

**TED® Connection, Category 1**  
**Underwater Astonishments**

**Overview**

Mensa for Kids' TED Extensions are short, easy to use guides that help teachers, parents and youth use TED talks in a classroom or home setting. They are not written in a lesson plan format, but they do have a list of discussion questions, all at higher levels of thinking.



**Watch the TED talk at:**

[http://www.ted.com/talks/david\\_gallo\\_shows\\_underwater\\_astonishments.html](http://www.ted.com/talks/david_gallo_shows_underwater_astonishments.html)

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**THINK ABOUT IT:**

1. Which was your favorite of the bioluminescent animals you saw?

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2. What were some of the reasons Dr. Gallo gave for how animals use bioluminescence?

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3. Can you think of any land animals that could benefit from bioluminescence?

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4. Dr. Gallo said, "Today we've only explored about 3 percent of what's out there in the ocean. Already we've found the world's highest mountains, the world's deepest valleys, underwater lakes, underwater waterfalls.... There's still 97 percent, and either that 97 percent is empty or just full of surprises." What do you think? Empty or full of surprises? What would surprise you most to find in the ocean?

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5. The male squid that were fighting turned white when they became aggressive. Can you think of anything else that turns white when it is inflamed? What color do people turn when they get angry?

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6. What did the coloration change in the squid tell you about what qualities male and female squid find important?

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7. Dr. Gallo mentioned that the shallow waters are full of predators. Why do you think there are more predators in the shallow waters than in the deep waters? What do you think people are more scared of – shallow or deep water? Does that make sense?

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8. The octopus used three different methods of defense. Can you find all three?

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2. \_\_\_\_\_
3. \_\_\_\_\_

9. Dr. Hanlon noted that the octopus was matching the pattern, color, brightness and texture of the algae in order to blend in. Imagine you were in a forest and needed to camouflage yourself. How could you match all of these aspects in that environment if you were able to do what the octopus does?



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10. Dr. Gallo said he loves cuttlefish. Which of the animals you saw in this talk was most impressive to you? Which would you most like to see in person?

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## DO IT:

- Take the bioluminescence dive with Dr. Widder at <http://www.teamorca.org/cfiles/bioluminescence.cfm>
- Dr. Gallo mentioned the strong eyesight of the octopus. Experiment with your own vision here, and learn one advantage the octopus has over your eyesight! <http://faculty.washington.edu/chudler/chvision.html>
- Make a paper octopus: <http://craftday.blogspot.com/2007/08/paper-octopus.html> or one out of a toilet paper roll: <http://www.youtube.com/watch?v=cACFDhPCAag>

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## READ ABOUT IT:

- *Octopus: The Ocean's Intelligent Invertebrate* by Jennifer A. Mather, Roland C. Anderson, James B. Wood (advanced readers)
- *Kraken: The Curious, Exciting, and Slightly Disturbing Science of Squid* by Wendy Williams (advanced readers)
- *Flotsam* by David Wiesner (young readers)
- *The Marine Biology Coloring Book* by Thomas M. Niesen

## WATCH IT:

- This site lists and links to 100 documentaries about the ocean:  
<http://www.onlineclasses.org/2010/05/09/100-documentaries-to-explore-the-deep-ocean-online/>
- *The Blue Planet: Seas of Life*
- *NOVA: Cuttlefish - Kings of Camouflage*

## SURF IT:

- Follow Dr. Widder's blog about her underwater adventures!  
<http://www.teamorca.org/cfiles/blog.cfm>
- Visit Dr. Gallo's professional home at the Wood's Hole Oceanographic Institute:  
<http://www.whoi.edu/> (learn more about the ocean here:  
<http://www.whoi.edu/page.do?pid=9544>
- Visit Dr. Hanlon's lab: <http://www.mbl.edu/mrc/hanlon/index.html> and learn more from his seminars available there.
- Read more about octopus vision here:  
<http://www.nature.com/news/2004/041206/full/news041206-5.html>
- Watch Dr. Gallo's TED talk about life in the deep oceans:  
[http://www.ted.com/talks/david\\_gallo\\_on\\_life\\_in\\_the\\_deep\\_oceans.html](http://www.ted.com/talks/david_gallo_on_life_in_the_deep_oceans.html)
- Watch filmmaker and amazing storyteller Mike deGruy's talk "Hooked by an Octopus:"  
[http://www.ted.com/talks/mike\\_degruy\\_hooked\\_by\\_octopus.html](http://www.ted.com/talks/mike_degruy_hooked_by_octopus.html)