Lesson 2: Quote the Ocean Experts

UNIT: Bioluminescence

TRANSCRIPT

HOOK 1

Hi, it's Anne. My friend Jaden has been having a great time researching and learning all about bioluminescence. You've been doing lots of research too, learning about bioluminescence to make a poster for the aquarium's new exhibit, Deep Ocean.

As Jaden was doing his research, he started to wonder: What kinds of information should he include in his poster? He decided to take a look at one of the other posters at the aquarium. He found an exhibit all about spider crabs. These crabs live in the ocean and sometimes gather in huge groups—it's like a giant pile of crabs.

Next to the exhibit, Jaden saw the poster that's all about spider crabs. Here's one of the paragraphs on the poster:

March of the Spider Crabs.
Once a year in the shallow waters of Australia, spider crabs gather together in groups that can grow to over 50,000 crabs. While in these large groups, the crabs molt. Molting is when the crabs shed their old shells to grow bigger shells. According to marine ecologist Doctor. Elodie Camprasse, "while they do that they're soft, so they tend to be vulnerable to predators. So we think one of the reasons they come together in such big numbers is because they're seeking protection from each other."

DISCUSSION 1

Discuss: What do you notice the writer of this poster included in this paragraph?

HOOK 2

The writer of this poster included lots of facts about spider crabs.

Jaden noticed that the information on the poster included specific numbers, definitions for words—like molting—and a quote from a marine ecologist who is an expert on spider crabs.

Numbers, definitions, and expert quotes help make writing more interesting and specific. Jaden thinks he can use these strategies in his writing, and so can you.

Today, you'll take notes on two more sources about bioluminescence. While you take notes today, keep an eye out for numbers, definitions, or expert quotes that you can add to your notes. Then you can use your notes later on to draft an amazing poster.

I'll get you started, step by step.

STEP 1

Get your supplies.

STEP 2

Get your Notes worksheet. Your notes might look different than this, and that's okay.

Read the notes you took in the last lesson.

STEP 3

Flip your research packet to Source 3.

For now, let's just read the Source. You'll take notes later on.

If you'd like to read this Source on your own, pause the video now, or keep playing to hear me read the source aloud.

Ocean Surface.
Sunlight zone. 0 - 200m below surface.

There are not many bioluminescent organisms in the sunlight zone because the sun lights this part of the ocean. Most are so tiny you'd need a microscope to see them!

Glowing algae, such as dinoflagellates, can make waves look like they are glowing.

Ostracods are tiny shrimp. They are so small, some people call them sea fireflies!

Twilight zone
200 - 1,000m below surface.

Only 1% of sunlight reaches the twilight zone. It will look completely dark to the human eye. Over 75% of sea organisms at this depth produce their own light as bioluminescence.

A vampire squid can make a cloud of glowing liquid to escape predators.

The lantern shark uses light to attract prey.

Lanternfish use light to communicate with other fish.

This atolla jelly flashes blue light to confuse predators.

Midnight Zone

1,000 - 4,000m below surface.

No sunlight reaches this zone of the ocean at all. All creatures live in this zone in complete darkness.

An estimated 75% of organisms at this depth produce their own light as bioluminescence.

The deep sea shrimp can blast predators with a cloud of glowing liquid to escape.

This comb jelly uses light to communicate or to scare away predators.

An anglerfish uses a dangling light right in front of its mouth to attract prey.

The giant squid uses flashes of light to confuse its prey.

If you'd like to hear me read this source out loud again, replay this step.

Otherwise, move on to the next step.

STEP 4

This Source contains lots of information about bioluminescence. It also has specific numbers and definitions that you can include in your notes.

When you take notes, you can add on to the notes you already have. If you want, you can draw a new section in your notes.

Read the source again and take notes as you read. Your teacher will tell you how long you have to take notes.

STEP 5

Nice job, writers! This Source may have given you even more answers to your questions, or maybe you thought of more.

Review the question section of your Notes. If you know the answer to any of your questions, you can put a check next to it. If you have more questions, you can add them to the box.

STEP 6

Flip your research packet to Source 4.

This Source is a transcript of an interview with Dr. Rene Martin. She is a scientist who studies bioluminescence at the American Museum of Natural History in New York. Let's watch our interview. For now, you can just watch and listen. We'll take notes later on.

So where in the ocean do we most frequently see bioluminescence occurring? The majority of bioluminescence and where it occurs in the ocean actually happens a lot in what we consider the open ocean midwater zone. These zones, specifically, are called the Mesopelagic or the Twilight Zone and the Bathypelagic called the Midnight Zone. And I actually looked this up recently, and 4,000 m is basically the entire length of Central Park in New York City. And so, if you just stood Central Park on its head and then went all the way down, that's approximately 4,000 m.

It's kind of crazy to think about how much open space there is down there and how much water there is down there. And it's also important to note that many of these organisms aren't restricted to just one depth in the ocean. This is a three-dimensional world. And so many of them perform something called a daily vertical migration, where they swim up into the surface at night to feed on a bunch of the zooplankton and other

organisms that are very abundant up there. And then they swim back down into the deep sea during the day, and that's usually to hide from predators.

And this mass migration is thought to be the largest migration on Earth because it is constantly happening around the globe as we're rotating. Can you tell us what are some of the reasons why these animals actually bioluminesce? If you're an organism that lives in the deep sea, one of the major benefits of evolving bioluminescence is to use it for a type of camouflage.

Many of the organisms that live in this area have something called photophores, or light organs on their stomachs.

And much of the light that's produced by these stomach light organs specifically matches both the color and the intensity of light that's coming from the surface of the ocean.

This type of camouflage that they're doing is called counterillumination. Some of the other cool behaviors, if you think of an anglerfish—so the one from *Finding Nemo* that has the esca on its head—they use those to attract prey.

It's also known to be used for defense mechanisms. So some species and some organisms will actually shoot out bioluminescent goo or make bright flashes to distract or stun different types of predators.

And also living in the deep sea, it means you've got to get creative in order to communicate. And so many of the organisms that use bioluminescence use it to communicate with each other.

If you'd like to watch this video again, replay this step. Otherwise, move on to the next step.

STEP 7

Source 4 is a transcript of what was said in the video you just watched. You can take notes on all the information in this source and keep an eye out for numbers and definitions.

Since Dr. Rene Martin is an expert, you can also choose some things she said to make an expert quote. If you find a sentence you want to include as an expert quote, make sure you copy the sentence exactly into your notes. Put it in quotation marks and write who said it.

Your teacher will tell you how long you have to take notes on Source 4.

STEP 8

In the last lesson, we heard from another expert scientist on bioluminescence, Dr. Edie Widder.

Flip back to Source 1 in your research packet.

Any of the sentences in this source could be used as an expert quote in your writing. Reread Source 1. If you want to include some things she said in your poster, add it to your notes as an expert quote. If you ran out of room, use the back of your Notes worksheet.

STEP 9

You now have read all the sources in your research packet. Review the questions section of your Notes. Check off any questions you found the answer to and add more if you want.

STEP 10

Now that you've read two more Sources, you'll need to add them to your Bibliography. Flip to your Bibliography page in your research packet. Use the information on Sources 3 and 4 to fill in the missing information.

STEP 11

Here's how Jaden filled out these parts of his Bibliography. Check to see if your Bibliography matches. If it doesn't, you can make changes.

WRAP UP

Amazing job, writers! You took notes on two more Sources, gathering specific numbers, definitions, and expert quotes. You may have found lots of answers to some of your questions, and you may have some questions you didn't find answers to at all. That's okay.

When writers do research, they often still have questions that didn't get answered. You won't be able to answer those questions in your poster, but you still have lots of other information to use.

In the writing process so far, you've been here gathering information. In the next lesson, you'll start to plan how your poster will go. All this hard work will make your poster both interesting and informative to the visitors who come to the Deep Ocean exhibit.

Make sure you put your V.I.P.s somewhere safe, and I'll see you next time.