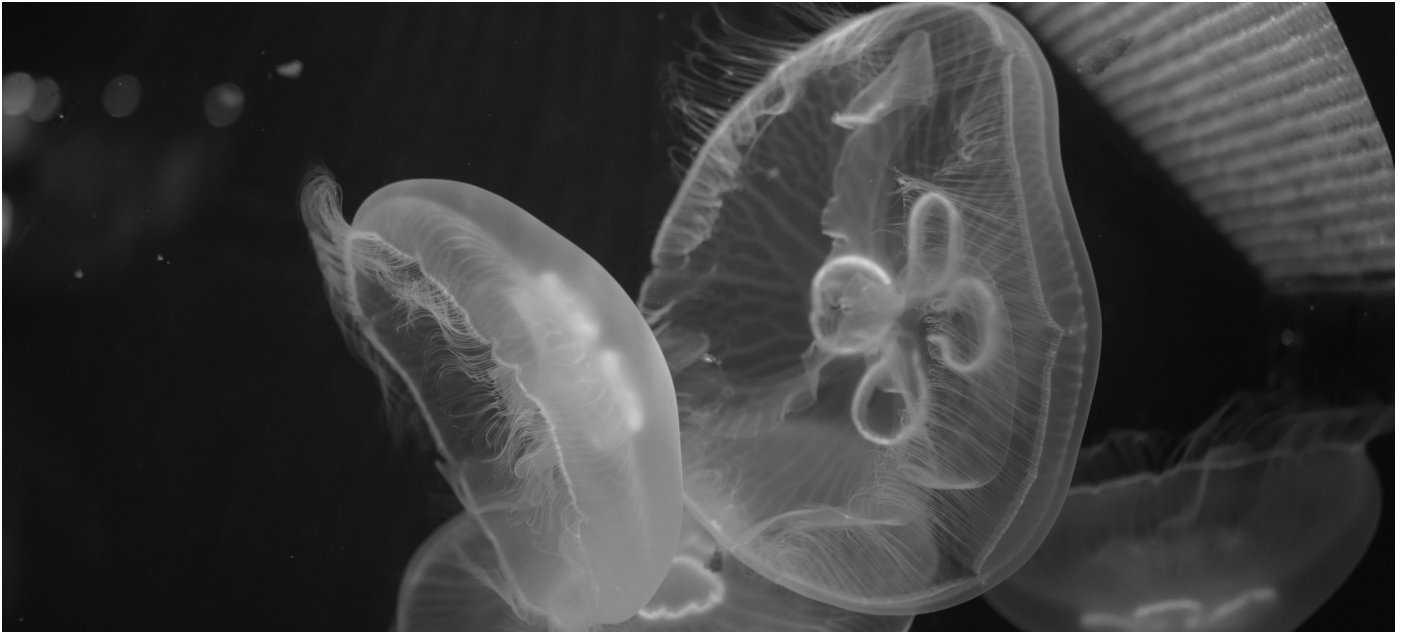


GLOWING IN THE DARK: FLASHLIGHTS OR FISH LIGHTS?

by Susan Smith



- 1 The ocean is full of creatures that create their own light, which is called bioluminescence. The light comes from special cells known as photophores that can shine steadily or blink. It is created by mixing chemicals, the same way a glow stick lights up after you bend it. This light does not heat up like a light bulb, so the animal is not hurt by it.
- 2 Now let's hit the beach and find some of these amazing creatures!
- 3 Dive into the waves at night, and suddenly the water glows. You have disturbed dinoflagellates. These tiny creatures are part of the plankton living in the top layer of the ocean. The light they produce helps to protect them. They light up to warn away any fish that want to eat them. How is this a warning? The glow attracts bigger fish that will happily eat those smaller fish that want to eat the dinoflagellates!
- 4 As you swim deeper into the ocean, the light dims and colors become dull. The yellow and red tones of sunlight are filtered out, but blue tones remain. That's why bioluminescent animals show mostly bluish or whitish lights.
- 5 Many animals use bioluminescence as camouflage. Some fish light up their undersides to match the light above them. When predators swimming below the fish look up, the fish seem to disappear.
- 6 Comb jellies light up their tentacles. When a predator approaches a jellyfish, the jellyfish detaches its tentacles. The predator follows the glowing strands, and the jellyfish floats safely away. Down in the sand, the brittle star can detach one of its flashing arms and then retreat into its burrow to escape an attack.
- 7 Some squids blink lights all over their bodies. They can even change the brightness and color of their lights. A predator can't tell what shape the squid is and goes off to find something more recognizable.

- 8 Flashing can also let other animals know that a mate is in the area. Different patterns of lights belong to different species. No one gets confused that way. For example, back up on land, fireflies use this ability to attract mates on warm summer nights.
- 9 Finally, we reach a depth where there is no sunlight. How do animals find—or avoid—each other? You know the answer: bioluminescence.
- 10 One deep-sea octopus has suckers that blink a blue-green light. This attracts curious creatures, and the octopus has a meal. The dragonfish dangles a glowing lure from its chin to bring prey to it. The anglerfish's lure hangs above its mouth from a long spine on its forehead.
- 11 Eating, finding company, avoiding being eaten—the deep, dark sea is a busy place. But not as dark as you thought.



BIOLUMINESCENCE ON LAND AND IN THE SEA

| | |
|------------------------|--|
| Communication | Light is used to help find a mate; for example, fireflies will flash at one another in a species-specific pattern to attract a partner. |
| Locating food | Some fish species that live in the darkest parts of the ocean use their light like a spotlight to find prey. |
| Attracting prey | Some fish species, like the anglerfish, use a luminescent lure to attract other fish so they can eat them. |
| Camouflage | In the dark depths of the ocean, it's hard to see anything below you, but you can easily see the silhouette of what's above you. This is why some species produce spots of light on their undersides. The light blurs their outlines and allows the fish to blend in with the light from above, known as counterillumination. |
| Mimicry | The cookie-cutter shark uses bioluminescence to prey on animals that are much larger and more powerful than it is. It has one unlit patch on its underside that resembles a smaller fish when viewed from below, which makes the cookie-cutter shark appear much smaller than it actually is. When a large predator approaches, the shark can take a large bite and then flee. |
| Self-defense | Bioluminescence also helps with self-defense. For example, when threatened, some animals release a cloud of bioluminescent fluid to confuse their predator, similar to the way squid defend themselves with a cloud of ink. Others use a bright flash to blind predators. |

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Test Questions

Circle the correct answer.

1. Reread paragraphs 3 and 4. Which statement below best describes a major difference between the two paragraphs?

- a. The second paragraph explains the cause of bioluminescent animals' appearance, while the first paragraph describes dinoflagellates.
- b. The second paragraph describes bioluminescent animals, while the first paragraph explains how dinoflagellates light up.
- c. The second paragraph tells about problems bioluminescent animals face, while the first paragraph presents ways dinoflagellates defend themselves.
- d. The second paragraph describes light in the ocean, while the first paragraph explains causes and effects of dinoflagellates abilities.

2. Which is the best main idea for the article "Glowing in the Dark: Flashlights or Fish Lights?"?

- a. Bioluminescence has many disadvantages for animals.
- b. Bioluminescence is a unique trait of some animals.
- c. Bioluminescence has many benefits for animals.
- d. Bioluminescence does not harm animals.

3. This question has two parts. Answer Part A first, and then answer Part B.

Part A: Which is the best meaning for the word *retreat* as it is used in paragraph 6?

- a. eliminate
- b. wander
- c. elevate
- d. withdraw

Part B: Underline the word or phrase from the text below that best helped you determine your answer in Part A.

The predator follows the glowing strands, and the jellyfish floats safely away. Down in the sand, the brittle star can detach one of its flashing arms and then retreat into its burrow to escape an attack.

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Test Questions (*continued*)

4. Which is one similarity between the comb jellyfish, brittle star, and squid?

- a. They use bioluminescence to find food.
- b. They have flashing lights all over their bodies.
- c. They use bioluminescence for protection.
- d. They can detach a part of their body.

5. This question has two parts. Answer Part A first, and then answer Part B.

Part A: How is the content in the table on the last page different from the article?

- a. The table describes various uses of bioluminescence, while the article does not.
- b. The table explains counterillumination, while the article does not.
- c. The article describes how sharks use mimicry, while the table does not.
- d. The article explains using bioluminescence for camouflage, while the table does not.

Part B: How is the content in the table on the last page similar to the article?

- a. Both discuss the concept of mimicry as a defense mechanism for sharks.
- b. Both explain how bioluminescence in sea animals works.
- c. Both discuss the concept of counterillumination.
- d. Both discuss how sea animals use lures to attract prey.