Biology Grade 7

CHAPTER 2: RESPIRATION OF LIVING BEINGS

Activity 4: Respiration in an aquatic medium

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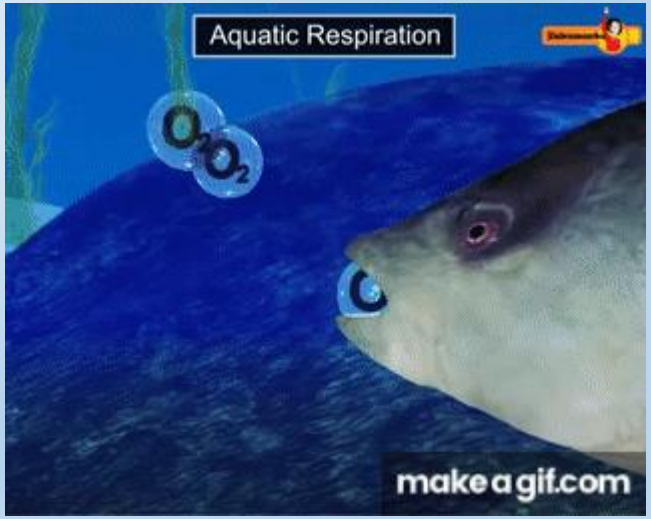
Activity 5: Respiration in an aquatic medium

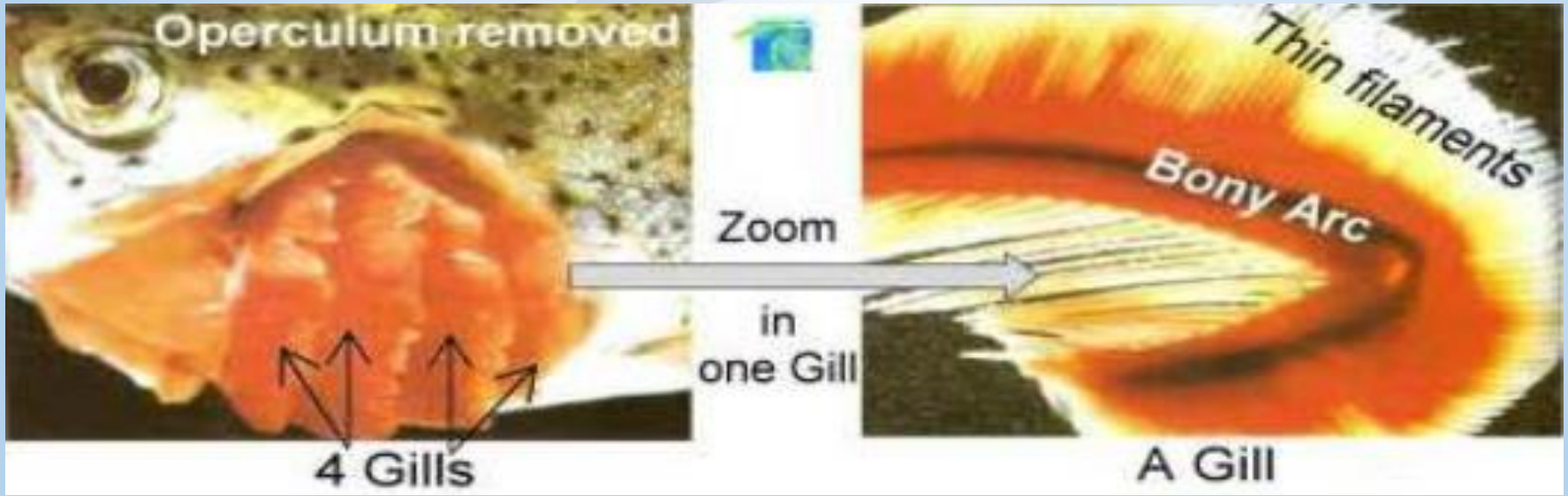
- Certain aquatic animals, like fish, respire in water using their gills. They take in dissolved oxygen and release carbon dioxide.
- How is respiratory gas exchange accomplished in the gills?

- Aquatic medium is the medium that is made up of water example sea, ponds…
- Aquatic animals are animals that live in an aquatic medium example fish, octopus…
- Gill respiration is the respiration by gills, it is mainly done by fish.



❖ The respiratory organ of the fish.

- water enters the fish through its mouth and exits through its operculum.
- Under the operculum, oxygen is absorbed from water and passes into the blood vessels of the fish.
- If we removed the operculum, we can see 4 red colored gills, each consists of filaments fixed on a bony arc.
- These filaments have thin wall and they are rich in blood vessels that favors oxygen absorption.



1. Name the respiratory organ of the fish.

Gills

2. Indicate the constituent of each gill.

Each gill consists of filaments fixed on a bony arc.

3. What is the red color of gills due to?

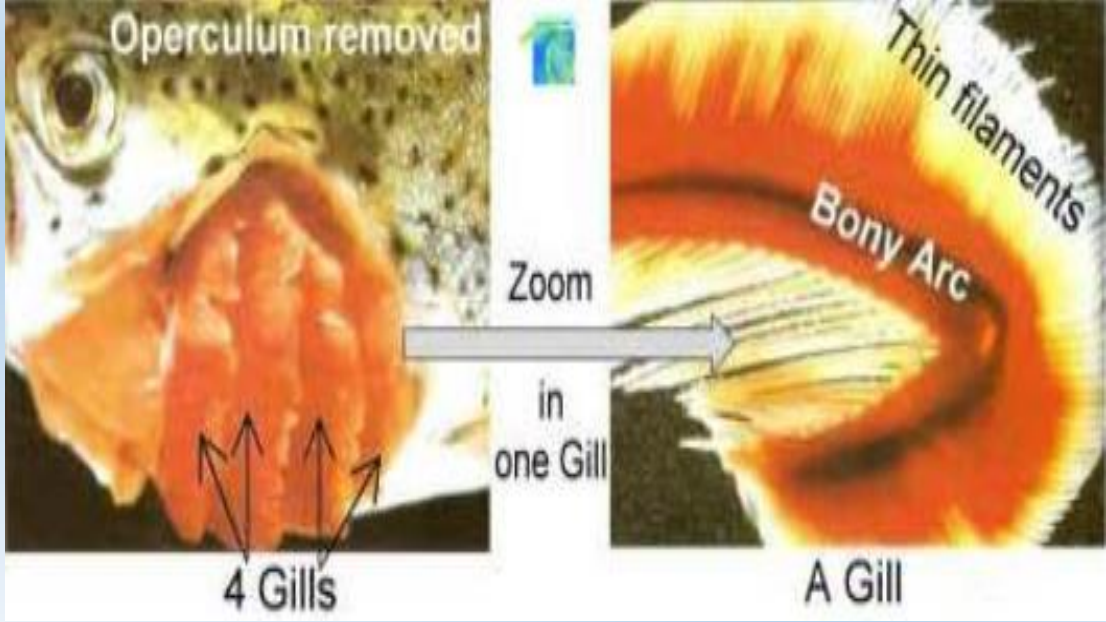
Gills are highly vascularized (rich in blood vessels).

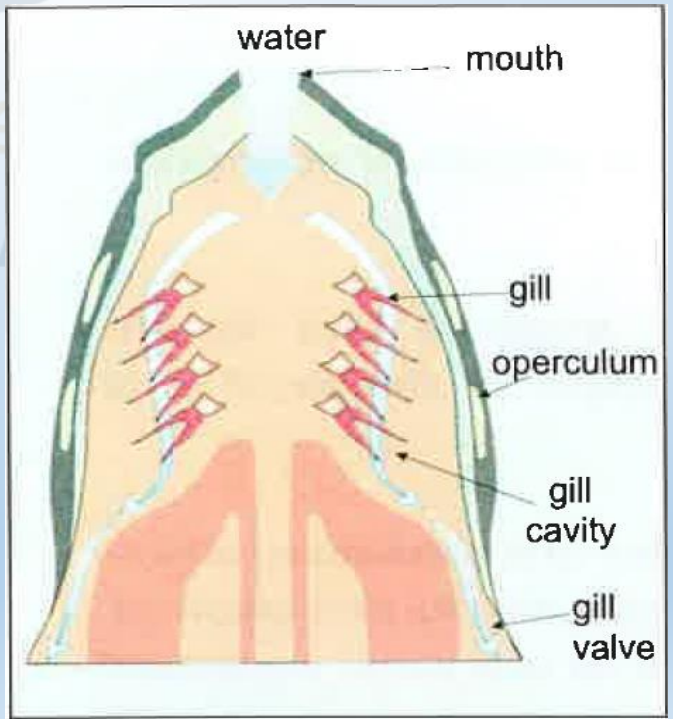
4. What are the characteristics that make the gills a favorable (suitable) medium for gaseous exchange.

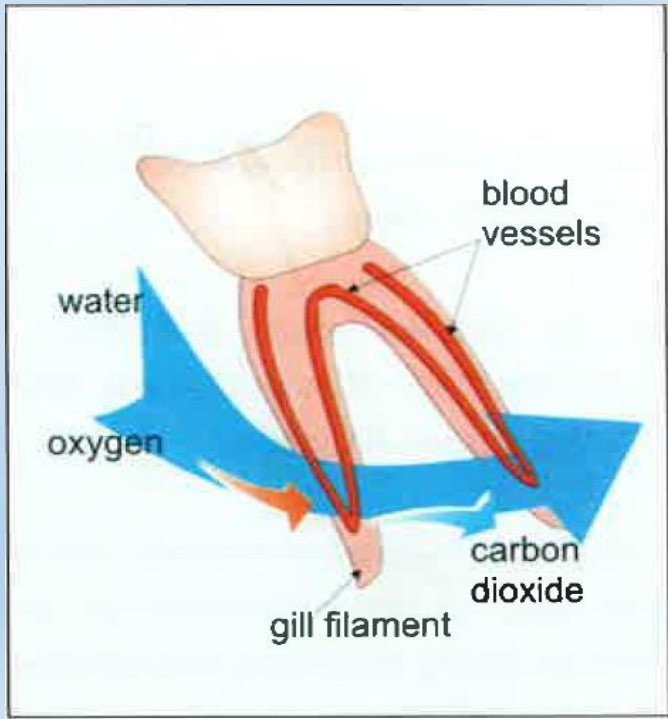
- ✓ Large surface area
- ✓ Rich in a blood vessels
- ✓ Thin wall membrane

5. Indicate the advantage of the thin wall and enrichment in blood vessels of the filaments.

To filtrate and absorb oxygen from the passing water.







❖ Gills, a surface of exchange

The following figures show the direction of water flow through fish body.

1. What is the number of gills under the two opercula?

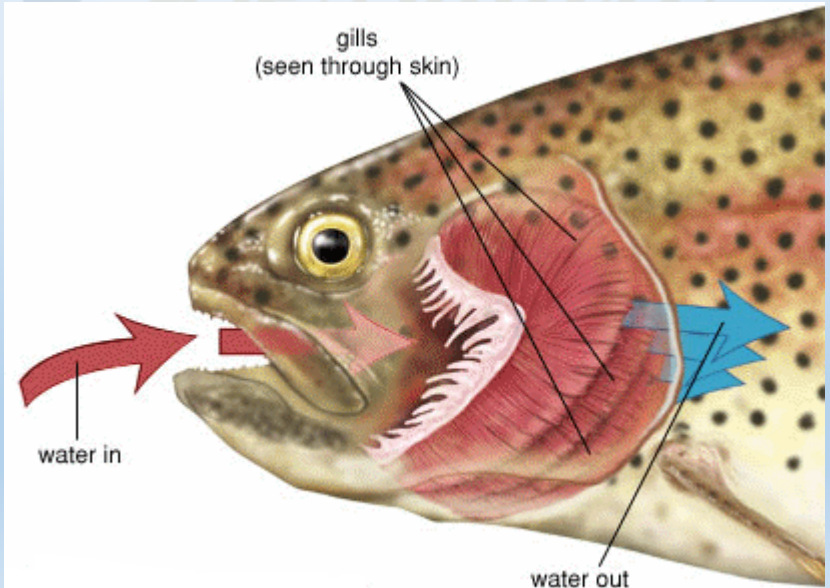
8

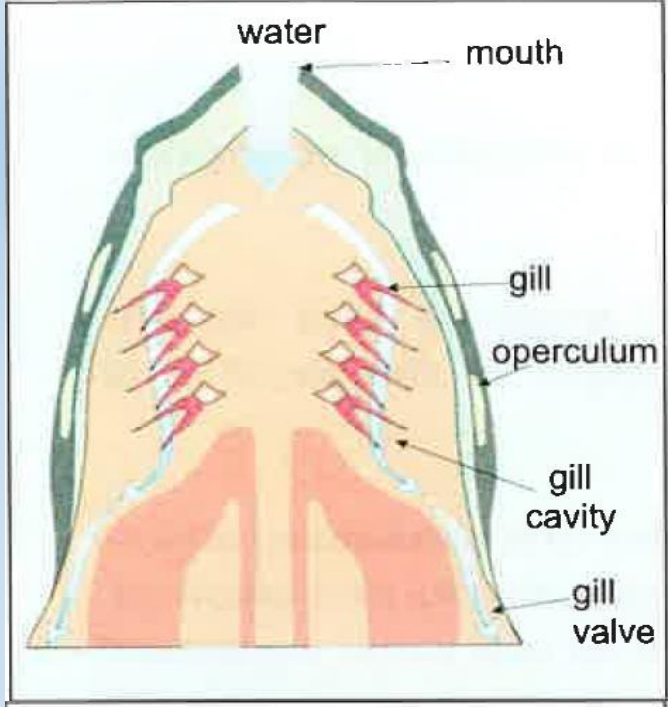
2. Draw out the function of gills.

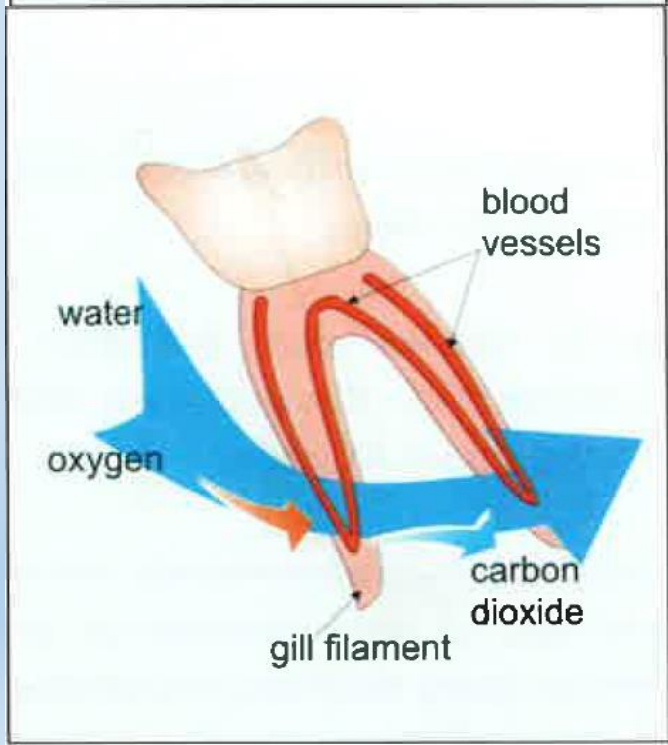
To absorb oxygen and release carbon dioxide.

3. Conclude the name of respiratory mode.

Gill mode respiration.







water	quantity of oxygen	quantity of carbon dioxide
enters into the mouth	+	-
leaves through the gill valve	-	+

(+): high
(-): low
The variation of the quantity of oxygen and carbon dioxide in water

4. Compare the quantity of different gases entering and leaving the body of the fish.

The quantity of oxygen entering the mouth is higher than leaving from the gill valve while the quantity of carbon dioxide entering the mouth is lower than leaving it form the gill valve.

5. What can you conclude?

Oxygen passes from water to blood while carbon dioxide passes from blood to water.

❖ The respiratory organ of frog in water

Frogs are amphibians; they live in water and on land. They respire by skin and lungs on the land. However, they only use their skin to respire in water.

1. Name the respiratory organ(s) of the frog on land.

Skin and lungs

2. Conclude the mode(s) of respiration on land.

Cutaneous and pulmonary modes of respiration

3. Name the respiratory organ(s) of the frog in water.

Skin

4. Conclude the mode(s) of respiration in water

Cutaneous mode of respiration