Poster: Bony Fish - External Anatomy (including information)

WA Curriculum
K-10 Science

Region
North Coast, Gascoyne Coast, West Coast, South Coast, Indian Ocean Territories

Summary
Fishes are a large and varied group of aquatic animal, superbly designed for underwater life. Bony fish represent the largest and most diverse class of fishes, with well over 20,000 species. This interactive poster explores the external anatomy of a bony fish.

BONY FISH (Class Osteichthyes)

EXTERNAL ANATOMY

The largest group of fish are the bony fishes and includes eels, seahorses and pipefish. The total number of species of bony fish is thought to be more than 15,000.

As the name suggests, bony fish have a bony skeleton with a protective bony plate called the operculum covering the gill cavity and a single external gill slit.

Masters of disguise

Unlike sharks, many bony fish have bright colours and patterns.

Fish that live on the sea floor often have flattened bodies, usually camouflaged in mottled, neutral colours.

Eyes

Bony fish have well developed eyes with almost 360° vision.

Unlike sharks, bony fish do not have eyelids. Some fish species have false eye spots on their tails to confuse predators as to which end is which.

Fish generally have good eyesight, but eye size does vary depending on habitat and behaviour.

Operculum

The operculum, or gill cover, is a hard bony plate that protects the gills. Bony fish have a single gill opening on either side of the head.

Dorsal fin

The dorsal fin acts like a rudder or keel on a boat, keeping the fish upright and stable. The dorsal fin can be split into two – the front spiny dorsal fin plays a role in protection, the second is known as the soft dorsal fin.

Lateral line

The lateral line is a series of sensory pores, or receptors, which detect vibrations and pressure changes in the water.

Nostril

Although fish don't have a nose they do have nostrils (or nares) that are used to smell odours (such as chemicals) in the water.

Fish chatter

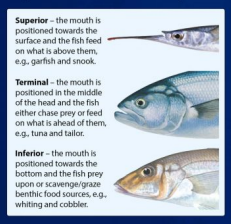
Fish produce sounds by rubbing together two bony parts of the body, such as their teeth or spines.

Mouth

Mouth shape and position often indicates what type of feeder the fish is e.g. upwards facing mouth indicates a surface feeder.

The mouth is very important in 'breathing' (gas exchange), as water is taken into the mouth and passed over the gills, where oxygen is extracted and carbon dioxide is released.

Bony fishes' teeth are attached to their jaws.



Superior – the mouth is positioned towards the surface and the fish feed on what is above them, e.g., garfish and snook.

Terminal – the mouth is positioned in the middle of the head and the fish either chase prey or feed on what is ahead of them, e.g., tuna and tailor.

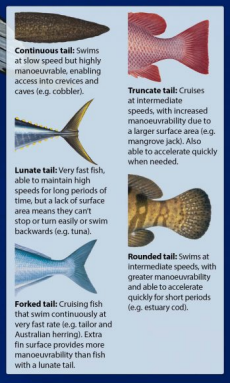
Inferior – the mouth is positioned towards the bottom and the fish prey upon or scavenge/graze benthic food sources, e.g., whiting and cobbler.

Caudal fin

The caudal fin or tail as it is more commonly known helps with steering, like the rudder on a boat. It also regulates the speed of forward movement.

The caudal fin of bony fish is called a homocercal tail because both the upper and lower lobes are the same size (or symmetrical), unlike in sharks where the upper lobe is generally larger than the lower lobe (referred to as a heterocercal tail).

Many bony fish move by bending their bodies so their tail finds thrust against the water.



Continuous tail: Swims at slow speed but highly manoeuvrable, enabling access into crevices and caves (e.g. cobbler).

Truncate tail: Cruises at intermediate speeds, with increased manoeuvrability due to a larger surface area (e.g. mangrove jack). Also able to accelerate quickly when needed.

Lunate tail: Very fast fish, able to maintain high speeds for long periods of time, but a lack of surface area means they can't stop or turn easily or swim backwards (e.g. tuna).

Rounded tail: Swims at intermediate speeds, with greater manoeuvrability and able to accelerate quickly for short periods (e.g. estuary cod).

Forked tail: Cruising fish that swim continuously at very fast rate (e.g. tailor and Australian herring). Extra fin surface provides more manoeuvrability than fish with a lunate tail.

Pectoral fin

Pectoral fins are used individually to turn the fish in either direction or control up and down movement. When used together, they act as brakes or allow the fish to swim backwards. Pectoral fins are absent in eels.

Fins

The fins of bony fishes are membranous and strengthened by a series of spines or soft rays. Unlike the rigid fins of sharks, the fins of most bony fishes can be folded flat against the body.

Ventral (Pelvic) fin

The paired pelvic (or ventral) fins assist with balance and steering, including side-to-side and up and down movement, as well as acting as brakes to slow the fish down.

Vent

The vent, or anus, is the external opening to the digestive and reproductive systems.

Anal fin

The anal fin assists with stability, stopping the fish rolling from side to side.

Scales

Bony fish have round, overlapping scales, although some species have lost their scales and have naked skin (e.g. toadfish, sunfish). Scales serve as a protective covering against bacterial infection and parasites. The skin also has thousands of mucous glands embedded in it. These secrete mucous that in turn provides an additional protective coating to the fish, makes it more streamlined for movement through the water and prevents any water leaking into the fishes' body.

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