

Fish scales in comparison



Biology

Microscopy / Cell Biology

Basics of Microscopy & Work Technology

Biology

Microscopy / Cell Biology

Humans & Animals

Biology

Animal Physiology / Zoology

Fish

Nature & technology

From the very small & the very big

Nature & technology

Plants & animals



Difficulty level

easy



Group size

1



Preparation time

10 minutes



Execution time

30 minutes



Teacher information

Application



Sea Bass (40x)

Fish glide through the water with almost no resistance. This is partly due to their streamlined shape, but is also related to the surface of the body: The fish is covered like a roof tile with small platelets called scales. There is a layer of mucus on top of them.

Other teacher information (1/4)

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Prior knowledge



Students should already know the structure of fish and some different scale shapes and characteristics.

Scientific Principle



Using a microscope, students look at the scales of different species of fish.

Other teacher information (2/4)

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Learning objective



Students should recognize that fish scales can have very different structures.

Tasks



Have students make a preparation of various fish scales and view them under the microscope.

Other teacher information (3/4)

Notes on material procurement

Fresh fish as a donor of fish scales can be obtained from an angler or at the fish counter of the supermarket. The sellers are certainly happy to give a few scales from the animals. It is necessary to bring screw jars with labels to record the names of the fish. Fish scales can also be obtained well in advance of the experiment and stored in a mixture of ethanol (methylated spirits) and glycerol (about 95% to 5%). They are then ready for use in this way. However, it is very interesting for the students to obtain the scales from the fish themselves.

Other teacher information (4/4)

Notes on implementation

Gain scales: Fish are scaled by scraping the surface with a knife from the tail towards the head. It is convenient to first place the scales in a screw-top jar or beaker and shake with water to remove excess mucus. The scales sediment and the water can be poured off. The scales are examined fresh or preserved as described above.

Distinguish scales: We distinguish placoid, ctenoid, cycloid and ganoid scales. For the class, we will primarily study edible fish with cycloid or round scales and with ctenoid or comb scales. The scales vary greatly in initial size and in some species (sardine) cannot be viewed at full size even at the lowest magnification.



Dorade (40x)



Cod (40x)

Safety instructions

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- Working with microscopes for too long can lead to physical discomfort (fatigue, headache, nausea), especially when students are untrained.
- Attention. To avoid accidents after the lesson, check the number of knives at the end of the lesson!
- Microscopes are sensitive. During transport and handling, care should be taken to ensure that everything is done carefully and without rushing.
- The general instructions for safe experimentation in science lessons to be applied to this experiment.

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Student Information

Motivation

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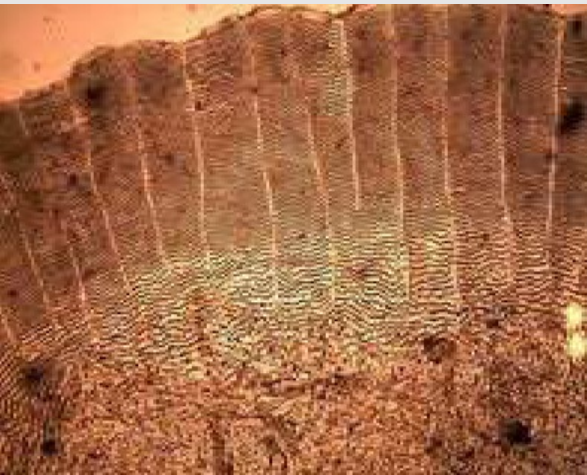


Sea Bass (40x)

Fish glide through the water with almost no resistance. This is partly due to their streamlined shape, but is also related to the surface of the body: The fish is covered like a roof tile with small platelets called scales. There is a layer of mucus on top of them.

Tasks

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Dorade (40x)

1. The fish is descaled
2. Microscope and draw different fish scales in the protocol!

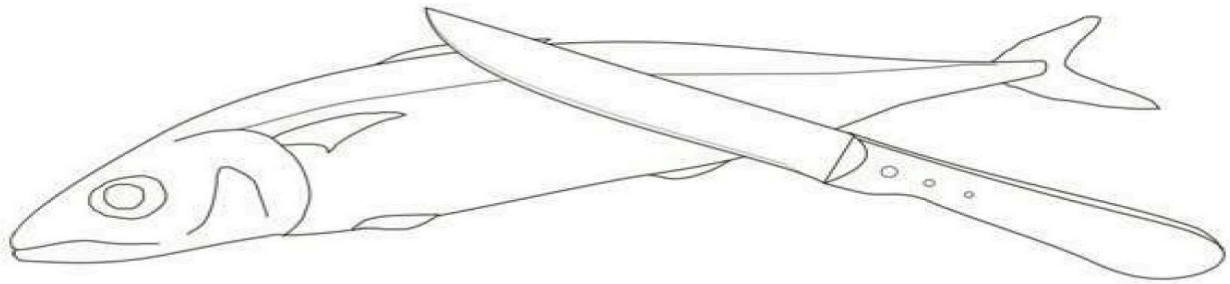
Equipment

Position	Material	Item No.	Quantity
1	PHYWE Binocular student microscope, 1000x, mechanical stage	MIC-129A	1
2	Microscopic slides, 50 pcs	64691-00	1
3	Cover glasses 18x18 mm, 50 pcs	64685-00	1
4	Beaker, 100 ml, plastic (PP)	36011-01	1
5	Dropping pipette with bulb, 10pcs	47131-01	1
6	Tweezers, straight, pointed, 120mm	64607-00	1
7	Knife, stainless	33476-00	1

Procedure (1/2)

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The fish is descaled The scales of the fish are obtained by scraping the edge of the knife along the surface of the fish from back to front. To remove some of the slime and obtain individual scales, place them in a beaker of water.

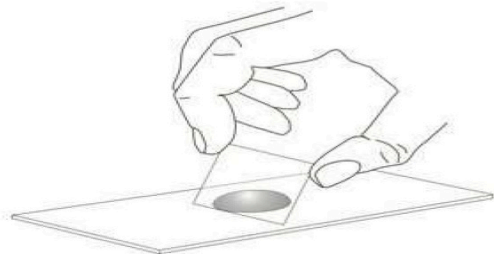


Procedure (2/2)

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Microscope and draw the fish in the protocol

Place the scale in a drop of water and cover it with a cover slip.





Report

Task 1

Drag and drop the correct words into the spaces provided

Fish glide through the water with almost no . This is partly due to their , but is also related to the surface of the body: The fish is covered with small platelets called . On top of them is a .

Task 2

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Fish are scaled by scraping the surface with a knife from the head towards the tail.

 True Incorrect Check

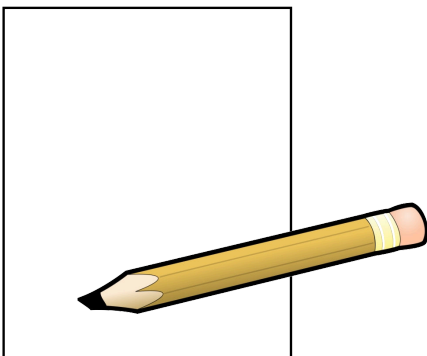
The fish scales of different fish species all look the same.

 True Incorrect Check


Task 3

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Draw the fish scales you microscoped and name each fish.



Slide	Score/Total
Slide 15: Fish Scales	0/5
Slide 16: Multiple tasks	0/2

Total  0/7

 Solutions

 Repeat