



Dissection 101: Dogfish Shark

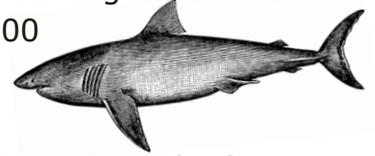
Name: _____

Student Checklist

Dogfish shark Checklist: Identify the following structures/locations.



Dogfish sharks are vertebrates in a class called Chondrichthyes. This group of fish are also called cartilaginous fish because their skeletons are made of cartilage. There are about 1,000 species of Chondrichthyes, of these approximately 400 are sharks. Rays and skates are also found in this class.



Note: The spiny dogfish shark has two spines located anterior to each of the dorsal fins. The supply house should have removed the spines for safety.

Fish, including the bony fish (perch) and the dogfish shark share similar characteristics:

- Fins – Provide movement forward (propulsion), maneuverability (directional movement), and stabilization
- Vertebrate – has backbone (spinal column)
- Uses gills for respiration
- Lives entire life in water

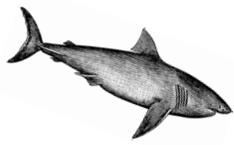
Use lines provided for additional notes

External structures

Draw and label the fins of a dogfish shark

- Unpaired fins
 - Two unpaired dorsal fins – stabilize movement
 - One tail (caudal) fin – movement forward
(Heterocercal fin: Larger dorsal (upper) lobe)
- Two paired ventral fins – maneuverability
 - Pectoral fins
 - Pelvic fins

Note: The male has elongated structures on the pelvic fins called claspers. The claspers are used to transfer sperm to the cloaca of the female during copulation.



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Student Checklist (Continue page 2)

- Cloaca: Common opening for the urogenital and digestive systems (found in both male and female fish)

- Eyes – Paired

- Lateral Line – Specialized sensory structure for detecting pressure changes/movement (Ex. vibration (waves) from movement of prey)

- Spiracles: Paired openings, leading into the gills, for oxygen rich water to pass. Especially important when mouth is closed or blocked by obstructions like sand.

- External Gill Slits – Water flows (from movement of shark) through the mouth/spiracles to the pharynx, passes through the internal gill slits over the gills, and then exits the external gill slits. The external gill slits are not covered by an operculum (pump like protective structure), like we see in the bony fish.

- Scales – Protective tiny tooth-like scales (covered with enamel) – sandpaper like

- Nostrils (external nares) – Paired; used to sense chemicals in the water; not connected to the throat

- Mouth – Ventral surface; strong jaw used to catch large prey and tear/bite into chunks; many teeth with rows of developing teeth



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Student Checklist (Continue page 3)

- Ampullae of Lorenzini – Pore-like sensory structures sensitive to slight electrical fields, like the electrical impulses produced in the muscles of prey.

Internal Structures

- Liver – The three lobed liver is the largest organ in the abdomen cavity; the liver is comprised of two large lateral lobes and a smaller medial lobe; the liver has many functions including detoxifying blood, stores oil for energy and density reduction (lacks swim bladder) and produces bile for fat digestion

- Spleen – Immune (white blood cell production); filters and stores blood

- Rectal gland – Removal of salt, deposits into large intestine

- Small intestine – Digestion and nutrient absorption; has spiral valve which increases surface area for nutrient absorption without increased length

- Gallbladder – Attached to the middle lobe of the liver; stores bile that was produced in the liver (gallbladder can have a green tint from the bile); during fat digestion the bile is released via the bile duct to the small intestine.

- Stomach – Food storage and digestion; complete digestive system

- Regions of the Stomach – The cardiac region of the stomach has rugae, which are folds that increase surface area for digestive juices and for increased volume for food storage; the pyloric region (J-shaped) has the pyloric valve leading into the intestine that regulates food passage



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Student Checklist (Continue page 4)

- Esophagus – Connects pharynx to the stomach

- Reproductive structures (view multiple sharks to identify both male and female structures)
 - Ovaries – Paired female gonad which tend to be plump and have a smooth appearance; produces eggs

 - Testes - Paired male gonads (testis - singular) which tend to be slender and have a smooth appearance; produce sperm; look for claspers on pelvic fin

 - Oviduct – Duct for transferring egg to uterus; sperm fertilizes egg in oviduct

 - Uterus – Fertilized eggs develop into pups

 - Internal fertilization - During copulation, the clasper of the male is inserted into the cloaca of the female, transferring sperm. The eggs released by the ovaries are fertilized in the oviduct. The fertilized eggs develop in the uterus of the female (ovoviviparous). The developing embryos each have their own egg (yolk); no connection to the mother. After approximately 2 years the pups are born live via the cloaca. There is no additional parental care.
 - Vas deferens - Coiled reproductive duct; transfers sperm; lies anterior to the kidney

- Kidneys – Excrete waste from the blood; long, thin, and paired; contained within the body wall



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Student Checklist (Continue page 5)

- Mesentery – Connective tissue; houses lymphatic tissue and blood vessels

- Pancreas – Located at the start of the small intestine; enzyme producing structure for digestion; hormone production

- Large intestine (colon) - Water absorption

- Heart – Two chambered: one ventricle and one atrium; sinus venosus; conus arteriosus

 - Deoxidated blood enters the sinus venosus from the body. Blood then enters the atrium (which has two lobes) and is then pumped to the ventricle. The ventricle pumps the blood through the conus arteriosus to the gills where gas exchange occurs. Oxygenated blood, with reduced pressure, is distributed to the body.
- Gills: Feather-like structures (increased surface area); used to remove oxygen from water for respiration

- Gills Rakers: Projections that prevent (strain/filter) particles, like food, from entering the gills

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