

ADVISORY 2, UNITS 3-4, LESSON 1 TRAITS, BEHAVIORS, AND REPRODUCTION

Summary

- In this lesson, students will read "Valuable Venom" (pp. 4-11) to learn about different types of venom and why some people risk their lives to collect venom from some of the world's deadliest snakes.

Science Background

There are nearly 3,000 species of snakes in the world. Most snakes are harmless, but about 650 species are venomous. Their bites inject toxic poisons into prey.

Snake venom is extremely complex. It can be composed of up to a hundred different toxins. The venom in each snake species is different. There can even be differences between the venoms of young and old snakes of the same species.

Over millions of years, venom has evolved to become highly specialized. It affects certain vital organs, but nowhere else. Because of this, venom can be quite helpful. Scientists use venom to create medicines that target specific conditions.

One of the first drugs to be developed from venom came from the Brazilian pit viper. This snake's bite causes a rapid drop in a victim's blood pressure. Scientists used the venom to create a drug that lowers high blood pressure in people. Other snakes' venom has been used to create drugs that treat everything from heart attacks to breast cancer.

With new technology and more than 20 million toxins in nature to test, scientists will continue to develop new medicines.

ENGAGE

Encourage students to flip through the articles and turn and talk with a partner to discuss what they see. Invite students to ask questions or share what they already know about venomous snakes.

EXPLORE

Instruct students to examine the photo, headline, and deck on pages 4-5 of their Readers. **Ask:** *Based on what you see and read here, why is the man in this photo taking a risk?* (The snake he's about to touch is deadly.) Brainstorm ideas about why the man would want to get so close to this snake.

EXPLAIN

Remind students that venom is a type of toxin that some snakes inject into their prey. **Ask:** *What does venom do?* (It disrupts or changes the chemical reactions that occur normally in the body.) *Why do people collect venom from deadly snakes?* (to make antivenoms and other medicines) Have students turn and talk as they discuss how different types of venom affect the body. (Example: Brazilian pit viper venom causes blood pressure to drop rapidly.) Challenge students to explain how scientists use these characteristics to make different types of medicine. (Example: Scientists used Brazilian pit viper venom to make a medicine that lowers high blood pressure in people.) Challenge students to explain why toxinologist Zoltan Takacs' "designer toxins" are so valuable. (They make it easier for scientists to screen toxins and select the best traits for making new medicines.)

ELABORATE

Use the National Geographic resource "Zoltan Takacs/Deadliest Lifesavers" (<https://www.nationalgeographic.org/media/zoltan-takacs/>) to take student on a learning adventure around the world as they learn more about Takacs' adventures and work.

EVALUATE

Have students complete the **Content Assessment** for this lesson. Encourage them to share and compare their results in small groups.

CONTENT ASSESSMENT: Selecting Traits

Describe how each snake's venom affects prey. Explain how scientists are using those traits to make new medicines.

	Describe	Explain
Brazilian pit viper		
King cobra		
copperhead		
saw-scaled viper		
banded sea krait		