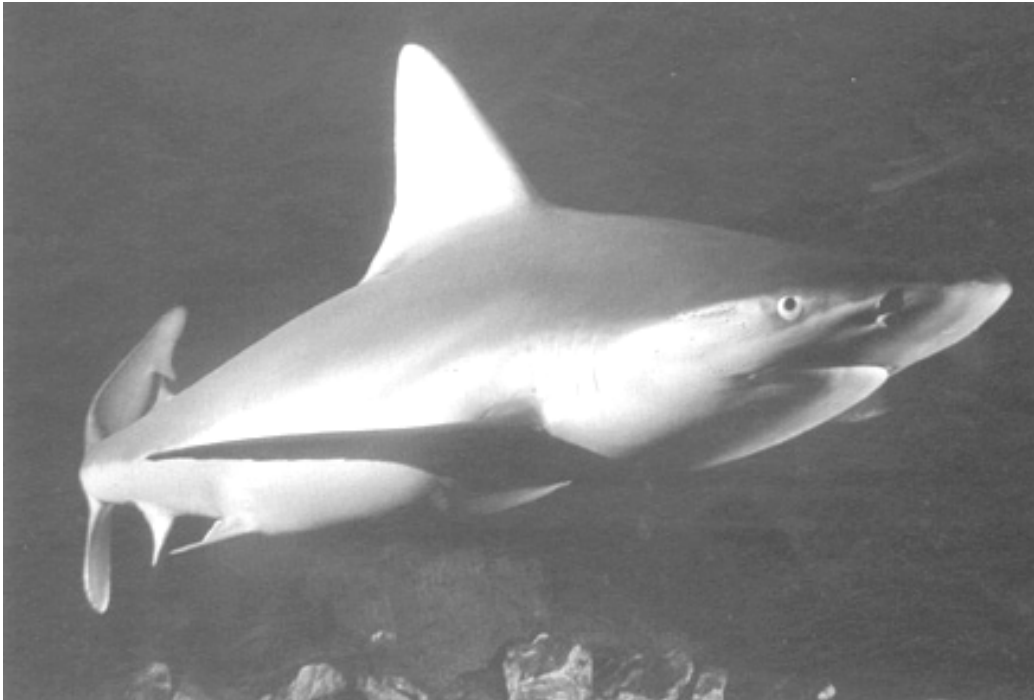


**B. Body shape.**

1. Sharks typically have a fusiform body (rounded and tapering at both ends). This body shape reduces drag and requires a minimum of energy to swim.



Brown sharks (*Carcharhinus plumbeus*) show the fusiform (rounded and tapering at both ends) body shape typical of most shark species.

2. Batoids are flattened, with a ventral mouth and gill openings.

**C. Coloration.**

1. Sharks and batoids are generally drably countershaded. Countershading is a type of camouflage in which the dorsal side is darker than the ventral side. The dark top of a countershaded animal blends in with the dark ocean depths when viewed from above. The light ventral side blends in with the lighter surface of the sea when viewed from below. The result is that predators or prey do not see a contrast between the countershaded animal and the environment.

The light ventral surface of a countershaded shark blends in with the lighter surface of the sea when viewed from below, camouflaging the shark from predators and prey.



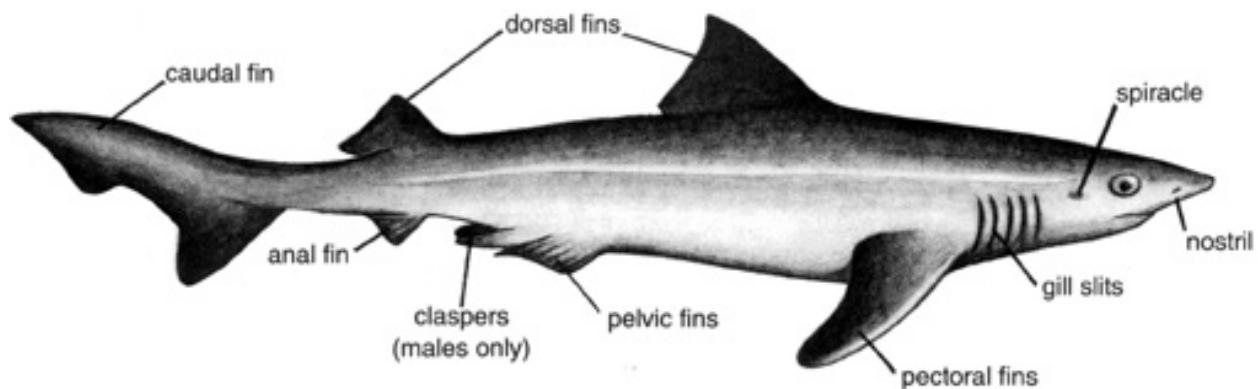
2. Some coastal benthic sharks and batoids are camouflaged to blend in with the ocean bottom.
  - a. Most stripes and other markings are juvenile colors that fade or disappear with age, as in the case of the tiger shark (*Galeocerdo cuvier*).
  - b. Some sharks, such as wobbegongs (family Orectolobidae) and the whale shark, keep their markings throughout their life.
  - c. The markings of some species change as the shark ages. For instance, young zebra sharks (*Stegostoma fasciatum*) have dark bands and saddles that fade to rather uniformly distributed spots on adult sharks. Adult *Stegostoma fasciatum* are called Australian leopard sharks.



Australian leopard sharks (*Stegastoma fasciatum*) show rather uniformly distributed dark spots.

#### **D. Fins.**

1. Fins are rigid, supported by cartilaginous rods.
2. Sharks have five different types of fins.
  - a. Paired pectoral fins lift the shark as it swims.
  - b. Paired pelvic fins stabilize the shark.
  - c. One or two dorsal fins stabilize the shark. In some species, dorsal fins have spines.
  - d. A single anal fin provides stability in species where it is present; not all sharks have an anal fin.
  - e. The caudal fin propels the shark.



A shark has five different kinds of fins, which lift, stabilize, and propel the shark.

3. The different families of batoids show various amounts of fin fusion and reduction. In particular, the greatly expanded pectoral fins are fused to the sides of the head, and the anal fin is absent. Stingrays have a barbed, venomous spine on a whiplike tail.

## **E. Head.**

### 1. Eyes.

- a. Eyes are lateral on sharks, dorsal on batoids.
- b. Some species have an eyelid-like structure called a nictitating membrane. The nictitating membrane protects the eye from being injured by thrashing prey while the shark is feeding.
- c. Eye size and position vary, depending on the particular habitat or behavior of the species. In general, deep-water sharks have bigger eyes than shallow-water sharks.

### 2. Nostrils.

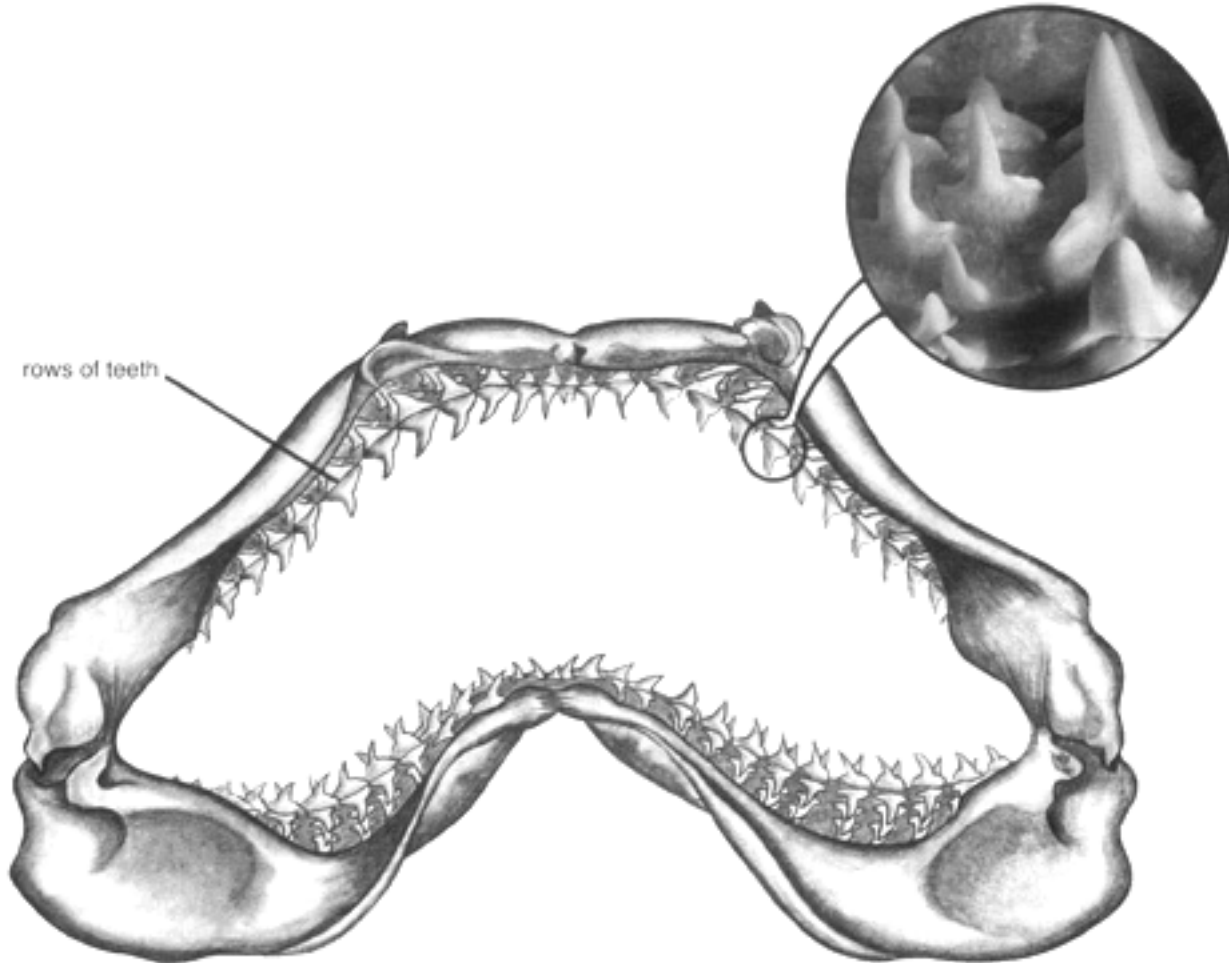
- a. Sharks and batoids have ventral external nostrils.
- b. Some species have nasal barbels, sensory projections near the nostrils.

### 3. Mouth.

On both sharks and batoids, the mouth is usually ventral. It is located at the tip of the snout in the whale shark, megamouth shark (*Megachasma pelagios*), frilled sharks (*Chlamydoselachus* spp.), and some carpet sharks (family Parascylliidae).

- b. The mouth may have labial folds or furrows.

- c. Teeth are modified, enlarged placoid scales. Sharks have numerous rows of teeth attached at their bases by connective tissue. Several rows of replacement teeth continually develop behind the outer row(s) of functional teeth. As the functional teeth fall out, replacement teeth take their place.



- d. Some species of sharks may shed as many as 30,000 teeth in a lifetime.

Sharks have numerous rows of teeth. Several rows of replacement teeth continually develop behind the outer rows of functional teeth. As the functional teeth fall out, replacement teeth take their place.

#### 4. Gill slits.

- a. Sharks have five to seven pairs of lateral gill slits.
- b. Batoids have five pairs of ventral gill slits.

#### 5. Spiracles.

Some species of elasmobranchs have small openings called spiracles behind the eyes at the top of the head. These openings bring oxygen-carrying water into the gill chamber. Spiracles originate from rudimentary first gill slits and are reduced or absent in active, fast-swimming sharks.