

Fishy Features: Examining External Structures of a GloFish®

Objective

The learner will identify the external structures on a GloFish® fluorescent fish that allow it to be well suited to its environment.

The learner will observe the growth rings on a fish scale to estimate the age of the scale.

Introduction

Fish have a variety of adaptations that allow them to live in water. Many have streamlined bodies that help them glide through the water. Most fish are covered with protective scales. The scales of most bony fish grow as the fish grows. The scales add a new layer of growth each season producing a series of rings called annuli. These rings are similar to the growth rings of a tree trunk. On top of the scales is a layer of slime. The slime layer helps the fish move more efficiently in the water as well as protect the fish from diseases.

Fish have several types of fins that help them move forward, backward, and from side to side. Some fins are paired while others are single. GloFish possess several different fins and each fin plays an important role in the fish's ability to move through the watery environment.

In this activity, you will observe the GloFish to identify external features including the number and location of fins. Additionally, you will observe a fish scale to estimate the age of a fish.

National Standards Addressed

Science as Inquiry A—Abilities necessary to do scientific inquiry

Life Science C—Structure and function in living systems

Materials Per Group

Microscope

Aquarium water

One GloFish® in a clear plastic cup of aquarium water

Hand lens

Colored pencils

Prepared slide of cycloid fish scale or glass slide and scale from a preserved (or market) fish

Safety Precautions

Demonstrate the proper procedure for carrying and handling the cup containing the fish. Instruct learners to wash their hands thoroughly after handling living organisms.

Procedures

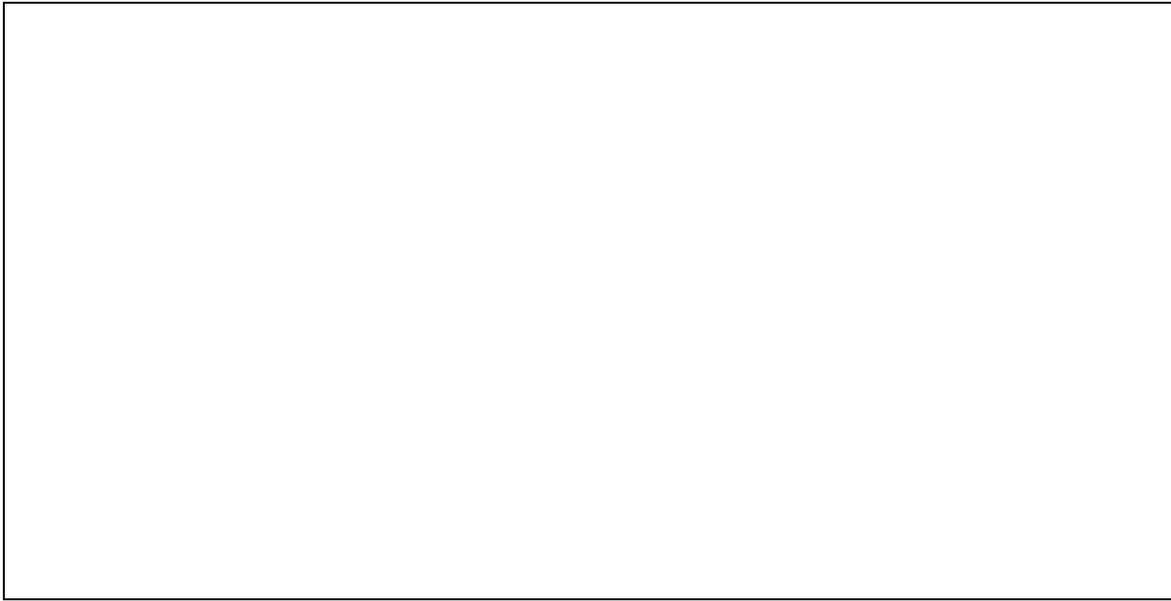
Part A: Fins and Features of the GloFish®

1. Obtain a GloFish swimming in aquarium water in a clear plastic cup.
2. Place the cup containing the fish on stable surface such as the lab table.
3. Use the hand lens to look carefully at the GloFish. Note the number and location of the fins found on the fish. Look into the cup from the top and from the side in order to see all of the features of the fish.
4. Make a drawing of the GloFish in the space provided on the student answer page. Use map pencils to color your drawing. Your sketch should include the noticeable features of the fish including the fins. Make sure to sketch the fins and features in the correct location on your diagram.
5. Use your textbook or other reference materials as a guide to label the following external structures on your fish drawing: eye, pectoral fins, lateral line, gill cover, pelvic fin, caudal fin, dorsal fin, anal fin, and nostril. In *Data Table 10.1*, record how many of each of these structures is found on your fish. For example, two eye, two nostril, etc.
6. Observe the movement of the GloFish. Watch as the fish swims through the water. Look at the fins to see how the fish uses them to swim. Write a description of how the fish uses its fins to move through the water in the space provided on the student answer page.
7. Use reference materials such as textbooks, library books, and/or internet resources to help you explain the function of each body feature listed in *Data Table 10.1*.

Part B: A Closer Look at Scales

8. Obtain a prepared slide of a scale from a typical boney fish. Alternately, your teacher may instruct you as to how to prepare your own slide using the scale of a preserved fish.
9. Place the slide on the microscope stage and observe the slide under low power magnification. Count the number of rings present on the scale.
10. Sketch the scale in the space provided on the student answer page. Your sketch should include any growth rings or annuli observed. Label the growth rings on your diagram.
11. Boney fish will form a growth ring or annuli during each season of growth. Based on the number of growth rings present, estimate the age of the fish that grew the scale.

Drawing of Fish



Data Table 10.1 - Fish Features and Functions

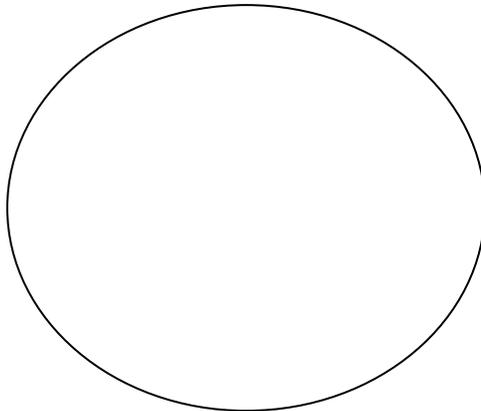
Fish Feature or Structure	Number	Function
Eye		
Lateral Line		
Gill Cover		
Gills		
Pelvic Fin		
Pectoral Fin		
Tail (Caudal) Fin		
Dorsal Fin		
Anal Fin		
Nostril		
Slime Layer		
Scales		

Lesson plan for GloFish® fluorescent fish; Starfire Red®, Sunburst Orange®, and Electric Green®. For additional FREE lesson plans, please visit the **GloFish.com** Classroom page at <http://www.glofish.com/classroom.asp>.

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Description of How GloFish® Moves

Drawing of Fish Scale



Estimated Age of Fish:

Elaborations or Extensions

Interested students can go to the Internet to find more information on GloFish® fluorescent fish or other genetically modified organisms. Students could explore adaptations of fins for specific jobs such as dorsal fin of the angler fish. Provide students with prepared slides of scales from shark, lungfish, gar, and perch to compare placoid, cosmoid, rhomboid and cycloid scales, respectively.

Fishy Features: Examining External Structures of a GloFish® Answer Sheet

Intended Grade Level

6th, 7th, and 8th

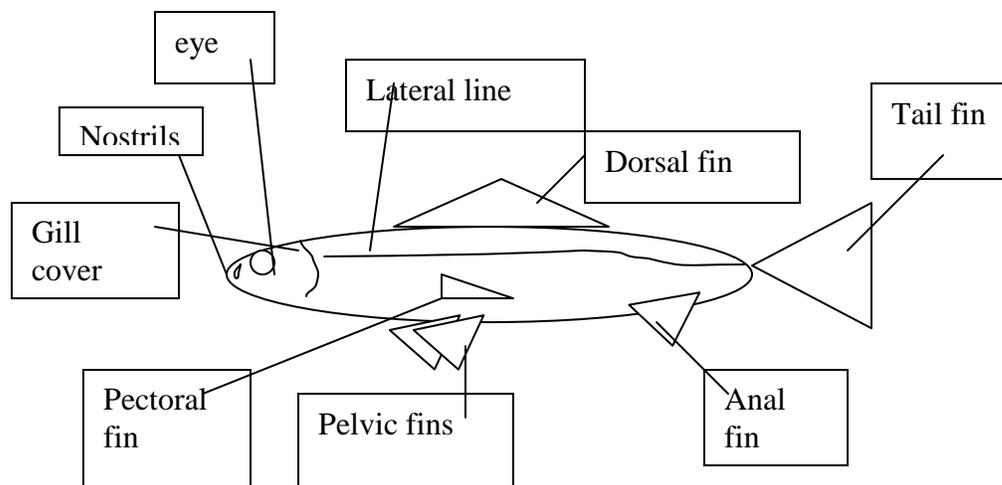
Teacher Information

Instruct students to let the fish acclimate for at least five minutes after they are put into the cup before making their observations.

Prepared slides of cycloid fish scales can be purchased from science supply companies.

Students can make their own fish scale slides. You may obtain fish scales from preserved fish specimen or you local fish market. The annuli are best observed in scales taken from the back half of the fish body above the lateral line.

Questions and Possible Answers



Check student descriptions for proper observations, sentence structure, and punctuation

Fish Feature or Structure	Number	Function
Eye	2	<i>Vision</i>
Lateral Line	<i>1 per side</i>	<i>Sense vibrations and electrical current</i>
Gill Cover	2	<i>Protects gills</i>
Gills	<i>2 sets</i>	<i>Removes oxygen from water</i>
Pelvic Fin	2	<i>Balance and stability</i>
Pectoral Fin	2	<i>Move right, left and swim forward</i>
Tail (Caudal) Fin	1	<i>Forward motion</i>
Dorsal Fin	1	<i>Balance</i>
Anal Fin	2	<i>Balance</i>
Nostril	2	<i>Smelling</i>
Slime Layer	<i>Covers scales</i>	<i>Protection and helps glide through water</i>
Scales	<i>Covers body</i>	<i>Protection</i>