

THE SHOCKING SECRET OF THE ELECTRIC EEL...AND MORE!

Age Range: 8-11 years
Grade Level: 3-6
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About the book:

Tag along with scientists as they uncover intriguing adaptations that help animals survive in their environments. Discover the electric eels hunting tactics and an unexpected defense strategy, why some fish sleep in mucous cocoons, how jumping spiders hear from across a room, what the shape of a European eel's head reveals about the animal's diet, and why midshipman fish sing only at night.

About the author:

Ana María Rodríguez is the daughter of Spanish immigrants, was raised in Venezuela, and moved to the United States in 1987. After being a scientist for 20 years she decided to focus on writing about science, nature, and people. She has authored 26 books for children and adults and contributed over 80 magazine articles. Her accolades include the “Highlights for Children” History Feature of the Year Award, books in Science Books & Films’ “Best Books Lists”, and awards from the Society of School Librarians International. She lives in Houston, Texas. Learn more about Ana by accessing her website at www.anamariarodriguez.com.



Discussion Questions:

THE SHOCKING SECRET OF THE ELECTRIC EEL

- Click [HERE](#) to view a video featuring an electric eel attempting to kill a crocodile. Though the video is narrated in a foreign language, identify the three types of electric pulses – low-voltage for sensing, high-voltage to make their prey twitch, and the stream of high-voltage pulses intended to paralyze prey.
- Observe a video demonstrating Kenneth Catania’s plastic crocodile and fake human arm experiment by clicking [HERE](#). In addition, consider the brief summary of explorer Alexander von Humboldt’s observation of electric eels attacking horses. Based on the text content, the evidence demonstrated in the two videos, and the findings of Catania’s experiments, evaluate Humboldt’s assumptions that an electric eel can kill a horse. Is there validity in Humboldt’s statements? Explain your answer.

PARROTFISH DON’T LET THE SEA BUGS BITE

- Explore the symbiotic relationship between the parrotfish and the cleaner fish. Explain why the parrotfish is not completely reliant on the cleaner fish to remain parasite-free at night.
- Watch a parrotfish create a mucus bubble by clicking [HERE](#). Notice the clusters of small, dark creatures moving around resting parrotfish. Evaluate the effectiveness of the parrotfish’s protective mucus cocoon as it guards against being attacked by unwanted parasites.

THE SECRET OF THE HAIRY-LEGGED JUMPING SPIDER

- Click [HERE](#) to access a video featuring a jumping spider stalking, chasing, and jumping on a bee. Discuss the jumping spider’s anatomy, most especially its four pairs of eyes. Describe how the jumping spider’s ominous features make you feel.

- Observe how the hair on the jumping spider’s legs quiver as the animal focuses on locating the bee. Explain how the jumping spider uses its hairs as a listening tool. Discuss how powerful listening in this way benefits the jumping spider as a predator.

EELS LET FOOD GET TO THEIR HEADS

- Click [HERE](#) to access a video featuring European eels feeding on a river bottom. Observe how the eel casually floats about while selecting bits of food to eat. Consider the notion that the eel makes a choice as to what food to eat, resulting in the shape its head will become.
- Predict what might happen if a particular European eel’s choice of food, be it soft or hard, were not available. Speculate, would they decide to eat the alternative type of food? How would you test this speculation?

THE SECRET OF THE UNDERWATER NIGHT HUMMERS

- Observe a video showing a male midshipman fish humming by clicking [HERE](#). Considering that groups of males, such as this, join together at night to hum loudly in hopes of attracting females, imagine how confusing and “very irritating” the noise was in San Francisco during the summer of 1984. Discuss the houseboat owners' surprise when they discovered the sound was being created by a group of fish!
- Click [HERE](#) to watch a fascinating video explaining the migratory pattern and mating practices of the plainfin midshipman fish. Consider the cluster of newly hatched fish clinging to the underside of a rock remaining moist in tide water. Describe the rugged nature of the male’s migratory pattern. Examine the male’s critical role in the fertilization and protection of plainfin midshipman eggs.

Extension Activities:

THE PAST MEETS THE PRESENT

The electric eel’s unexpected and deadly “leap-and-shock” behavior intrigued both Alexander von Humboldt in the early 1800’s and Kenneth Catania in 2014. Both scientists studied this amazing creature, in depth, and their findings have made important discoveries about the electric eel’s abilities to shock and awe.

Write a fictional piece in which Humbolt and Catania meet in present day to discuss their findings. Incorporate facts presented in the text, videos presented in this guide, and additional research in your piece. Illustrate your work. Share your story with the class.

For further literary inspiration, consider two videos posted below:

- Click [HERE](#) to learn more about Alexander von Humbolt and his remarkable contributions to science.
- Click [HERE](#) to find out about Kenneth Catania’s discoveries regarding the electric eel. Also note, the connection between Catania and Humbolt referenced in the video.

THE SHOCKING SECRET OF THE ELECTRIC EEL SCIENTIST SEARCH PUZZLE ANSWERS

- | | |
|-----------------------------------|---|
| 1. <u> c </u> Botanists | a. study microorganisms |
| 2. <u> b </u> Ecologists | b. study relationships such as predator-prey |
| 3. <u> e </u> Environmentalist | c. study plants |
| 4. <u> k </u> Marine biologists | d. studies stars, planets and galaxies |
| 5. <u> i </u> Zoologists | e. scientists study things such as air quality, water quality, soil quality, etc. |
| 6. <u> j </u> Entomologists | f. study about the earth’s materials like rocks and minerals |
| 7. <u> h </u> Herpetologists | g. the study of birds |
| 8. <u> g </u> Ornithologists | h. study of reptiles and amphibians |
| 9. <u> a </u> Microbiologists | i. study animals and their behavior |
| 10. <u> f </u> Geologists | j. focus on the study of insects |
| 11. <u> d </u> Astronomers | k. study oceanic organisms |
| 12. <u> l </u> Archacologists | l. study the remains of human life |

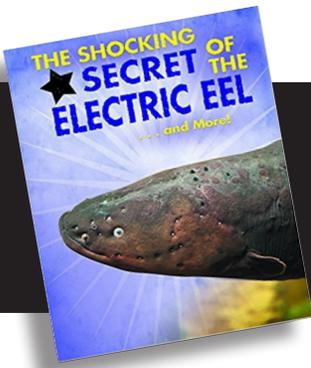


Common Core State Standards - Anchor Standards: Reading: R.1, R.2, R.4, R.7, R.10.
 Writing: W.3, W.4, W.7, W.8, W.9. Speaking & Listening: SL.1, SL.2, SL.4, SL.5.
Next Generation Science Standards: K-ESS2-1, K-ESS3-1, K-LS1-1, K-ESS3-1

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THE SHOCKING SECRET OF THE ELECTRIC EEL...AND MORE! The Scientist Search Puzzle

Refer to a dictionary to discover the definition for each type of scientist listed below.
Write the letter of the correct match next to each scientist title.

1. _____ Botanists
 2. _____ Ecologists
 3. _____ Environmentalist
 4. _____ Marine biologists
 5. _____ Zoologists
 6. _____ Entomologists
 7. _____ Herpetologists
 8. _____ Orinithologists
 9. _____ Microbiologists
 10. _____ Geologists
 11. _____ Astronomers
 12. _____ Archaeologists
- a. study microorganisms
 - b. study relationships such as predator-prey
 - c. study plants
 - d. studies stars, planets and galaxies
 - e. scientists study things such as air quality, water quality, soil quality, etc.
 - f. study about the earth's materials like rocks and minerals
 - g. the study of birds
 - h. study of reptiles and amphibians
 - i. study animals and their behavior
 - j. focus on the study of insects
 - k. study oceanic organisms
 - l. study the remains of human life