

Fish and Shark WebQuest

Use the website links to help answer the following questions:

<http://www.flmnh.ufl.edu/fish/Education/education.htm> Florida Museum of natural History

Fish Groups and Anatomy

1. What is the most primitive group of fishes and what is the defining characteristic of animals in this group?
2. When did the Agnathans first appear in the fossil record?
3. Describe both of the only surviving Agnaths today.
4. The class Chondrichthyes is made up of which animals?
5. How can you identify a male shark, skate, or ray? Where are the claspers located and what are they used for?
6. List three differences between sharks and rays in their body plans and how they swim.
7. List and describe the two classes that make up the group Osteichthyes.
8. Research the group Sarcopterygii and explain why all terrestrial vertebrates from cows to humans are included in this group which describes fish? (you may have to use more than just this website to find a complete answer)
9. What differentiates the three main groups of fish from each other?

Anatomy

<http://www.flmnh.ufl.edu/fish/education/Diagrams.htm>

Anatomy of fish and sharks

10. Make a detailed sketch of a bony fish and label the following:

- | | | |
|--------------------------------------|--|-----------------|
| a. Dorsal fin (both spines and rays) | b. Caudal fin (both upper and lower lobes) | |
| c. Caudal peduncle | d. Anal fin | |
| e. Anus/Cloaca | f. Pectoral fin | |
| g. Pelvic fin | h. Operculum | i. Lateral line |

11. Describe two types of teeth that can be found in fish.

12. It is thought that teeth developed from scales in fish based on what evidence?

13. Make a detailed sketch of a shark and label the following:

- | | | |
|--|--|-------------|
| a. 1 st and 2 nd dorsal fins | b. Caudal fin (both upper and lower lobes) | |
| c. Caudal keel | d. Anal fin | |
| e. Pelvic fin of male (include clasper) | f. Pectoral fin | |
| g. Gill openings | h. Mouth, nostril and eyes | i. Spiracle |

Photoreception (ability to detect light) Sight

14. Most fish can see very well and some fish even have a special eye structure called the *Tapetum lucidum* that allows them to see very small amounts of light. How does this structure work?

15. How are fish eyes different from ours and how do they focus?

Chemoreception (ability to detect chemicals) Smell and Taste

16. How are the nostrils on a fish different than those on humans?

17. What advantage does having their nostrils located on the sides of their head give a fish?

18. What is the lowest level of chemical concentration that a shark can sense? Give an example of this in drops of blood per gallons of water, or number of molecules in gallons of water.

19. Where are all the locations that taste buds can be located on a fish?

20. How does a goatfish or catfish use its barbels (whisker like projections either under or surrounding the mouth)?

Mechanoreception (ability to detect vibrations and touch) Hearing and Touch

21. Where is the ear located in a fish?

22. Much like humans, the fish's ear provides it with a sense of balance. How does this work?

23. Fish also have a system for detecting movements and pressure changes in the surrounding water called the lateral line system. Research this system and describe how it functions and what it allows the fish to do with regards to hunting, navigation, and schooling.

Electroreception (ability to detect electrical potential)

24. How is electroreception generally used in most fish species?

25. Describe what the *ampullae of Lorenzini* is and how it is used in sharks.

26. How sensitive is *ampullae of Lorenzini* system in sharks compared to other animals?

27. How is it thought that this system is used by some animals to detect the Earth's electromagnetic field?