

How Do Fish Breathe?

Background Information for Teacher:

Humans use their lungs for breathing and the lungs are part of the respiratory system. Fish have gills that extract or take oxygen out of the water. A fish opens its mouth and gulps water and pumps it over the gills. The gill cover is open when the mouth is closed. When the mouth closes, the gill cover opens and this forces the water into the gill chamber. Inside the gill chamber, they have fabric like threads that are called filaments that are connected by a gill arch that is in two rows.

There are also thin plate-like structures called lamellae. Blood flows through the lamellae and filters the oxygen from the water and releases carbon dioxide into the water.

After the fish gets its oxygen from the water, it passes out through the gill openings and the breathing process begins again.

Objectives: Students will be able to explain how a fish breathes underwater.

Grades: K-2

Procedures:

1. . Access prior knowledge: Ask students how fish breathe, have they ever seen a fish breathing, what happens if a fish is taken out of the water? Why do you think that happens?
2. Watch the following videos to explain how gills work.

<https://www.youtube.com/watch?v=XEIRlw5rCUk>

<https://www.youtube.com/watch?v=8bRluf6EtsA>

Use teacher background information above to review how fish breathe underwater.

3. Set up the following demonstration:

Materials:

- A clear glass (or a plastic cup),
- coffee grounds,
- a coffee filter or a piece of paper towel,
- an elastic band,
- and some water.

- First mix the water and coffee grounds. Then, put the filter over the cup and secure it with the elastic band.
- Pour the water and coffee ground mixture over the filter and watch the water go through the filter down into the glass. The coffee grounds will stay in the filter. I wasn't very careful and managed to get the mixture on my table.
- The filter represents the gills. The coffee grounds represent the oxygen that the fish gets from the water. The water that passed through the filter into the cup represents the water that the fish pushes out through the gill chamber with the carbon dioxide in it.
- Extension: Have students write and/or draw about the demonstration in their science journals.
- Evaluation: Teacher observation of student participation and understanding of concept.