

- 1 **Read and underline the definition** of the word below. Knowing this word and its definition will help you complete the following activities.

**engineer** (noun) An engineer is a person who designs technologies to solve problems.

- 2 **Reread the informational text on the next page, “Borrowing Nature’s Designs.”** Informational texts give facts about a topic. **Use the glossary** to help you with the meaning of unfamiliar words.
- 3 The main idea of this text is in Paragraph 1. **Put a star (★) in the margin next to the main idea of the text.**
- 4 Informational texts often have subheadings that can help you identify the main ideas in different sections of the text. **Focus on the main idea and key details of one section.**
  - a **Put a checkmark (✓) next to one subheading.** The subheading can help you think about the main idea of the section.
  - b **Underline 3 to 4 key details in this section.** Key details in each section can also help you think about the main idea of the section.
- 5 **Complete the chart by rewriting the information *in your own words*.** Use the markings you made on the text to help you paraphrase the text.

text main idea	
subheading	
section main idea	
section key details	

- 6 **Write a summary of one section of the text** on another page. Use information from your chart to help you.

★ **Work with a partner to research another technology based on a design from nature. Use an approved search engine and the key word *biomimetic*. Then, create a multimedia presentation using video, photos, or diagrams to explain what you learn.**



### Borrowing Nature's Designs

<sup>1</sup> Imagine a day when doctors could help a person grow a replacement body part—just like starfish and lizards can do. What if bridges were built from something much stronger than steel—fibers made of spider silk! Some engineers study nature's designs in order to develop new technologies. These engineers are using a kind of science called biomimetics. Biomimetics comes from the Greek words *bios* “life” and *mimesis* “to imitate.”

#### <sup>2</sup> ***Prickly Plant Parts***

In 1941, a Swiss engineer named George de Mestral went for a hike with his dog. Afterward, picking off burrs from his clothes and dog's fur, he became curious. How did the burrs manage to stick so well? He studied the structure of each burr and discovered that the spines ended in tiny hooks. He went on to invent a kind of fastener made of tiny hooks. He helped start a company to produce the fasteners. Velcro® is still a trade name for these burr-inspired fasteners. They are used on clothing, shoes, school binders, and many other products.

#### <sup>3</sup> ***Sticky Feet***

Little lizards called geckos have an astounding ability to cling to walls, ceilings, and other surfaces. For decades, scientists have studied gecko feet to figure out what makes them so sticky. Experiments show that millions of microscopic hairs on each toe are mainly responsible for a gecko's grip. But geckos don't just stick to a surface—they unstick, too. To do that, a gecko tugs the foot in the opposite direction, releasing the grip. Engineers have developed gecko-inspired robots that climb walls. They've made a fabric-like material that can stick to smooth surfaces. They're also working on grippers that might someday be used to pick up junk floating in space.

<sup>4</sup> What problems will biomimetic engineers try to solve next? One thing is for sure: nature will provide inspiration for new solutions.

### GLOSSARY

**burrs** (noun, plural) A burr is a prickly covering of a nut or seed.

**surfaces** (noun, plural) A surface is the outer layer.

**structure** (noun) A structure is the way parts are arranged.

Name: \_\_\_\_\_



- 1 Read and underline the definition of the phrase below. Knowing this phrase and its definition will help you complete the following activities.

**natural hazard** (noun) A natural hazard is an event in nature that causes damage.

- 2 Reread the poem on the next page, “Hail” by J. Patrick Lewis. Poets use the sound, as well as the meaning, of words to express feelings and ideas.

- 3 Poets often use figurative language to help readers form pictures in their minds. A metaphor is a type of figurative language in which two unlike things are compared without using *like* or *as*.

- a Go back to the poem, and circle the two nouns in Lines 1 and 2.
- b What does this comparison help you imagine?

\_\_\_\_\_

- 4 Alliteration is the repetition of beginning sounds in words. Poets often use alliteration to put emphasis on words and ideas.

- a Go back to the poem, and underline two pairs of words with repeated beginning sounds in Lines 1 and 2.
- b Write the words below.

\_\_\_\_\_

- 5 The rhythm of a poem is like a drumbeat the goes with groups of words.

- a Read the poem aloud, and listen for the rhythm.
- b What does the rhythm help you imagine?

\_\_\_\_\_

- 6 The narrator in a poem is called the speaker. How does the speaker seem to feel in Line 6?

\_\_\_\_\_

- 7 The poem has a central message, or theme, about nature. Write a sentence to state this theme.

\_\_\_\_\_

- ★ A haiku is a three-line, 17-syllable poem that paints a clear picture about a single moment or image, usually from the natural world. The syllable pattern is 5-7-5. Write a haiku about a natural hazard, such as an earthquake or blizzard.



## Hail

*by J. Patrick Lewis*

- 1 The hail flies
- 2 on furious hooves.
- 3 It batters cars
- 4 and rooftops,
- 5 slamming anger,
- 6 and then melts away.

### WORDS TO KNOW

**batters** (verb) To batter is to pound or hit with force.

**furious** (adjective) Furious means powerfully fast or violent.

**hooves** (noun, plural) A hoof is a horse's foot.

Name: \_\_\_\_\_



- 1 Read and underline the definition of the word below. Knowing this word and its definition will help you complete the following activities.

**contribute** (verb) To contribute means to give help to a person, a group, or a cause.

- 2 Reread the persuasive text on the next page, “Join the North School Walkers.” Authors of persuasive texts state their opinion or position and often give reasons and evidence to support it.
- 3 The authors state their position in Paragraph 1. Put a star (★) in the margin next to their position.
- 4 In Paragraphs 3 to 5, the authors give three reasons and evidence to support their position.
  - a Put a checkmark (✓) in the margin next to each reason.
  - b Underline evidence that supports each reason.
- 5 Complete the chart below by rewriting the information *in your own words*. Use the markings you made on the text to help you paraphrase the text.

opinion	
reason 1	
evidence	
reason 2	
evidence	
reason 3	
evidence	

- 6 On another page, write a summary of the text. Use information from your chart to help you.

- ★ Create a poster to illustrate and explain a program that—in your opinion—would contribute to your community. Clearly state your opinion and give reasons and evidence to support it.



### Join the North School Walkers

Dear Parents of North School Students:

- <sup>1</sup> Have you heard about our walking-school-bus program? It began last year with 30 students. As the new school year begins, 50 students have enrolled. It would be great to see 100 or more students participate because this program has many benefits that will help our children and our community.
- <sup>2</sup> Here's how the program works. Your child waits for the "bus" each morning at an assigned time and place. The bus is not a vehicle but a group of students with one adult leading and one adult following. All the walkers stay together, with the adults making sure that everyone crosses streets safely. At the end of the school day, the walkers reverse their route. Right now, the adults are volunteers, but we hope to find the money to pay workers soon.
- <sup>3</sup> The walking-school-bus program is good for everyone's health. Health experts point out that today's youngsters are not getting enough exercise and are at risk of developing health problems as a result. Walking is a simple and effective physical activity. And it doesn't pollute the air with vehicle fumes!
- <sup>4</sup> In addition, students have a safer way to get to school. The walking-school-bus program reduces not just the number of school buses but also the number of parent-driven cars that clog the streets by North School. When students no longer have to dodge traffic to enter the building, safety will be improved.
- <sup>5</sup> There has been an unexpected bonus to the program—a greater sense of community among the walkers. What better way to feel part of a neighborhood than by taking a daily walking tour! Help your child and our community by enrolling in the North School Walkers program. Sign-up sheets are in the school office.

Sincerely yours,

Edda Freeman and Tony Palermo  
Parent Coordinators of the North School Walkers

Name: \_\_\_\_\_



- 1 Read and underline the **definition** of the word below. Knowing this word and its definition will help you complete the following activities.

**resource** (noun) A resource is a supply of something you need.

- 2 Reread the story on the next page, “An Uninvited Guest.” It is realistic fiction—a story about events that could actually happen to lifelike characters in a believable setting.
- 3 Go back to the story, and **circle the three main characters**.
- 4 Most events in the story take place in one setting, which is described in Paragraph 1. The events at the end of the story take place in a different setting, which is described in Paragraph 12. **Put a box around each setting.**
- 5 The characters must solve a problem when an “uninvited guest” wants to share a resource: their home! **Put a star (★) in the margin next to the problem.**
- 6 The characters solve their problem in a series of events. **Put a checkmark (✓) in the margin next to each major event.**
- 7 The characters’ problem is solved in the resolution, near the end of the story. **Put a smiling face (😊) next to the resolution** in Paragraph 10.
- 8 **Complete the chart below.** Use the markings you made on the text to help you.

main characters	
settings	
problem	
major events	
resolution	

- 9 Why do the characters react differently to the bat’s need for two resources: somewhere to live and something to eat? Use information from your chart and details from the story to help you answer the question on another page.

★ This story is told from the point of view of a third-person narrator. What if the story were told from the point of view of the bat? Rewrite the story from this first-person point of view.



### An Uninvited Guest

<sup>1</sup> The dark-winged, unidentified flying object swooped from the ceiling toward the family seated in the kitchen and back up again. Bashir screamed, and his sister Aisha slid off her chair to hide under the table.

<sup>2</sup> “Don’t worry,” their grandmother said calmly. “It’s just a bat.”

<sup>3</sup> “What do you mean it’s just a bat?” Bashir shrieked, “Those things carry rabies!”

<sup>4</sup> Aisha peered out from under her hiding spot. “Babies? I don’t see its babies.”

<sup>5</sup> Bashir shook his head and answered, “Not babies—rabies, rabies! It’s a disease you get from bats. They bite you, and then you die.”

<sup>6</sup> Aisha started to cry, and their grandmother said, “Let’s not overreact. First, very few bats carry rabies. Second, there’s a medical treatment for rabies. And third, this poor bat is probably just as afraid of you as you’re afraid of it.”

<sup>7</sup> “Who’s afraid?” asked Bashir in the bravest voice he could muster. Just then, the bat spread its wings and glided toward Bashir’s head. He screamed again and ducked behind Aisha under the table.

<sup>8</sup> After a few more swoops around the room, the bat settled on a shelf. With a toss of a blanket, Bashir’s grandmother succeeded in trapping the bat in its soft folds.

<sup>9</sup> Bashir crept closer to the bundle in his grandmother’s arms and saw that the bat’s eyes were fixed on him with a combination of what he thought might be curiosity and fear. “Now what should we do with it?” he asked in a hushed tone.

<sup>10</sup> “We need to set it free, of course,” their grandmother asserted, walking to the door and opening it. “I’m not sure if this bat wants to make a home in our attic or if it’s lost, but it will be much more comfortable outside.” She shook the blanket gently to release the bat, and they watched it soar into the distance until it disappeared.

<sup>11</sup> Bashir breathed a sigh of relief, and his grandmother smiled. “I’m always happy to see bats outside because they devour mosquitoes,” she remarked. “We need them, even though we don’t like to share our indoor spaces with them.”

<sup>12</sup> One evening not long after the visit with his grandmother, Bashir noticed familiar black figures circling against the sky outside his window. He recognized them immediately and murmured, “Hello, my mosquito-eating friends,” pleased that this time he did not feel afraid at all.