

Food Chains/Nutrition

TEACHER'S NOTES

What this topic is about

Almost all the energy that drives living things comes from the Sun. Animals cannot make use of that energy directly, so they eat plants, which can. Food chains like this transfer energy. The marine food chain works in the same way as the food chain on dry land.

What will pupils learn?

- Green plants can make their own food
- Some animals (herbivores) eat green plants
- Some animals (carnivores) eat other animals
- This is called a food chain
- What different types of fish eat

Essential information

Most food chains are very short. Phytoplankton (planktonic plants) float in the lighter surface waters of the sea. They harness the Sun's energy through photosynthesis to produce oxygen and to live and grow. They produce oxygen as a waste product. The phytoplankton are food for other living things.

For example, krill are small shrimp-like crustaceans that feed on phytoplankton. Whales feed by eating huge quantities of krill (blue whales can eat four tonnes of krill every day). This is a food chain.

But food chains are seldom simple. Other creatures eat phytoplankton, including a lot of the sea's filter feeders – shellfish and small fishes. They might be eaten in turn by gulls, turtles and other sea creatures. These interlinking food chains become a food web.

Not all food chains start with a green plant. There are bacteria, deep-sea life forms that can harness chemical energy. These bacteria live in total darkness near the hydrothermal vents of the Pacific Ocean, in very high temperatures. They take simple chemicals like methane and hydrogen sulphide from the superheated water and turn them into complex food materials. Deep sea animals eat the bacteria in the same way other animals eat plants. Shrimps, clams and worms all eat these bacteria.

Things your pupils can do:

● *Before their visit*

KS2 and KS3 children should be learning about the range and adaptations of plants. Seaweeds, for example, are plants. Compare them with land plants and identify their important place in the food chain.

Use books, magazines, CD-ROMs and the internet to find out all they can about other examples of food chains in a range of habitats: for example, the food chains they belong to when they eat their breakfast.

● *During their visit*

Key Stage 1

Fishes have evolved in almost every imaginable colour and pattern. Very often a fish's colour has a very practical function – colour can camouflage a fish from both predator and prey. When breeding, some fishes' colours become brighter, which attracts potential mates.

Show your pupils some photos of beautiful coloured fish (Trigger fish, wrasse, mandarin, royal gramma, Atlantic blue tang, etc.) before their visit. Then give them a list of names of the fish they might see during their visit. Have them guess the colours before arriving – and investigate the colours once on-site.

Food Chains/Nutrition (continued 1)

TEACHER'S NOTES

Key Stage 2

Tell your pupils there are not many green plants in the Sea Life Centre as the animals are fed prepared food. Get them to look for a herbivore or plant-eater (a primary consumer); a small carnivore or meat-eater (a secondary consumer or predator); and a large carnivore (a tertiary consumer or top predator).

Look for plants and animals that belong in food chains. You may see barnacles - which filter tiny green plants from the sea; sea urchins - which eat barnacles; fish - which eat sea urchins; and small tope sharks - which eat fish. Find out how the Sea Life Centre keeps these apart in different tanks.

● After their visit

Key Stage 1

- Ask your pupils to design and illustrate a poster that demonstrates a marine food chain.

Key Stage 2

- Develop other food chains in the classroom, using books and other secondary sources
- Explore the other primary sources of undersea energy - bacteria, for example, that can harness energy from volcanic spouts.

Pupil Work Sheet

Activity answers

List of items it takes to feed all the fish (on average there are 6,500 creatures) in a typical Sea Life Centre:

Mackerel 6kg, **squid** 50kg, **mysis frozen** 3kg, **frozen krill** 3kg, **sandeel** 1kg, **crab** 1kg, **vitamin/mineral supplement** 0.5kg

Swordfish have long beak like jaws, which they use for spearing.

Jellyfish use their tentacles to catch small animals and then push them into their mouths to eat.

Lobsters use their two huge claws for self-defence and food. One claw has sharp edges like scissors and is used for cutting. The other is much larger and is used for crushing.

The **starfish** is an efficient eater, but has pretty disgusting table manners. It rips open its favourite food - a mussel - with its powerful tubed suckers, pushes its stomach out through its mouth, eats the flesh then pulls its stomach in again.

Sometimes an **anemone** will attach itself to the shell of a **hermit** crab, to the benefit of both - the anemone helps to keep away the crab's enemies, and in return it can enjoy leftovers from any food the crab may catch.

Stingrays feed on fish and vertebrates - attacking its prey with their poisonous tails.

The **puffer** fish loves to eat so much it will eat until its almost unconscious. The puffer is well-equipped to find and eat food - feelers hang down from their nostrils, helping them find food as they float along the ocean floor.