



NAUTILUSLIVE.ORG

OCEAN EXPLORATION TRUST

Author: [Jason McGee](#)

Science Lesson: Adaptations of Octopus

Objective: TLW explore how octopuses have adapted IOT meet their needs for survival.

“Look Fors”: TL is using vocabulary presented in the videos and discussion, along with various STEM projects to analyze and discuss how octopuses have adapted to guarantee their survival.

Key

TTW: The Teacher (Will)

TLW: The Learner (Will)

WG: Whole Group work

SG: Small Group work

IOT: In Order To


- Clear plastic cups
- Water
- Food coloring
- Large resealable plastic bags
- Paper plates (approx. 10 in.)
- Small plastic octopus toys
- *Animal Showcase* - Venn Diagrams: [Beginner](#) and [Level 2](#).


Supplies

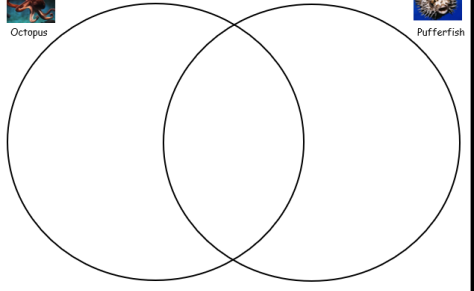
Student Work

Beginner

Name _____


 Octopus


 Pufferfish

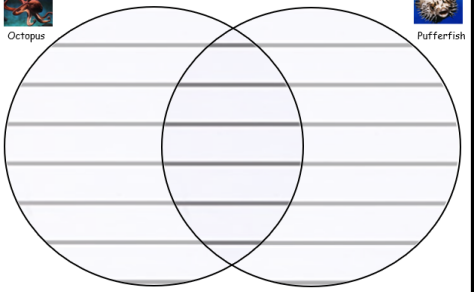


Level 2

Name _____

 Octopus

 Pufferfish



- TTW share this video showcasing many different cephalopods (squid and octopus) seen by the E/V *Nautilus* team (<https://nautiluslive.org/video/2018/06/21/cephalopod-week-cascadia-margin>)
- Learn about octopus specifics from SciShow Kids video: *The Outrageous Octopus!* <https://www.youtube.com/watch?v=XyDNTfmFmJw&t=102s>. TTW guide a discussion how octopus have developed many **adaptations** (any special change that gives a species increased chance at survival; adaptations can be physical or behavioral) to meet its needs.
- Background Reading – TTW read *Octopus: Master of Disguise* by Josh Plattner <https://www.getepic.com/app/read/42443>. TLW discuss any new information learned from the text.

1. Engage

- TLW explore one octopus adaptation through The Octopus Ink project. TLW place a toy octopus in the bottom of a clear, plastic cup and fill the cup with water. With the help of TT, TLW add dark food coloring to the water. Dark food coloring represents octopus' ink, a natural dye made from highly concentrated melanin stored in an ink sack. Many octopus have developed ink as an adaptation to secrete to evade, deter, or confuse predators.
- TLW lead the discussion on the importance of the ink adaptation and how it helps protect the octopus.

2. Explore

- **Bendy Body Challenge** – Challenges TL to climb through a small hula hoop. Try again this time with an arm and leg going through the hoop at the same time (making it more difficult). Try the same challenge with a smaller hoop. TTW guide the discussion how hard parts of our bodies, like bones, make this task difficult. Octopus have soft bodies. A hard mouth part, called a beak, is the only hard part of an octopus skeleton.
- **Try it!** - TTW cut a 1-inch hole in a paper plate. TLW draw an octopus on a large resealable plastic bag. zip the resealable plastic bag well and attempt to move the “octopus” through the small hole in the plate. Soft body parts and the ability to take in and jet out water to propel their bodies, make octopus excellent at moving through small places in their habitat looking for food.

3. Explain

Supporting essential questions that can be used to evaluate student understanding:

- How has the octopus adapted to meet its need for survival? How would you describe some of the octopus’ adaptations?
- Why do you feel it is necessary for researchers to learn the various adaptations of an octopus? How could these adaptations benefit humans?
- What kinds of questions would you want to investigate as a researcher of octopus?
- In your own words, how would you describe the similarities in adaptations of an octopus and a spotfin porcupinefish?

5. Evaluate

- To further explore (if your center will allow), TT may purchase a package of frozen octopus from certain food markets. Conduct this exploration in a sand and water table or within a tray if on desk or table surface. TL will use gloves and magnifying glasses to analyze the octopus’ body plan. TT use chilled water to preserve the animals.
- **Make sure to wash hands, tables, and any used tools thoroughly afterwards!**

4. Extend

Animal Showcase:

Inspire your young explorers by showcasing a new ocean animal each class/club meeting.

For this lesson, TT may showcase the *Spotfin Porcupinefish* with the video below. Chosen as another example of an animal with different adaptations to protect from predators, porcupinefish can inflate with seawater to three times their size. **Try comparing the two species’ adaptations and life under the waves by creating a Venn Diagram or Bridge Map.**

<https://www.youtube.com/watch?v=dg9YdYlf3Zs>

Additional Resources and Links

- Compilation deep sea octopus highlight videos (<https://nautiluslive.org/video/2018/06/21/cephalopod-week-cascadia-margin>)
- Dumbo octopus hovers in mid-water: <https://nautiluslive.org/video/2014/08/19/unusual-and-large-dumbo-octopus-sighting>
- Ghostly Grimpoteuthis octopus: <https://nautiluslive.org/video/2018/10/23/ghostly-grimpoteuthis-octopus-glides-rov-hercules>
- Cockatoo squid hovers past *Hercules*: <https://nautiluslive.org/video/2017/08/27/translucent-cockatoo-squid-flutters>
- YouTube.com- *Octopus Changes Color and Texture* <https://www.youtube.com/watch?v=ydrc489USbM>