

Who eats who? Beachy food chains

This activity shows how beach animals and algae (plankton and seaweed) depend on each other. Children can also imagine the exciting ways that life changes when the beach is underwater.

Background for group leaders

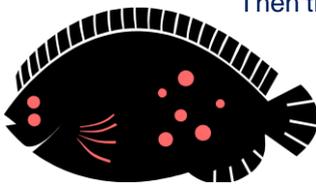
1. Beach food chains begin with **seaweed**, **phytoplankton** (tiny plant-like organisms in the sea and sand), and **particles of decaying matter**.

2. Small animals filter plankton or these organic particles out of the sea or sand. For example **lugworms** sieve edible scraps out of the sand and when the tide comes in **barnacles** wave feathery legs to catch passing plankton. Other creatures, including **limpets**, **sea urchins** and **winkles**, have strong rasping teeth or tongues which they use to scrape up small seaweed.

When the tide comes in barnacles feed by waving legs out of their trap doors



3. **Crabs**, **whelks**, **lobsters**, and most **fish** are carnivores or scavengers. They use drills, strong teeth or crushing claws to break the shells of mussels and limpets. **Starfish** also eat prey with shells but they have a different eating style. They grip shellfish, such as cockles, until the cockle tires and opens its shell a fraction. Then the starfish slips its stomach into the cockle's shell and dissolve the poor creature alive!



4. Larger carnivores such as **otters**, **seals**, **birds**, **salmon** and **halibut** do not live on the beach but visit it for a feast. They are well adapted for this, for instance the long beaks of **oyster catchers** are perfect for picking buried cockles.

Beaches are many worlds in one. Most animals are active at high tide and many feed only at night by smelling out their prey. (We can get a glimpse of what life is like underwater by looking into a fresh rock pool.) When the tide is out most animals hide - but shorebirds and humans flock to the beach.

Another whacky world exists beneath the sand. Here lugworms, bivalves, (animals with two shells such as razor shells and cockles), crabs and sometimes weaver fish are buried.

The two games described here should get children running around and thinking about how wildlife interacts. Simple food chains (e.g. seaweed-limpet-crab-seagull) are introduced using games and then the more advanced idea of food webs is discussed. Game 1 should suit children of all ages; Game 2 is aimed at upper primary children.



Signs of a lurking lugworm beneath the sand

Preparation

The labels (page 4) should be printed, cut out and possibly laminated. Children could do some research into food webs but this is not essential. Prior to the trip you could identify a safe rock pool for children to examine.

You will need

Four cones or other markers to mark out a pitch for Game 1; a set of labels (page 4). Copies of instructions and the labels sheet to show the correct order for food chains (pages 2- 4).

Fun follow-up and Links

Children could draw pictures of the seaweed and animals they saw at the beach and link them to create a food web display. Alternatively, they could make pictures of different worlds at the beach, tide in, tide out, or life above and below the sand.

Let's start, instructions for the beach

Instructions for group leaders



If a safe rock pool is at hand show children differences between creatures that are in and out of the water. Anemones might be open in the water where they use their sticky tentacles to trap fish and shrimps. Winkles should be moving about and feeding on algae; sometimes you can see their trails. If you gently disturb a rock or seaweed you might also see small shrimps or fish moving around, they are very shy because big fish love to eat them. Tell children this is what all rocky areas are like when the tide is in and to imagine how much food there is for visiting fish.

Food web facts for children



Like us many these creatures visit the beach but do not live there. *See if they can think of some? Cod, otters, herons and salmon.* In this way beaches are very important for sea and land animals, a bit like cafes or restaurants where they can go to fill up with food.



Cool biologists wanted to find out what was eating limpets. So they made pretend limpets from soft wax (a bit like play dough), painted them to look exactly like limpets and stuck them to rocks. They left them overnight and then examined the marks they found in the wax. They got a surprise; *can you guess what had left tooth marks in their limpets? Rats!* There were also sharp claw marks from crabs.

Game 1 - Tide in ~ Tide out!

Maximum activity duration: 30 minutes

Mark out a large pitch (say 20m square) using cones or flags. Children should stay in this area. Split children into three teams: **Seaweed**, **Winkles**, **Butterfish** (these are long slippery fish that live in rock pools). Each team should draw a home circle.

- Start the game by shouting “Tide In”, children should run around constantly whispering the name of their team. They aim to tag as many opponents as possible and take them back to their home base. **Seaweed can tangle butterfish, winkles can eat seaweed and butterfish can eat winkles.** (No one can be caught when they are transporting their prey back to base.)
- To end the game shout “Tide Out” everyone should stop still and the team that has captured the most opponents wins a point.
- Now repeat the game with the tide out. First ask children what might be different? Of course fish will not be hunting when the tide is in. So for the next round **butterfish should change into Seagulls.**



For younger children you could now ask the three teams to act out a video clip of when the tide is in. Most things will be moving and eating and the seaweed will be swaying. On your shout they should change to a tide-out video. The animals will be hiding under seaweed and only birds will be moving around. The team with the best scene wins.



Seaweed → Winkle → Lobster → Human

The labels on page three are arranged in food chains and coloured differently for five teams. The object of this game is to encourage children to make food chains and see what happens if links in the chain are removed.

1. Mix up the labels and give one to each child. If there are less than 20 children a chain can be left out and top levels of one chain can also be removed as necessary. Children should look at their label and listen to the following information carefully as the first team to make their food chain correctly will win points.

- All the food chains start with seaweed, small seaweed or dead seaweed. Seaweed doesn't eat anything. It makes food by catching sunlight.
- Winkles and limpets live in shells. They have sharp tongues with razor blades for eating seaweed.
- Crabs and lobsters have massive claws for crushing shells and eating what's inside.
- Sand hoppers are the jumpy creatures you find under rocks and seaweed! They feast on smelly rotting seaweed. Fish love to eat them.



When you signal children should find the other people in their team colour and hold hands to make their food chain in the right order.

2. When children are in the right order ask them to remain in their chains but stand close together. Consider the following:

What do humans like to eat? Ask children with appropriate cards to sit down (answer: there is one in each group, winkles, crabs, salmon, cod, lobsters). What would happen if we were very greedy and ate all of these things? Which other animals would disappear? You could think of other impacts such as an oil spill killing the seaweed or a disease killing seals.

In real life food chains link to form food webs. To show how this happens tell children they can move but must keep holding hands in their chains. They should touch feet to represent links between chains and people touching feet must stay still. Call: "dead seaweed and seaweed feet together, humans and salmon feet together, seals and lobsters feet together, winkles and cod feet together". They should end up with a big tangle to show how complicated webs can get!



To discuss

Can you think of other ways that creatures depend on each other? Hermit crabs live in the shells of big whelks or even bottle tops. Tiny crabs called pea crabs live inside mussel shells and steal bits of food from mussels. Humans use seaweed to help their vegetables grow.

Tall seaweed called kelp is like an oak tree of the sea. Hundreds of little creatures make their homes in the bottom of kelp. If you have time you could look for some kelp on the beach and examine it.

Examine the bases of washed up kelp to find signs that tiny animals once lived there



Game 2. Food webs. Cut out labels for children.

Seaweed TEAM RED	Winkle TEAM RED	Butterfish TEAM RED	Otter TEAM RED
Small Seaweed TEAM GREEN	Limpet TEAM GREEN	Crab TEAM GREEN	Seagull TEAM GREEN
Dead Seaweed TEAM BLUE	Sand-hopper TEAM BLUE	Salmon TEAM BLUE	Heron TEAM BLUE
Dead Seaweed TEAM YELLOW	Sand-hopper TEAM YELLOW	Cod TEAM YELLOW	Seal TEAM YELLOW
Seaweed TEAM PURPLE	Winkle TEAM PURPLE	Lobster TEAM PURPLE	Human TEAM PURPLE