

Copy of Notes: "What is a fish, really?"

The Requirements

ALL fish:

- Live in water
- Have a backbone (vertebrates)
- Breathe air through gills
- Have fins

Most fish:

Have scales

Are cold blooded

*** Tuna can raise their body temperatures a small degree, so are not considered truly cold blooded

Fish share the same taxonomy until class

Domain- Eukarya

Kingdom- Animalia

Phylum- Chordata

Sub Phylum- Vertebrata

3 main classes of fish

Classes-

Agnatha

Chondrichthyes

Osteichthyes

Class: AGNATHA

A means no, not

Gnathos- (Greek) jaw

Jawless Fish Class

Agnatha fishes have skeletons made of cartilage.

Agnatha fishes are primitive animals that have changed little during the past 330 million years.

Examples: Lampreys are parasitic, using a suction-cuplike mouth to attach itself to a host.

Class: Chondrichthyes

Two Greek roots - cartilage- kondros (χόνδρος) and fishes- ichthyos

These types of fishes have skeletons made of cartilage

They also have paired fins and jaws.

No operculum, must keep moving to breathe.

Have live births.

Special scales feel like sandpaper.

Examples:

- Sharks
- Sting rays
- Manta rays
- Whale Sharks
- Dogfish Sharks

FUN FACT: A shark's teeth are actually modified scales. They are triangular in shape and are arranged in 6 to 10 rows along the shark's jaw.

Class: Osteichthyes

Greek osté=bone + ichthýes=fish

"Bony Fish"

Over 20,000 different species

2 Main Types of Bony Fish:

Ray Finned:

Most fish are this type

Fins are supported by bony structures called Rays.

Lobe Finned:

Fins are long, fleshy, muscular, supported by central core of bones.

Thought to be ancestors of amphibians.

Examples are: Coelacanth, Lungfish

Examples:

- Salmon
- Tuna
- Tarpon
- Seahorse
- Eel

Fish versus Fishes

What's the difference between "fish" and "fishes"?

The classical definitions of these two terms are a bit complex. "Fish" can be both singular and plural, but in all cases it refers to a single species. "Fishes" is always plural and always refers to more than one species. For example, an aquarium full of guppies (*Poeciliareticulatus*) is full of fish; the ocean is full of fishes.

More Fish Characteristics

Respiration

Water flows over Gills as fish opens mouth and swims.

Water flows opposite direction of blood flow.

O₂ diffuses from the water into the blood.

Gills are made of thousands of gill filaments.

Gills are covered by the Operculum.

Reproduction

Most fish species reproduce sexually, and fertilize their eggs externally meaning laying eggs outside of the body. (Sharks-internally).

Spawning is the process of fertilizing eggs and this typically happens outside of the fish.

Baby fish are called FRY.

Structures

Lateral Line System- used to detect vibrations, orient the fish in water, it is a line of cells running down the side of the fish.

Otoliths- Some fish have structures called otoliths that are inner ear bones to sense vibration of sounds.

Operculum- gill cover, movement of operculum allows more water to be drawn in.

Swim Bladder- a gas filled sac that helps the fish maintain buoyancy. Sharks don't have a swim bladder!

Fins- Dorsal, Caudal, Pectoral, Pelvic, Anal.

Ampullae of Lorenzini- Sharks have these special structures that sense electricity in the water such as heartbeat and salinity.