Fish for a Place

How different waters favor different traits

ZOO.7.1 "Students will understand why evolutionary changes lead to the diversity of fish and how they have adapted to the different aquatic environments."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline one environmental challenge in each of the four habitats. Circle a fish trait that helps in each habitat, then give each matching challenge and trait the same number.

Why Fish Come in So Many Forms

1. A fish darting through a coral reef faces tight spaces and sudden attacks. Many reef fish have deep, narrow bodies that let them turn sharply among branches and rocks. A fast swimmer built for long trips would have a harder time making those turns. Fish do not change their bodies because they need to. In each generation, inherited differences arise through mutation and the reshuffling of genes. If a body shape helps a fish survive and reproduce in a particular habitat, that trait can become more common over many generations. Reefs therefore favor different features from open water.

2. Far from shelter, open-ocean tuna travel long distances to find prey. Their streamlined bodies and powerful tails reduce drag and support sustained swimming. That design is useful in open water but offers little help when turning through a crowded reef. Thousands of meters below the surface, sunlight is absent, and food can be scarce. Some deep-sea anglerfish use a glowing lure, lit by light-producing bacteria, to bring prey close enough to catch. A tuna's speed would not help it attract prey in the darkness. Different conditions can favor strikingly different fish, even in two saltwater habitats.

3. Fresh water creates another challenge. In some seasonal wetlands, pools shrink and dissolved oxygen falls. African lungfish can breathe air with lungs, and some survive dry periods buried in mud, protected by a mucus cocoon. These features help where water may disappear, but they do not give a lungfish the long-distance speed of a tuna. An inherited feature is not a universal upgrade: its value depends on where a fish lives. As populations face different pressures over many generations, natural selection changes how common helpful traits are. Branching lineages and these accumulated changes help explain the wide variety of fish alive today.

2 ANSWER WITH EVIDENCE

Use the passage

1. Why might deep, narrow bodies become more common in a reef fish population over many generations?

2. Tuna and deep-sea anglerfish both live in salt water. How does each fish's way of finding or catching prey fit its habitat?

3. Why would a lungfish's ability to breathe air be more useful in a seasonal wetland than a tuna's long-distance swimming ability?

4. Use two habitats from the passage to explain why there is no single best body design for every fish.

3 YOUR TURN

Your own words

Imagine a fish population in a fast-flowing stream where insects hide beneath smooth stones. In 4 to 5 sentences, propose two inherited traits that could become common, explain how each could help the fish, and describe how natural selection could spread the traits over generations.

ANSWER KEY

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HIGH SCHOOL · ZOO.7.1

PART 1 · READ AND MARK

Underline one environmental challenge in each of the four habitats. Circle a fish trait that helps in each habitat, then give each matching challenge and trait the same number. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	Why might deep, narrow bodies become more common in a reef fish population over many generations?	**Fish with those inherited bodies can turn through tight reef spaces, which may help them survive and leave more offspring.**
2	Tuna and deep-sea anglerfish both live in salt water. How does each fish's way of finding or catching prey fit its habitat?	**Tuna use streamlined bodies and powerful tails to travel long distances in open water to find prey. Some deep-sea anglerfish use a glowing lure to draw prey close in dark water.**
3	Why would a lungfish's ability to breathe air be more useful in a seasonal wetland than a tuna's long-distance swimming ability?	**Wetland pools can shrink and lose dissolved oxygen, so breathing air helps lungfish survive there. Long-distance swimming does not solve that problem.**
4	Use two habitats from the passage to explain why there is no single best body design for every fish.	**A tuna's shape supports long trips in open water, while a reef fish's deep, narrow body supports sharp turns in tight spaces. Each design fits a different habitat.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

A flattened body could help a fish stay near the streambed, where the current is weaker. A downward-facing mouth could help it pick insects from beneath stones. Fish that inherit these traits might get more food, survive, and leave more offspring. Over many generations, natural selection could make both traits more common in the population.

Accept other plausible traits if each has a clear link to the stream conditions. The response should explain a change in inherited traits across generations, not a change caused by an individual fish's need.