Beneath the Surface

Compare body structures across three animal taxa

ZOO.8.10 "Dissect representative taxa and compare their internal and external anatomy and complexity."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline each external structure and circle each internal structure named in the passage. Number matching structures that perform the same function in different animals.

Three Specimens, Different Solutions

1 Three preserved specimens lie on the lab tray: an earthworm, a crayfish, and a perch. Before opening any specimen, examine its outer structures. The earthworm's long body has repeated segments but no jointed limbs. Its thin, moist skin lets oxygen pass into tiny blood vessels. A crayfish also has a segmented body, yet a hard exoskeleton covers it, and jointed walking legs extend from the thorax. Its gills lie beneath the protective carapace. The perch has fins and overlapping scales; its gills sit behind a bony cover. Similar jobs, such as breathing and movement, can depend on very different structures.

2 Inside the earthworm, a crop stores swallowed material and a muscular gizzard grinds it. Blood remains in vessels, with five pairs of muscular aortic arches helping move it. In the crayfish, a stomach processes food, and a digestive gland helps break it down and absorb nutrients. Its heart pumps hemolymph into body spaces rather than keeping it entirely inside vessels. The perch has a stomach and intestine, while its two-chambered heart sends blood to the gills and then the rest of the body. Both earthworm and perch have closed circulation, despite their very different outer coverings.

3 Dissection can reveal how external clues connect to hidden systems. A crayfish's rigid covering supports jointed limbs but must be shed for growth; its gills require water to exchange gases. A perch moves through water with fins, and water flowing over its gills supplies oxygen. An earthworm crawls by contracting muscles against a fluid-filled body cavity, and drying skin would interfere with gas exchange. Compare each specimen by the same functions: movement, breathing, digestion, and circulation. More specialized parts do not make one animal a "higher" form. Each arrangement reflects its evolutionary history and the conditions in which it lives.

2 ANSWER WITH EVIDENCE

Use the passage

1. Both the earthworm and crayfish have segmented bodies. How do their external structures for movement differ?

2. Compare how the earthworm, crayfish, and perch obtain oxygen. Include where gas exchange occurs in each animal.

3. How do the earthworm's and crayfish's internal digestive structures perform similar jobs in different ways?

4. Compare circulation in the crayfish and perch. What happens to their circulating fluids after the heart pumps?

3 YOUR TURN

Your own words

Design a brief dissection comparison for two of the three specimens. In one paragraph, describe the order you would inspect an external feature and two internal systems in both specimens, explain what the comparisons could show about function, and name one conclusion those observations alone cannot establish.

ANSWER KEY

Beneath the Surface

PART 1 · READ AND MARK

Underline each external structure and circle each internal structure named in the passage. Number matching structures that perform the same function in different animals. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	Both the earthworm and crayfish have segmented bodies. How do their external structures for movement differ?	**The earthworm has no jointed limbs and crawls by contracting muscles. The crayfish has jointed walking legs supported by an exoskeleton.**
2	Compare how the earthworm, crayfish, and perch obtain oxygen. Include where gas exchange occurs in each animal.	**Oxygen passes through the earthworm's moist skin. The crayfish exchanges gases at gills beneath its carapace, while the perch exchanges gases at gills behind a bony cover.**
3	How do the earthworm's and crayfish's internal digestive structures perform similar jobs in different ways?	**Both process food. The earthworm stores it in a crop and grinds it in a gizzard; the crayfish processes it in a stomach, while a digestive gland helps break it down and absorb nutrients.**
4	Compare circulation in the crayfish and perch. What happens to their circulating fluids after the heart pumps?	**The crayfish's heart pumps hemolymph into body spaces. The perch's heart pumps blood to the gills and then through vessels to the rest of the body.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

I would compare the crayfish and perch. First, I would inspect the crayfish's jointed legs and the perch's fins to compare structures used for movement. Next, I would examine the crayfish's stomach and digestive gland and the perch's stomach and intestine to compare food processing. Finally, I would locate each heart and look for vessels or body spaces to compare circulation. These observations would show different ways to perform similar functions, but they could not establish that either animal is more evolved.

Accept any pair of specimens if the plan compares an external feature and two internal systems in a clear order. The stated limitation should distinguish anatomical observations from an unsupported ranking or broader claim.