Shark Anatomy

Reproduction

Three modes of reproduction have evolved in sharks. Adults reproduce using internal fertilization: males fertilize eggs in the female (placental viviparity) and produce young sharks called “pups.” Gestation can take 6 to 30 months. The largest bearer is the Whale Shark up to 300 embryos; whereas Sandtiger Sharks bear only two pups. Pups have to be ready to survive as soon as they are born; there is no parental care in the first weeks.

Adult

Egg laying

Eggs develop in uterus

1. Ovoviviparity: Fertilized eggs are enrobed inside egg cases in one of the uteri. The eggs are known as “mermaid’s purses” are laid or wrapped around substrate and hatch a young shark seven weeks later after the egg sac is consumed. Ex. catshark, Zebra Shark.

2. “Aplacental viviparity”: Several different modes, but unified by a lack of placental attachment to the mother and live birth. Yolk sac viviparity: embryos develop in utero and are primarily nourished via a lack of placental attachment to the mother and live birth. Yolk sac viviparity: embryos develop in utero and are primarily nourished via a yolk sac. The embryos consume throughout gestation as their primary source of sustenance. Most catsharks, some deepwater sharks such as false catsharks). In some extreme cases the largest embryos consume other embryos (sandtiger sharks).

3. Placental viviparity: embryos develop in utero, and are primarily nourished via a placenta. Placental viviparity: embryos develop in utero, and are primarily nourished via a placenta. Yolk sac viviparity: embryos develop in utero and are primarily nourished via a yolk sac. The embryos consume throughout gestation as their primary source of sustenance. Most catsharks, some deepwater sharks such as false catsharks). In some extreme cases the largest embryos consume other embryos (sandtiger sharks).

A small number of large pups are born live.

Birth

Hatchling

Adult

Fecundity

Most recently evolved mode or “placental viviparity” embryos develop a placental connection while they develop inside the uterus and are fed with a milk-like nutrient rich substance called “fetoplacental”. At term, the pups are born live. Ex. hammerheads, Bull and Lemon Sharks.

At least 550 species of shark have evolved from the original sharks 400 million years ago. They differ broadly in form and function, which enables them to thrive in multiple habitats and seas ranging from cold Greenland water and deep waters to warm tropical seas.

Sharks take in oxygen from the water or “respire” by flowing water across their gills. Brains like Zebras or Nurse Sharks can be stationary and “buccal ventilate”, pumping water over their gills and even using a spiral valve located behind the eye to increase water flow. Others like the white hamstring and silky sharks need to constantly swim to respire.

Teeth

Made of animal and invertebrates when used to the “placental” teeth avoid the hindgut. Behavior and dietary preferences of their owners. Songs are passed to their fill, others are used to eat or layer prey, and others like how plates to eat hard prey.

Ampullae

Named by the biologist Lamont, these super sensory organs are filled and located around the head and allow the detection of electrical impulses and help sharks find nearby or hidden prey.

Skin - covered in dermal denticles "teeth"

Ampulla of Lorenzini

Most sharks have a higher resolution and are in color. They have a high number of “rods" and an extra membrane at the back of the eye "Tapetum lucidum", like a filter that allows them to see in very low light conditions. Species such as Carcharhinus Reelf and Galeocerdo Sharks have "nictitating membranes", others like the white hammerhead or silky sharks need to constantly swim to respire.

Ampullae

Gill slits

Oxygen in - water in

Liver – large for increased buoyancy

Lateral bar – changes in water pressure

Heart

Teeth - replaceable

Snout

Gills

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Lateral line

Encapsulated fin rays

Nasal bone

Eyes

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Heads

The size and shape of a shark's head helps to identify where and how the animal travels. The long, narrow head of the Shortfin Mako is a slender moving animal, the sharp nose of the Silky Shark suggests a more hydrodynamic animal evolved for greater speed.