

College Guild
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Marine Biology

Unit 4 of 5

Strange Creatures of the Sea

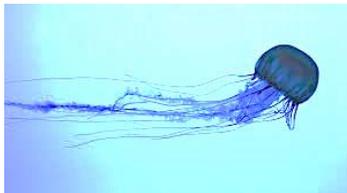
Before beginning this Unit, imagine what you think of as an alien. We'll return to this idea at the end of the Unit.

1. In your own words, define "creature". What does it mean to you?

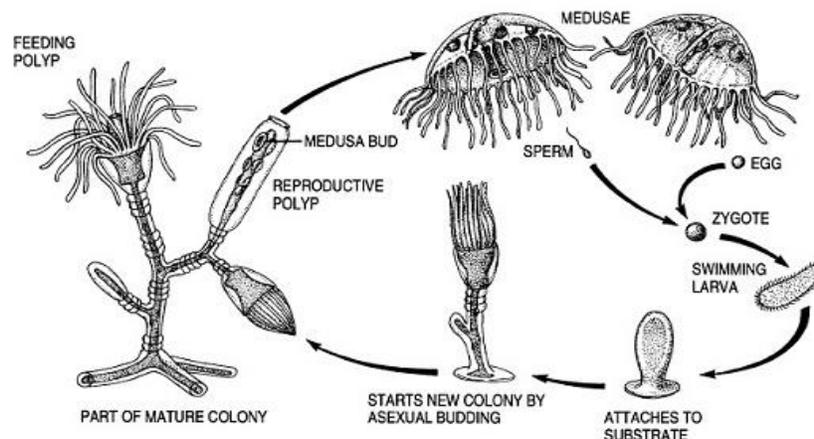
2. Sketch your conception of a strange creature.

Besides hosting a wealth of mammals, crustaceans, and sharks, the ocean is home to some of the world's oldest organisms: those which have existed for over 650 million years -- longer than any dinosaur and far, far longer than the earliest humans (who appeared just 6 million years ago). One cannot explore marine biology until he or she examines these creatures: those that have some of the strangest, but most helpful, marine adaptations. By getting a closer look at these odd species, we can glean deeper insight into the oceanic environment.

Jellyfish



These gelatinous floating creatures with long tentacles and transparent, pulsating bodies are not "true" fish at all: they're actually a variety of plankton, a much simpler organism. With only a few basic body parts, they have an extremely limited ability to control movement; however, predators nearing the jelly get shocked with the stinging tentacles (or lappets).



The smallest varieties of jellyfish are less than an inch in length, but the largest can reach up to seven feet. Regardless of size, all jellies are composed of 98% water: that's why they seemingly "disappear" after washing up on shore -- the water evaporates from their bodies.

Like many species, two jellyfish (one male and one female) mate to combine genetic material. Many types release over a billion eggs that hatch into moving larvae. These soon attach themselves to hard surfaces, resembling anemone-like **polyps**. At this stage, the polyps can generate exact genetic copies (clones) of themselves in a process that serves as a secondary means of reproduction. If the water is too cold or too salty, however, the polyps harden into cysts and enter a period of hibernation for up to six years. The polyps next become **ephyrae** -- juvenile jellyfish -- and then grow into mature **medusac** within a few weeks.

When another creature or human comes into contact with jellyfish lappets, unique cells (called **cnidocytes**) inside release a poisonous venom faster than the time it takes to blink. This results in the sting, which begins to swell, blister, and ache. While a myth exists that the best cure for a jelly sting is urine, it can actually cause the pain to spread. Instead, one should try to soak the wound in saltwater or vinegar.

Although hundreds of species are suffering from human impact and global climate change, jellyfish populations are increasing worldwide. There are several explanations for this. First, it may be a normal fluctuation in numbers: every other decade, there seems to be more "blooms" (groups of jellies) appearing offshore. Secondly, while other animals may not be able to survive in warmer waters, jellyfish withstand it quite well -- it actually encourages polyp transformations and reproduction. Third, overfishing by humans has also encouraged polyp transformations and reproduction. As well, overfishing by humans has decreased the number of species that compete for the same sources of food and nutrients as jellyfish.

The seas near Japan are currently experiencing a huge increase in Nomura jellyfish: gigantic jellies that tend to reach lengths of six feet and weights of 450 lbs. As a result, many Japanese fishermen have turned to catching them for several types of cuisine, including popular jellyfish salad and smoked soy jellyfish.



3. Name three jellyfish adaptations and describe how they help the creature survive in various conditions.
4. Write a haiku poem (a three-line poem with a 5-7-5 syllable pattern) describing jellyfish. It may incorporate some of the information you've learned, or simply describe what you imagine it would be like to encounter a jellyfish.
5. Jellyfish polyps can virtually clone themselves. If you could, would you clone yourself? Why or why not?
6. Jack Johnson sings in one of his songs:

"When you move like a jellyfish rhythm don't mean nothing. You go with the flow, you don't stop. Move like a jellyfish, rhythm means nothing. You go with the flow you don't stop."

This is a powerful metaphor about how one might live life: what does it mean for someone to "move like a jellyfish?"

7. Write a short story in which a character is stung by a jellyfish.

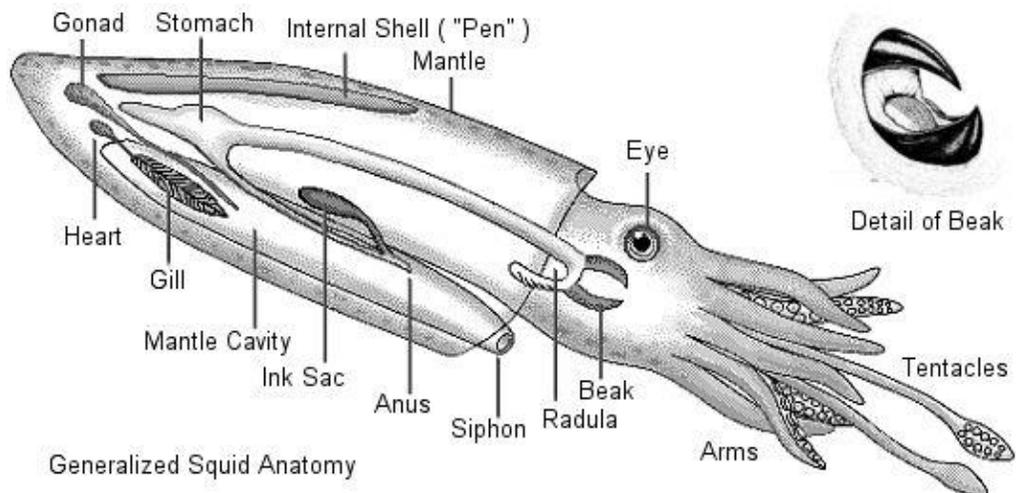
Strange Squid

Although there are more than 280 species, the giant squid is perhaps the most mysterious. They reach sizes of up to forty-two feet long and weights of nearly 2,000 pounds, but few have been sighted living in the wild. Perhaps this is due to their preferred realm, located in the cold, lightless depth of the abyssal zone. Nonetheless, their eyes -- the largest of any animal on the planet at one foot across -- help them see far more at this depth than any other organism. Residing in the deep water provides another advantage, too: the giant squid is among the largest organism within this zone, and thus has few predators (the sperm whale is virtually the only exception).



To eat, the giant squid casts out its eight arms. Sharp, suction-like circles on each of two tentacles stick fast to abyssal fish, smaller species of squid, and even other giant squids. Next, the predator reels the prey in towards its *beak*. The beak helps the squid cut its meal into smaller pieces, which are even further broken down by teeth on the *radula* (an organ similar to a tongue). Finally, the food travels through the esophagus and the brain before it finally reaches the stomach.

Despite the availability of modern technology and some known information about this species, the giant squid is still scientifically mysterious. For example, only one live specimen has ever been captured on film: this didn't even occur until 2006! Due to this, rumors circulate easily. After one large specimen washed up on a beach, a reporter noted that the organism's length was a whopping sixty-six feet; however, it's unlikely that this measurement was accurate.



Jules Verne's classic novel *20,000 Leagues Under the Sea* paints the picture of a human flesh-devouring fiend, and historical tales and legends bore rumors of a tentacled sea monster. The human imagination tends to run wild when facts remain unknown. The article below illustrates what can happen when the media exacerbates falsehoods like these:



*An image of a monster 160-foot-long (49-meter-long) giant squid made the social media rounds yesterday, but fear not—it's a hoax. The photo of the enormous deep-sea denizen after it washed on to a beach in Santa Monica, California, accompanied a satirical article on the website *The Lightly Braised Turnip* this week. People began to share the photo of the supposed cephalopod on Facebook and Twitter, and thus the fake giant came to life...*

David Emery writes on About.com that the giant squid in the photograph is actually a 30-foot-long (9-meter-long) giant squid that washed ashore in Spain in October 2013...

Charles Paxton, a researcher at the University of St. Andrews in Scotland who studies how long giant squid can grow, notes that a scientific paper published in 1887 recorded a giant squid 55 feet (16.8 meters) long found in New Zealand. Although Paxton thinks this is a fairly credible account, "the tentacles are stretchy so there can be error," he wrote in an email. Fifty-five feet (16.8 meters) is still nowhere close to the supposed 160-foot (49-meter) length of the giant squid that's taken over the Internet.

"And we're not likely to see a 160-foot-long (49-meter-long) squid any time soon," Paxton noted. "I think if 160-foot squids were around, we would have found 80-, 90-, and 100-foot squids, and we haven't," he said.

Lee, Janet J. "160-Foot Giant Squid Hoax: How Big Do They Really Get?" *National Geographic*. National Geographic Society, 10 Jan. 2014. Web. 22 May 2016.

8. As you've discovered, scientists still have a great deal to learn about the giant squid. If you were a marine biologist assigned to study this species, which topics would you explore first and why? (Think of this as finding answers to questions you have about this animals: which inquiries would you begin with?)

9. Pretend you are the captain of a ship that's attempting to circumnavigate the world in 1580. Virtually nothing is known about ocean life, but you encounter what scientists will later determine is a giant squid. Write a letter to the queen of your home country (the funder of this journey) describing your stunning discovery.

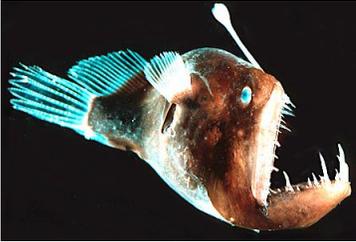
10. As evidenced with false information about giant squid, missing the basic facts and relying on what others say can easily lead to rumors that often get wildly out of hand. Write about a time in your life when lack of information or misinformation led to a rumor or dramatic events (If you can't think of an example, make one up!).

Sampler of Surreal Swimmers

There is no shortage of species that might fit the category of strange underwater creature. Here's a peek at some of these bizarre but fascinating oceanic creatures.



Officially deemed "world's ugliest animal", the blob fish occupies deep water surrounding the continent of Australia. It has no skeleton and no muscle -- adaptations that allow it to withstand extreme deep-sea pressures (if it had typical fish anatomy, it would be crushed beneath the force). It expends minimal energy swimming, as it merely opens its mouth and allows prey to float right in. It grows to about one foot in length and belongs to a family of fish called fatheads.



As another abyssal zone creature, the anglerfish has some odd adaptations. It is most recognizable by its dorsal spine: in females, this extends beyond the face like a fishing rod. The tip of this "rod" is illuminated, tempting prey in the lightless environment. With a body up to three feet long and an extra pliable skeleton, this fish devours other creatures twice its size. Males are much smaller and exist as parasitic mates -- relying completely on their partner for survival.



The leafy sea dragon has no teeth: instead, it sucks shrimp, zooplankton, and fish larva through its tube-like snout. Its leaf-like extensions help it camouflage in its preferred habitat -- among seaweed and kelp along Australia's southern coast. Like seahorses, the female lays up to 300 eggs, but the males incubate and "give birth" to the young. It can grow up to eighteen inches long and lives for five to ten years.



The brightly colored nudibranch appears to be a slow, shell-less sea slug, but in reality it's extremely poisonous. When a predator frightens it, it releases deadly toxins: some species produce these naturally while others feast on anemones and sea sponges to ingest them. While each species features a unique color palette, all are vibrant: this warns predators to stay away. The name "nudibranch" derives from the Latin term from "naked gills" -- apt, as the gills are fully exposed.



The ribbon eel has a trumpet-like snout with three flaps above its nostrils: it uses these to sense vibrations and locate prey. A juvenile is almost completely black, but the black fades to an electric blue as it ages. At this point it is a male, but becomes a female when it reaches four feet in length and turns completely yellow. Females mate with younger males and lay eggs in the crevices of coral reefs.



A native of deep, open waters in the northern hemisphere, the stargazer is a well-camouflaged fish. Its eyes and mouth are located directly on top of its large head, giving it its ghastly appearance. It burrows into the sand and waits for a small fish or crustacean to swim by. When it sense prey, it creates a small vacuum in its mouth and sucks the unsuspecting creature in. The triangular organ between its eyes delivers strong shocks to stun potential predators.

11. As you've learned, certain species of jellyfish and squid can grow extremely large. Which of the six creatures above would you find most frightening if a giant version was discovered? How would scientists react? In contrast, how might the media react?

12. If you were one of these strange species, which would you be and why?

13. Which of these marine creatures is most like your "creature" conception? Why?

14. Using one characteristic from five of the organisms discussed in this Unit, draw your own "creature of the sea." Name your creature and describe how it uses its key characteristics for survival.

Remember: First names only & please let us know if your address changes

Appendix Marine Biology: Unit 4 of 5

Citations

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