Hidden Body Spaces

Use body-cavity evidence to classify mollusks.

ZOO.3.2 "Describe why mollusks are classified as eucoelomates."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline two statements that show why mollusks meet the test for a true coelom, and circle two spaces that do not meet that test.

What Counts as a True Coelom?

1 At low tide, a clam closes its shell and waits under damp sand. Its hard shell is easy to see, but an important clue to its classification lies inside. During development, three tissue layers form: an outer ectoderm, an inner endoderm, and a middle mesoderm. A **coelom** is a fluid-filled body cavity between the digestive tract and the body wall. In a **eucoelomate**, mesoderm lines the cavity completely. This lining, not the size of the cavity or the presence of a shell, is the key test for a true coelom.

2 A clam has only a small coelom, including a **pericardial cavity** around its heart and spaces associated with its reproductive organs. These spaces are lined by mesoderm. Much more of the clam's interior is a **hemocoel**, a network of spaces through which its circulating fluid flows. The hemocoel is not the true coelom because it lacks a complete mesoderm lining. A snail also has a reduced coelom, even though its body looks very different from a clam's. Both animals still qualify as eucoelomates because they retain a fully lined body cavity.

3 Other hollow places can make the distinction tricky. When a clam opens its shell, water enters the mantle cavity, a space between its soft body and its mantle. That space is not a true coelom. The hollow center of its gut is not a coelom either. A squid differs from a clam in another way: it has a closed circulatory system rather than broad blood-filled spaces like a clam's. Yet squid also have small, mesoderm-lined coelomic spaces. Across these mollusks, the same structural test works: look for a body cavity enclosed by mesoderm, not simply an empty-looking region.

2 ANSWER WITH EVIDENCE

Use the passage

1. How does the cavity around a clam's heart support its classification as a eucoelomate?

2. A clam's hemocoel is larger than its coelom. Why does that not change the clam's classification?

3. Why would the mantle cavity be poor evidence that a clam is a eucoelomate?

4. A squid's circulatory system differs from a clam's. Why can both still be classified as eucoelomates?

3 YOUR TURN

Your own words

A classmate claims, “Mollusks cannot be eucoelomates because most of their internal space is not a coelom.” Write a four-sentence reply that uses evidence from two different mollusks in the passage and distinguishes a true coelom from one other space.

ANSWER KEY

Hidden Body Spaces

PART 1 · READ AND MARK

Underline two statements that show why mollusks meet the test for a true coelom, and circle two spaces that do not meet that test. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	How does the cavity around a clam's heart support its classification as a eucoelomate?	**The pericardial cavity is a body cavity lined completely by mesoderm, so it is a true coelom.**
2	A clam's hemocoel is larger than its coelom. Why does that not change the clam's classification?	**Classification depends on the presence of a fully mesoderm-lined cavity, not its size. The clam has such a cavity even though its larger hemocoel lacks that lining.**
3	Why would the mantle cavity be poor evidence that a clam is a eucoelomate?	**The mantle cavity is a space where water enters, but it is not a body cavity completely lined by mesoderm.**
4	A squid's circulatory system differs from a clam's. Why can both still be classified as eucoelomates?	**Both have small coelomic spaces lined by mesoderm. Their different circulatory systems do not change that shared trait.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

A mollusk can be a eucoelomate even when its true coelom is small. In a clam, the cavity around the heart has a complete mesoderm lining. A squid also has small coelomic spaces lined by mesoderm, despite having a different circulatory system. The clam's larger hemocoel does not change its classification because that blood-filled space lacks the required lining.

Accept any two mollusks named in the passage if the reply correctly connects their classification to a fully mesoderm-lined cavity. The other space may be the hemocoel, mantle cavity, or gut lumen, but the student must distinguish it from a true coelom.