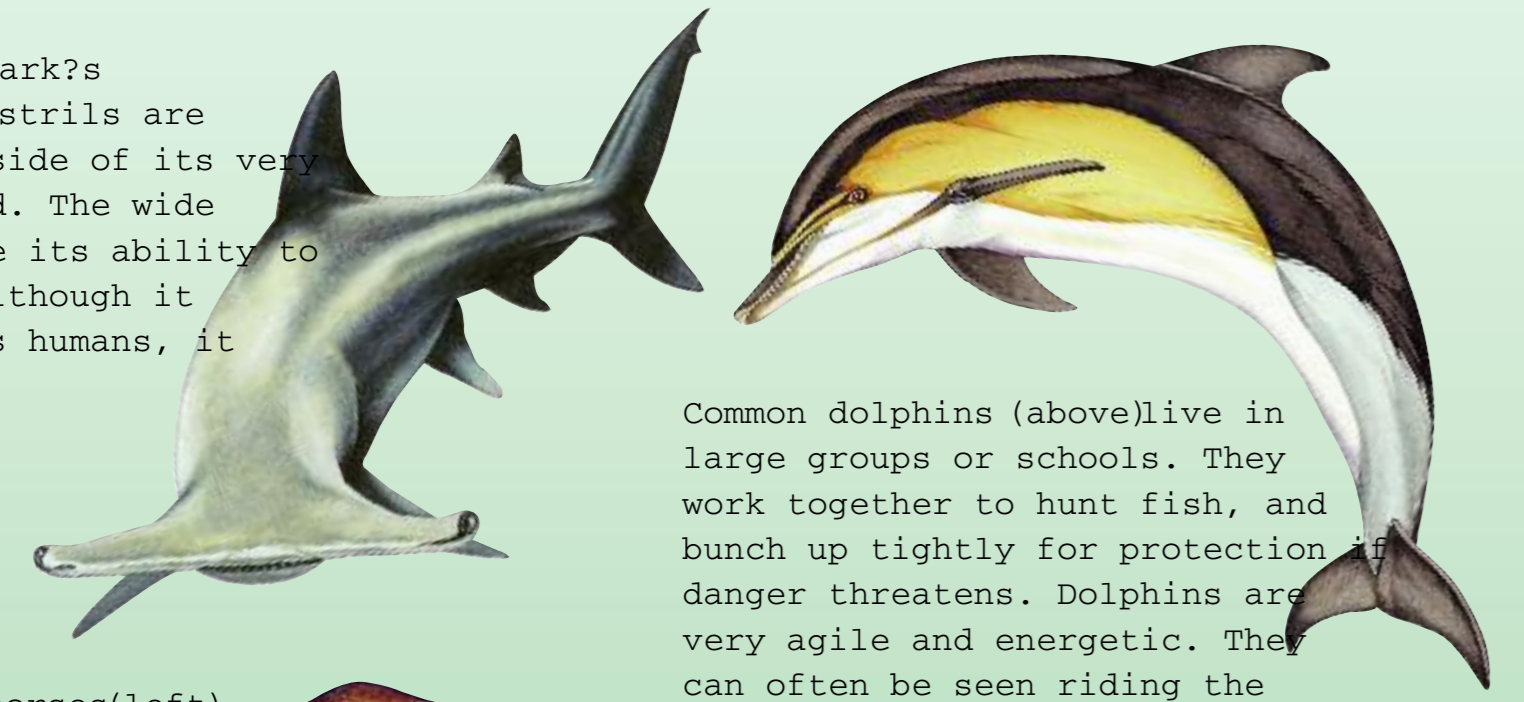


PANORAMAS

OCEAN LIFE

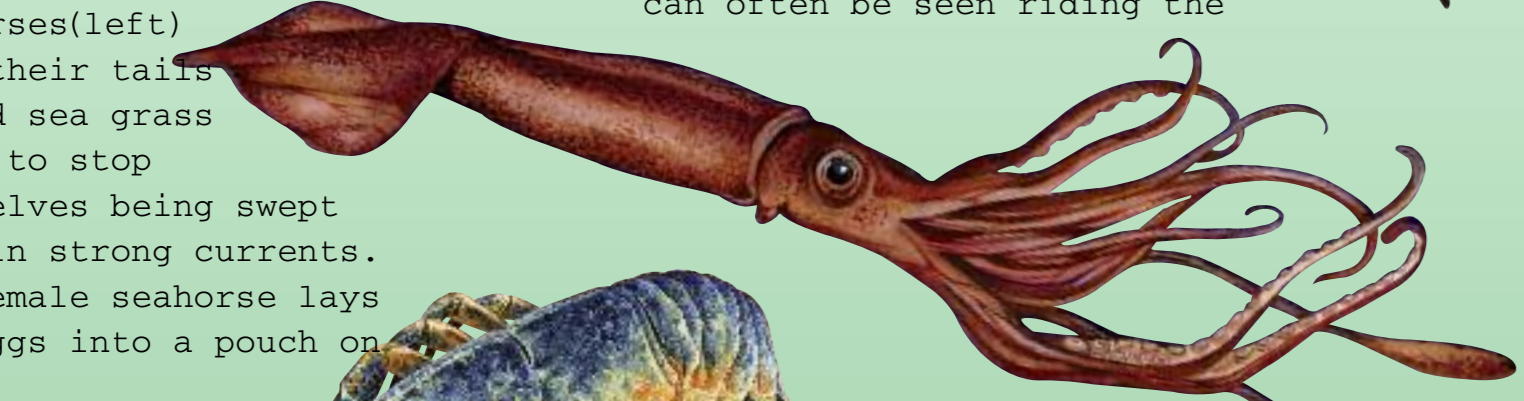
The hammerhead shark's (right) eyes and nostrils are found on either side of its very oddly shaped head. The wide head may increase its ability to see and smell. Although it sometimes attacks humans, it



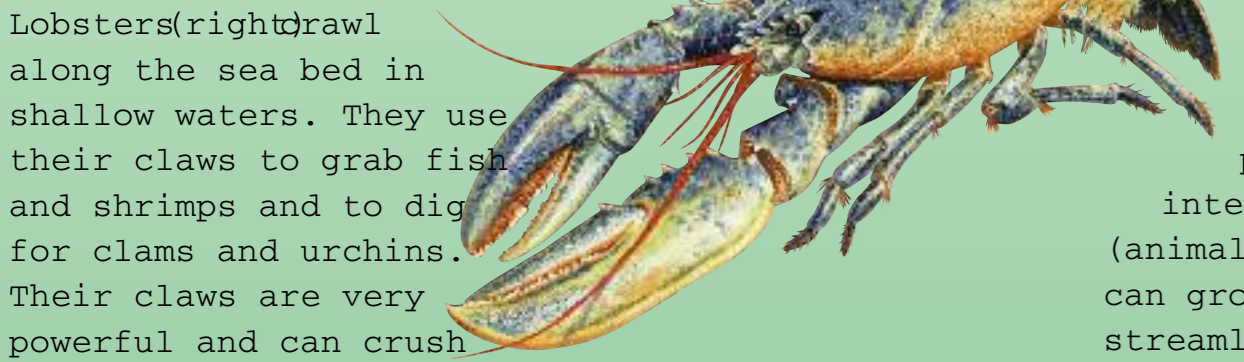
Common dolphins (above) live in large groups or schools. They work together to hunt fish, and bunch up tightly for protection if danger threatens. Dolphins are very agile and energetic. They can often be seen riding the



Seahorses (left) curl their tails around sea grass stems to stop themselves being swept away in strong currents. The female seahorse lays her eggs into a pouch on



Giant squid (above) can change their colour in seconds to scare off predators. They are the most intelligent of all invertebrates (animals without backbones). Giant squid can grow up to 20 metres long. Their streamlined bodies enable them to glide



Lobsters (right) crawl along the sea bed in shallow waters. They use their claws to grab fish and shrimps and to dig for clams and urchins. Their claws are very powerful and can crush

PANORAMAS

OCEAN



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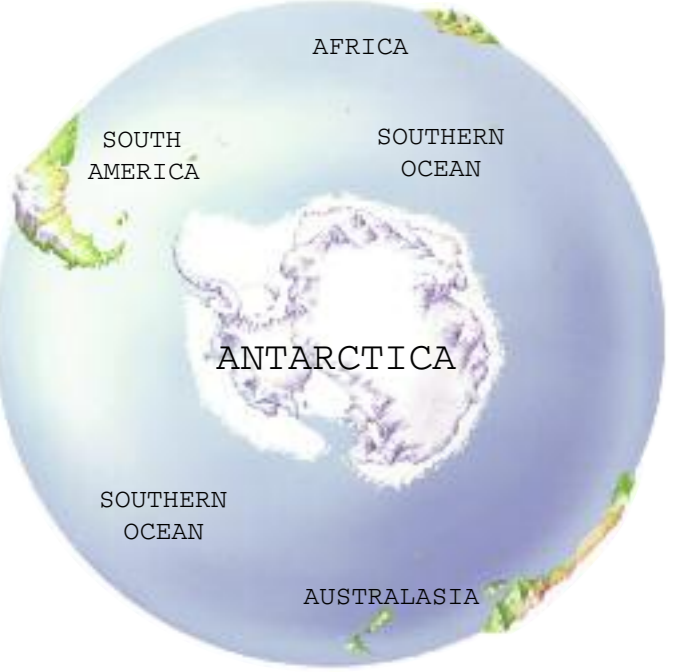
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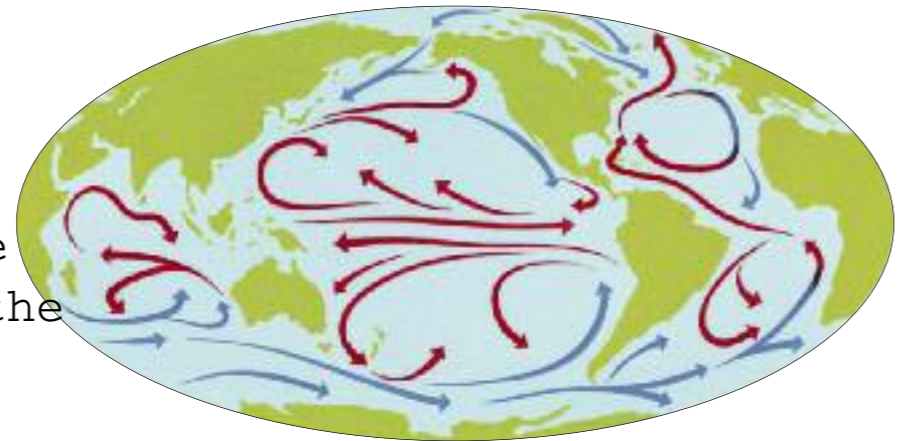
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- 7 Ocean Depths
- 12 Polar Waters
- 14 Amazing Ocean Creatures
- 15 Ocean Giants
- 20 Ocean Travellers
- 22 Glossary and Index



SOUTHERN OCEAN
The Southern Ocean surrounds the continent of Antarctica. More than half of this ocean freezes over each winter. Icebergs, which break off from the

THE OCEANS

OCEAN WATERS cover nearly three-quarters of our planet's surface. There are five great oceans: in order of size, the Pacific, Atlantic, Indian, Southern and Arctic Oceans.



OCEAN CURRENTS
The ocean waters swirl around the Earth. Heated by the sun, surface waters flow from the warm tropics towards the icy polar regions. As they so, colder currents move in to take their place. Winds that blow over these ocean currents carry their warm or cool temperatures to the nearby lands. The Gulf Stream, which flows north from

SURFACE WATERS

MANY BIRDS catch their food from the surface waters of the ocean. The tropic-bird and booby plunge into the water itself. Air trapped in the feathers of these diving birds enables them to rise to the surface quickly and fly away with their catch. Other ocean birds, such as the albatross, snatch fish from the surface with their beak or claws.

Some creatures live half above and half below the water. The upper part of a Portuguese man-of-war is like a sac



RED-TAILED TROPIC-BIRD

MAGNIFICENT FRIGATEBIRD

PORTUGUESE MAN-OF-WAR

WANDERING ALBATROSS

BROWN BOOBY

BOTTLENOSE DOLPHIN

FLYING FISH

ZOOPLANKTON

OCEAN FLYERS AND LEAPERS

Flying fish skim the surface of the water, gliding for distances of up to 100 metres. Their wings are actually long, taut fins. They fly to escape predators in the water, making them a target for birds.

Many whales and dolphins leap out of the water. This is known as breaching. Some smaller kinds can go very high and

PLANKTON



PLANKTON

The plants of the ocean are not like those on land. Called plankton, they are microscopic in size and float around in the sunlit waters. Microscopic animals, called zooplankton, feed on them. The most common kind of zooplankton are tiny shrimp-like animals called copepods. The young of fish and crabs are also kinds of





CORAL REEF

Coral can grow in shallow waters along tropical coasts around the world. Sometimes it forms great underwater banks, called coral reefs. Coral comes in many fantastic shapes and colours. Many colourful animals live on or near the reefs. Some fish, such as the parrotfish, use their

KEY

- 1 Starfish
- 2 Zebra lionfish
- 3 Damselfish
- 4 Seahorse
- 5 Parrotfish
- 6 Angelfish
- 7 Barracuda
- 8 Clownfish
- 9 Butterflyfish
- 10 Pufferfish
- 11 Moray eel
- 12 Leopard shark

OCEAN DEPTHS

MOST ocean life is found near the surface, where sunlight can easily pass through the water allowing plankton (tiny plants) to grow. Many animals feed on plankton. Below 200 metres only a little light can get through and fewer animals live here. Some of these creatures travel to and



KEY

- 13 Beaked whale
- 14 Octopus
- 15 Garfish
- 16 Sperm whale
- 17 Giant squid
- 18 Gulper eel
- 19 Anglerfish
- 20 Viperfish
- 21 Hatchetfish
- 22 Chimaera
- 23 Tripodfish
- 24 Sea spider

IN THE

Some of the animals that live at the bottom of the ocean are attached to the ocean floor and look more like plants. A few creatures like sea cucumbers and brittle stars, creep about searching for dead animal remains in the mud. Deadly white sea spiders pick their way across the mud. They feed by sucking

CHAMPION

The sperm whale is known to dive deeper than 1000 m but it can probably go to depths of more than 3000 m in search of its favourite prey, giant squid. The sperm whale can spend up to two hours underwater before returning to the surface to breathe.

DEEP-SEA CREATURES

Below about 3000 m the water is as black as night and icy cold. How do animals survive at this depth? A steady supply of food rains down from above in the form of decomposing parts of dead animals and plants. Scavengers living in deep waters feed on these remains and other animals feed on them. Some creatures, like the hatchetfish or lanternfish, travel to the upper layers of the ocean to feed and may be snapped up as food themselves on the way

Sea level

Depth

Depth

Depth

Depth 1000

Depth 3000

Depth 5000

POLAR WATERS

THE WATERS of the Arctic Ocean are among the coldest in the world. Some ocean animals migrate to warmer places in winter. Others stay and try to find enough food to survive until spring.

The walrus is well-equipped for life in such a freezing climate. Its massive body is covered with tough skin. Underneath, there is a thick layer of fat, called blubber, that protects the animal from the cold. The bearded seal, so-called because of the long bristles on its snout, stays in the

UNICORN OF THE

The narwhal, a kind of whale, is one of the strangest-looking creatures in Arctic waters. The males have a spiralling tusk which is actually one of their two teeth. They may use it as a sword to fight other males to win females. Narwhals feed on

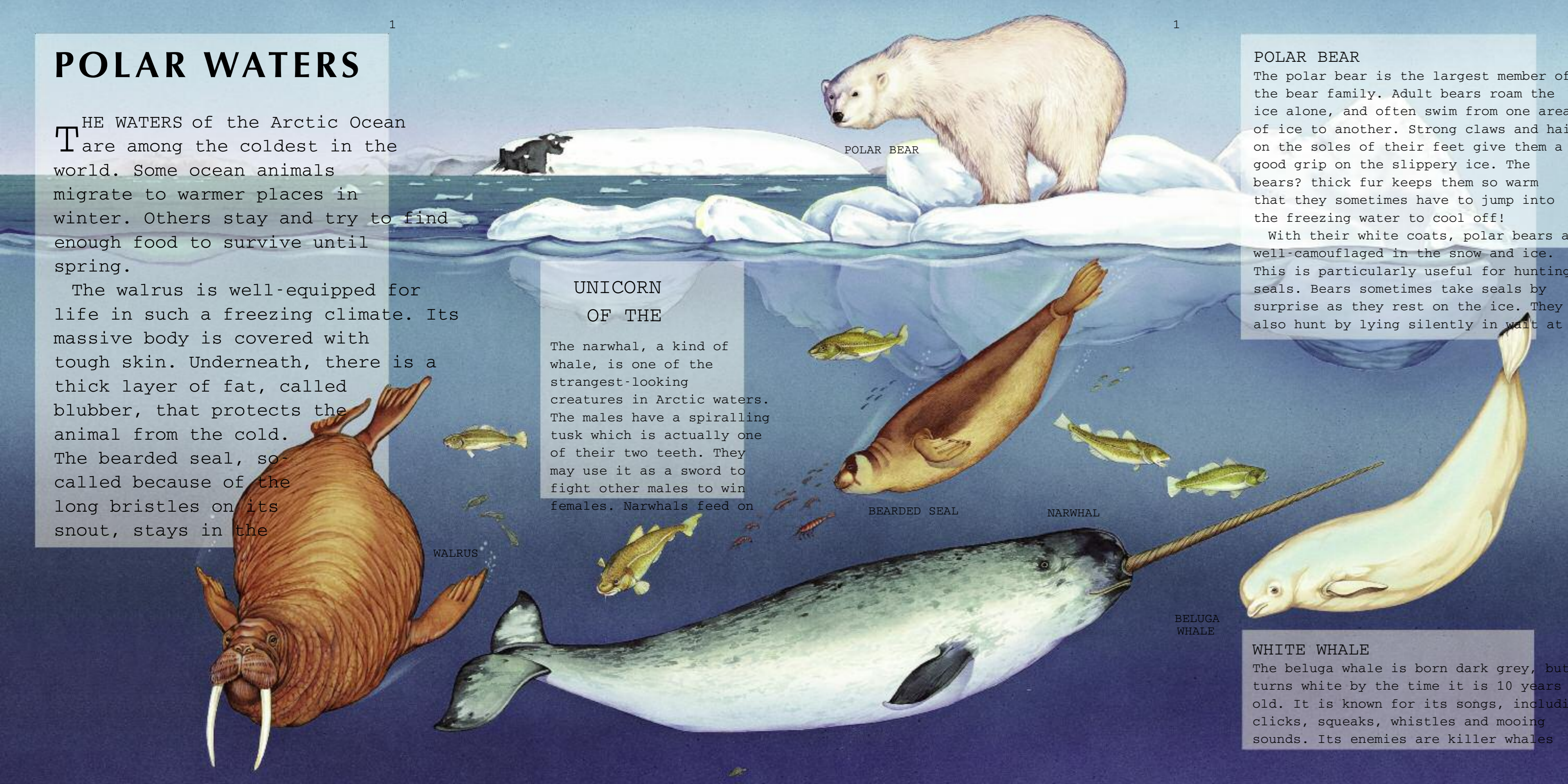
POLAR BEAR

The polar bear is the largest member of the bear family. Adult bears roam the ice alone, and often swim from one area of ice to another. Strong claws and hair on the soles of their feet give them a good grip on the slippery ice. The bears' thick fur keeps them so warm that they sometimes have to jump into the freezing water to cool off!

With their white coats, polar bears are well-camouflaged in the snow and ice. This is particularly useful for hunting seals. Bears sometimes take seals by surprise as they rest on the ice. They also hunt by lying silently in wait at

WHITE WHALE

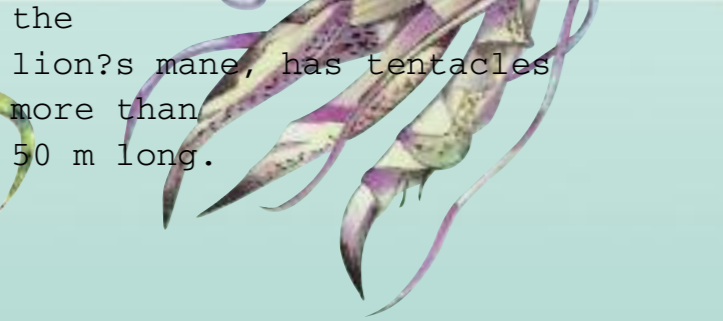
The beluga whale is born dark grey, but turns white by the time it is 10 years old. It is known for its songs, including clicks, squeaks, whistles and mooing sounds. Its enemies are killer whales



AMAZING OCEAN CREATURES

Many ocean creatures may look extraordinary to us, but the colours, shapes or other distinctive features they have are there to help them to survive. Their sharp spines or powerful venom, for example, may give them protection against predators or equip the animals to be dangerous predators themselves.

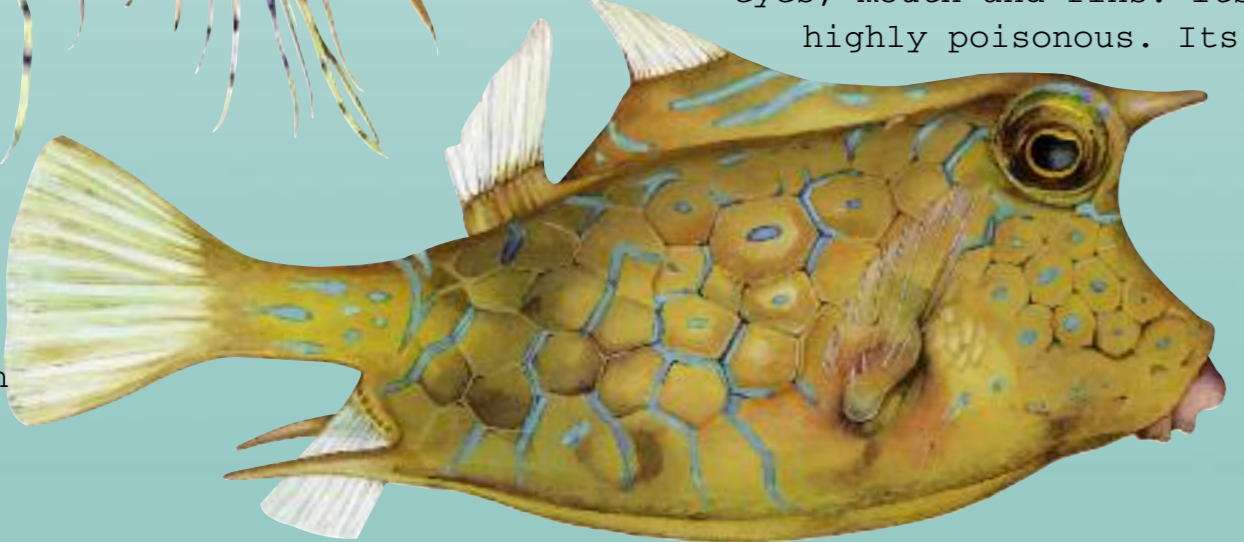
POISONOUS
 Jellyfish are more than 95% water. They have no heart, bones, brain or even real eyes. The most venomous creature on Earth is the box jellyfish. Just a touch of its powerful stinging tentacles can kill a person in four minutes. The largest jellyfish, the lion's mane, has tentacles more than 50 m long.



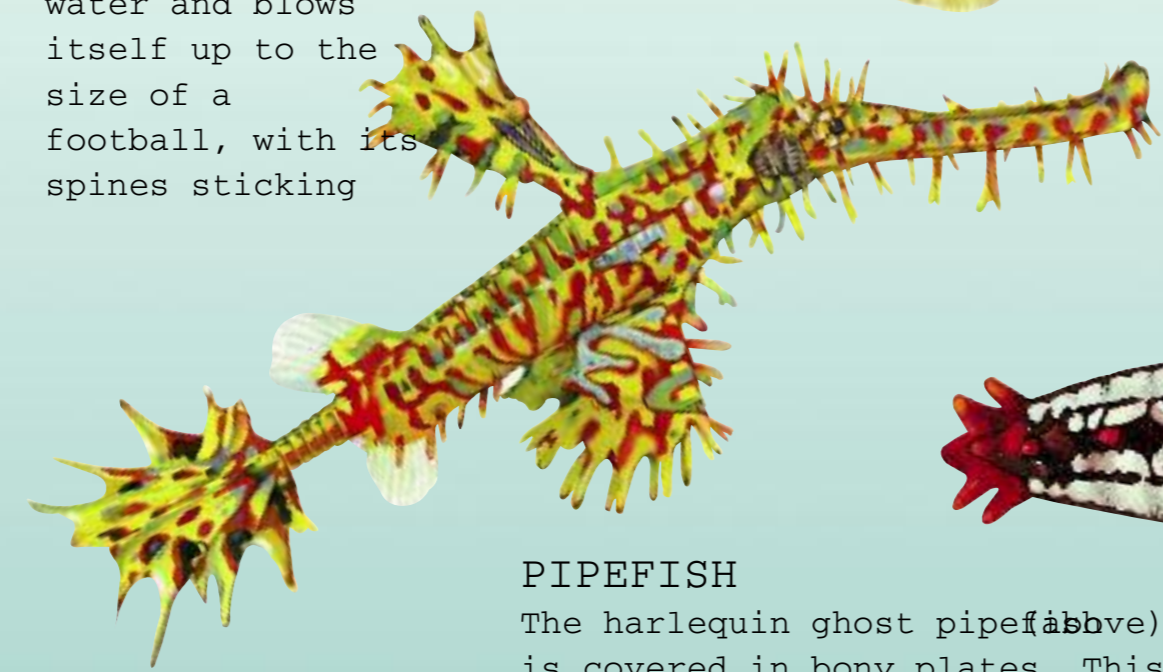
COWFISH
 The thornback cowfish (below) is built like a tank! Its body is really just a bony box with holes for its eyes, mouth and fins. Its skin is highly poisonous. Its horns



LIONFISH
 The zebra lionfish (above) may look very beautiful, but those spiny fins are deadly to touch. Each fin contains enough lethal venom to kill its prey. Lionfish hunt in groups,

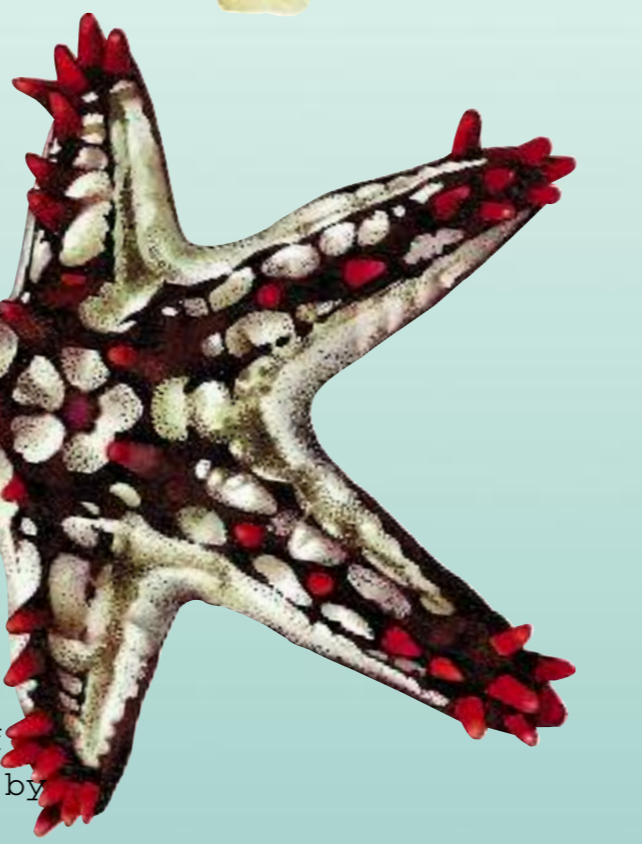


STRIPED BURRFISH
 The striped burrfish (right) hunts for shellfish, barnacles and crabs to eat. It uses its spines for defence. If a bigger fish threatens to eat it, the burrfish immediately swallows huge mouthfuls of water and blows itself up to the size of a football, with its spines sticking

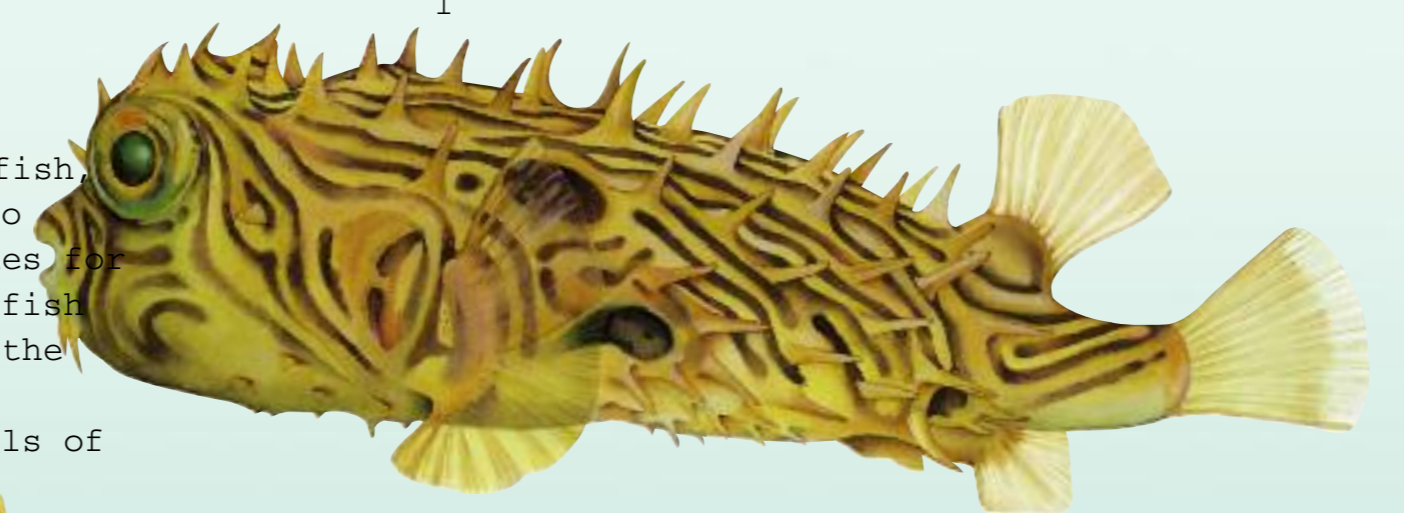


PIPEFISH
 The harlequin ghost pipefish (above) is covered in bony plates. This relative of the seahorse is camouflaged to look like a piece of coral, making it difficult to spot by attackers. It feeds on zooplankton and shrimps,

SEA SLUG
 Unlike its land relatives, the sea slug (right) is very brightly coloured. But be warned, this animal is deadly poisonous! The delicate tufts on its back are the stinging parts that once belonged to a jellyfish or sea anemone. The sea slug

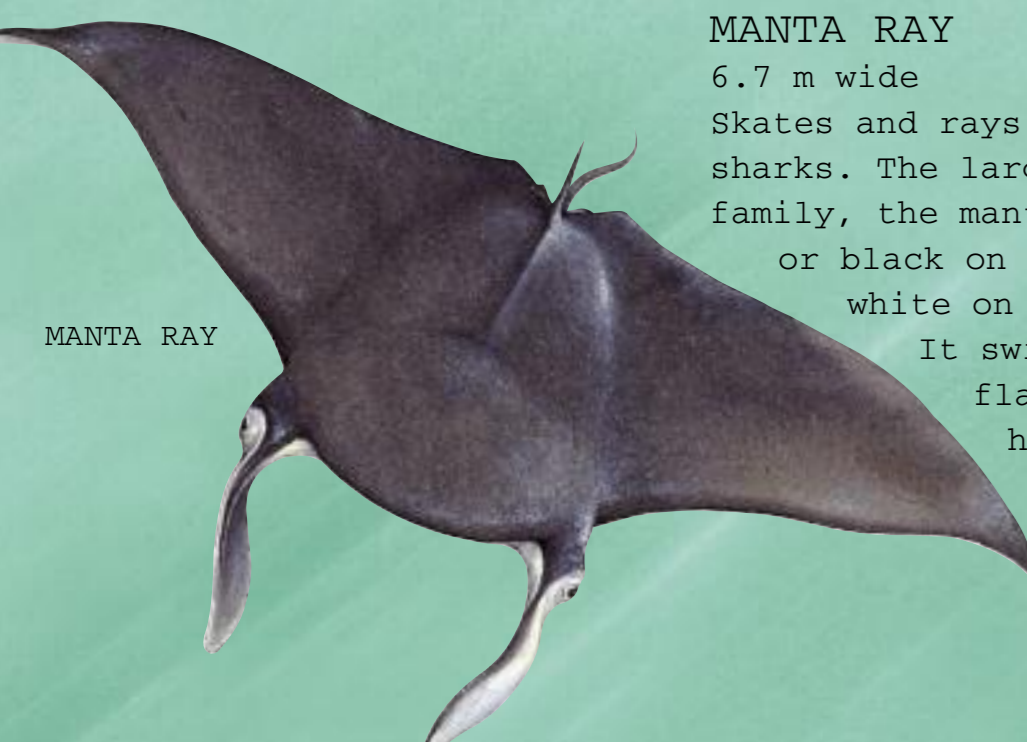


STARFISH
 The starfish (above) has neither head nor brain. Its mouth is in the centre of its body. Its spine skeleton is on the outside. The starfish creeps slowly along the sea bed in search of its prey. Using the suckers on its arms, it fastens on to a tightly-closed clam shell and gradually prizes open. Then it feeds on the flesh



OCEAN GIANTS

THE OCEANS are home to the called the cetaceans (the group giants of the animal kingdom: also includes dolphins and the whales. The water supports porpoises). The cetaceans are the their enormous bodies, allowing only mammals to them to move freely in search of spend their entire food. With their long, sleek bodies in the water. fins, flippers and tails, some whales instead of thick look quite similar to fish, coats of hair particularly sharks. They are noto keep fish at all, however, but mammalshem warm, Like humans, they must breathe they have air, they are warm-blooded and the thick layers of mothers nurse their young. They fat, called belong to a group of mammals blubber, beneath



MANTA RAY
6.7 m wide
Skates and rays are relatives of sharks. The largest of the ray family, the manta, is dark grey or black on its topside and white on its underside. It swims by flapping its huge wings, often at great speed. It can even

All animals are drawn to scale

PACIFIC OCTOPUS
Arm span up to 9 m
Octopuses have eight sucker-covered arms which they use to clamber about the ocean floor and occasionally swim in search of crabs



PACIFIC OCTOPUS

and lobsters to eat. They seize their prey in their suckers, stun it with venom, and then crush it in their powerful beaks. Octopuses use their intelligence and keen eyesight both to hunt and avoid capture. They can also change colour, squirt ink and make a quick

WHY DO WHALES
Whales can make different sounds to express anger, sadness and surprise. There is evidence that they sing to locate their position in the ocean and also to communicate with one another. They sing new songs each year and may also sing songs that they have

LEATHERBACK TURTLE
1.85 m long
The leatherback turtle's about 2.7 m. It is also black shell feels like hard rubber. The largest marine turtle, its front flippers have a span of the deepest-diving



LEATHERBACK TURTLE

GREAT WHITE SHARK
Up to 7 m long
The great white shark is turtles and sea mammals. one of the most ferocious predators in the oceans. Although it has been known to attack and kill humans, this is rare; it usually feeds on fish, its has up to 3000 teeth in its mouth, arranged in rows. Some are 8 cm long and serrated perfect for



GREAT WHITE SHARK

WHALE SHARK
Up to 15.2 m long
The whale shark is the world's largest fish. Rarely straying from warm, tropical waters, it feeds on krill and fish which it filters from the water passing through its gills. Although it has

BLUE WHALE
Up to 30 m long
A blue whale is the largest whale of all. A fully grown blue whale's heart can be as big as a small car and its tongue can weigh more than an elephant! Their huge size



BLUE WHALE

DIVER

DIVER
Scuba divers can only dive to about 50 m below the surface of the ocean. Below that, the water pressure is too high.

made blue whales a prime target for whale hunters. Like all whales, the blue By 1967 their numbers had dropped so low that come to the water's hunting blue whales was surface from time to time. banned. Even today, the numbers remain whale's nostrils, or blow dangerously low and theyholes, remain shut. When are still in danger of it comes to the surface it

SOUTHERN ELEPHANT SEAL



ELEPHANT SEAL
Up to 6 m long
Elephant seals are so-called because of their huge size and the male's elephant-like trunk. The female is much smaller than the male.

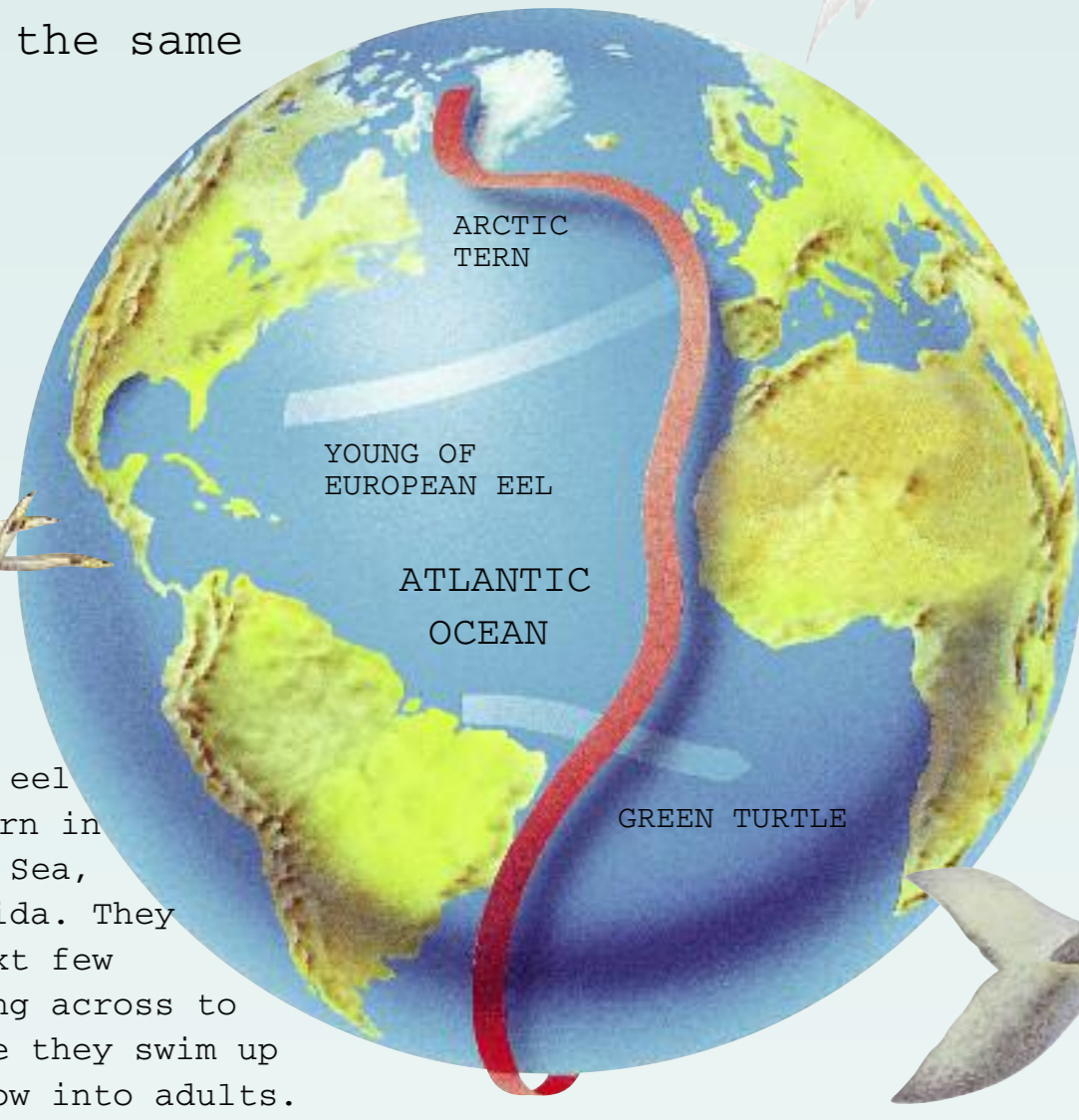
A GIANT
The blue whale spends its summers in the cold waters around the Arctic icecap or Antarctica. It feeds on huge quantities of tiny shrimp-like animals called krill. To satisfy its huge appetite, it engulfs about 40 million of them each day. Like all baleen whales, the blue whale has hundreds of baleen plates, each fringed with stiff hairs, hanging from its upper jaw. It uses them as a kind of sieve, trapping the krill from great

OCEAN TRAVELLERS

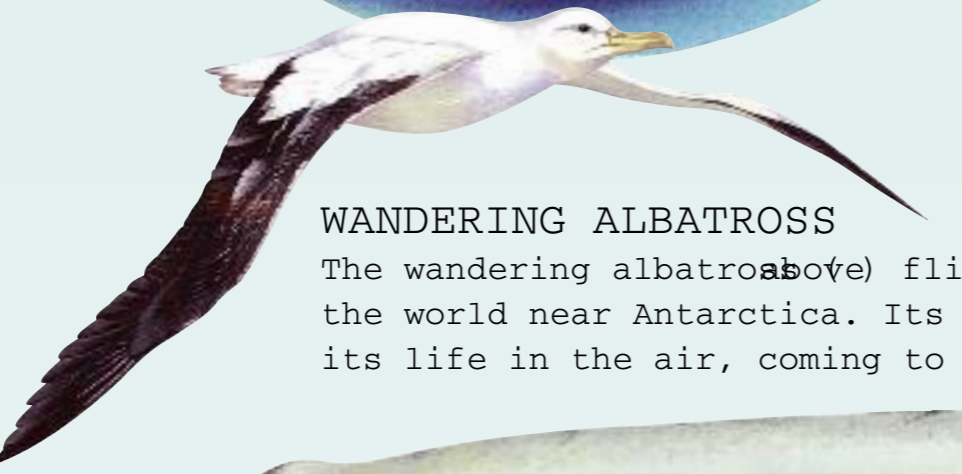
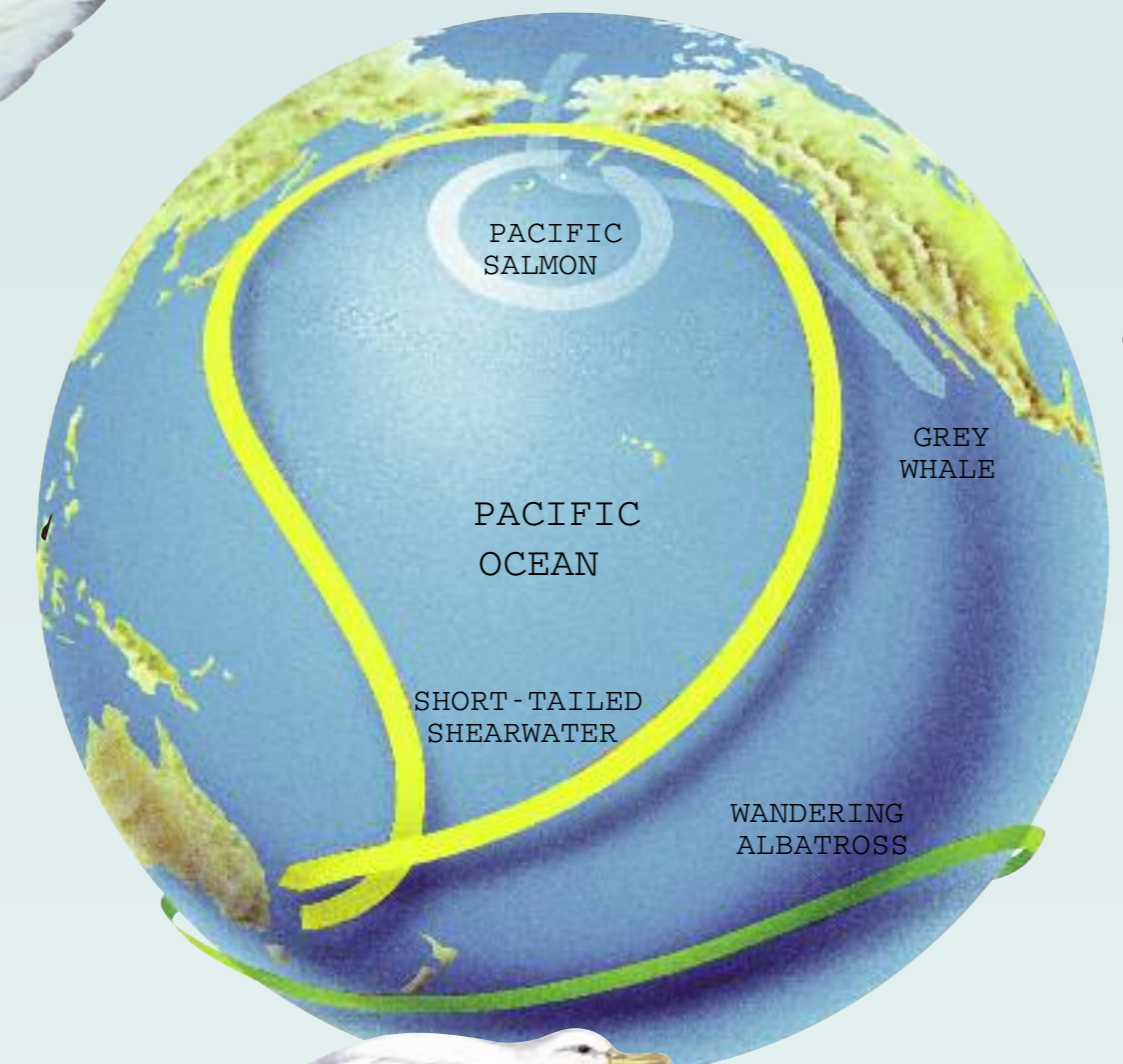
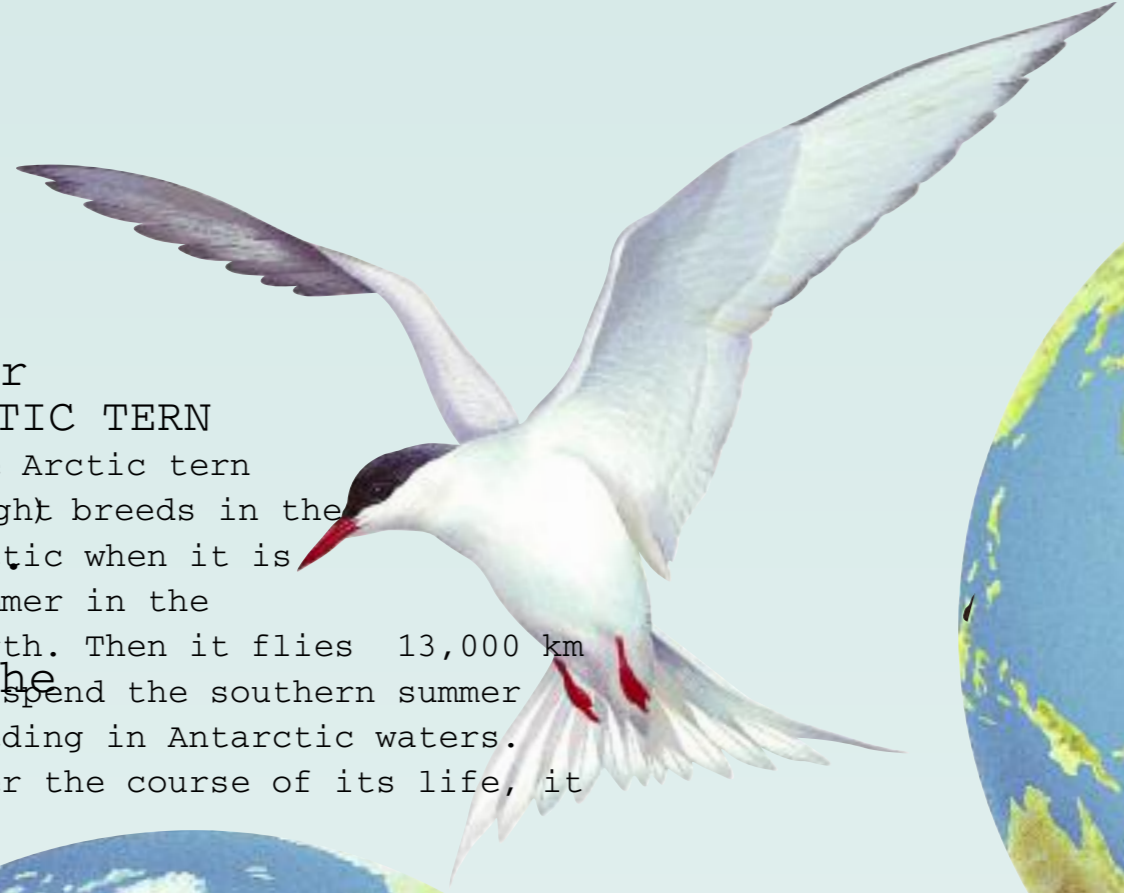
ANIMALS are always on the move in search of fresh sources of food. Some travel at the same time each year to places where the new season brings a more favourable climate for feeding or breeding. This is called migration. Journeys of migration are sometimes made to distant parts of the world. The most ambitious travellers may fly or swim incredible distances across oceans and back again to the same



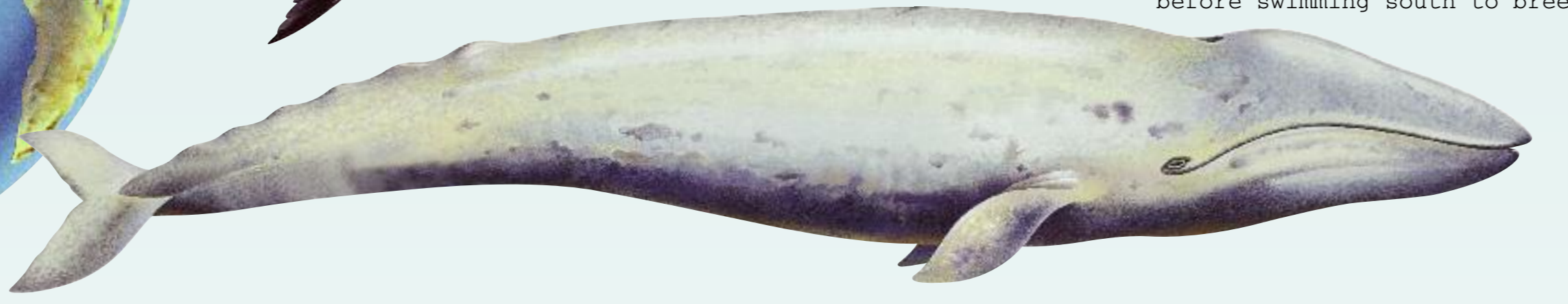
GREEN TURTLE
Probably the farthest-travelled reptile is the green turtle (above). Every two or three years, it swims up to 2250 km from the waters off the coast of Brazil, where it feeds, to its breeding grounds on tiny Ascension Island in the middle of the



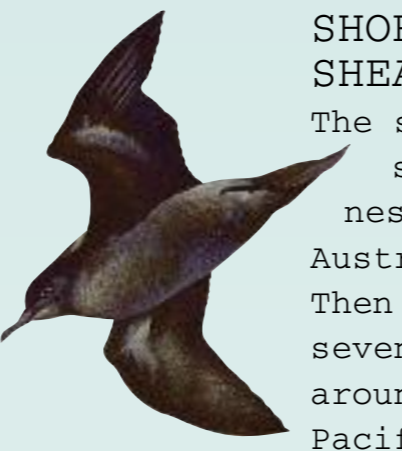
ARCTIC TERN
The Arctic tern breeds in the north. Then it flies 13,000 km to spend the southern summer feeding in Antarctic waters. Over the course of its life, it



WANDERING ALBATROSS
The wandering albatross (above) flies round the world near Antarctica. It spends nearly all its life in the air, coming to land on ocean

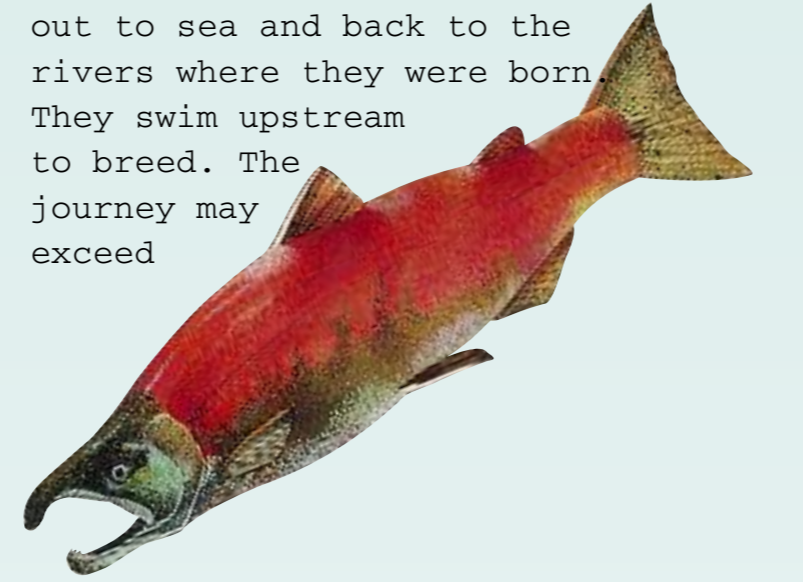


GREY WHALE
No other mammal migrates as far as the grey whale (above). It feeds in Arctic waters in summer before swimming south to breed



SHORT-TAILED SHEARWATER
The short-tailed shearwater (left) nests on islands near Australia in summer. Then it sets off on a seven-month journey around the north Pacific. It makes use of following winds to help

PACIFIC SALMON
Pacific salmon (below) travel out to sea and back to the rivers where they were born. They swim upstream to breed. The journey may exceed



GLOSSARY

BALEEN A material which grows as plates from the roof of the mouth in some kinds of whale. It is sometimes known as whalebone . The plates are fringed with fibres, and they are designed to filter plankton from sea water.

BIOLUMINESCENCE The production of light by living things. It enables some sea fish to locate one another for mating or to attract their prey.

CAMOUFLAGE The means by which living things escape the notice of predators (or prey, when they themselves are predators) by using their colours and patterns to blend into the surroundings.

CETACEANS An order of mammals that includes the whales, dolphins and porpoises. The cetaceans can only live in water either in the ocean or large rivers but, because they are mammals, they must come to the surface to breathe. They are streamlined animals, and have almost no hair.

CORAL A hard substance produced by polyps, tube-shaped animals with a mouth at one end surrounded by a ring

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