

What Can Kesler Science Do for You?

4th - 8th grade science teachers love our Life, Earth, and Physical Science materials! With these easy and engaging materials, teachers can save planning time and put their focus back on the teaching that really matters.



5E LESSONS

Two-week lessons with over 100 topics



ESCAPE ROOMS

Engaging activities for review



INQUIRY LABS

Three different levels to fit every student



AMAZING ANCHORS

Anchoring phenomenon to book-end your lessons



SUB PLANS

Never worry about planning for a sub again.



WARM-UPS

Bellringers for the entire year



STATION LABS

Student-led exploration



INTERACTIVE NOTEBOOKS

Bring science journals to life.



WIKI TICKETS

Quick formative assessments



STEM CHALLENGES

Real-world STEM problem-solving



GRAPHING

Table and charts and graphs ... OH MY!



SCIENCE READING COMPREHENSION

Leveled reading passages with mini-activities



SPANGLER COLLABORATION

Exclusive Steve Spangler lessons and videos



WRITING PROMPTS

Writing activities covering 100+ topics

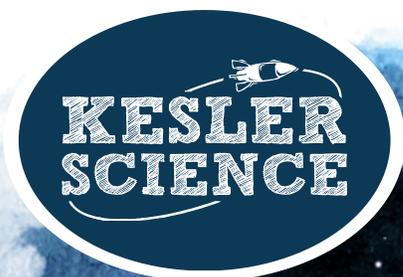


EXPLORIES

Story-driven units with integrated activities



The Kesler Science Professional Learning Network (PLN) group on Facebook has a huge community of engaged and supportive science teachers - come join us!



Mysterious Deep Ocean Lights

If you wanted to find the most extreme forms of life on planet Earth, the ocean would be a great place to start! We've found the Greenland shark that can easily live over 300 years. Then there's the 10 foot-long, iridescent, burrowing sand worm *Eunice aphroditois*. And the Pompeii shrimp? It survives boiling-hot deep-sea vents by wearing a bacteria coat. The ocean is a wild place to explore!

The tough part of ocean research is the difficulty and danger of getting deep under the waves. There's a saying that we know more about the surface of the Moon than our own seafloor! As of right now, we've only thoroughly mapped about 25% of the ocean floor. It's dark, it's deep, and it's not easy to send humans down there.

Scientists today are getting creative with solutions to these obstacles: underwater drones, infrared cams, and even animals wearing cameras! For example, scientists have been attaching tiny cameras to migrating elephant seals. The seals are fine—the epoxy glue pops off when they shed their fur—and the footage we're getting back is *wild*.

In one video, scientists saw quick flashes of blue light cutting through the dark. Turns out, tiny bioluminescent squid were lighting trying to scare off predators before becoming dinner.

Another camera, dropped on a free-falling metal arm, caught a deep-sea ambush. Out of nowhere, an octopus squid came charging in, flashing two glowing orbs of light straight at the camera. These spheres of light, called photophores, are located at the end of two short tentacles. Lots of marine creatures have photophores like the little ones lining the skin of the Atlantic midshipman fish in the photo above. The octopus squid photophores are the size of lemons, the largest that we've seen in *any* animal! Scientists think they're used to confuse prey or communicate with other squid.



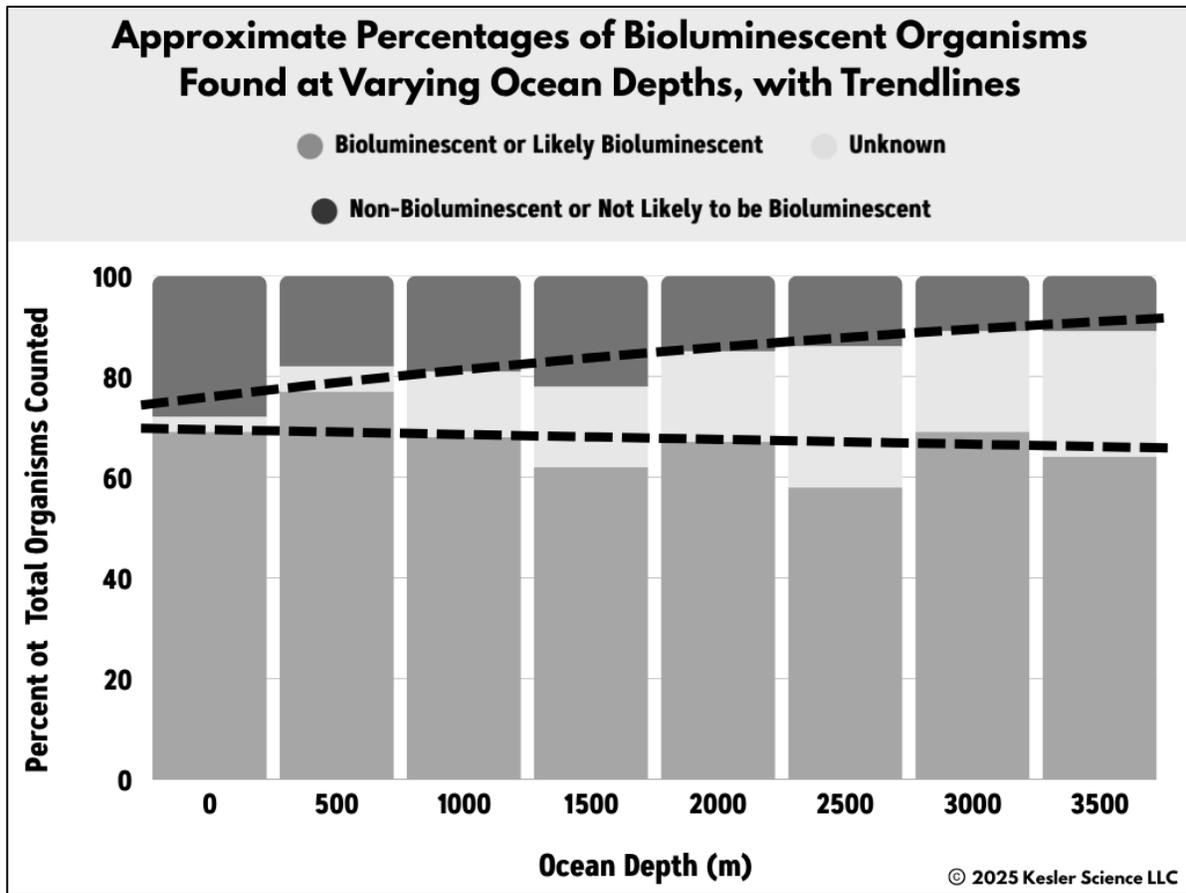
Photophores lining the skin of the Atlantic Midshipman Fish

Sometimes knowing **when** to explore the ocean can be just as valuable as knowing **where** to look. In the 1940's, Navy workers detected tons of ocean activity during nightfall on their radar. Fast forward to present day, and we see the rise in popularity of a sport called "blackwater diving."

Blackwater diving, or scuba diving at night, allows divers to experience the most massive nightly migration of organisms that we know about. We guess about **11 billion** tons of animal biomass, including pelagic worms, larval jellyfish, larval anemone, and beautiful sea butterflies, move up and down the water column every night from deep to shallow water and back again. Almost all of these sea creatures are bioluminescent!

The more we look, the more we realize: the ocean might be the most alien place we've got on this planet. And we've only just scratched the surface.

The graph on the next page shows percentages of bioluminescent capability at different ocean depths. It's shocking to see just how many types of sea creatures can light up on their own!



1. According to the graph, are you more likely to find bioluminescent creatures towards the ocean surface or deeper down in the water?

2. At a depth of 1000 meters, sunlight can no longer be seen in the ocean water. What does the graph tell us about ocean life at this depth?

3. What happens to the proportion of "unknown" organisms as the depth increases? Predict why this pattern might occur.

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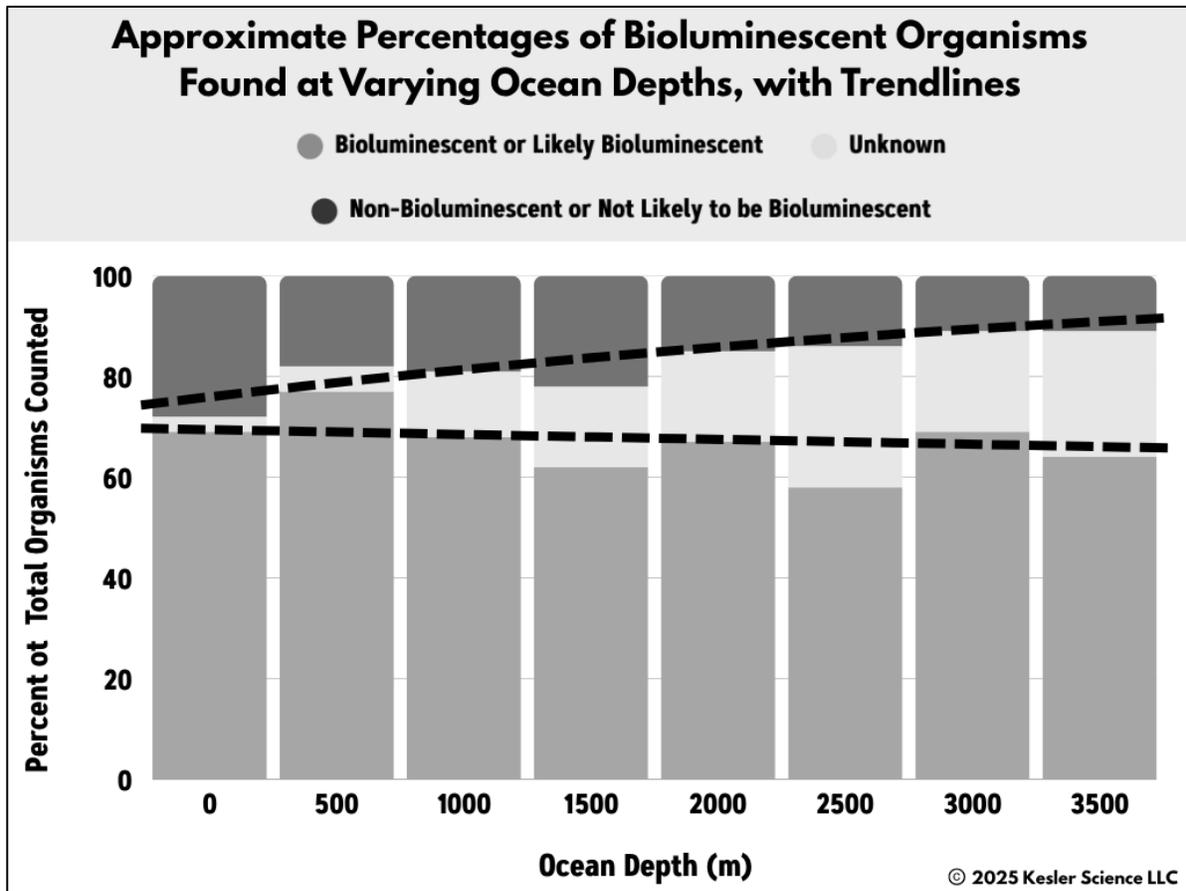
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1. According to the graph, are you more likely to find bioluminescent creatures towards the ocean surface or deeper down in the water?

The graph generally shows that there is more bioluminescent life towards the surface. At 0 meters in depth, the bioluminescent capability is about 70%. At a depth of 3500 meters, the bioluminescent capability is closer to 65%.

2. At a depth of 1000 meters, sunlight can no longer be seen in the ocean water. What does the graph tell us about ocean life at this depth?

Students can list any of the data shown at the 1000-meter mark on the graph. For example, about 70% of the organisms are bioluminescent or likely bioluminescent at this depth, and the amount of undefined, unlikely and non-bioluminescent organisms is about 30%.

3. What happens to the proportion of "unknown" organisms as the depth increases? Predict why this pattern might occur.

The proportion of "unknown" organisms increases with ocean depth. Predictions may vary but encourage students to think about how observing and documenting a wide range of life forms becomes more challenging at greater ocean depths.