Name_____ Date_____

Fishy Fish

The evolutionary development of fish introduced new characteristics such as **jaws** and **paired fins** that had not been seen in the other animal groups that came before them. Paired fins along with a tail allow fish to maneuver through the water very accurately. Modern day fish are divided into two main categories:

a) cartilaginous fish
b) bony fish

Cartilaginous fish or **Chondrichthyes** are fish that have skeletons made of **cartilage**, though such fish do have teeth that are made of bone. Cartilage is more flexible than bone and allows for more efficient swimming. Good examples of this type of fish are **sharks** and **rays**.

Most sharks have very streamlined bodies and are excellent swimmers, but they are denser than water and they will sink if they stop swimming. As they swim, they continually take in water through their mouths and out through their gills. This provides their bodies with oxygen. Some sharks do spend time resting on the sea floor, but they must use the muscles of their jaws and throat to pump water over the gills in order to continue breathing.

Most sharks are carnivores. They eat prey whole or use their powerful jaws and many sharp teeth to tear it into smaller pieces. Sharks have good vision but do not distinguish color. They also have a strong sense of smell with nostrils that are used only for smelling and not breathing. Sharks have no eardrums. Sound reaches them through the water and their entire body transmits the sound to the inner ear. Sharks also have a **lateral line system**. This is a line of microscopic organs that run along the body of a shark and are used to detect changes in water pressure.

Osteichthyes are fish with bony skeletons that live in both the ocean and in freshwater habitats. These fish are always slimy due to the glands in their skin that continually secrete mucus. Bony fish also have a lateral line system, and they breathe by drawing water over pairs of gills covered by a flap called the **operculum**. Water enters through the mouth and exits through the gills by the movement of the operculum and surrounding muscles. This allows bony fish to breathe while they are not moving. Another feature found only in the bony fish is the **swim bladder**. Osteichthyes can transfer gas between the swim bladder and their blood to control buoyancy. Unlike sharks, bony fish can remain very still without sinking.

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Fishy Fish Questions

1. True or False. Fish use paired fins and a tail to move through the water efficiently.

2. Fish are divided into two main categories based on whether their skeleton is made of _____ or _____.

3. Give two example of cartilaginous fish.

4. True or False. Sharks must either keep swimming or use the muscles of their jaws and throat to pump water over the gills in order to keep breathing.

5. The nostrils of a shark are used only for _____.

6. Class _____ are the bony fish.
   a. Chondrichthyes
   b. Insecta
   c. Osteichthyes
   d. Amphibia

7. The flaps covering the gills of a bony fish are called _____.

8. Lateral line systems are found in:
   a. bony fish
   b. cartilaginous fish
   c. both bony and cartilaginous fish
   d. none of the above

9. Fish are slimy due to the _____ that is secreted by glands in their skin.

10. What does a swim bladder allow a bony fish to do that sharks cannot do?

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Fishy Fish Answers

1. **True** or False. Fish use paired fins and a tail to move through the water efficiently.

2. Fish are divided into two categories based on whether their skeleton is made of **cartilage** or **bone**.

3. Give two example of cartilaginous fish. **Sharks and rays**

4. **True** or False. Sharks must either keep swimming or use the muscles of their jaws and throat to pump water over the gills in order to keep breathing.

5. The nostrils of a shark are used only for **smelling**.

6. Class _____ are the bony fish.
   a. Chondrichthyes
   b. Insecta
   c. Osteichthyes
   d. Amphibia

7. The flaps covering the gills of a bony fish are called **operculum**.

8. Lateral line systems are found in:
   a. bony fish
   b. cartilaginous fish
   c. both bony and cartilaginous fish
   d. none of the above

9. Fish are slimy due to the **mucus** that is secreted by glands in their skin.

10. What does a swim bladder allow a bony fish to do that sharks cannot do?
    A bony fish can be almost motionless and not sink while a shark has to keep swimming to avoid sinking.