

The **INCREDIBLE OCTOPUS**

Meet the Eight-Armed Wonder of the Sea

ERIN SPENCER

CURRICULUM GUIDE



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We cover a wide range of topics in *The Incredible Octopus*, including octopus biology, cephalopod relatives, ecosystem roles, and current research. See our curriculum guide below to learn how you can include the content in this book in your classroom. The following discussion questions align with the [Next Generation Science Standards](#) for grades 2 to 5 and are organized by Disciplinary Core Ideas (DCIs).

2ND GRADE

2. INTERDEPENDENT RELATIONSHIPS IN ECOSYSTEMS

2-LS4-1. Make observations of plants and animals to compare the diversity of life in different habitats.

Applicable sections from *The Incredible Octopus*:

- Where Do Octopuses Live? (p. 8)
- Anatomy of an Octopus (p. 12)
- Octopus Relatives (p. 20)
- Meet the Octopuses (p. 38)

Potential discussion questions:

- Octopuses live all over the world! Pick two of the habitats shown in “Where Do Octopuses Live.” What are two special behaviors or traits that would help an octopus survive in those habitats? Hint: Some of them are also featured in the “Meet the Octopuses” chapter!
- Review the “Anatomy of an Octopus.” What are some of the features that help them thrive in the ocean?
- What are some similarities between octopuses, cuttlefish, nautilus, and squid? What are some differences?
- Pick two different octopuses in the “Meet the Octopuses” section. Name two things they have in common and two ways they are different. Which is your favorite and why?



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2ND GRADE Continued

K-2 ENGINEERING DESIGN

K-2-ETS1-2. Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.

Applicable sections from *The Incredible Octopus*:

- Octopus Technology (p. 64)

Potential discussion questions:

- Pick one of the inventions featured in “Octopus Technology.” Draw the part of the octopus that inspired the invention. What problem is the invention trying to solve, and why are octopuses good at solving that problem? Be sure to look at the rest of the book for clues!

3RD GRADE

3. INTERDEPENDENT RELATIONSHIPS IN ECOSYSTEMS

3-LS4-3. Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all.

Applicable sections from *The Incredible Octopus*:

- Where Do Octopuses Live? (p. 8)
- Deepest: Dumbo Octopus (p. 44)
- Coldest: Antarctic Octopus (p. 52)

Potential discussion questions:

- Pick 3 habitats featured on “Where Do Octopuses Live”? Name two challenging things about surviving in each habitat. Brainstorm why octopuses might be able to live in those habitats.
- Look at the habitats in “Where Do Octopuses Live”? If you were an octopus, where would you want to live? Why?
- The deep sea is cold and dark! Would this make it harder for animals to live there? Why or why not?
- The Antarctic is really, really cold! Would this make it harder for animals to live there? Why or why not?
- What is one reason why octopuses can survive in Antarctic waters?



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3rd GRADE Continued

3. INHERITANCE AND VARIATION OF TRAITS: LIFE CYCLES AND TRAITS

3-LS1-1. Develop models to describe that organisms have unique and diverse life cycles but all have in common birth, growth, reproduction, and death.

Applicable sections from *The Incredible Octopus*:

- Octopus Babies! (p. 18)
- Studying Octopus Brains (p. 60)

Potential discussion questions:

- Octopuses make eggs—can you name two other animals who also make eggs?
- Use your classroom resources to find another ocean animal that makes eggs. How are they similar to octopuses? How are they different?
- Octopus moms spend a lot of time protecting their eggs before they hatch. Why is this important?
- In “Studying Octopus Brains” we meet the scientist Dr. Z. Yan Wang. What are some reasons she gives for why octopuses don’t live very long after they have babies?

3-LS4-2. Use evidence to construct an explanation for how the variations in characteristics among individuals of the same species may provide advantages in surviving, finding mates, and reproducing.

Applicable sections from *The Incredible Octopus*:

- Anatomy of an Octopus (p. 12)
- Now You See Me . . . (p. 25)

Potential discussion questions:

- Pick one of the body parts listed in “Anatomy of an Octopus.” What is one way it helps the octopus find food or escape predators? Can you think of a way you could change that feature to make it even more helpful? Get creative!
- We learned about chromatophores in “Now You See Me.” Imagine you have two octopuses—one can change color faster than the other. How might that help them survive?



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4th GRADE

4. STRUCTURE, FUNCTION, AND INFORMATION PROCESSING

4-LS1-1. Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.

Applicable sections from *The Incredible Octopus*:

- Anatomy of an Octopus (p. 12)
- Suckers! (p. 15)
- Nine Brains? (p. 16)
- Now You See Me . . . (p. 25)
- You've Been Inked! (p. 26)
- What Do Octopuses Eat? (p. 28)
- Meet the Octopuses (p. 38)

Potential discussion questions:

- Pick one of the body parts listed in “Anatomy of an Octopus.” What is one way it helps the octopus find food or escape predators? Can you think of a way you could change that feature to make it even more helpful? Get creative!
- Name two ways octopuses use their suckers to sense their environment.
- How is an octopus’s brain different from ours? How is it similar? How does an octopus’s brain help it survive?
- Some other invertebrates have hard outer shells that help protect them from predators, but octopuses don’t have them. What are other ways they protect themselves from getting eaten? Hint: “See You’ve Been Inked!” and “Now You See Me . . .”
- Review “Now You See Me.” What are two things octopuses use to change shape or color? Can you think of other animals that can change color?
- Imagine you are an octopus. Suddenly, a shark is swimming toward you! Using your knowledge of octopuses, what are 3 things you would do to escape the shark?
- In “What Do Octopuses Eat” we learn about a few techniques octopuses use to eat their food. Name the body part(s) the octopus uses for each technique (flip back to “Anatomy of an Octopus” for help!)
- Review the species listed in “Meet the Octopuses.” For each, name one behavior or feature they use to help them survive in their specific habitat.



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4th GRADE Continued

4. STRUCTURE, FUNCTION, AND INFORMATION PROCESSING

4-LS1-2. Use a model to describe that animals receive different types of information through their senses, process the information in their brain, and respond to the information in different ways.

Applicable sections from *The Incredible Octopus*:

- Suckers! (p. 15)
- Nine Brains? (p. 16)
- You've Been Inked! (p. 26)
- Now You See Me . . . (p. 25)

Potential discussion questions:

- Draw a comic strip with three panels: First, an octopus notices something (it could be prey, a predator, or another octopus!). Second, the octopus responds with its suckers, camouflage, ink, or other feature. Third, the outcome, or what happens next! Why did you choose the response you chose?
- Look at "Nine Brains?" and "Suckers!" Describe step-by-step how an octopus sees something on the seafloor and decides if it's food or not.

5th GRADE

5. MATTER AND ENERGY IN ORGANISMS AND ECOSYSTEMS

5-LS2-1. Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.

Applicable sections from *The Incredible Octopus*:

- What Do Octopuses Eat? (p. 28)
- What Eats Octopuses? (p. 30)

Potential discussion questions:

- Draw a food web that has three parts: a clam, an octopus, and a whitetip shark. Who is eating who? How does energy move through the food web?
- Octopuses can be both predators and prey. What other animals are also both predators and prey? What about animals that are only predators (think: animals at the top of the food chain that no one else eats)? What about animals that are only prey (think: animals that only eat plants but not other animals)?