

Lesson (6) Biological adaptation of living organisms in the aquatic

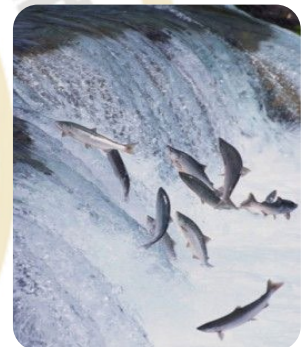
Choose the correct answer:

1- Which of the following do sea bottom fish do to adapt to the oxygen in their surrounding environment?

- A. Speed up their metabolism to reduce their oxygen demand
- B. Slow down their metabolism to consume more oxygen
- C. Speed up their metabolism to consume more oxygen
- D. Slow down their metabolism to reduce their oxygen demand

2- The opposite figure shows salmon fish migration, which is an adaptation.....

- A. Behavioral only
- B. Physiological only
- C. Behavioral and Physiological combined
- D. Not considered an adaptation



3- The figure shows the life cycle of salmon. Study it and then determine which of the following represents stages (1) and (2) indicated by the arrow?

	(1)	(2)
A	River	Sea
B	River	River
C	Sea	Sea
D	Sea	River



4- If the concentration of a saline solution (X) is greater than the concentration of a saline solution (Y), a semipermeable membrane separates them. Which of the following moves due to osmosis?

- A. Salt from solution (X) to solution (Y)
- B. Salt from solution (Y) to solution (X)
- C. Water from solution (X) to solution (Y)
- D. Water from solution (Y) to solution (X)

5- Amoeba adapted to low osmotic pressure. Which component performs each of the following?

	Collect excess water	Discharge excess water from the cell
A	Contractile vacuole	Plasma membrane
B	Plasma membrane	Plasma membrane
C	Plasma membrane	Contractile vacuole
D	Contractile vacuole	Contractile vacuole

6- Osmotic adaptation of adult salmon allows them to:

- A. Moving from fresh water to salt water
- B. Moving from salt water to fresh water
- C. Remaining in salt water
- D. Remaining in fresh water

7- Which of the following is a physiological change in deep ocean fish?

- A. Compact body
- B. Strong arteries
- C. Slower metabolic rate
- D. Large gills

8- Which of the following adaptations enables deep-sea fish to adapt with a lack of oxygen?

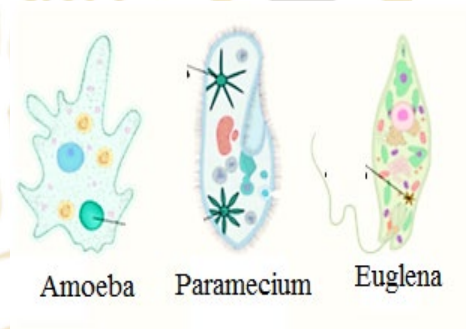
- A. Slower metabolic rate
- B. Compact body
- C. Increased salt concentration in cells
- D. Strong blood vessels

9- Amoeba and freshwater fish are similar in...

- A. Cellular respiration
- B. Body complexity
- C. Gas exchange organ
- D. Osmoregulation methods

10- Amoeba, Paramecium, and Euglena are similar in.....

- A. They contain pseudopods from the excess body.
- B. The osmotic pressure outside them is equal to pressure inside them.
- C. The osmotic pressure outside them is higher than inside them.
- D. They are multicellular organisms.



the

11- Ocean Bottom bony fish are structurally adapted by having...

- A. Swim bladder
- B. Kidneys
- C. A contractile vacuole
- D. Wide eyes

12- Deep-sea fish adapt to a lack of oxygen by...

- A. A high concentration of salts in the blood
- B. A slow metabolic rate
- C. A compact body
- D. Strong blood vessels

13- Fish that live in salt water...

- A- The osmotic pressure outside them is lower than inside them.
- B- Water moves from their bodies to the outside.
- C- They get rid of excess water through the contractile vacuole.
- D- The osmotic pressure inside them is lower than outside them.

14- Sea fish facing water salinity by:

- A. Swallowing large quantities of water, controlling blood urea levels.
- B. The kidneys, where excess salts are eliminated in the form of dilute urine.
- C. The contractile vacuole.
- D. Large gills.

15- The osmotic pressure in the bodies of fresh water fish is:

- A- Low, causing them to lose water from their bodies.
- B- High, causing them to lose water from their bodies.
- C- Low, causing their bodies to gain water.
- D- High, causing their bodies to gain water.

16- The osmotic pressure in the bodies of salt water fish is...

- A- Low, which leads to water loss from their bodies.**
- B- High, which leads to water loss from their bodies.**
- C- Low, which leads to water gain from their bodies.**
- D- High, which leads to water gain from their bodies.**

17- What type of adaptation does salmon have?

- A- Physiological only**
- B- Physiological and structural**
- C- Physiological and behavioral**
- D- Physiological, behavioral, and structural**

18- Which of the following are characteristics of deep-sea fish?

	Eyes	Body shape
A	Wide	compressed
B	Wide	Flexible
C	Narrow	compressed
D	Narrow	Flexible

19- Large gills and fine capillaries help deep-sea fish by:

- A. Increasing oxygen extraction efficiency**
- B. Increasing their metabolic capacity**
- C. Decreasing oxygen extraction efficiency**
- D. Maintaining water and salt balance.**

20- What is the environment in which each of the following occurs for salmon?

	The environment in which it is born	The environment in which it lives until sexual maturity	The reproductive environment
A	River	Sea	River
B	Sea	River	River
C	River	River	Sea
D	Sea	Sea	River

21-What is the importance of the swim bladder (or swim sac) for bony fish?

- A- Helps them float
- B- Improves their ability to extract oxygen
- C- Reduces water resistance to their movement
- D- Enables them to withstand high pressure

22- A 10% saline solution and a 15% sugar solution are separated by a semi-permeable membrane. What happens?

- A- Water moves from the saline solution to the sugar solution.
- B- Water moves from the sugar solution to the saline solution.
- C- Salt moves from the saline solution to the sugar solution.
- D- Salt moves from the sugar solution to the saline solution.

23- Unicellular organisms, such as amoeba, obtain oxygen and get rid of carbon dioxide through:

- A. The plasma membrane by diffusion
- B. The contractile vacuole by diffusion
- C. The plasma membrane by osmosis
- D. The contractile vacuole by osmosis



- 24- It refers to the behavioral or physical traits of living organism that help it to survive better in its ecosystem.
- a) transpiration.
 - b) adaptation.
 - c) respiration.
 - d) excretion.
- 25-Which of the following is from the structural adaptation of the dolphin?
- a) the presence of large-sized gills.
 - b) the large sized eyes.
 - c) the presence of air bladder.
 - d) the presence of breathing opening at the top of head.
- 26-Icefish lives in the cold Southern Oceans at depths of up to approximately.....
- a) 2 km.
 - b) 20 km.
 - c) 200 km.
 - d) 2000 km.
- 27-The whales use their in communications, and hunt their preys.
- a) bodies colors.
 - b) sounds.
 - c) big eyes.
 - d) fins.
- 28-Viper fish has high concentrations of hemoglobin in its blood to adapt to the.....
- a) lack of oxygen.
 - b) high salinity.
 - c) high pressure.
 - d) darkness.



Essay Questions

- 1- How does the ice - fish adapt to its surrounding environmental conditions?
- 2- Explain how sharks have physiologically adapted to increase external osmotic pressure.
- 3- Give reason:
 - (a) Sea bottom fish have strong and hard arteries and veins
 - (b) Sea bottom fish are able to effectively regulate blood pressure
- 4- Give one example of each of the following adaptations to the aquatic environment:
 - (a) Physiological adaptation
 - (b) Behavioral adaptation
 - (c) Structural adaptation
- 5- What is the role of gills in fish that live in salt water?
- 6- How do deep-sea fish adapt to each of the following, and what type of adaptation is used in each case?
 - (a) Lack of oxygen
 - (b) Increased pressure
 - (c) Lack of light
- 7- Compare between fresh water fish and salt water fish in terms of:
 - (a) The direction of water flow between the fish's body and the aquatic environment
 - (b) The method of adaptation to the aquatic environment in which they live
- 8- Think about what happens when tilapia fish move from the Nile River to the Mediterranean Sea.

9- What are the consequences of the inability of the following organisms to maintain balance of water and salts within their bodies?

(A) Freshwater fish

(B) Saltwater fish

**10- What is the difference between behavioral adaptation and structural adaptation?
Give an example.**

11- The figure shows an ice - fish. What do you know about this fish in terms of:

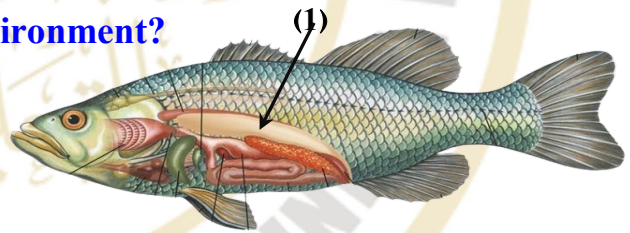
(a) The habitat in which it lives?

(b) The depth at which it lives?

(c) The type of adaptation to suit its environment



12- What is the name of the component indicated by the arrow (1), and what is its importance in adapting to a freshwater environment?

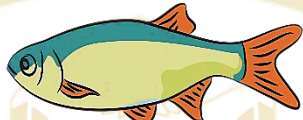
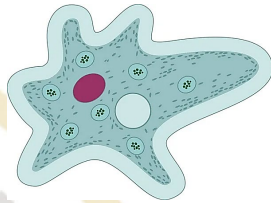


13- The figure represents a viper fish, a deep-sea fish. Write two structural and physiological adaptations of this fish that enable it to live in its environment.

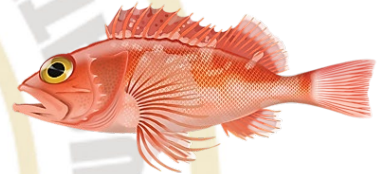


Viper fish

14) What is the type of adaptation in the following according to the information written above each picture.

The streamline shape of Dolphin	The Salmon migration	The contractile vacuole in amoeba
		
.....		

15- Examine the fish in the figure, and explain why it has big eyes?



16- The fish in the figure has a compressed body, so do you expect to find this fish in the shallow areas of the ocean? And why?



Integrated Sciences

2025-2026

1st Secondary
First Term

Weekly Assessment
6th Week



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محمد عنتر

إعداد
محمد عبداللطيف
مجدي فتحي

Choose the correct answer:-

1- Which of the following distinguishes dolphins from ice - fish?

- A- Streamlined shape
- B- The presence of fins
- C- The presence of gills
- D- The presence of snorkels

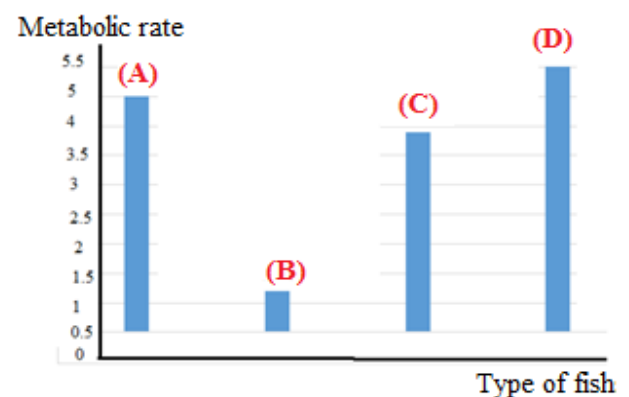
2- Which of the following is true about salmon?

- A- Young spend the first period of their lives in the sea
- B- Adult fish reproduce in river waters
- C- Adult fish spend most of their lives in rivers
- D- Young fish migrate from the sea to the river

3- The graph represents the relation between some marine fish and the its metabolic rate, Study it and then determine:

Could anyone choose to live in deep waters?

- A- (A)
- B- (B)
- C- (C)
- D- (D)



4- Which of the following happens to an amoeba when its contractile vacuole is removed?

- A- The amoeba regulates its water needs naturally.**
- B- The amoeba can easily get rid of excess water.**
- C- The osmotic pressure inside it increases.**
- D- The osmotic pressure inside it decreases.**

5- Based on your study of some fish species and their variety of adaptations to their surrounding environment, determine which of the following marine organisms differs from other species in the type of adaptation that distinguishes it?

- A. Tilapia**
- B. Salmon**
- C. Ice - fish**
- D. Dolphins**

6- Factors that lead to behavioral adaptation include...

- A. Oxygen deficiency**
- B. Water depth**
- C. Reproduction**
- D. Water resistance**

7- Which of the following is a common factor between structural adaptation and physiological adaptation in marine organisms?

- A. High pressure**
- B. Migration**
- C. Emitting distinctive sounds**
- D. Osmotic pressure**

8- Which of the following organisms demonstrates a structural adaptation that distinguishes it from other species at the same taxonomic level?

- A. Tilapia**
- B. Salmon**
- C. Ice - fish**
- D. Dolphins**

9 - Which of the following structures primarily helps fish move horizontally in water?

- A- Gills**
- B- Fins**
- C- Air bladder**
- D- Scales**

10- Which of the following results from freshwater gardening is the elimination of excess body fluid?

- A. The presence of a contractile system that helps expel excess water.**
- B. The excess urine produced by the body is diluted.**
- C. The blood contains a high percentage of urea.**
- D. The presence of openings at the top of the head.**

11- Which of the following distinguishes deep-sea fish in terms of the composition of their blood vessels?

- A- Strong and robust**
- B- Weak and thin**
- C- Strong and thin**
- D- Weak and thick**

12- In salmon fish...

- A- Adult fish get rid of excess water.**
- B- Adult fish get rid of excess salts.**
- C- Young fish swallow large amounts of water.**
- D- Young fish get rid of excess salts.**

13 - Which of the following is true about salmon?

- A- The osmotic pressure inside the cells of young fish is higher than the osmotic pressure of the surrounding medium.**
- B- The osmotic pressure inside the cells of young fish is lower than the osmotic pressure of the surrounding medium.**
- C- The osmotic pressure inside the cells of adult fish is higher than the osmotic pressure of the surrounding medium.**
- D- The osmotic pressure inside the cells of adult fish is equal to the osmotic pressure of the surrounding medium.**



14- Which of the following do bottom-dwelling fish do to adapt to the oxygen in their surrounding environment?

- A. Speed up their metabolism to reduce their oxygen requirement
- B. Slow down their metabolism to consume more oxygen
- c. Speed up their metabolism to consume more oxygen
- d. Slow down their metabolism to reduce their oxygen requirement

15- The adaptation that include certain actions, whether inherited or learned is

- a) functional adaptation.
- b) behavioral adaptation.
- d) structural adaptation
- c) No correct answer.

16- The Viper fish is characterized by the flexibility of its skeletal structures to withstand

- a) the high pressure.
- b) the strong ocean currents.
- c) the salinity of ocean water.
- d) the darkness in the deep ocean.

17- Deep-sea fish withstand high pressure because.....

- a) they have flexible bodies and reduced air spaces.
- b) their bones are filled with air.
- c) they use lungs to equalize pressure.
- d) they produce oxygen internally.

18-The migration is one of the most important examples for behavioral adaptation in

- a) Whale.
- b) Salmon.
- c) Viper.
- d) Dolphin.

Essay Questions

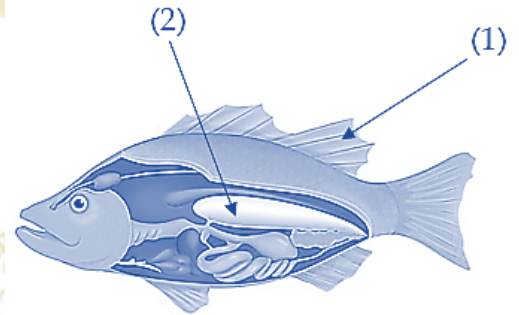
1- How does a living organism adapt to its surrounding environment? Explain.

4- Explain this statement: "Lack of oxygen is not a problem for some marine organisms."

5- Although dolphins are mammals, they can live in water. Explain.

6) In the opposite diagram mention the name and the function of the labeled organs.

	Name	Function
(1)		
(2)		



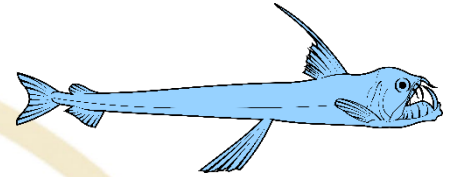
7) What challenges do deep-water fish face? And how do they adapt to them structurally?

The challenges	Structural adaptation

8) What is the function of the contractile vacuole in Amoeba.

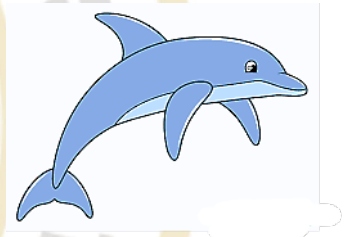


9) In the opposite figure represent the viper fish. what is the structural and physiological adaptation.



10) Mention three forms of structural adaptation in the dolphin.

- a)
- b)
- c)



11) In the opposite figure, what is the kind of the adaptation in the salmon fish and whales?





Give reason:

1) The bony fish have a swim bladder or air sac.

.....

2) In Dolphins, the breathing openings at the top of their heads instead of noses.

.....

3) The living organisms in aquatic environment have the ability to effectively regulate blood pressure.

.....

4) The Viper Fish is characterized by the flexibility of its skeletal structures.

.....

5) The living organisms in aquatic environment have strong and durable arteries and veins.

.....

Write the scientific term:

Statement	Scientific term
1) The certain behaviors or actions, whether inherited or learned behaviors, that help living organisms face harsh conditions or better utilize available resources.	
2) A structure that helps euglena to get rid of the excess water.	
3) A structure in the fish the helps it to extract dissolved oxygen from water.	