Spines Beneath Skin

Trace visible spines to an echinoderm's internal skeleton.

ZOO.6.1 "Recognize that the echinoderms have spines on their skin that are extensions of plates that form from the endoskeleton."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline each description of a spine, circle each mention of a skeletal plate, and number the places where the passage connects the two. Use your marks to trace the spines back to the endoskeleton.

What Supports a Spine?

1. At low tide, a sea star grips a rock beside a pool. Its upper surface feels rough because short spines stick out through the skin. Beneath that skin lie many hard plates, called ossicles, arranged in a flexible network. The plates are part of an endoskeleton, a supporting framework inside the animal's body. The spines project outward from those plates rather than growing from the skin alone. A person looking only at the surface might mistake the spines for an outer shell, but their connection runs inward to the skeletal plates.

2. Nearby, a sea urchin rolls slowly over the rock. Its long spines pivot when it moves, making the animal look like a walking pincushion. Under the living skin, tightly fitted skeletal plates form a firm, rounded test. Each large spine meets a raised area on a plate at a movable joint. The spine is not simply a hard hair made by the skin. It belongs to a system of mineralized skeletal parts associated with the internal plates. The difference between a sea star's short spines and a sea urchin's long ones does not change where their support begins.

3. Farther down the beach, a living sand dollar lies just below the sand. Its small, closely packed spines move grains across its body. Like the other two animals, it has plates beneath its skin, and its spines extend from the plate-based skeleton. A washed-up sand dollar may be pale and bare because its skin and tiny spines have worn away. The remaining hard test is made of plates, not an outer shell that grew over the skin. Across these three forms, spine length and body shape vary, but the underlying link between spines and skeletal plates remains.

2 ANSWER WITH EVIDENCE

Use the passage

1. A sea star's spines are visible above its skin. Why are they still linked to an endoskeleton?

2. How does the sea urchin's movable spine connect to its skeleton?

3. A washed-up sand dollar has lost its tiny spines. What remains, and how was it connected to the spines?

4. Sea stars have short spines, while sea urchins have long ones. What skeletal relationship do they share despite that difference?

3 YOUR TURN

Your own words

Invent an echinoderm for a museum label. In three sentences, give it a name, describe its visible spines, and explain how the spines connect to plates beneath its skin rather than forming an outer shell.

ANSWER KEY

Spines Beneath Skin

PART 1 · READ AND MARK

Underline each description of a spine, circle each mention of a skeletal plate, and number the places where the passage connects the two. Use your marks to trace the spines back to the endoskeleton. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	A sea star's spines are visible above its skin. Why are they still linked to an endoskeleton?	**The spines project from plates beneath the skin, and those plates are part of the endoskeleton.**
2	How does the sea urchin's movable spine connect to its skeleton?	**It meets a raised area on one of the skeletal plates at a movable joint.**
3	A washed-up sand dollar has lost its tiny spines. What remains, and how was it connected to the spines?	**A hard test made of plates remains. The spines extended from that plate-based skeleton.**
4	Sea stars have short spines, while sea urchins have long ones. What skeletal relationship do they share despite that difference?	**In both animals, the spines project from skeletal plates beneath the skin.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

The pebble creeper has rows of stubby spines along its back. Each spine projects from a hard plate beneath its skin. The plates form an endoskeleton, not a shell covering the skin.

Accept descriptions that distinguish visible spines from the internal plates supporting them. For the sea urchin, a movable joint connects each large spine to a plate.