Sting and Survive

How cnidarians use stinging cells to catch food and resist predators

ZOO.2.7 "Describe how nematocysts (stinging cells) of Cnidarians are used for capturing food and for defense."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline what triggers a nematocyst to fire, circle what happens to prey, and number two details that show how a sting can defend a cnidarian.

A Sting with Two Jobs

1 At low tide, a sea anemone looks like a soft flower anchored to a rock. Its waving tentacles hold specialized cells called cnidocytes. Each cnidocyte contains a tiny capsule called a nematocyst, with a tightly coiled thread inside. When a passing shrimp brushes a tentacle and chemical cues from its body are detected, the capsule fires. The thread shoots out in a fraction of a second. In many species, it pierces the shrimp and delivers venom. The shrimp struggles less, so the anemone's tentacles can pull it toward the mouth. The anemone digests its catch inside its body.

2 A jellyfish also carries cnidocytes on its tentacles. Suppose a fish tries to bite one. Contact with the fish can trigger nearby nematocysts to fire, sending threads against the fish. Some threads deliver venom that causes pain or disrupts the fish's movement. The fish may pull away instead of taking another bite. Here, the sting helps the jellyfish avoid being eaten, rather than helping it eat the fish. This defense is not perfect: some animals, including sea turtles, can still eat jellyfish. Nematocysts improve a cnidarian's chances of survival, but they do not make it safe from every predator.

3 The same rapid discharge can serve either job because it acts at the point of contact. If the animal touching a tentacle is prey, stinging can slow or hold it long enough to move it toward the mouth. If the contact comes from a predator, stinging may make an attack difficult or unpleasant. A nematocyst fires only once; the cnidarian must replace used capsules with new ones. Not every species has the same venom or the same kinds of threads, so stings vary in their effects. What matters in both situations is that contact produces an immediate response.

2 ANSWER WITH EVIDENCE

Use the passage

1. How does contact with a shrimp lead to the anemone getting food?

2. How might a nematocyst sting keep a jellyfish from being eaten by a fish?

3. Why can a sting help capture prey in one encounter but provide defense in another?

4. If a cnidarian's nematocysts could not fire, how would both its feeding and its defense be affected?

3 YOUR TURN

Your own words

Imagine a coral polyp encounters a tiny drifting crustacean, then a fish tries to bite the polyp. Write four sentences explaining how nematocysts could help in each encounter, and why the same capsule cannot be used twice.

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PART 1 · READ AND MARK

Underline what triggers a nematocyst to fire, circle what happens to prey, and number two details that show how a sting can defend a cnidarian. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	How does contact with a shrimp lead to the anemone getting food?	**Touch and chemical cues trigger nematocysts to fire. Their threads sting the shrimp, which struggles less and can be pulled to the anemone's mouth.**
2	How might a nematocyst sting keep a jellyfish from being eaten by a fish?	**Threads fire when the fish makes contact, and venom may cause pain or disrupt its movement, prompting it to pull away.**
3	Why can a sting help capture prey in one encounter but provide defense in another?	**Nematocysts respond rapidly at the point of contact. A sting can slow prey so it can be eaten, or discourage a predator from continuing its attack.**
4	If a cnidarian's nematocysts could not fire, how would both its feeding and its defense be affected?	**It would have more trouble slowing or holding prey and less ability to sting predators that touch it.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

When the crustacean touches a tentacle, nematocysts fire their threads. The sting helps the polyp hold the crustacean and move it to its mouth. If a fish tries to bite the polyp, other nematocysts may sting the fish and cause it to pull away. Each capsule fires only once, so the polyp cannot use a fired capsule again.

Accept answers that connect contact, nematocyst discharge, and different outcomes for prey and predators. Do not require students to claim that every sting injects venom or stops every predator.