

# LESSON 14: PARTS OF THE FISH

## TEACHER GUIDE

**Note:** This is a long lesson. It should take an hour and a half to two hours; it is designed to be taught in two parts. A good break point is after the “lecture and discussion” section and before the “activity”.

## BACKGROUND INFORMATION

Fish are similar to humans in some ways, and different in others. These differences are due to the differences in habitat. Humans and fish are physically separated by water. Each species evolved specific characteristics which allowed them to improve their survival chances within their environment. This relates to Darwin’s theory of evolution by natural selection.

The following are further thinking/discussion questions included in the “conclusion” segment of this lesson. Here are some basic answers:

- o What do you think would happen if a fish suddenly lost its scales?
  - Scales are a fish’s protection against predators and disease. The fish would be much more vulnerable without them.

- o Why are fish different colors?
  - Different species of fish evolved their unique colors because they maximized their chance of survival. For example, brightly colored fish might blend in with the coral around them. On the other hand, dull looking fish might be hard to see at the bottom of the ocean, where it is very dark.
- o Why do fish have more than one fin?
  - Multiple fins help the fish swim faster, and maneuver more effectively.
- o Why do you think fishes' eyes are sometimes on the sides of their head and sometimes on the top of their head?
  - Fishes' eyes are on the sides of their head because that way they can watch out for predators that might be sneaking up from the side.
  - Some fish have eyes on top of their heads because they typically live on an ocean or lake bottom so with eyes on the top of their head they can easily see what is above them.

**Note:** You may wish to give the assessment sometime after you present this material. This is because the assessment asks for free-recall of the definition of various fish body parts and placement. This task will likely require some before-hand studying.

## LESSON OBJECTIVES

- To introduce some of the scientific language used in labeling fish.
- To get the students thinking about attributes humans share with other species, using fish as an example.

- To get the students thinking about how and why attributes differ amongst species.
  - To introduce the concept of evolution using a real-life comparison.
- To practice identifying, and putting the correct names to body parts, using fish as an example.

## **LESSON MATERIALS**

- A master diagram of a labeled fish.
- A blank sheet of paper for each student.
- Drawing materials which may include: pencils, colored pencils and markers.
- Copies of the fish diagram for the assessment (found on the next page).
- Copies of the assessment.

## **ASSESSMENT ANSWER KEY**

- 1) Basically, fish have gills because they need them to survive in their underwater environment. At a more complex level, fish evolved gills as a way of optimizing their environment. Gills allow the fish to successfully extract oxygen from the water.
- 2) If a fish suddenly lost its fins, it would be unable to swim. This would lead to the fish's death. It would neither be able to escape from predators, nor find food.
- 3) The answers to the labeling portion of this assessment depend on the depth you are looking for from your students. Basic answers to each part are:
  - Nostrils – to smell

- o Upper and lower jaw – to open and close their mouths
- o Mouth – to eat food
- o Eyes – to see
- o Operculum – the gill covering
- o Pectoral fin – side fin
- o Dorsal fin – top fin
- o Pelvic fin – bottom, front fin (the more rostral of the ventral fins)
- o Anal fin – bottom, hind fin (the more caudal of the ventral fins)
- o Caudal fin - tail

# STUDENT GUIDE – WHAT ARE THE PARTS OF FISH & WHAT DO THESE PARTS DO?

## VOCABULARY

Since this lesson is largely focused on vocabulary, there is not a “vocabulary” portion to this lesson.

## LECTURE AND DISCUSSION

- Fish are animals that are surprisingly similar to us. They have a lot of the same parts.
  - Ask the class: what parts do you think fish have that we also have?
- Fish have:
  - A heart
  - A liver
  - A kidney
  - A stomach
  - A brain
  - A spinal cord
  - An intestine
  - Teeth
  - An esophagus
  - Eyes
  - And even more!

- A fish's internal functioning is pretty similar to ours; fish have to process oxygen and food just like we do. That's why they have a lot of the same parts.
- However, fish have to deal with a different environment than we do.
  - Ask the class: where do fish live?
  - Ask the class: if we all jumped in the ocean right now without any equipment and tried to live like fish, could we survive?
- Since fish can live under water and we cannot, there must be some parts that they have that we do not. These parts must help them survive underwater.
- Give the class several minutes to observe the fish in your aquaponics system. Ask them to look for features a fish has that people do not. Consider letting the students go in groups to avoid over-crowding.
  - Ask the class: what features did you see on the fish that people do not have?
- You can probably see that fish have:
  - Gills – fish use gills to get oxygen from the water so they can breathe.
  - Scales – scales are a fish's protective layer.
  - Fins – fish use their fins to swim.
  - Special body shapes to make swimming efficient.
- Other fish parts include:
  - Nostrils – to smell
  - Upper and lower jaw – to open and close their mouths
  - Mouth – to eat food
  - Eyes – to see
  - Operculum – the gill covering
  - Pectoral fin – side fin
  - Dorsal fin – top fin
  - Pelvic fin – bottom, front fin
  - Anal fin – bottom, hind fin
  - Caudal fin - tail

## ACTIVITY

- Put-up a large picture of a fish with its external parts labeled. Give each student a blank sheet of paper and drawing materials.
- Have each student draw and decorate a fish. It may also be fun to have each student name their fish.
- Each student should then label their fish's parts, using the master diagram.
- Each picture should include a word bank. This will be a list of the parts and their functions.
- Once everyone has completed their drawing, have each student switch drawings with another student and check their work.
  - Each student will use their drawing as their study guide for the assessment; therefore it is important they are correct. You may wish to walk around and check them over as well.

## CONCLUSION

- Reiterate that fish have some parts that are similar to ours, and some that are different.
- The similarities are due to the fact that both species must complete some of the same tasks.
- The differences are due to differences in habitat, we live on land, whereas fish live in water.
- Go over the location and function of each of the external fish parts identified in this lesson. You might consider asking the students to recite the names and functions.
- Further thinking/discussion questions:

- o What do you think would happen if a fish suddenly lost its scales?
- o Why are fish different colors?
- o Why do fish have more than one fin?
- o Why do you think fishes' eyes are on the sides and tops of their head?

## **EXTENSION**

- Art – fish can be used as a model for a lot of art projects such as sculpture and painting.
- Science – the understanding of why fish have different parts from us is a great lead into the topic of evolution. Species have a variety of body parts and functions because they evolved to fit their environment.



Name \_\_\_\_\_

Date \_\_\_\_\_

## ASSESSMENT 14 – PARTS OF FISH

- Explain why fish have gills but we do not: (in your own words)
  
- What do you think would happen to a fish if it suddenly lost its fins?
  
- Write what you know about each of the following parts and label its location on your fish picture:
  - Nostrils –
  
  - Upper jaw –
  
  - Lower jaw –
  
  - Mouth –

- o Eyes –
  
- o Operculum –
  
- o Pectoral fin –
  
- o Dorsal fin –
  
- o Pelvic fin –
  
- o Anal fin –
  
- o Caudal fin -