

# Ask®

## Got Bones?

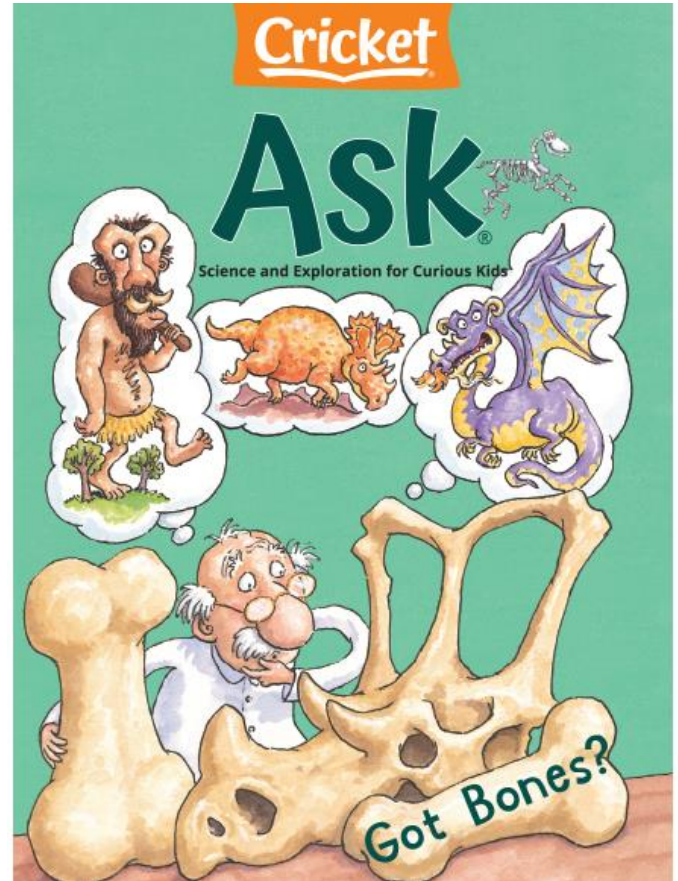
Although it's October, this issue of ASK will show students that skeletons are more than just Halloween decorations. From broken bones to bones filled with water, readers will acquire new knowledge and participate in theme-related activities.

## CONVERSATION QUESTION

What do bones do?

## TEACHING OBJECTIVES

- Students will learn about the treatment and healing of a broken bone.
- Students will learn about the three types of skeletons.
- Students will learn about a Native American artifact made from bone.
- Students will obtain information from a nonfiction text.
- Students will classify information.
- Students will sequence events.
- Students will collect and represent data on a bar graph.
- Students will participate in a bone strength science experiment.
- Students will write stories using personification and first-person point of view.



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.

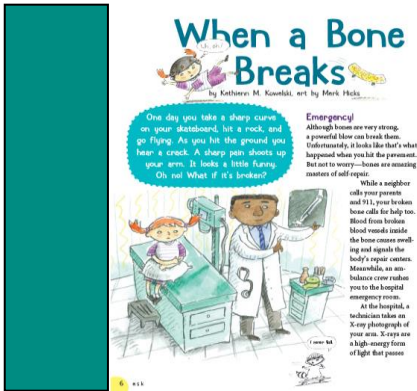
## SELECTIONS

- **When a Bone Breaks**  
Expository Nonfiction
- **Where Do You Keep Your Skeleton?**  
Expository Nonfiction
- **A Hairpin's Tale**  
Fantasy

## When a Bone Breaks

pp. 6–11, Expository Nonfiction

A thud, a crack, a shooting pain—a broken bone. This article details how broken bones are treated by medical professionals and how the body itself works hard to summon bone-healing cells to help restore the bone.



## RESOURCES

- Obtain Information: Bone Crushing

## OBJECTIVES

- Students will learn about the treatment and healing of a broken bone.
- Students will obtain information from a nonfiction text.
- Students will collect and represent data on a bar graph.

## KEY VOCABULARY

- technician (p. 6)** a worker trained with special skills or knowledge, especially in how to operate machines or equipment used in science
- fracture (p. 7)** a crack or break
- framework (p. 9)** a supporting structure around which something can be built

## ENGAGE

**Conversation Question:** What do bones do?

Read aloud the title of the article—“When a Bone Breaks.” Give students a few minutes to discuss real-life experiences. Point out that people usually discuss the incident first and then lament about what they were not able to do with a broken bone. Ask the class to help you “flip the script” for students suffering from a broken bone by listing all the things that CAN be done while healing (read, watch movies, listen to a podcast, sing, etc.). Give students time during the week to create get-well cards incorporating ideas from the list. Keep the completed cards in the classroom to be distributed to schoolmates with broken bones throughout the school year.

## INTRODUCE VOCABULARY

Display the following statements and underline the key vocabulary terms. Review how to infer the meanings of new words by using context clues and background knowledge. Then have partners work together to determine the meaning of each word. Reveal definitions.

- The care unit includes a laboratory with a technician.
- One third of women over 90 have sustained a hip fracture.
- The bridge over the river has a steel framework.

## READ & DISCUSS

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

- Explain the difference between a simple fracture, a greenstick fracture, and an open fracture.
- What cells work together to form new bones?
- Why are scientists studying purring cats in relation to bone health?
- What do bones need to stay healthy?
- Why is keeping bones healthy a special challenge for astronauts?

## SKILL FOCUS: Obtain Information

**INSTRUCT:** Guide students to obtain information from the text, captions, and drawings in the article. Remind them that the article was written to teach readers how science and the body work together to heal a broken bone. Introduce the *Obtain Information: Bone Crushing* worksheet. Instruct students to underline the correct word to complete each sentence.

**ASSESS:** Review and discuss the answers students chose to complete the sentences. Have them make corrections as necessary.

## EXTEND

**Mathematics:** Have students survey their classroom to determine how many students have broken a bone. Students should divide responses by type of bone broken (leg, ankle, arm, wrist, other). Once the information is organized, have students create a bar graph to represent the data. Bar graphs must be neat, easy to read, and include a title, a scale, labeled axis, and bars.

## Bone Crushing

**Obtain Information** Read through the sentences and note the choice of answers. Revisit the article and then underline the correct word to complete each sentence.

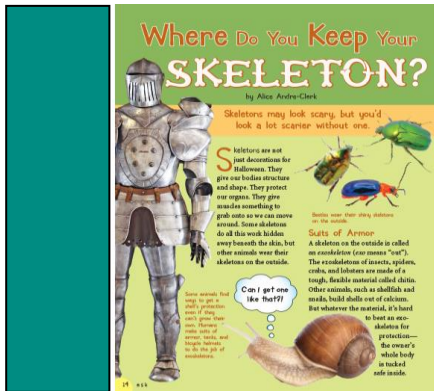
1. The centers of your largest bones are filled with a jelly-like substance called **(tissue/marrow/vessels)**.
2. The outermost part of a bone is called **(white bone/mesh bone/compact bone)**.
3. Bones are mostly made of **(blood/calcium/water)** and other minerals.
4. Cells that recycle bone, called **(osteoclasts/osteoblasts/marrow)**, break down older bits of bone.
5. When the bone breaks but doesn't fracture, it is called a **(simple/crush/greenstick)** fracture.
6. The surface of the bone is covered with a thin skin of **(nerves/tissue/minerals)**.
7. **(Marrow/Collagen/Osteoblast)** makes the bones strong and just a bit bendy.
8. Inside the hard outer layer is a stiff, honeycomb-like web called **(fiber/cell/spongy)** bone.
9. Blood from broken blood vessels inside the bone causes **(swelling/rash/nausea)**.
10. Bones are **(tissues/muscles/organs)** filled with living cells, nerves, and blood vessels.



## Where Do You Keep Your Skeleton?

### pp. 14–17, Expository Nonfiction

Some skeletons are hidden away beneath the skin, while the skeletons of some creatures are displayed on the outside. Readers will learn about different types of skeletons and how they function.



## RESOURCES

- Classifying Information: No Bones About It

## OBJECTIVES

- Students will learn about the three types of skeletons.
- Students will classify information.
- Students will participate in a bone strength science experiment.

## KEY VOCABULARY

- molting** (p. 15) losing a covering of feathers, hair, skin, or shell and replacing it with new growth in the same place
- modified** (p. 17) slightly changed

## ENGAGE

**Conversation Question:** What do bones do?

Remind students that bones are mostly made of calcium and other minerals. Bone-building cells get these building materials from the food we eat. Give students a few moments to brainstorm a list of foods that provide calcium (cheese, sardines, soybeans, milk, leafy greens, etc.).

## INTRODUCE VOCABULARY

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

- Name some animals that molt and then explain how **molting** serves a purpose for the animal.
- How is a racecar **modified** to become faster, lighter, and safer?

## READ & DISCUSS

Post and discuss questions prior to reading. Have students read the article independently and answer the questions in full sentences.

- What is the purpose of a body's skeleton?
- Why can't large animals have an exoskeleton?
- How do endoskeletons protect our most vital organs?
- What is the big advantage of a skeleton that is made of living bone?
- How do animals with hydrostatic skeletons move?

## SKILL FOCUS: Classify Information

**INSTRUCT:** Instruct students to obtain information from the text, captions, and photos in the article. Remind students that the article was written to teach readers about the characteristics of different skeleton types. Introduce the *Classifying Information: No Bones About It* worksheet and instruct students to label each sentence with the correct letter as indicated.

**ASSESS:** Have students peer-review the worksheet with a partner. If a disagreement arises, guide students to revisit the text.

## EXTEND

**Science:** Students will participate in a science experiment to discover what makes bones strong. Materials for each group: dried, clean chicken bones (leg/wing), a glass, white vinegar. Procedure: 1. Divide the class into small groups and give each group a chicken bone. Have them feel its rigidity by trying to bend it. (Warn them not to force it or it will break.) 2. Place chicken bone in the glass and fill glass with vinegar. 3. Let the bone soak for three days. Then pour out vinegar. 4. Add fresh vinegar and soak bone for two more days. 5. Remove bone from vinegar and dry it. Now have students handle the bone and feel how it bends. Conclusion: Bones are made of calcium and collagen. The acid in the vinegar dissolved the calcium carbonate so that only collagen was left. Calcium is what is needed to make our bones strong. When there is not enough calcium, our bones are more likely to break.

### No Bones About It

**Classifying Information** Use information from the article to determine if the sentence pertains to an **endoskeleton (E)**, an **exoskeleton (X)**, or a **hydrostatic skeleton (H)**. Mark each sentence with **E**, **X**, or **H** to indicate the correct skeleton.

- \_\_\_\_\_ 1. One big advantage of a skeleton made of bone is that it can grow right along with us.
- \_\_\_\_\_ 2. These skeletons keep the animals inside from drying out.
- \_\_\_\_\_ 3. The bony skeleton inside gives animal bodies their basic shape.
- \_\_\_\_\_ 4. These are referred to as “squishy skeletons.”
- \_\_\_\_\_ 5. When the animal inside gets bigger, it has to shed its shell and form a new one.
- \_\_\_\_\_ 6. Humans, like all vertebrates, have this type of skeleton.
- \_\_\_\_\_ 7. These skeletons are made up of little compartments filled with water, blood, or another liquid.
- \_\_\_\_\_ 8. These skeletons are made of a tough, flexible material called chitin.
- \_\_\_\_\_ 9. The benefits of this skeleton are being able to replace lost water and fitting into tight spaces.
- \_\_\_\_\_ 10. These skeletons continue to strengthen and repair themselves for the entire life of the animal.

**THINK TANK:** What are positive and negative features of each skeleton? Discuss with a partner.

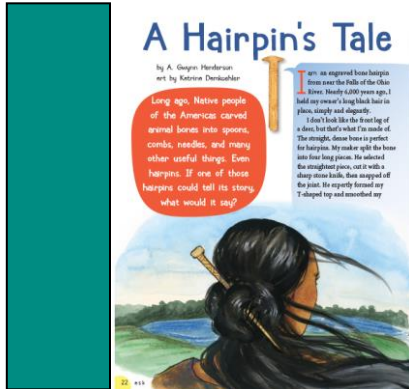


# Ask® Teacher Guide: October 2023

## A Hairpin's tale

pp. 22–23, Fantasy

Readers will follow the journey of a 6,000-year-old hairpin carved from the leg bone of a deer. Written from the perspective of the hairpin, this tale is both informative and heartwarming.



## RESOURCES

- Sequence of Events: “Hair” Today, Gone Tomorrow

## OBJECTIVES

- Students will learn about a Native American artifact made from bone.
- Students will sequence events.
- Students will write stories using personification and the first-person point of view.

## KEY VOCABULARY

- archeologist (p. 23)** a scientist who studies past human life and activities by studying the bones, tools, and other remains of ancient people

## ENGAGE

**Conversation Question:** What do bones do?

Brainstorm with students a list of materials from nature that might have been used by people living thousands of years ago to make useful and necessary items (bone, stone, etc.). Discuss how a particular material might have been used. For example, a stone might have been chiseled away to make an arrowhead for hunting. Create a list of materials and their possible uses. This list will be a resource for students when they complete the EXTEND language arts activity.

## INTRODUCE VOCABULARY

Post and discuss the key word and definition. Take the opportunity to do a primary word study using the word **archeologist** as follows:

- How many letters does the word have?
- How many letters are vowels? How many are consonants?
- How many syllables does the word have?
- Is the word a thing/person (noun), an action word (verb), or a describing word (adjective)?
- How can you use the word in a sentence?
- Who might work with an archeologist to study human history?

## READ & DISCUSS

After reading, lead a discussion based on the following questions.

- What type of bone was the hairpin made from?
- Why did the maker of the hairpin engrave a beautiful design on it?
- How did the hairpin eventually snap?
- How were the hairpin pieces lost?
- What could the archeologist learn by studying the buried, broken piece of the hairpin?

## SKILL FOCUS: Sequence of Events

**INSTRUCT:** This article presents the reader with detailed information about the journey of a Native American hairpin from bone to breakage. Present the *Sequence of Events: “Hair” Today, Gone Tomorrow* graphic organizer. Tell students they will divide the hairpin’s journey into the beginning, middle, and end and record details and events from each part of the journey.

**ASSESS:** Review the worksheet. Challenge students to orally tell the tale of a favorite toy using beginning, middle, and end.

## EXTEND

**Language Arts:** Students will write a three-paragraph tale describing the journey of an item created from bone/stone. Have the class revisit the list created in the ENGAGE activity for ideas. Remind students that they will be using personification in their first-person account of the object. Post the following question from the introductory paragraph of the article: *If a hairpin could tell its story, what would it say?* Have students create their story around a similar question.

## “Hair” Today, Gone Tomorrow

**Sequence of Events** Use information from “A Hairpin’s Tale” on pages 22–23 to tell the story of the hairpin from beginning to end.

Beginning	
Middle	
End	