Ask® Teacher Guide: July/August 2021

Life in a Shell

This month's issue of ASK magazine contains articles and photographs that beautifully emphasize that every shell has a story. From mollusks to turtles, readers will discover the magnificence of a shell's appearance and learn about the biological functions of shells.

CONVERSATION QUESTION

How are shells important in the natural world?

TEACHING OBJECTIVES

- **Students will learn how shells are created by their soft-bodied inhabitants.**
- **Students will learn how hermit crabs secure new homes.**
- **Students will learn about the turtle's most unique anatomical structure—its shell.**
- **Students will explain a biological process.**
- **Students will collect evidence from a nonfiction text.**
- **Students will compare and contrast the features of bone and shell.**
- **Students will write a shell-themed concrete poem.**
- **Students will use a mathematical process to solve a science-based word problem.**
- **Students will write a creation myth explaining how a particular turtle species came into existence.**

In addition to supplemental materials focused on core STEM skills, this flexible teaching tool offers vocabulary-building activities, questions for discussion, and cross-curricular activities.

SELECTIONS

- **Secrets of the Shells**
  Expository Nonfiction, ~850L
- **Home, Sweet Shell**
  Expository Nonfiction, ~610L
- **On the Back of a Turtle**
  Expository Nonfiction, ~850L

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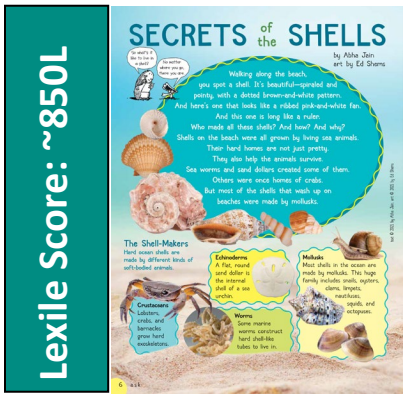
Secrets of the Shells

pp. 6–11, Expository Nonfiction

Students will learn how the beautiful shells that adorn our beaches serve an important function for marine wildlife. This article explains how and why mollusks create these natural masterpieces.



RESOURCES

By the Seashore: Biological Process

OBJECTIVES

- Students will learn how shells are created by their soft-bodied inhabitants.
- Students will explain a biological process.
- Students will write a shell-themed concrete poem.

KEY VOCABULARY

- ***mantle* (p. 7)** a thin layer inside a mollusk's shell that protects its soft body parts and helps build the shell
- ***nacre* (p. 7)** a hard, shiny, and smooth substance on the insides of the shells of some shellfish
- ***chambers* (p. 9)** small spaces inside something

ENGAGE

Conversation Question: How are shells important in the natural world?

Display the title of the article, "Secrets of the Shells," and ask students what they know about shells. Spend a few minutes sharing prior knowledge, and then arrange the class into five groups. Assign each group a different category: tools, building, music, jewelry/art, money. Have students work together to determine how shells could be used for each purpose. After each group shares, display page 11 of the article and have students check for accuracy.

INTRODUCE VOCABULARY

Post and discuss the three key terms and definitions. Advise students to highlight these words in the text as they are revealed. After reading the article, have students make a cross-section diagram of a mollusk. They will label the **mantle**, **nacre**, and **chambers**, as well as other mollusk features mentioned in the reading. Page 7 will guide students in making a precise illustration.

READ & DISCUSS

Read the article aloud with the class. Have students reread the article with a partner to answer the questions below. Discuss responses.

1. Where do all the shells on the beach come from?
2. List four different shell-makers.
3. How are the inner shell and the outer shell made differently?
4. What happens when a mollusk gets too big for its shell?
5. How do different shell shapes help the animal to survive? Give examples.
6. How do mollusks move around?

SKILL FOCUS: Biological Process

INSTRUCT: This article presents the reader with detailed information regarding the natural process by which mollusks create shells. Present the *By the Seashore: Biological Process* graphic organizer and tell students they will be recording details about this process. They will need to consult the article to gather information that relates to each step of the process and explain the procedure in their own words.

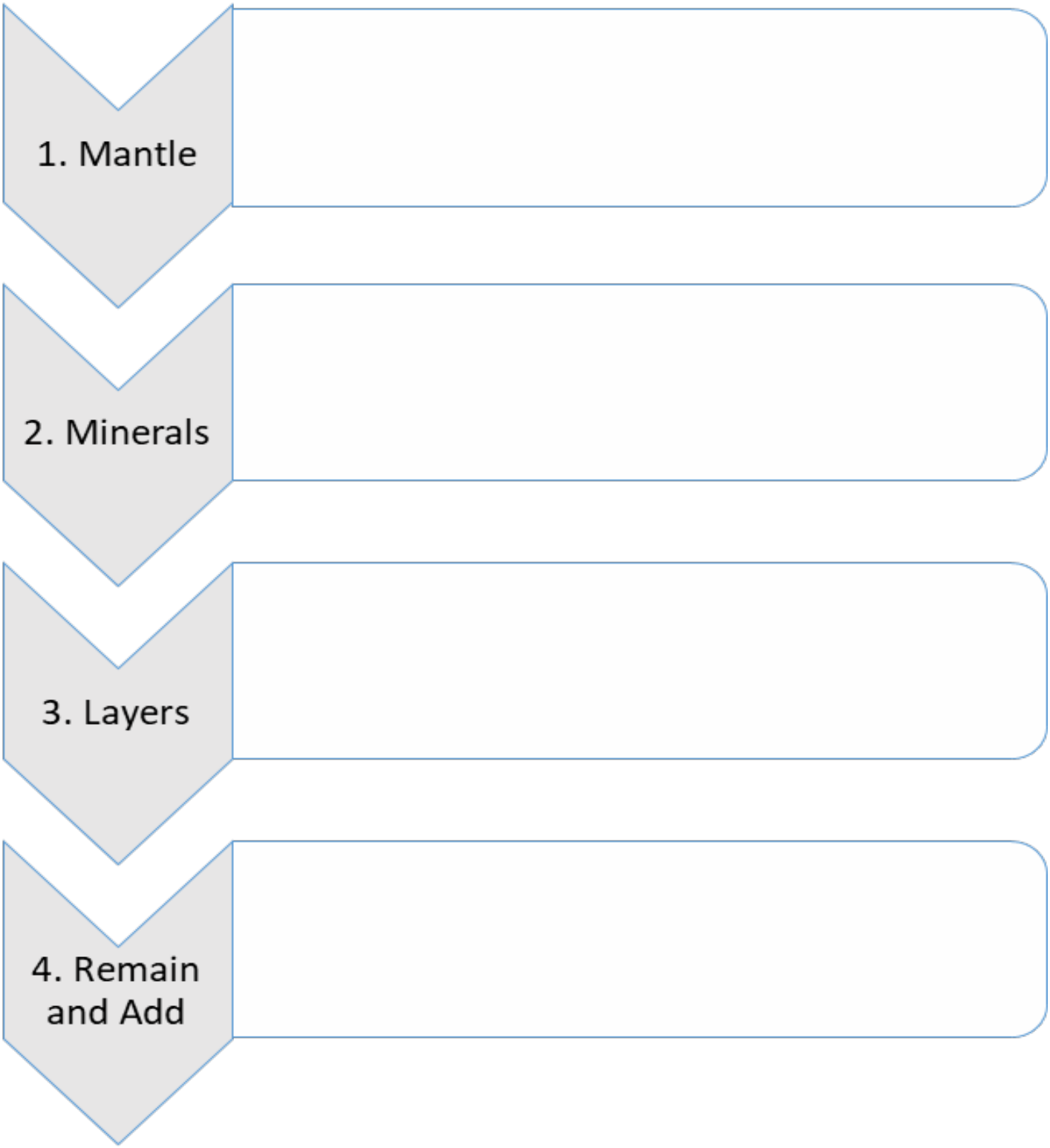
ASSESS: The activity above reinforces how a mollusk makes its shell. After reviewing, have students use the back of the paper to explain how these shells get their patterns and colors. (Refer to article page 10.)

EXTEND

Language Arts Explain to students that in a concrete poem, or shape poem, the words of the poem create a picture that matches the topic of the poem. Show students examples of concrete poems from books or the internet. Ask students to review the many unique shapes of seashells presented in photographs throughout this article. Have students choose a shape to use for the purpose of creating a concrete poem. Encourage poets to enhance their finished product by adding color and a background.

By the Seashore

Biological Process Use the article to explain how a mollusk builds its shell.



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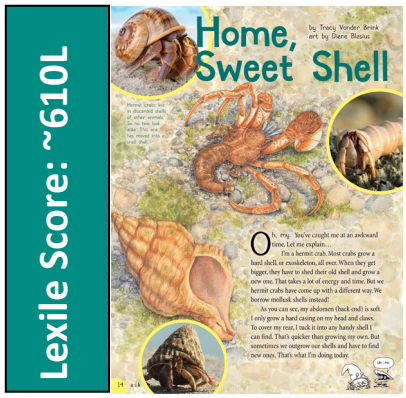
Home, Sweet Shell

pp. 14–17, Expository Nonfiction

Unlike mollusks, hermit crabs don't grow their shells—they borrow them! Students will learn how a hermit crab continues to secure new homes throughout its lifetime, shedding what no longer serves its purpose.



RESOURCES

Flipping Houses: Collecting Evidence

OBJECTIVES

- Students will learn how hermit crabs secure new homes.
- Students will collect evidence from a nonfiction text.
- Students will use a mathematical process to solve a science-based word problem.

KEY VOCABULARY

- ***discarded* (p. 14)** thrown away
- ***exoskeleton* (p. 14)** the hard outer covering that protects some animals; external skeleton
- ***shed* (p. 14)** to lose something naturally, such as skin, fur, or a shell

ENGAGE

Conversation Question: How are shells important in the natural world?

Ask students what makes a particular home "perfect" for its occupants. Have students think about comfort, size, and location. Then ask students how animals in the wild choose or build their homes. How are human and animal needs similar and different?

INTRODUCE VOCABULARY

Post and discuss the key terms as well as the title of the article. Be sure that students understand the definitions before reading the article. As a post-reading activity, have students use the three vocabulary words to summarize the article in paragraph form.

READ & DISCUSS

Reinforce comprehension of the concepts presented in the article by using the following prompts to direct discussion.

1. What is unique about the hermit crab's home?
2. What happens if a hermit crab's new shell is too small? What happens if the shell is too big?
3. How does a hermit crab know a shell is just right for inhabiting?
4. List three reasons why a hermit crab searches for a new shell.
5. What happens when two or more crabs want the same shell?
6. Why is it more difficult for hermit crabs that live on land to find shells? How are scientists and citizens helping?

SKILL FOCUS: Collecting Evidence

INSTRUCT: This article presents the reader with detailed information about the hermit crab's continual quest for a more suitable dwelling. Present the graphic organizer, *Flipping Houses: Collecting Evidence,* and tell students they will be reviewing the article and highlighting sentences that describe why, how, where, and when hermit crabs find a new home. After they have collected evidence addressing all of these points, they will record the information in the organizer.

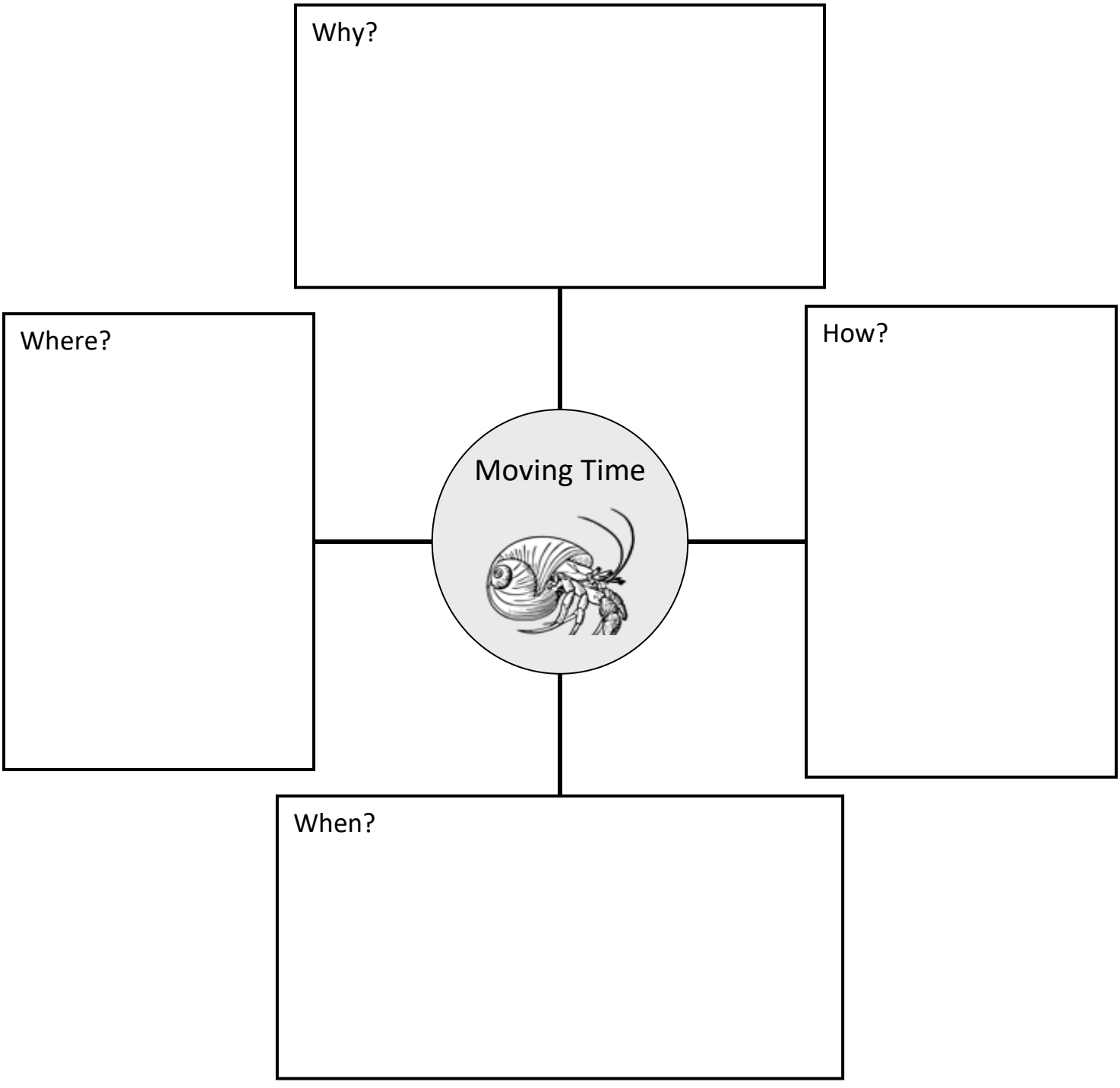
ASSESS: Reconvene and discuss answers. Have students compare a hermit crab's reasons for moving to human reasons for moving.

EXTEND

Mathematics Present to students the following fact: Hermit crabs in the wild live approximately 40 years, and will change their shell every 12–18 months. Point out that it is easy to reason that crabs will have about 40 homes in 40 years, if they shed the shell once per year. However, this is a generalization. How many shells will a hermit crab inhabit in its life time if it lives 36 years and swaps shells every 18 months? Use the Read-Draw-Write process to show your mathematical thinking. (**Answer:** 24 shells)

Flipping Houses

Collecting Evidence Gather evidence from the text indicating that it is time for a hermit crab to find a new home.



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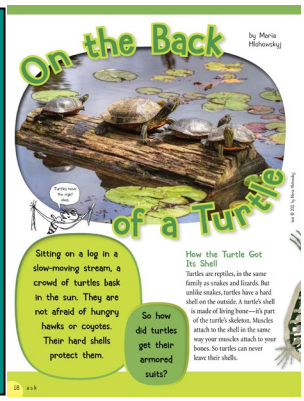
On the Back of a Turtle

pp. 18–22, Expository Nonfiction

Carrying his home on his back, the turtle is a fascinating creature. Readers will learn interesting facts about this reptile's body and habits, focusing on their "armored suits."

Lexile Score: ~850L



RESOURCES

Funny Bones: Compare and Contrast

OBJECTIVES

- Students will learn about the turtle's most unique anatomical structure—its shell.
- Students will compare and contrast the features of bone and shell.
- Students will write a creation myth explaining how a particular turtle species came into existence.

KEY VOCABULARY

- ***dome* (p. 19)** a shape that resembles the top half of a ball
- ***semi-aquatic* (p. 20)** living part of the time in water and part of the time on land
- ***hinge* (p. 21)** the part of a door, gate, or cover that allows it to open or close

ENGAGE

Conversation Question: How are shells important in the natural world?

Motivate students to read about turtles by having them decorate the back of a paper bowl, creating the animal's shell. Supply crafting materials, as well as cardboard templates for children to fabricate the feet, tail, and head. Tell the class that you want them to create a realistic representation of a turtle, so to be mindful when choosing colors and materials. After the reading, have students revisit their creations and use new words from the article to share their turtle with the class.

INTRODUCE VOCABULARY

Post and discuss the three vocabulary words and definitions. Have students Think-Pair-Share with a partner. Give them the following brainstorming directives, one at a time:

- Where do you see **domes** in architecture? Why?
- List two **semi-aquatic** animals.
- Where would you find **hinges** in a school or home?

READ & DISCUSS

Pose the following questions to the students to prompt meaningful discussion following the reading of the article.

1. List three functions of a turtle's shell.
2. What clues suggest turtle shells evolved from backbones and ribs?
3. Explain the three distinctive parts of a turtle's shell.
4. Why are turtle shells different shapes and colors?
5. How are scientists helping threatened species of turtles?

SKILL FOCUS: Compare and Contrast

INSTRUCT: Students will work in pairs to compare and contrast the features of bone and shell using information from the article. Instruct students to revisit the text to underline information that will be helpful for this purpose. Introduce the *Funny Bones: Compare and Contrast* graphic organizer and have partners use it to record the data.

ASSESS: Reconvene and review the graphic organizer with the class. Have students use the information gathered on the Venn diagram to explain the differences and similarities in paragraph form.

EXTEND

Language Arts Page 22 mentions an ancient Hindu myth that describes the world resting on the back of a giant turtle, swimming through space. Review the criteria for writing a creation myth, and have students choose one of the turtles from the article (spiny softshell, box turtle, Blanding's turtle, alligator snapping turtle, pig-nosed turtle, leatherback sea turtle) and write a symbolic narrative of how it came into existence.

Funny Bones

Compare and Contrast Use information from the article to compare and contrast bone and shell. Consider the following: physical appearance, structural components, and location.