
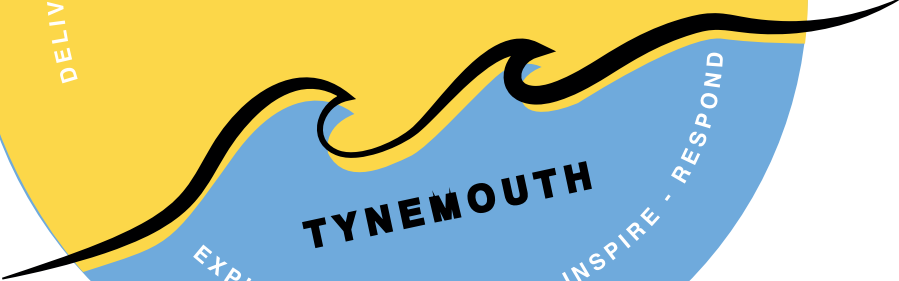


DELIVERED BY SURFERS AGAINST SEWAGE REGIONAL REPRESENTATIVES



**SURFERS  
AGAINST  
SEWAGE**

# OCEAN SCHOOL



**TYNEMOUTH**

EXPLORE - INVESTIGATE - INSPIRE - RESPOND



# WHY OCEAN SCHOOL?

Plastic pollution has sadly become synonymous with any coastal activity, from surfing to swimming, beach holidays to wildlife watching – it is simply an expected part of our experience.

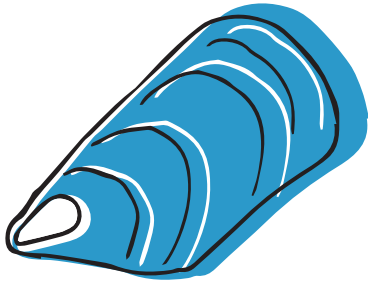
This is why marine plastic pollution, and specifically tackling society's throwaway, excessive or unnecessary plastic culture is now Surfers Against Sewage's top priority.

Plastic pollution is an issue that connects the environment with all parts of society, and is something that we can take action on at every level. Indeed, it will only be through concrete, collective, positive action that we will be able to catalyse the shift that is needed to stop the flood of plastic pollution from overwhelming our world.

**In response to this necessity we are proud to present Ocean School...**



# WELCOME TO OCEAN SCHOOL



Ocean School invites teachers and students to the greatest classroom on earth! A place that fills us with wonder every time we visit and like every great teacher, it inspires and empowers us to look beyond the horizon and take stewardship of our ocean.

Our beaches provide a stimulating and inspiring environment to learn in.

From interactive biology in the mini-ecosystems (that are presented in wonderful 3D in rock pools) to the simple, yet vital citizenship lessons in hard work and collective action.

Our beaches and oceans provide glorious, sometimes challenging real-life examples of many subjects in the national curriculum.



## HOW TO USE YOUR OCEAN SCHOOL TEACHERS PACK

Each card in this pack represents a different segment of your Ocean School Session.

Ocean School was designed with outdoor learning in mind. However each activity can be adapted to work in the classroom.

*“Outdoor and environmental education research suggests that educational experiences in outdoor settings can be significant in developing environmental sensitivity and knowledge.”*

**Dr. Alison Lugg (2007).**

# PLASTIC FREE COASTLINES



## THE FACTS

Plastic pollution can now be found on every beach in the world.

Scientists have recently discovered microplastics embedded in the Arctic ice.

In 1950, the world's population of 2.5 billion produced 1.5 million TONNES of plastic.

In 2016, a global population of more than 7 billion people produced over 320 million TONNES of plastic. This is set to double by 2034.

Every day approximately 15 million pieces of plastic and their way into our oceans.

There is an estimated 5.25 trillion macro and microplastic pieces floating in the open ocean, weighing up to 269,000 TONNES.

Plastics consistently make up 60 to 90% of all marine debris studied.

Approximately 5000 items of marine plastic pollution are found per mile of beach in the UK.

Over 200 plastic bottles litter each mile of UK beaches.

Recent studies have revealed marine plastic pollution in 100% of marine turtles, 59% of whales, 36% of seals and 40% of sea bird species examined.

100,000 marine mammals and 1 million sea birds are killed by marine plastic pollution annually.

# BEACH CLEAN



## REMEMBER

EVERY ACTION WE TAKE,  
HOWEVER SMALL, HAS AN  
IMPACT. EVERY PIECE OF  
PLASTIC POLLUTION WE  
REMOVE IS A VICTORY IN OUR  
BATTLE TO CREATE  
PLASTIC FREE COASTLINES.

Beach Cleans are an integral part of what we do at Surfers Against Sewage. Simply by grabbing a pair of gloves and heading down to our nearest beach clean we are united in taking simple, positive steps towards Plastic Free Coastlines together. What's more, the very fact that many thousands of people are happy to donate their precious time to help protect their beaches sends an incredibly powerful and positive message of collective responsibility!

They are also loads of fun! Who wouldn't want to spend the day on the beach with like minded people?

### STEP ONE

Pick a beach to run your beach clean on. All beaches need help, so maybe just choose your favourite.

### STEP TWO

Contact us on [beachcleans@sas.org.uk](mailto:beachcleans@sas.org.uk) with your chosen beach, date of clean and number of pupils attending.

### STEP THREE

We will then support you through the simple planning process and send out your SAS School Beach Clean Kit.

### STEP FOUR

HAVE FUN and let us know how your Beach Clean went!

# OCEAN PLASTIC SURVEYING & SORTING



## FACT!

**OVER THE LAST 15 YEARS  
THE AMOUNT OF PLASTIC  
POLLUTION WASHING UP ON  
UK BEACHES HAS ALMOST  
DOUBLED**

## INVESTIGATING AN ECOSYSTEM

It would be impossible to count all of the plastic pollutants on a beach, so today we will work together to take a sample. Using a tool called a quadrat, we will mark out an area on the beach and start investigating!

## HOW TO SET UP YOUR QUADRAT

If you do not have a set of quadrats in your school you can make your own using sticks and string. Alternatively, if you are at the beach you can draw a quadrat into the sand for pupils to begin their investigations.

## POINTS OF DISCUSSION

How many colours can we see within the quadrat?  
How many textures can we feel within the quadrat?  
Discuss how man-made materials, found within the quadrat, may have arrived at the beach

## WANT TO INVESTIGATE FURTHER, HERE'S HOW;

Why not use sieves to survey the top layer of sand?

Discuss the items left in the sieve.

How have the items made their way to the beach?

### MATERIALS NEEDED

1x length of string (why not try to use discarded fishing net?)  
4x sticks (driftwood?)  
1x sieve  
1x pen & paper to record your findings

### LEARNING OUTCOMES

How organisms affect and are affected by their environment

Taking measurements, using a range of scientific equipment.

# OCEAN PLASTIC SURVEYING & SORTING PART 2



## RECORDING AND REPORTING OUR RESULTS

Recording and reporting our findings is crucial when observing an environment or habitat. The beach provides us with a blank canvas to record our findings in an interactive and memorable way.

## NATURAL V NON- NATURAL PIE CHART

At the beach, sort the natural and non-natural items into a circle drawn into the sand.

*Points of discussion*

*How do man-made items make their way to the beach?*

*What might man-made items be mistaken for?*

*How long does plastic last in the marine environment?*

## ITEM BAR CHART

How many bottles did we find?  
How many green bottles did we find?  
Create a bar chart using the items found on the beach.

A visual representation of pollutants on your beach or in your school playground.

*Points of discussion*

*What was the most common beach clean find?*

## VENN DIAGRAM

An interactive way of identifying and sorting different shapes and colours. Label each circle with an item that pupils should place inside e.g: red / circular / rough. If a student finds a red, rough and circular item it would be placed in the centre.

*Points of discussion*

*Discovering textures / shapes & colour.*

## LEARNING OUTCOMES:

Taking measurements using a range of scientific equipment.

Using test results to make predictions.

Understand how human and physical processes interact to influence and change landscapes, environments and the climate.

# ROCKPOOL INVESTIGATION

Rockpools provide us with a fantastic opportunity to explore coastal habitats up close. Not only does it provide many learning opportunities, it is an inspiring part of each session that allows students to discover the wonders of nature by themselves, nurturing their own sense of responsibility.

## WHAT IS A HABITAT?

The place where an animal lives is known as a habitat. Different animals live in different habitats. Remember, your house is your habitat!

### Points of discussion - Habitats

*What is a habitat?*

*What is the biggest / smallest habitat you can think of?*

*The effect humans might have on these habitats*

## CHANGES IN A ROCKPOOL HABITAT

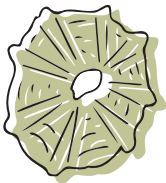
A rockpool habitat goes through regular, daily and seasonal changes. From changes in light and heat to water level changes rockpool inhabitants have to be very adaptable.

### Points of discussion

*How will the tide change a rockpool habitat?*

*What differences can you and in the different rockpools across the beach?*

*What effect might plastic pollution have on these rockpools?*



## BENEATH THE WATER

What can we see when we delve under the water? Every rockpool is unique and gives us an opportunity to explore habitats in our environment.

### Points of discussion - In the rockpool

*How many colours can you see?*

*How many different plants and animals can you see?*

*Investigate different parts of a rockpool (explore underneath the seaweed, why would animals choose to live here?)*

*What will change in each rockpool during the day? (this is a great opportunity to introduce tides)*



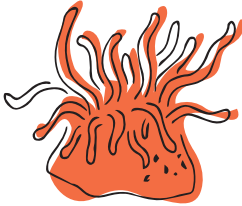
## LEARNING OUTCOMES:

Identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals.

Identify and name a variety of plants and animals in their habitat

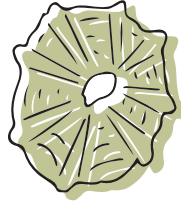


# ROCKPOOL EXPLORATION



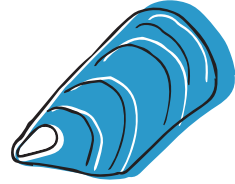
## BEADLET ANEMONES

FACT: The beadlet anemone will grow to 7cm high!



## LIMPET

FACT: Limpets teeth consist of the strongest biological material ever tested.



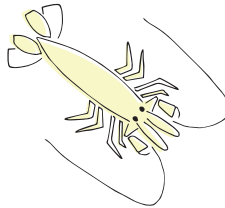
## MUSSEL

FACT: Mussels have beards! They grow a hair-like substance to attach themselves to rocks.



## BARNACLE

FACT: A barnacle has a lifespan of just 5 to 10 years.



## SHRIMP

FACT: There are over 128 species of shrimp!



## SEA LETTUCE

FACT: Sea lettuce makes its own food by photosynthesis.



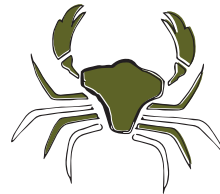
## BLENNY

FACT: A blenny is capable of living out of water for many hours.



## STARFISH

FACT: Starfish have eye spots at the end of each arm.



## CRAB

FACT: Crabs have an external skeleton called an 'exoskeleton'.

# FOODWEB CHALLENGE

## WHO EATS WHO?

The Foodweb Challenge is an immersive game that introduces students to the concept of food webs. Simply by playing the game and following the steps up the 'food pyramid', the students will create their very own, complex marine food web. Understanding and valuing what constitutes healthy, sustainable marine ecosystems is vital if we are to learn to protect them.

### Points of discussion *Untangling our (food) web*

Who eats who?

What is this process called?

What is an ecosystem?

What plants and animals live in a marine ecosystem?

Where do we (humans) fit in?

What happens if we take too much?

What happens when pollutants enter the ecosystem and food web?

### MARINE FOOD WEB

From microscopic to absolutely massive, these are just a tiny few examples of the vast array of life in our seas. *(Kids Clue - Try to remember those that are highlighted for the game!)*

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**PLANKTON** - Phyto and Zoo

Filter Feeders - **LIMPETS** – Mussels – Anemones - Whales!

Small Fish & Crustaceans - **BLENNY FISH** and Sand Eels – **KRILL**, Shrimps and Prawns

Big Fish - Mackerel - Cod - **TUNA**

Gulls - **HERRING GULL** - Kittiwake

Fulmars - North Sea Fulmar

Turtles - Leatherback

Seals - **GREY SEAL**

Sharks - Basking - **GREAT WHITE** - Dog fish

Whales - **BLUE WHALE**

# FOODWEB CHALLENGE

—  
LET'S  
EAT!

## HOW TO PLAY

Who knows how to play 'Rock - Paper - Scissors'? *Practice together*

Who can do the impression of a.....  
Plankton > Blue Whale? *Practice together*

## AIM

To get the top of the Food Pyramid of course! – Surely that's the most important thing, isn't it?!

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## LET'S GET STARTED

**SPLASH 1:** Everyone starts as plankton.

**SPLASH 2:** Find someone who is the same animal as you, say hello and make your animal's noise and action.

**SPLASH 3:** Challenge them to a Food Web Rock-Paper-Scissors duel.

*The winner moves 'up' the food pyramid to become the next organism.*

**SPLASH 4:** Both winner and loser must then swim away to find someone who is the same as them.

**SPLASH 5:** Repeat the process all the way to the top of the food web.

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## YOU'VE REACHED THE TOP OF THE FOOD PYRAMID!

### PAUSE

Numbers – How many of each organism does there need to be for an ecosystem to be sustainable? Connectivity - Every plant and animal (including us) is connected by what we eat.

### REPLAY

Try the game again with a Blue Whale, Humans and Plastic Pollution in the mix. Try removing Plankton or Krill from the ecosystem.

### REFLECT

Responsibility - What we as humans produce and the consequences of neglectful consumption/waste. Remember our Aim? - Does being at the 'top' of the food pyramid mean we're safe, that we're invincible?

# WHAT IS A CIRCULAR ECONOMY?



A circular economy is an alternative to a traditional linear economy, **MAKE > USE > DISPOSE**, in which we keep resources in use for as long as possible, extract the maximum value from them whilst in use, then recover and regenerate products and materials at the end of each service life.

## *Points of discussion*

What does the word economy mean to you?

Who can name a linear economy product or process?

Who can name a circular economy product or process?

Why is a circular economy important?

Plastic pollution is an issue that connects the environment with all parts of society, by creating a circular economy we stand a chance of stopping unnecessary plastics escaping into the environment and polluting the places we love.

The circular ocean economy wheel is a great tool for beginning a discussion about how to change items from being single-use items to becoming part of a circular economy.

## LEARNING OUTCOMES:

What improves and harms a pupil's local, natural and built environments.

To resolve differences by looking at alternatives, making decisions and explaining choices.

To recognise the role of voluntary, community and pressure groups.

# IT'S TIME TO TALK SOLUTIONS!

Using our imagination we are going to do some positive problem solving.

## **STEP 1:** Re-imagining Plastic Pollution

*"I am not a plastic bottle I am a ..... microphone!"*

**HOW TO BEGIN:** Form a circle with your students and pick up an item that the students found on the beach clean, e.g. plastic bottle.

*"Now we need to use our imaginations! We will pass the bottle around the circle and re-imagine it as something else. I am not a plastic bottle, I am a .... telescope, I am not a carrier bag, I am a ... jelly fish.*

Once the bottle has returned to you ask the students why we asked you to do this: Answers Single - use is no use!



## ACTIVITY 2

**AT THE BEACH:** Students will enter the giant, interactive, sandy circular economy diagram \* *fig 1. In research teams, students will discuss and propose potential solutions to the plastic pollution problem at each stage of the circular ocean economy.*

**AT SCHOOL:** Using chalk students will draw out a giant, circular ocean economy diagram. In research teams students will discuss and propose potential solutions to the plastic pollution problem at each stage of the circular ocean economy.

### **MATERIALS NEEDED:**

- 1 x rake
- 1 x chalk
- 6 x tubs (these will represent the six different steps in the circular ocean economy)

### **LEARNING OUTCOMES:**

- Recognise that environments can change and that this can sometimes pose dangers to living things.
- To resolve differences by looking at alternatives, making decisions and explaining choices.
- To recognise the positive role of voluntary, community and pressure groups.

# CURRICULUM TARGETS



Ocean School has been designed to compliment KS1 - 3 curriculum targets in a fun, interactive and empowering way.

## Curriculum targets met at KS1

### Science

- Working scientifically
- Animals, including humans
- Living things and their habitats

### Citizenship

- Preparing to play an active role as citizens

### Geography

- Human and physical geography
- Geographical skills and fieldwork

## Curriculum targets met at KS2

### Science

- Working scientifically
- Animals, including humans
- Living things and their habitats

### Citizenship

- Preparing to play an active role as citizens
- Developing confidence and responsibility and making the most of their abilities

### Geography

- Human and physical geography
- Geographical skills and fieldwork
- Locational knowledge

## Curriculum targets met at KS3

### Science

- Evolution and inheritance
- Relationships in an ecosystem
- Earth and atmosphere
- Working scientifically

### Citizenship

- Preparing to play an active role as citizens
- Developing confidence and responsibility and making the most of their abilities

### Geography

- Human and physical geography
- Geographical skills and fieldwork
- Locational knowledge



Surfers Against Sewage is a marine conservation and campaigning charity inspiring, uniting and empowering communities to protect oceans, waves, beaches and wildlife.

Plastic pollution in our oceans is the new sewage. Blighting our beaches and strangling our seashores it reaches every part of our oceans. It is one of the biggest global environmental threats of our age and fighting it together is our priority issue.

If you have found this resource helpful please let us know by emailing; [education@sas.org.uk](mailto:education@sas.org.uk)