" COVERS A RANGE OF MATERIALS WHICH HAVE BEEN DELIBERATELY DISCARDED, OR ACCIDENTALLY LOST ON SHORE OR AT SEA.



Plastics make up 80% of all marine litter from surface waters to deep-sea sediments (IUCN, 2018). The plastics that we see on our beaches is just a small part of marine litter. In fact, scientists estimate that 70% of marine litter is on the seabed, 15% is floating in the water column and just 15% is what we see on our beaches (OSPAR, 1995).



SOURCES OF MARINE LITTER



Image used courtesy of An Taisce's Clean Coasts programme

SOURCES OF OCEAN PLASTICS & MARINE LITTER

1. Litter dropped in towns and cities
2. Overflowing litter bins
3. Litter dropped at the beach
4. Poorly managed industrial waste discharges
5. Lost shipping containers
6. Lost/discharged fishing gear
7. Recreational litter blown by the wind
8. Poorly managed landfill sites
9. Microbeads from personal care products
10. Sewage related litter



The Effects of Plastic



Plastics make up 80% of all marine litter from surface water to deep-sea sediments (according to IUCN, 2018). What we find on our beaches is only the beginning of marine litter.



It is estimated that 70% of marine litter is on the seabed and so will never be seen. 15% is floating in the water column and 15% is what we find on our shores (according to OSPAR, 1995)

The solution to this global issue must begin at home! But don't forget to tell others what you are doing to make this change happen.



WHAT HAPPENS TO PLASTICS IN OUR OCEANS?

When plastic enters the ocean, it can easily be mistaken for food and eaten by a sea creature. Many animals mistakenly ingest plastic believing it to be a food source. This can cause injury, suffocation, starvation and often death. It can look, smell and move with the current like the food of many marine species. National Geographic have reported that 700 different marine species have ingested plastic.

Example:

For example, Curvier's beaked whales use echolocation to identify and locate objects to hunt. They travel to depths of three kilometres or more to feed. There is no daylight at this depth so they identify food by echolocation alone. Their natural food has an echo very similar to plastic bags.

Plastic lining from a disposable coffee cup





Case Study

40 kg of plastic found in whale's stomach

A dead whale was found in the Philippines with 40 kilograms of plastic in its stomach on Friday 16 March 2019. Scientists identified the cause of death as starvation and dehydration due to plastic.

The 40 kilograms of plastic content pulled from the stomach of the juvenile male Curvier's beaked whale consisted of plastic bags, rice sacks and shopping bags.

When an animal eats plastic its chances of survival go down immediately. When ingested, plastic can compact in the stomach, stopping the ability of real food to enter the animal's intestines. When plastic lines the stomach, it inhibits nutrient absorption and can contribute to fatality. Each one of us can make a difference to marine life by saying no to single-use plastics wherever possible.

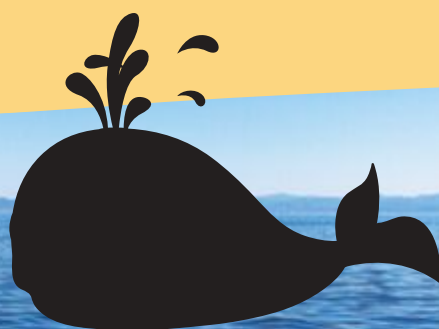
Activities:

- Explore how long plastics will last. Use the activity sheet on the following page to discuss how long plastics will last.
- Survey the classroom, school and homes for the types and number of plastic items used everyday. How many of these are reusable versus single use? This is a good opportunity to work on graphs, etc.
- Examine what other everyday items they reuse e.g. library books, bags, bottles, etc. Could they reuse more items?
- Discuss where plastic goes – landfill, incineration, recycling. What can be recycled?
- Put paper and plastic into a container filled with water and observe how both materials react over time; does one break down faster than the other?
- Examine the effects of plastics on animals:
<https://ourblueplanet.bbcearth.com/blog/?article=why-do-marine-animals-eat-plastic>
- Make posters to encourage recycling and also reusables in your school. Split your class into groups to create an action plan to reuse more plastics or reduce the dependence on plastics e.g. what can be reused, who can do this, when can it be achieved, etc.



Activities:

- Investigate ways to reuse plastics within your class, using prompts or group work, depending on your class's level.
- Host a debate between your classes or even neighbouring schools. Sample topics include 'we have reached peak plastic', 'it is not possible to ban plastics in Ireland' or 'a circular economy is the only way forward for Ireland'. Further debate topics and roles can be found at <https://www.sas.org.uk/wp-content/uploads/Debate-Role-Cards.pdf>
- Take a look at how your school recycles, composts and disposes of waste. Could you improve? Graph/illustrate what you do and make a plan to improve on it. If you already do everything you possibly could, celebrate this and tell others how to achieve the same standard!
- Encourage your class to research group projects on the effects of plastics in our oceans. Display these projects for your community or school to see. Projects could take the form of a short video, a presentation, art project, etc.
- The solution to this global issue must begin at home! But don't forget to tell others what you are doing to make this change happen.



How long will plastics last?



The Lifecycle of Plastics



Plastic bag
20 years



Coffee cup
30 years



Plastic straw
200 years



6-pack plastic rings
400 years



Plastic water bottle
450 years



Coffee pod
500 years



Plastic cup
450 years



Disposable diaper
500 years



Plastic toothbrush
500 years

Explore:

1. Ask your pupils to guess how long each item takes to break down before revealing the answer.
2. Science classes can download lessons plans about plastic from <http://sta.ie/lesson/the-life-of-plastics-from-cradle-to-grave>
3. Put paper, plastic and other materials into a container filled with water and observe how the different materials break down over time.
4. Senior classes can download the EPA's waste pack for secondary schools to learn more about sustainability
<http://epa.ie/pubs/reports/other/education/secondary/geography/> and also <http://epa.ie/researchandeducation/education/secondary/>

Case Studies



To cut through the enormity of the ocean pollution crisis, the simplest approach can be to focus on something recognisable within these images , for example a plastic bottle or coffee cup. Find one in an image and discuss with the class how it got there. Pupils will identify with images of animals and plastic, although it can be important not to show images that may distress them.

Examine the following case studies with your class to get more information about marine pollution.

- 1. Cigarette butts**
- 2. Single-use plastic bottles**
- 3. Disposable cups**
- 4. Microbeads**
- 5. Plastic Soup**



Cigarette butts

Cigarette related litter makes up 54.4% of all litter items nationally.

Cigarette butts are not biodegradable; in fact, it takes 12 years for a cigarette butt to break down.

The chemicals found in one cigarette butt can leach out and contaminate approximately 7.5 litres of water within one hour.

The Ocean Conservancy found that cigarette butts were a toplitter item found on beaches across 190 countries during their International Clean Up Day in September 2017.



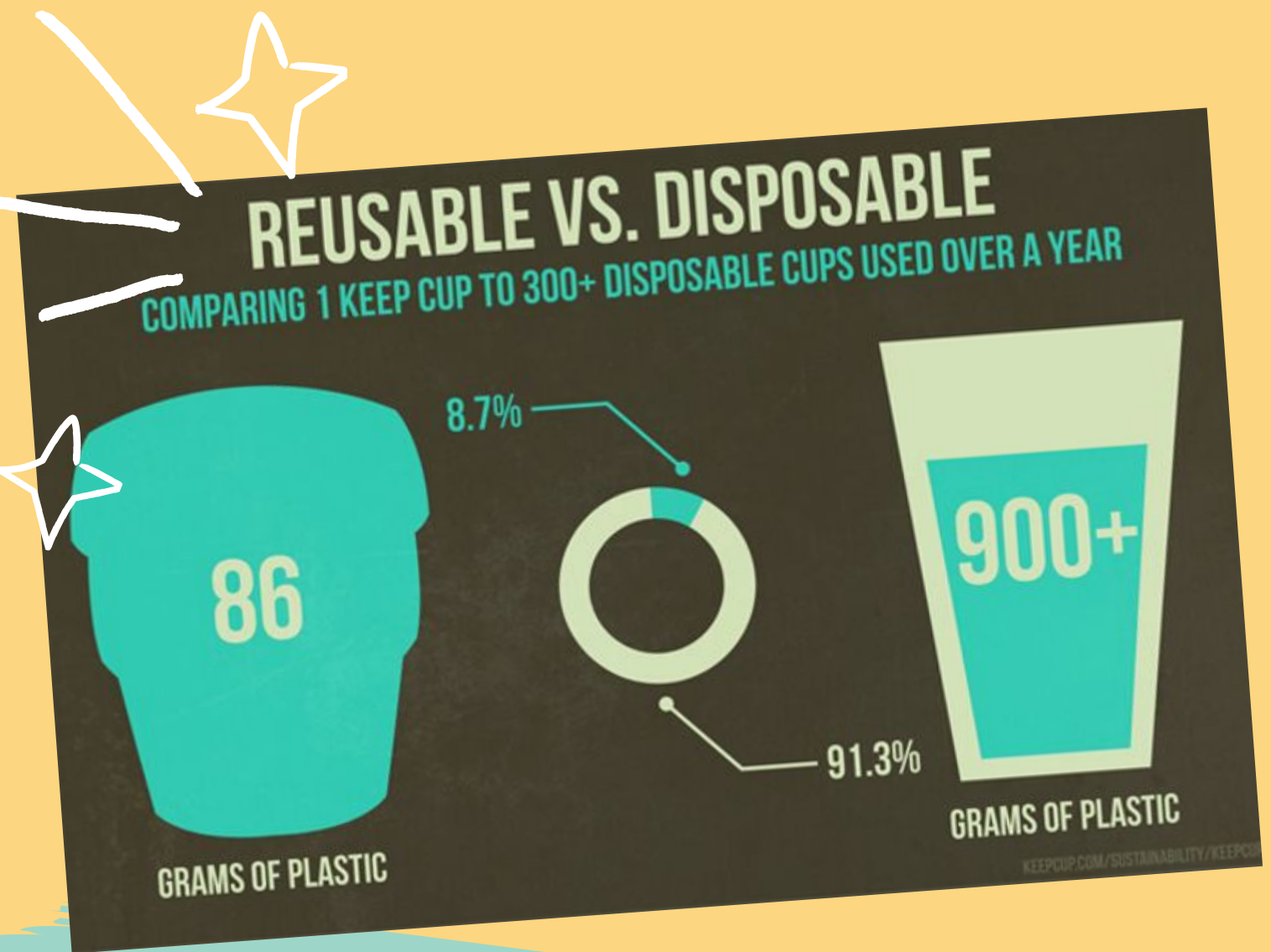
Single-use Plastic Bottles

The ocean is expected to contain 1 tonne of plastic for every 3 tonnes of fish by 2025, and by 2050, more plastics than fish by weight. About 8 million tonnes of plastic are thrown into the ocean annually.

Around 22 million plastic bottles are purchased in Ireland each week – roughly 5 bottles per person per week.

The likelihood of coral becoming diseased increases from 4% to 89% after coming in contact with marine plastic. Coral reefs are home to more than 25% of marine life. The average time for a plastic bottle to break down is at least 450 years, however it will break down to microplastics and never fully disappear.

Buy a reusable water bottle ... and use it! Say no to single use plastic? Think before you buy.
Rethink, Reduce, Reuse, Recycle



Disposable Cups

There is an estimated two million disposable cups a day in Ireland going into landfill. This works out at 22,000 every hour or 366 every minute. If stacked in a pyramid, this amount of cups would stand taller than the Spire on O'Connell Street in Dublin!

The cups are lined with plastic to make them waterproof but means that they can not be recycled

While there are recyclable and compostable cups on the market in Ireland, these can't be recycled or composted in Ireland due to the collection system in place. The reason for this is the mixed recyclables get sorted by machines which cannot differentiate between the various types of single use cups - they can end up in the paper stream and cause contamination. Compostable cups get sent to landfill if put in a composting bin as the composting centres can't be sure if the cup is compostable or not - there are lots of different types of disposable cups sold. Even if a cup is recyclable or compostable, these are still single use items using natural resources unsustainably and encouraging a make, take and throwaway lifestyle.

Choose to Reuse – Buy a reusable coffee cup and say goodbye to single use!



Microbeads

Microbeads are tiny particles of plastic. These are in face soaps, body washes, toothpastes, lip gloss and nail polish. Wastewater treatment facilities can't filter out microbeads and so they get discharged into waterways and oceans.

They do not biodegrade and persist for a very long time in the environment, with a half-life of hundreds of years. Sea creatures absorb or eat microbeads. These microbeads are passed along the marine food chain. Since we are ultimately at the top of this food chain, it is likely that we are also absorbing microbeads from the food we eat.

In Ireland, microbeads are set to be banned under a new government-backed bill approved by the Cabinet in July 2019. The Bill will look to restrict the manufacture, import, export or sale of certain products containing microbeads.

ACTIONS:

Discuss ways to overcome the microbead and how students and the school could take action on this.

To find out more about microbeads in Ireland, read about the Beat the Microbead on <https://cleancoasts.org/our-initiatives/beat-the-microbead/> or watch this video at <https://storyofstuff.org/blog/plastic-microbeads-ban-the-bead/>



Plastic Soup

PLASTIC CONCENTRATES IN 5 ROTATING CURRENTS CALLED GYRES.

Our plastic waste has created a gigantic “plastic soup” in the Pacific of up to 15 million square kilometres – almost the size of Russia. Over the next 10 years, the plastic soup could double in size. At this speed, the plastic grows as much as 8 football fields every second.

In the plastic soup there are 60 pounds of plastic at the ocean surface to every one pound of plankton. Over the last ten years we have produced more plastic than during the whole of the last century. One million sea birds and 100,000 marine mammals are killed annually from plastic in our oceans.

It is important to highlight this issue as a means of emphasising that plastic litter in Ireland is a problem for and effects the entire world.

Image used courtesy of An Taisce's Clean Coasts programme

Think Before You Flush



Think Before You Flush is a campaign aimed at raising awareness about the problem sanitary products and other items can cause in our marine environment if they are flushed down the toilet. The campaign is operated by An Taisce's Clean Coasts programme.

When the right things are flushed down a toilet, they start a journey through our wastewater treatment network travelling along pipes to a treatment plant where the waste is taken out and the water is treated and returned to rivers and the sea.

But when items that should be put in a bin are flushed down the toilet instead, they cause problems in our homes, in the wastewater treatment network and at the wastewater treatment plant. These items can block pipes and some even end up in our seas and beaches.

Items commonly found on beaches and in our sea include wipes, cotton buds, sanitary products and nappies. All of these items should be put in the bin, even wipes that claim to be suitable to be flushed down the toilet.

For experiments, videos and more information about this topic, visit <https://thinkbeforeyouflush.org/resource-library/>

Images used courtesy of An Taisce's Clean Coasts programme

Solutions

- what can we do?



THERE ARE A NUMBER OF SIMPLE ACTIONS THAT WE CAN TAKE TO MAKE A DIFFERENCE AND HELP TO SOLVE THE PROBLEM OF MARINE LITTER.

1. Take the Take 3 for the Sea pledge today, either as a class group or with your entire school. You can do this at www.waterfordcouncil.ie and a personalised certificate will be sent to you. You can share this pledge with others on your school website, newsletter or social media using the following: I pledge to pick up (at least!) 3 pieces of litter every time I visit the beach or riverbank #Take3forthesea
2. Choose to use reusables whenever possible. Scientists and explorers agree that limiting or eliminating our use of disposable plastics and increasing our use of reusable items will be the best way to clean up our oceans.
 - a. Talk to your class about what they could reuse. For example, many of them may already bring a reusable water bottle to school - can they refill it in school? Do they use it outside school, for sports activities, etc? Do they use a lunchbox or clingfilm and tinfoil? Or maybe both a lunchbox and cling film/tinfoil also?
 - b. If a pupil names something that they don't reuse, discuss whether there is an alternative to this item.
 - c. Encourage them to look at home also. Ask the class to make a list of all the items that they reuse.
 - d. Discuss how many uses an item can have e.g. an insulated bottle can be used for both hot and cold drinks, a reusable cup can be used for water, soup or even ice cream!

INCREASING OUR USE OF REUSABLE ITEMS WILL BE THE BEST WAY TO CLEAN UP OUR OCEANS

What can we do contd.



3. Take part in or organise a cleanup. Many groups already carry out regular clean ups of their area; you may choose to get involved in one of these, or organise your own, whether informally or advertised. The Big Beach Clean takes place across Ireland 20th - 22nd September 2019. Why not take part in it this year? Always remember to be water safety conscious - check out <https://www.watersafety.ie/> for tips and advice before carrying out a clean up near water.

4. Borrow items - most children are familiar with borrowing books and DVDs from the library. Use this as an example of how useful it can be to borrow something that will only be used once/infrequently. What other items do they borrow from an organisation, business or friend? Discuss the benefits of buying second hand.

5. Encourage your local community and businesses to come on board also. For example:

- a. a local business might help by signing up to [Refill.ie](https://refill.ie) and pledge to refill a water bottle free of charge when asked. There are over 850 businesses who have signed up to this in Ireland. This avoids buying unnecessary (single use) plastic drinking water bottle waste, thus helping our environment our health and our pockets at the same time. Find out more about this and how to get a business involved at <https://refill.ie/get-involved>
- b. Invest in a reusable cup and encourage friends/family to do the same. Ask your local cafes to join the Conscious Cup Campaign; you could begin by asking if they give a discount when using your reusable cup. To find out more and get a letter to give to the cafe manager, see <https://consciouscup.ie/resources/individuals.php>

WHY NOT TAKE A PLEDGE AS A COMMUNITY TO CUT OUT
DISPOSABLE CUPS, BOTTLES OR EVEN SINGLE USE PLASTICS?

What can we do contd.



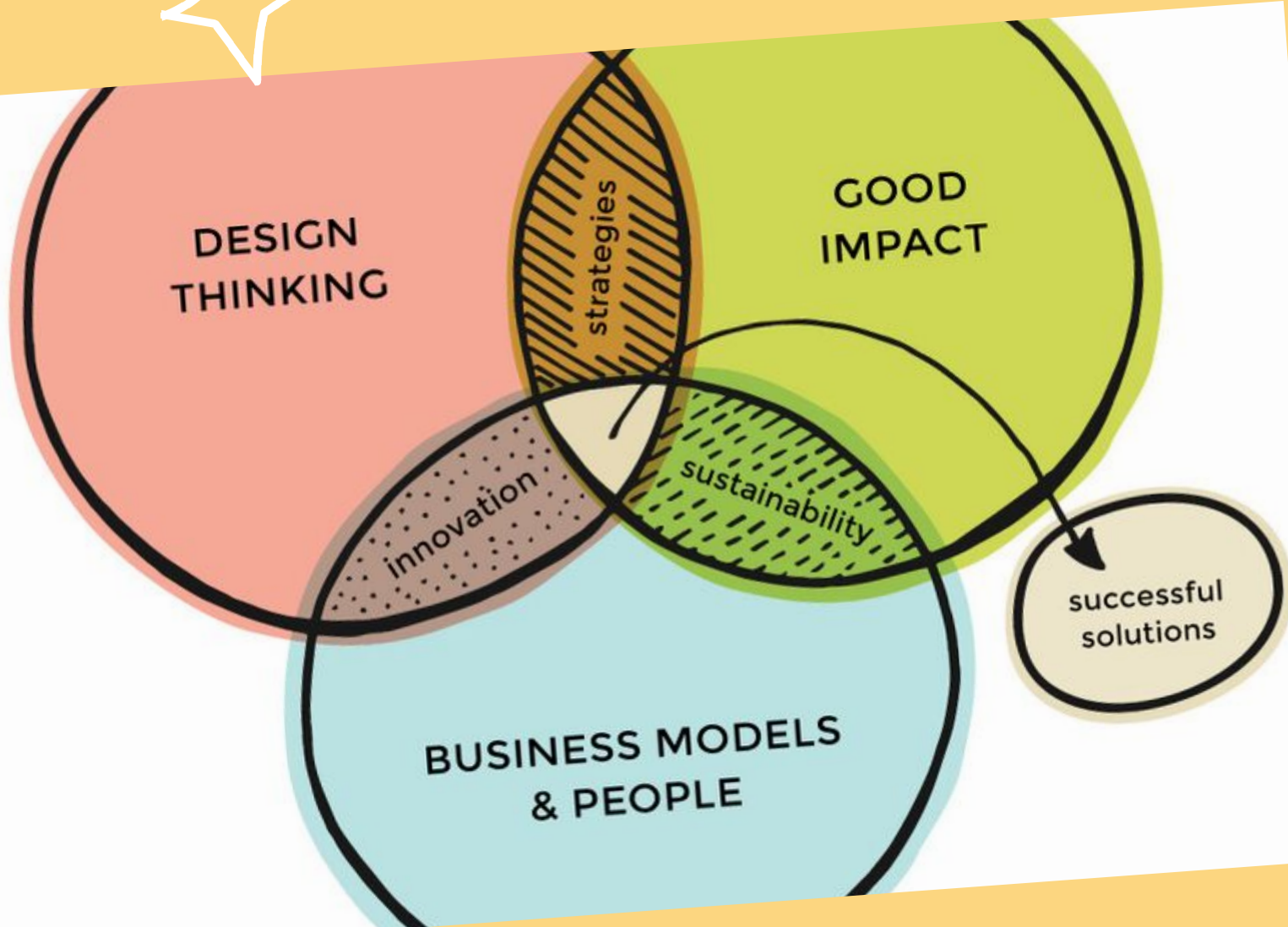
6. Prevent waste whenever possible. As we saw with the case studies on plastic bottles and coffee cups, if the waste is not created in the first instance, there is no waste or litter problem.

7. Assign a week or month in your school to raise awareness about this issue. For example you could hold a talent show around it, theme art projects around it, etc. These could be displayed at open nights, parent-teacher meetings, etc. Explore the EPA's waste pack for primary schools for lesson plans, ideas, etc. to learn more about this <https://www.epa.ie/pubs/reports/other/education/primary/waste/>

8. Arrange for Waterford City & County Council's Environmental Awareness Officer to come to speak to your class about waste preventions and marine litter by phoning 0761 10 10 20.

9. Spread the word in your community; ask local libraries to display artwork, work with local businesses and shops to display anti litter/single use plastic information and posters, etc. The solution to this global issue must begin at home! But don't forget to tell others what you are doing to make this change happen.

WORK AS A CLASS AND WITH YOUR ENTIRE SCHOOL TO CREATE A
WHOLE SCHOOL ACTION PROJECT



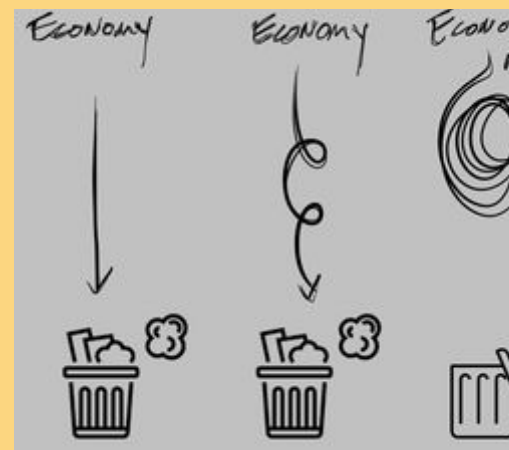
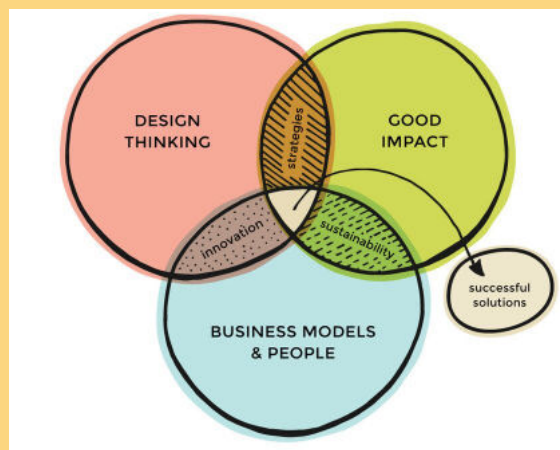
Discussion for senior classes: *A circular economy*

Demand for plastic grew from its low cost and durability but is a serious threat to the natural environment. Plastic production from new, finite resources like oil and gas must decrease if we are to protect our oceans and wildlife. We need to reassess our relationship with plastic. If plastic is to be used, it must fit within a circular economy model.

The circular economy (opposed to the current 'take-make-dispose' linear model) is modelled on nature, so that there is no such thing as waste; it is renewable and regenerative by design. Materials (like plastics and metals) are recovered to create new materials while biological nutrients (like food waste) are processed to regenerate agricultural and natural systems. The circular economy model embraces renewable energy and represents an exciting blueprint for the future where waste and pollution become a thing of the past.

CIRCULAR ECONOMY

Will our current method of consumption sustain the planet in the near future?



ASK YOUR CLASS HOW THE CURRENT SYSTEM CAN CHANGE TO BECOME A WORKING CIRCULAR ECONOMY. WHAT WOULD *THEY* CHANGE?

The circular economy encourages the waste of an industry to be recycled as raw material by another industry or the same. Its objective is to produce goods and services while strongly limiting

- the consumption and waste of raw materials and
- non-renewable sources of energy.

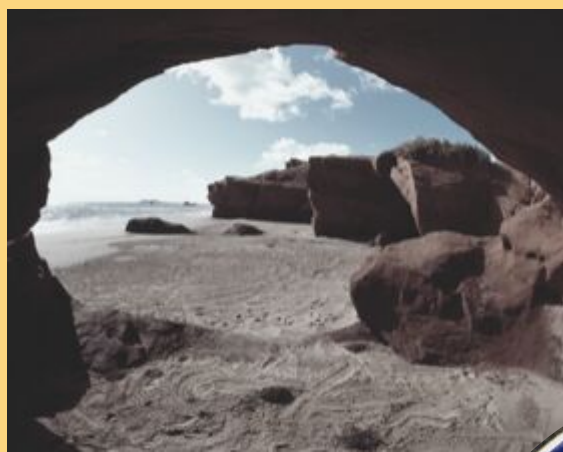
One of the main arguments in favour of a circular economy is that achieving a sustainable world can be as profitable as linear models and allow consumers to keep enjoying similar products and services. To achieve models that are economically and environmentally sustainable, the circular economy focuses on areas such as design thinking, systems thinking, product life extension, and recycling.

Videos that may help explain this to your class:

<https://youtu.be/9GorqroigqM> The Story of Stuff project explains Circular Economy

<https://youtu.be/zCRKvDyyHmI> Ellen MacArthur Foundation's Re-thinking Progress: The Circular Economy

<https://youtu.be/M125Vonn844> EU Environments video explaining Circular Economy



Take 3 for the Sea passport



Encourage your class to visit all of Waterford's Take 3 for the Sea locations - all Blue Flag beaches and Green Coasts in County Waterford will have one of these plaques erected. Once they have taken three pieces of litter from a beach, they can tick this location off the 'passport' on the next page.

Take 3 for the Sea Passport

Waterford's Blue Flag Beaches 2019



Ardmore



Clonea



Councillors Strand,
Dunmore



Main beach,
Dunmore



Tramore

Waterford's Green Coast Beaches 2019



Annestown



Ballyquin



Curragh



Goat Island



Guillamene



Newtown Cove

Further Information

USE THE FOLLOWING LINKS TO FURTHER EXPLORE THESE TOPICS AND LOOK AT CASE STUDIES.

ENCOURAGE YOUR CLASS TO THINK OF IT AS A GLOBAL ISSUE::

- Visit the EPA's website to download their pack of primary school educational resources developed to encourage your students to think about waste in Ireland and how we can all contribute to reducing the amount we dispose of.
<https://www.epa.ie/pubs/reports/other/education/primary/waste/>
- Take a look at the Blue Flag beaches around Ireland at <https://beachawards.ie/wp-content/uploads/2019/05/Blue-Flag-2019-Ireland-Map.pdf>
- Students will enjoy looking at the subject through the eyes of others e.g. surfers, etc.
<https://plasticoceans.org/films/>
- The BBC's Blue Planet website has interesting information about marine pollution with fantastic photos and videos
<https://ourblueplanet.bbcearth.com/blog/?article=why-do-marine-animals-eat-plastic>
- Visit <https://www.take3.org/> to learn more about the Take 3 for the Sea campaign globally



Further Information



- The Plastic Oceans website contains good information and a 37 page educational guide for schools
<https://plasticoceans.org/the-facts/>
- Senior classes will learn a lot from the simple animated stories at <https://storyofstuff.org/> The Story of Stuff Project's journey began with a 20-minute online movie about the way we make, use and throw away all the Stuff in our lives. It tackles everything from the story of plastics and the story of microbeads to the story of solutions.
- The Surfers against sewage website gives information about their work to create cleaner beaches and seas. It contains information and actions for a plastic free school: <https://www.sas.org.uk/>
- National Geographic has written some articles with interesting points of view. Begin with this article on reusable cutlery and this one on the true harm plastics are doing before reading others:
<https://www.nationalgeographic.com/environment/2019/06/carrying-your-own-fork-spoon-help-plastic-crisis/> and also
<https://blog.nationalgeographic.org/2016/04/04/pesky-plastic-the-true-harm-of-microplastics-in-the-oceans/>
- The Ellen MacArthur Foundation has lots of easy to read information on the circular economy
<https://www.ellenmacarthurfoundation.org/>



Acknowledgements



Waterford City and County Council would like to thank the EPA and Clean Coast Ireland for their kind permission to use their images and information in this booklet. We would also like to recognise the work that so many individuals, groups and schools already undertake to keep our beautiful coast litter free.