



Fish Matters

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TOPIC: Fish Matters

THEME: Fish

DEPARTMENT: Ichthyology



*Storing fish in alcohol for science
Source: NMK - Ichthyology*

Lesson Objectives

1. The learner shall be able to identify a fish.
2. The learner shall appreciate the importance of fish in the ecosystem.
3. Appreciate the need for conservation of fishes.

Learning resources

1. Text
2. Video
3. Photo

Ichthyology

Ichthyology is the study of fish. This includes the biology, classification and conservation of fish, as well as fish farming for food and commercial purposes.

An ichthyologist is a biologist who studies fish. They investigate things like the history, environment, reproductive habits and behaviour of various fish species.

Characteristics of a fish

A fish is a cold-blooded vertebrate that lives in water and breathes using special organs called gills. Vertebrates are animals with backbones. A fish has fins and scales on the body.



Tilapia
Source: iStock

Parts of a fish

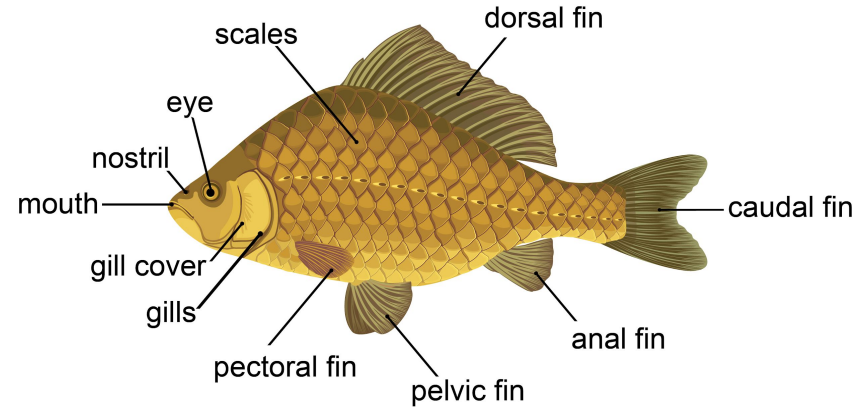
The body of a fish is divided into different parts. Each of these parts has its own function:

Mouth - The mouth is located at the front of the head of the fish. It is used for eating and breathing.

Eyes - Fish have two eyes, mostly located on either side of the head. The eyes are used to detect movement and prey in their surroundings. Fish also use their eyes to look for mates, shelter and identify enemies.

Gill - Fish have gills located on either side of the head of the fish to help them breathe in water. They are used to obtain oxygen from water and expel carbon dioxide.

Gill cover - The gill cover is also known as the **operculum**. It is a flap of skin that covers the gills. It protects the gills and also helps in regulating the continuous flow of water over them.



Labelled fish
Source: NMK - Ichthyology

Nostril - Fish have nostrils that are located on the top of the head. The nostrils allow the fish to smell water. By smelling water, fish can detect if another fish is injured or if they need to run from their enemies. Fish also smell water to detect chemicals and help migratory fish find their way back home.

Scales - Scales are thin, protective plates that cover the body of the fish. They help to reduce friction in water (the force that opposes movement) and protect the fish from enemies.

Anal fin - This fin is located at the bottom side of the fish towards the tail. It helps to stabilise the fish and provide balance when swimming.

Caudal fin - This fin is located at the tail end of the fish. It is also known as the tail fin. It helps to propel the fish through water and steer it from side to side.

Dorsal fin - Dorsal fins are paired and located on the top side of the fish. These fins help to stabilise the fish and control its movement through the water. They stop the fish from rolling on its side.

Pectoral fin - The pectoral fins are paired and located on the sides of the body of the fish. They are used for steering the fish and moving forward.

Pelvic fin - Pelvic fins are paired and are located at the bottom part of the fish. They are used for stability and help the fish to stop moving.

Lateral Line - Series of pores that run along the length of the fish body. They are used to sense vibration in the water and detect water movement.

Types of fish

There are over 30,000 types of fish in the world. The fish are found in freshwater, salty water and brackish water.

1. **Freshwater fish** - These are fish that spend some or all of their lives in freshwater such as ponds, swamps, rivers and lakes. Examples of freshwater fish include: tilapia, catfish, Nile perch, lungfish and barb.



Pancake headed catfish
Source: NMK - Ichthyology

2. **Marine/Saltwater fish** – These are fish that live in sea water such as seas and oceans. They can swim alone or in large groups called school. Examples of marine fish include: hawkfish, eel, puffer fish, oxeve and flute mouth.



Red-lipped Batfish
Source: Fishbase



Handfish
Source: iStock

3. **Brackish water fish** – These are fish that live in the areas where freshwater and saltwater mix, for example where the river opens into the ocean. Fish that live in these areas are able to tolerate a wide range of water salinities. Examples of brackish water fish include: tarpon, red drum and channel catfish.



Golden flathead goby
Source: Fishbase

Reproduction in fish

Fish reproduce by bearing live young or by laying eggs. Fish that lay eggs have the eggs fertilised outside the body. They are called **oviparous**. Most fish are oviparous including barbs, goldfish, catfish, gouramis and tilapia.

Fish that bear live young ones give birth to fully formed and functional young ones called fry. The eggs are fertilised and hatch within the female. Such fish are called **ovoviviparous**. Examples include sharks, rockfish and rays.

Some fish give birth to live young ones, and the eggs develop while getting food from the parent. Such fish are called **viviparous** including wrasses and parrot fishes.

Importance of fish

Fish provide many services for both humans and the ecosystem. They are part of the food chain and nutrient cycling. They serve as sources of food providing vitamins such as vitamins A, B and D. They also provide minerals such as calcium, iodine, fluorine, magnesium and zinc.

Fish also support our economies through generation of employment, foreign exchange earnings and tourism.



Fish as food
Source: iStock

Fish preservation methods

Fish preservation means keeping the fish in a condition fit for human consumption for a short or longer period. Different methods, both traditional and modern, are used to preserve fish.

Traditional methods of preserving fish include drying, salting, pickling and smoking. Modern techniques of preserving fish are freezing and canning.

For scientific purposes, fish specimens are preserved whole using a liquid called formalin. In the laboratory, specimens are washed in running water, sorted, identified and stored in 70% alcohol.



*Smoking fish for human consumption
Source: NMK - Ichthyology*



*Dried fish for human consumption
Photo: NMK - Ichthyology*



*Fish preserved in alcohol for scientific purposes
Photo: NMK - Ichthyology*

Conservation

Fish conservation is the protection of wild fish populations. Scientists who work in the field of fish conservation may work directly with a species of fish or they may work to protect and clean up the environment that fish live in.

Individuals can also work to conserve fish in different ways for example avoiding polluting the fish habitats, using recommended fishing techniques and tools, creating awareness to the public especially through fishermen training, educational programmes for schools groups and becoming fish conservation ambassadors.