Practice

Answer the following using complete sentences.

1. State the purpose of a fish's scales and the mucus coating. _____

   _____

2. Describe how the lateral line organ of the shark detects vibration.

   _____

   _____

3. What does the swim bladder of bony fish do? _____

   _____

4. What do the ampullae of Lorenzini do for the shark? _____

   _____

5. Describe what a fish will look like that has countershading as its body color. _____

   _____

6. Where will a fish with countershading body color live? _____

   _____

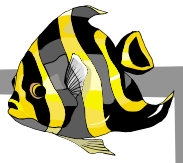
7. State examples of fish that exhibit the following body types:

   a. fusiform: _____

   b. depressed or flattened: _____

   c. laterally compressed: _____

   d. snake-like bodies: _____



Lab Activity 1: Identify Species of Sharks and Rays

Investigate:

- Identify species of sharks, using a key.

Materials:

- shark pictures and key

Procedure:

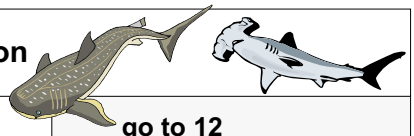
1. Use the following statements to identify the sharks and rays pictured.

2. Begin at choice number 1 with each shark or ray. Decide whether the *first* or *second* sentence best describes the shark or ray. Use that choice to either identify the shark or ray and continue down the key.

3. Once the shark or ray is identified, write the name in the blank.

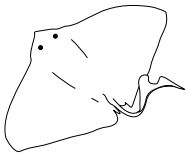
4. Then go to the next picture. Begin again at number 1. Each name is used only once.

Shark Identification

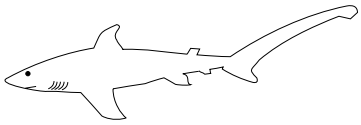


1. body kitelike (viewed from top) body not kitelike	**go to 12** **go to 2**
2. pelvic fin absent and nose sawlike pelvic fin present	**sawsharks** **go to 3**
3. seven gill slits present five gill slits present	**sevengill sharks** **go to 4**
4. only one dorsal fin two dorsal fins	**cat sharks** **go to 5**
5. mouth at front of snout not underside mouth on underside of head	**whale sharks** **go to 6**
6. head expanded on side with eyes at end head not expanded	**hammerhead sharks** **go to 7**
7. top of caudal fin same size and shape as lower top of caudal fin different from lower	**mako sharks** **go to 8**
8. first dorsal fin very long, half of body first dorsal fin regular in length	**false catsharks** **go to 9**
9. top of caudal fin very long, half of body top of caudal fin different from lower	**thresher sharks** **go to 10**
10. long needle-like point on end of nose nose without long point	**goblin sharks** **go to 11**
11. anal fin absent anal fin present	**dogfish sharks** **requiem sharks**
12. small dorsal fin present near tip of tail no dorsal present near tip of tail	**skates** **go to 13**
13. two horn-like appendages on front no horn-like appendages	**manta rays** **stingrays**

Analysis:

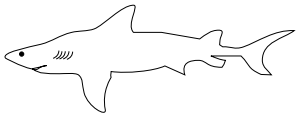


1. _____

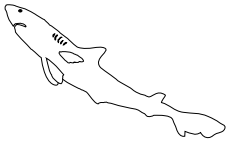


2. _____

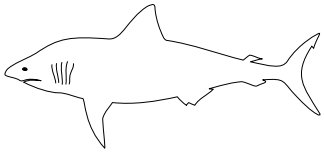
3. _____



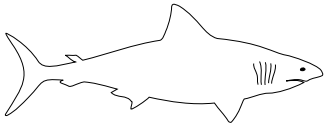
4. _____



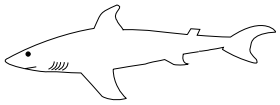
5. _____



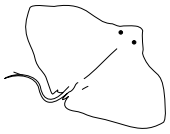
6. _____



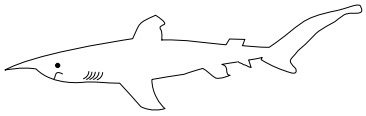
7. _____



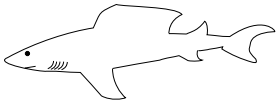
8. _____



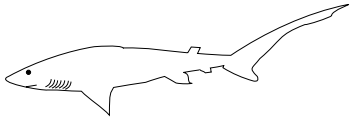
9. _____



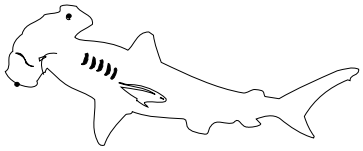
10. _____



11. _____



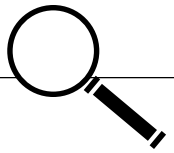
12. _____



13. _____

14. _____

Lab Activity 2: Fish Printing



Investigate:

- Observe the body form and fins of a fish.

Materials:

- whole, intact, fresh fish from market
- water-soluble ink or paint
- newsprint or other grainy paper
- small pieces of modeling clay or toothpicks
- newspapers
- piece of sponge

Procedure:

1. Cover work area with newspaper.
2. Rinse fish and pat dry to remove oils and slime.
3. Place fish on newspaper and spread fins and mouth. Use clay or toothpicks to hold in place (on underside only).
4. Use a small sponge to dab, not spread, paint on surface of fish. This is much like sponge painting. Do not slide sponge on surface. A little paint goes a long way.
5. Make sure area around fish is not covered with paint, and carefully place a piece of paper on top of your fish. Use your hands to press the paper all over the fish, covering all parts without sliding it or picking it up.
6. Gently peel the paper from the fish—you've created art!
7. Let dry; then label the fins, gill cover, and any other features you can see.
8. Write a paragraph describing the adaptations and habitat of the fish used.

Lab Activity 3: New Millennium Fish

Investigate:

- Review what you have learned regarding the anatomy of fish, the ocean environment, and the organism's methods of adapting to survive.

Materials:

- butcher paper
- notebook paper
- colored pencils or markers
- scoring rubric
- textbook or other marine resources

Procedure:

1. Imagine it is the year 2055. Since the turn of the century, over-fishing and global warming have dramatically altered characteristics of oceans. Make a list of 10 characteristics that would describe the Pacific Ocean in 2055. List these on a sheet of paper titled *New Millennium Ocean*.

2. Given the hypothetically evolved condition of the Pacific Ocean, *create* a fish of the *future*. Make a list of the different ways this *New Millennium Fish* would adapt to survive. Write this list on the same sheet of paper of the *New Millennium Ocean* characteristics. Title this list *New Millennium Fish*.

3. Draw and color a picture of the *New Millennium Fish* on a sheet of paper. Use the entire sheet of paper. Include labels for the fish anatomy or descriptors for any new or unusual adaptations the fish may have evolved. Be sure to use the correct coloration, appendages, fins, etc. Using the fish's adaptations, create a name for the *New Millennium Fish*.

4. After completing your New Millennium Fish drawing, display your drawing and list of characteristics on the wall. Enjoy viewing your classmates' fish creations.

Analysis:

Your drawing will be graded using the following rubric or scoring guide. Your teacher will tell you what points are possible to earn for each category. Write in the possible points in the first column, then use the second column to compare your scored rubric with your teacher's.

New Millennium Fish Rubric

_____

_____

	points possible	self-rating	points earned
1. The drawing has illustrated the correct and total number of adaptations listed.	_____	_____	_____
2. Color, labels, and other descriptors clarify what the model intended to show.	_____	_____	_____
3. Name is suitable and correlates to the characteristics listed.	_____	_____	_____
4. The drawing is neat and presentable.	_____	_____	_____
		total points	_____

Practice

Use the list below to write the correct term for each definition on the line provided.

Agnatha	**caudal**	**pectoral**
buoyancy	**denticles**	**scales**
cartilage	**dorsal**	**ventral**
cartilaginous	**lamprey**	

_____ 1. at or near the chest

_____ 2. located on the stomach or belly

_____ 3. at or near the tail

_____ 4. located on the back

_____ 5. small toothlike structures that cover the body of sharks and rays

_____ 6. thin, flat plates that make up the covering of bony fish

_____ 7. a jawless parasitic fish with a tubelike body and large teeth

_____ 8. firm but flexible material that makes up the skeletons of sharks, rays, lampreys, and hagfish

_____ 9. tendency to remain afloat in a liquid or gas

_____ 10. class of fish with skeletons of cartilage; includes sharks and rays

_____ 11. group of jawless fish with cartilage skeletons; includes lampreys and hagfish

Practice

Match each definition with the correct term. Write the letter on the line provided.

_____ 1. large group of fish of the same type, size, and age that travel and feed together

_____ 2. coloration in fish where the colored body pattern contains many lines which hide the fish's outline and helps camouflage the fish

_____ 3. coloration in many fish where the dorsal side is dark and the ventral side of the fish is light

_____ 4. a streamlined body shape exhibited by many pelagic fish

_____ 5. flap of tissue that covers the fish's gills

_____ 6. depositing or releasing a mass of eggs and sperm directly into the water

_____ 7. nerve receptors in tiny pores in the shark's snout that can detect electric fields of other animals

_____ 8. line of sensitive sound receptors along each side of a fish's body

_____ 9. visible opening for breathing found in cartilaginous fish only

_____ 10. gas- or air-filled organ that regulates the buoyancy of bony fish

A. ampullae of Lorenzini

B. countershading

C. disruptive coloration

D. fusiform

E. gill slits

F. lateral line

G. operculum

H. school

I. spawning

J. swim bladder