



THE SECRET OF THE SCUBA DIVING SPIDER...AND MORE!

Age Range: 8-11 years

Grade Level: 3-6

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About the book:

Readers will dive along with an underwater spider and also discover why caterpillars need an emergency whistle, how bats jam each others' signals, that zombie beetles really exist, and what makes cockroaches so hard to catch. Primary sources include interviews with the scientists and original photos. Simple yet detailed language makes complicated scientific ideas easy to understand.

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 SECRET OF THE SCUBA DIVING SPIDER

- Explain the connection between the diving spider’s threatened habitat and its rare existence. Consider how the scientific study of this rare insect could possibly protect its existence.
- Determine why the diving bell spider’s scientific name is translated to mean “aquatic spinner of silver.”
- Predict why the oxygen level changes when the spider is present in the diving bell and when it is not.
- Click [HERE](#) to watch a video featuring the diving bell spider. Tell how the video shared and presented new facts about this incredible spider.

- A *hypothesis* is considered to be an ‘educated guess’ that guides scientific exploration. The scientists in this chapter hypothesized that the caterpillar whistled when under attack. Discuss how their hypothesis guides their research and finding.
- Click [HERE](#) to watch a video of the North American walnut sphinx. Determine how the video corresponds with the research presented in the chapter.

JAMMING SIGNALS, RIGHT OFF THE BAT

A CATERPILLAR’S EMERGENCY WHISTLE

- The word *predator* is defined as an animal that naturally preys on others. Explain how and why caterpillars need to protect themselves from predators.

- Discuss how bats use echolocation to “see in the dark.”
- Describe how bats use echolocation to track food.
- Explain how bat biologist Aaron Corocran’s observations and hypothesis brought about a deeper understanding of the use of echolocation to “jam” the feeding signals of other bats.
- To watch a short video about the Mexican free-tailed bat, click [HERE](#).

TALES FROM THE ZOMBIE BEETLE

- A *zombie* is defined as a human who has died and has supernaturally been brought back to life. Consider how the ladybug's paralysis when incubating the wasp cocoon appears to be zombie-like.
- Discuss how the "viral species" scientist Nolwenn Dheilley discovered is based on biological weaponry.
- Click [HERE](#) to watch a video featuring a zombie ladybug coming back to life.

THE SECRET OF THE UNSTOPPABLE COCKROACH

- Discuss the benefit of observing the structure of a strange and icky creature to discover an invention that could eventually become helpful to many.
- Explain how the roach's exoskeleton can be considered to be a suit of armor.
- Tell how the systematic study of a roach's movements can assist scientists and engineers with the development of robotics.
- Click [HERE](#) to watch a video demonstrating how the study of the roach's strength, dexterity, and speed led to the development of the CRAM robot.

Extension Activities:

TAXONOMY:

Taxonomy is an elaborate system of classification of all living things. The Plant and Animal Kingdoms are categorized in a system of shared characteristics. The 'Science Tongue Twisters' referenced in the book present the *genus* and *species* names for each animal. Research the taxonomy of each animal by discovering the complete Scientific Classification, as listed on the right. When complete, compare and contrast each list. Identify shared classification categories. Discuss ways that the animals have shared or differing physical characteristics.

SCIENTIFIC CLASSIFICATION

Kingdom:

Phylum:

Subphylum:

Class:

Order:

Family:

Genus:

Species:

CATCH A SPIDER WEB:

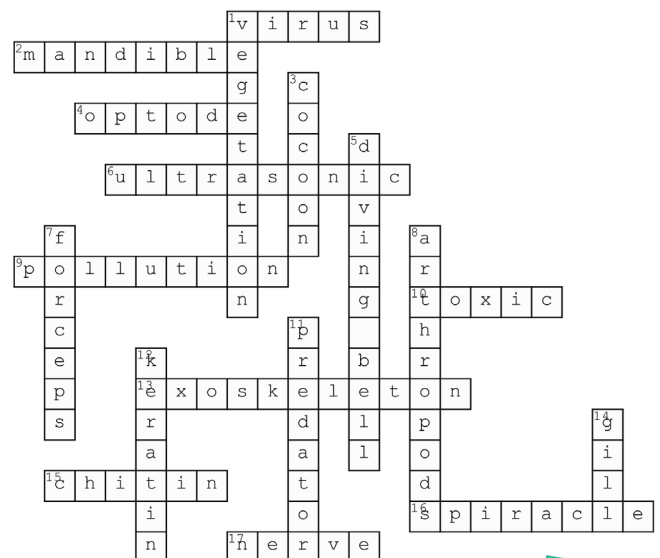
Supplies: Spider web, non-toxic spray paint, paper, pencil

Procedure:

- Gently spray the spider web with the spray paint, with the can about 6-8 inches away from the web. Make sure you use either non-toxic paint or do this in an area where other plants and wildlife will not be affected.
- Place your paper under the spider web and lift it up into the web. The web will stick to the paper.

Application: Closely observe the repetitive pattern of the spider web design. Using paper and pencil, sketch a likeness of the captured web. Write a narrative describing how and why the pattern of the web contributes to the spider's survival.

THE SECRET OF THE SCUBA DIVING SPIDER... AND MORE CROSSWORD PUZZLE ANSWERS



Common Core State Standards - Anchor Standards: Reading: R.1, R.2, R.4, R.7, R.10.
 Writing: W.2, W.6, W.7. Speaking & Listening: SL.1, SL.2, SL.4, SL.5.
Next Generation Science Standards: K-LS1-1, 3-LS4-1, 3-LS4-4

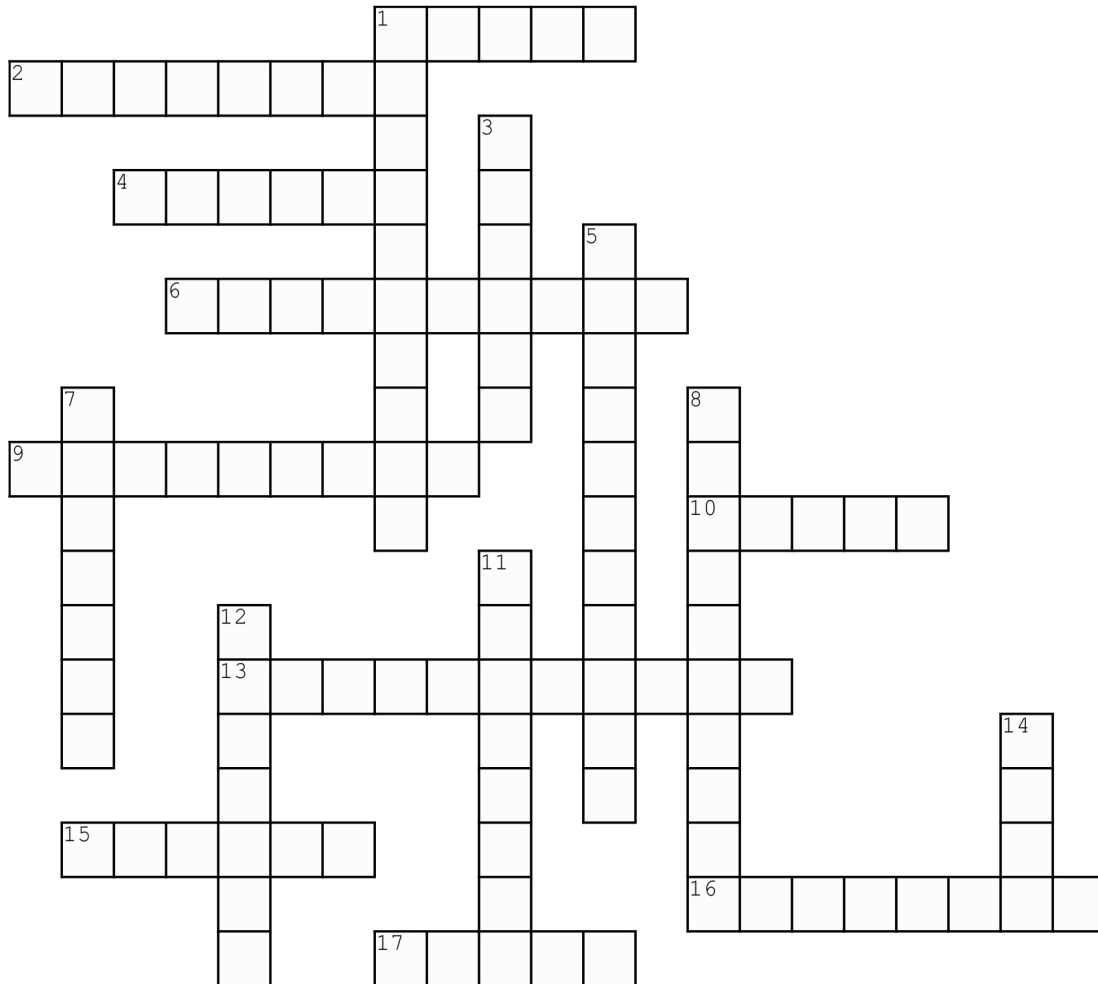
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THE SECRET OF THE SCUBA DIVING SPIDER...AND MORE! Crossword Puzzle



Across

1. A microscopic particle that can replicate inside living cells
2. The mouth part of an animal
4. A sensor to detect a chemical
6. A sound people cannot hear
9. Contamination of the environment
10. Poisonous
13. A hard, protective covering of insects
15. A tough coating that protects the outside body of some insects
16. A small opening in an insect
17. Fibers of the nervous system that carry messages between the brain, spinal cord, and other parts of the body

Down

1. Plants growing in a particular place
3. The silky covering that encloses a caterpillar while it transforms into an adult
5. A chamber that holds air underwater
7. A surgical instrument
8. An invertebrate animal that has jointed limbs, segmented body, and an exoskeleton
11. An animal that hunts other animals for food
12. The main protein that makes up hair, nails, feathers, and hooves
14. A breathing organ of a fish