Stupendous sharks

Subject links:
Science, Maths, Art

Age: 5-7

Curriculum links:
Biodiversity, Adaptations, Habitats, Ecosystems, Oceans, Measure, Creativity

Ocean Literacy Principles:

5. The ocean supports a great diversity of life and ecosystems
6. The ocean and humans are inextricably interconnected

Learning Objectives:

- To discover the variety of sharks found in UK waters
- To explore the basic biology of sharks
- To understand that sharks are apex predators
- To know that shark populations are affected by human activity

Sustainability Goals:

Resources provided:

- Sharks Fact File
- Shark Image Reel
- Shark outline
- Shark anatomy poster
- Shark food chain worksheet
- Curriculum links

Extra Resources Required
Scissors & glue

Step 1 Background

Sharks have been around for millions of years, but today they're in serious decline with many shark species under threat of extinction. Sharks are at the top of the food chain virtually everywhere they're found. Their body shape and structure, scales and teeth are all perfectly adapted to being apex predators. We're lucky to have 40 species of shark visiting UK seas.
You can find more information in our Sharks Fact File.

Step 2 Set the Scene

5 minutes - Shark association

Write the word 'shark' on the board. In pairs, students should discuss the first words that spring to mind. After around 30 seconds, students should feed back their words. Write these on the board, and for each word have a show of hands to see how many other people also thought of that word and record totals on your board. Find out what the most common words associated with sharks are and use this to discuss today's topic. Take a photo of your board and save it for the reflect activity.

Step 3 Activities

Activity 1: 5 minutes - Fascinating sharks

Use the top facts on the fact file along with the Shark image reel to share some amazing facts about the diversity, speed and age of sharks.

Activity 2: 10 minutes - Shark anatomy

Display the blank shark outline on the whiteboard, you could also print these out for students to write on or they could draw their own outline. Asking questions and discussing answers with students, name the body parts of the shark and ask students to annotate their outline. Ask students if they think sharks are mammals, fish, reptiles or amphibians. Explain that sharks are fish and discuss the characteristics of fish. You can find lots of information on the Shark Trust's anatomy poster.

Activity 3: 10-15 minutes - Sharks in the UK?

Ask students where sharks live and whether we have sharks in the UK. Display the image reel to reveal some of the key UK shark species, and use information in the fact file to study each species further. Show the image of 6 sharks and discuss similarities and differences. Use this to discuss how a shark's features are adapted to its environment. For example, angel sharks live on the seafloor and are camouflaged by their colour, meaning they're able to blend in and hide!

Step 3 Activities (continued)

Activity 4: 15-20 minutes – Top predators

Introduce the concept of a food chain using a simple example that students can relate to, such as sun, grass, zebra, lion. Explain that animals eat to get energy and that a food chain shows this transfer of energy. Explain how grass is a producer because it makes its own energy from the sun. Hand out the Food chain worksheet and explain that students need to cut out the image cards and stick them in the correct order. Once completed, check their work and discuss which images show producers and predators. Students should write these key terms under the correct image.

Explain how overfishing and pollution are causing shark numbers to decline. Discuss what would happen to the rest of the animals in the food chain if shark numbers declined. For example, if blue shark numbers declined, squid may increase in number. This could then affect crab numbers, which may decrease due to higher predatory pressure. Have a class discussion around how the children feel about this, and whether they think sharks should be protected.

Step 5 Reflect

Can you name any sharks that live in the UK? Show the blank outline of a shark and see if students can name different sections. What types of food do sharks eat? Why are sharks in trouble?

Return to the activity in Set the Scene and repeat it. Once again, analyse the results and compare these to the initial words students came up with to see how they've changed.

Step 6 Follow up

To learn more about predators and food chains, complete our What is a food chain? lesson.

Take a look at our Grouping animals lesson to continue learning how to categorise animals by their characteristics.

Sharks Fact File

Top facts

- You are more likely to be killed by a lawnmower, vending machine or coconut than a shark attack.
- Sharks have been around for around 455 million years.
- Some sharks lay eggs and some sharks give birth to live young.
- Sharks don't have bones but instead have cartilaginous skeletons.
- There are 1,107 described Chondrichthyan species around the world - these include sharks, rays, skates and chimaeras. Of those species, there are 432 species of sharks.
- Makos are the fastest shark in the ocean reaching up to 45mph

Sharks in the UK

Over 40 different species of shark have been observed in UK waters, and 21 of those species live in the UK throughout the year.

Basking shark © 12019/10259 images via Pixabay

Basking sharks can reach lengths of up to 12 metres, making them the second largest shark. These gentle giants are filter feeders, mostly dining on plankton. Their huge mouths can open up to one metre wide!

The basking shark is a seasonal visitor to the UK, so the best time to spot one is between May and October.

MARINE CONSERVATION SOCIETY

Sharks Fact File

Blue sharks are migratory; each year they make huge trans-Atlantic migrations and can travel 5000 miles in one trip. They visit the UK in the summer. They migrate in a "school", or larger group.

Blue shark © Adam Searcy via Flickr

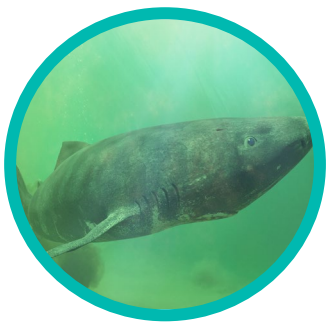
Angel sharks are nocturnal. They inhabit sandy or muddy areas of the seabed, and bury themselves during the daytime. They are critically endangered. Their numbers have declined dramatically during the last 50 years, to the point where they have been declared extinct in the North Sea.

Angel shark © Luis Miguel Estevez via Shutterstock

Small spotted catsharks are also known as lesser-spotted dogfish. This is the most common shark in the UK. They live in shallow waters spending their time close to the seabed. They are small sharks approx. 75cm in length. Their egg cases, commonly known as mermaid purses, can often be found washed up on beaches.

Small-spotted catshark © David Ceballos via Flickr

Greenland sharks are the second largest species of carnivorous shark after the great white. They are found in very deep waters and sometimes referred to as the world's most mysterious shark. Footage of Greenland sharks swimming in their natural environment was not captured until 2003. Many Greenland sharks have a small parasite attached to their eyes, which slowly causes the shark to go blind.



Greenland shark © Dotted Yeti via Shutterstock

Research has shown that these fascinating creatures could live to around 400 years old, making them the longest-lived vertebrates on the planet!

MARINE CONSERVATION SOCIETY

Sharks Fact File

Feeding and diet

Sharks' teeth are adapted to their diet, some have sharp teeth for piercing and slicing prey, others have blunt teeth for crushing and some are filter feeders with very small teeth that they don't actually use for feeding. All sharks regularly lose and replace their teeth. Sharks can have on average 12-13 rows of teeth – the bull shark has a whopping 50 rows of teeth!

Basking shark
© jidanchaomian via Flickr

Cookie cutter shark teeth
© JSUBiology via Flickr

Threats to Sharks

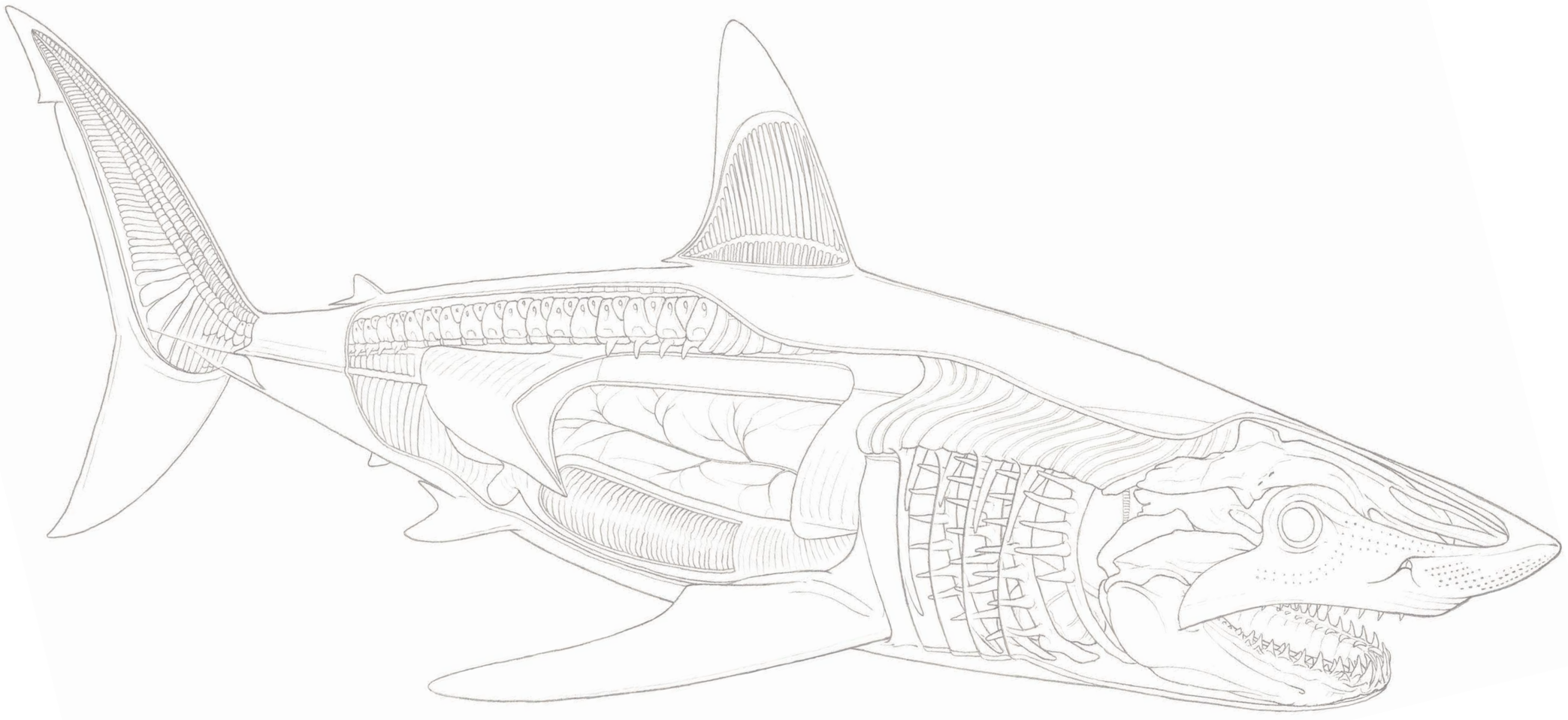
Sharks have been around for millions of years, but today they are in serious decline, with many shark species under threat of extinction. Sharks are slow-growing species, with some sharks like hammerheads producing very few young, making them more susceptible to threats.

Sharks are at the top of the food chain in virtually every location they're found. Their presence indicates a healthy marine ecosystem. If we lose sharks, something will have gone seriously wrong with our seas.

It's estimated that a staggering 100 million sharks are killed every year worldwide because of unsustainable fishing practices, shark finning, overfishing, pollution and habitat destruction. If this continues, we are in danger of losing many of our iconic shark species forever.

MARINE CONSERVATION SOCIETY

SHARK ANATOMY



SHARK ANATOMY

Skeleton

This is made of cartilage – just like human ears and noses. Cartilage is flexible and enables a shark to move quickly through the water. It is also light so keeps the shark buoyant.

Muscle

Sharks have two types of muscles that move the skeleton. Red muscle breaks down fat providing energy for long distance swimming. White muscle breaks down sugars, enabling the shark to make short fast sprints when catching prey or escaping danger.

Liver

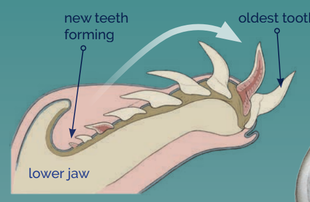
A large oily liver provides a shark with neutral buoyancy, so it doesn't sink or float.

Dorsal Fin

This keeps the shark steady and upright.

Jaws

The jaws are not attached to the skull, so a shark is able to quickly shoot its jaws forward to catch prey.



Teeth

Most sharks have several rows of teeth - as the front row wears down a new row moves in from behind to replace them, like a conveyor belt. Some sharks can lose 30,000 teeth in their lifetime!

Caudal Fin

The tail is used to propel the shark forward through the water.

Pelvic Fin

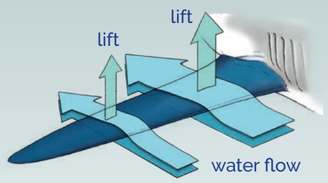
Spiral Valve

The spiral valve is part of the small intestine, its shape provides a greater surface area for digestion of food.

Stomach

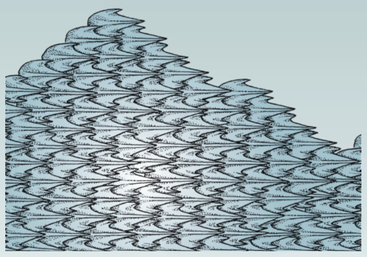
Pectoral Fin

Pectoral fins provide balance and are used to steer. They act like aeroplane wings, as water flows beneath them the shark is lifted up.



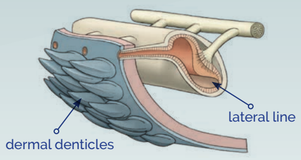
Skin

A sharks' skin feels like sandpaper. It's covered with millions of tiny teeth-like scales called denticles, which point backwards, helping the shark to swim faster by reducing water resistance.



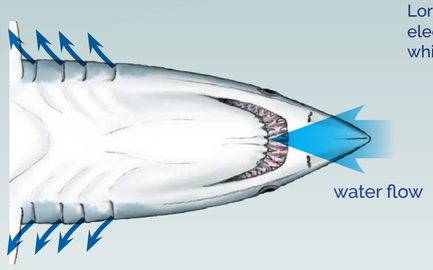
Lateral Line

Sharks are very sensitive to touch and can even feel pressure differences in the water. This is due to the lateral line, which is made up of nerve endings under the skin that run from the head down along the body.



Gills

As a shark swims forward water enters its mouth and passes out through the gills. Oxygen in the water is absorbed into tiny blood vessels near the gills, which is then carried around the body.



Ampullae of Lorenzini

A shark's snout is covered in small pores called 'ampullae of Lorenzini', these can detect tiny electrical currents in the water, which are given off by prey.

Nostrils

Mouth

Nostril

Gill

Tail

Pectoral Fin

Spiracles

Spiracles behind the eyes draw water in, which is then pumped out over the rays gills.

SKATE

CHIMAERA

Caudal Fin

Dorsal Fin

Gills

Pelvic Fin

Pectoral Fin

SHARK TRUST

www.sharktrust.org

The Shark Trust works to advance the worldwide conservation of sharks, skates, rays and chimaeras, collectively known as Chondrichthyans.

Illustration and design by Marc Dando, www.wildlifeillustrator.com

Shark food chain

Name: _____

Name:	Name:	Name:	Name:

P_____ P_____

MCS/Paul Naylor

MCS/Mark Kirkland

MCS/James Lynott

MCS/Mark Kirkland

Curriculum links

England

Science

- Identify and name a variety of plants and animals in their habitats.
- describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets).
- identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.
- Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food.

Wales

Science

- I can explore relationships between living things, their habitats and their life cycles.
- I am beginning to appreciate and care for living things and my own environment.

Scotland

Sciences

- I explore and appreciate the wonder of nature within different environments and have played a part in caring for the environment.
- I can distinguish between living and non-living things. I can sort living things into groups and explain my decisions.
- I can explore examples of food chains and show an appreciation of how animals and plants depend on each other for food.
    - Demonstrates awareness of how energy from the sun can be taken in by plants to provide the major source of food for all living things.
    - Interprets and constructs a simple food chain, using vocabulary such as ‘producer’, ‘consumer’, ‘predator’ and ‘prey’.
- By researching, I can describe the position and function of the skeleton and major organs of the human body and discuss what I need to do to keep them healthy.