

Read the scientific article. Then answer the questions that follow.

from “A Dire Shortage of Water”

by Emily Sohn, Science News for Kids

Causes

1 Scientists are just beginning to understand the conditions that lead to droughts. They’re finding that small changes in the flow of wind and water can have a huge effect on climate around the globe.

2 Strangely enough, much of the story depends on the temperature of water in the oceans.

3 Normally, winds blow west across the tropical Pacific Ocean, away from Central and South America. As wind-driven warm water moves over the ocean, it piles up in Indonesia and elsewhere in the western Pacific. Warm air rises offshore, causing rain to fall. Meanwhile, cold water comes up from the bottom off the coast of South America. This flow allows a richness of life to flourish near the coast, and it helps maintain predictable weather patterns from season to season.

4 Every 5 to 10 years or so, though, the wind dies down. As a result, the surface of the Pacific Ocean gets warmer. Rainfall then tends to fall further to the east. Such a change in weather causes, among other things, floods in Peru and droughts in Australia and Indonesia. This new weather pattern is known as El Niño.

5 An opposite cascade of events happens during the weather pattern called La Niña, when Pacific surface temperatures cool down. Both El Niño and La Niña, when they happen, usually last for 2 to 4 years.

6 The current drought in the West could last much longer than that. In fact, historical records show that droughts typically go on for 10 to 50 years.

7 And it’s not just El Niño and La Niña at work. In the last few years, scientists from the U.S. Geological Survey (USGS) have begun to link precipitation on the Colorado Plateau to temperature shifts both in the Pacific Ocean and in the Atlantic Ocean.

Atlantic Effects

8 A recent statistical study by USGS researchers found that less moisture falls on the United States when surface temperatures in the North Atlantic are warmer than normal. These conditions prevailed during a number of droughts over the past century.

9 The study also found a correlation between warm water in the central North Pacific and drought in the southwestern and northern plains of the United States. When water is warm in both the North Atlantic and the North Pacific at the same time, conditions can get mighty dry in the American West.

10 This explains at least a part of what’s going on right now in the Colorado River Basin, geologist John Dohrenwend says.

11 Records show that the basin’s annual flow volume has been dropping for more than a century. But the drought has grown much worse since the year 2000. Compared to measurements taken in 1922, water flow has dropped to one-third of its original rate.

People Problems

- 12 Oceans can't take all of the blame for the impact of today's drought, Dohrenwend says.
- 13 Although ocean temperatures may be an important factor in starting a drought, people are making the problem of water shortages much worse. Dohrenwend notes that cities are growing faster in the southwest than anywhere else in the country. And people keep pouring in.
- 14 "Many of these people are retired persons who lived in the northeast or northwest and want to get out of the cold," Dohrenwend says. It's hard for them to adjust to using less water than they're used to, he adds, and they don't want to let go of their golf courses, green lawns, or long showers.
- 15 "Over time, more and more water has to be allocated to people moving in and less goes to everything else," Dohrenwend says.
- 16 Ironically, as the drought continues, the cycle feeds on itself. Ranchers go out of business because they don't have enough water to grow alfalfa for their cattle. Then developers arrive and build more homes. As more people move in, the demand for water continues to grow—even as the supply of water rapidly dwindles.

How Long?

- 17 It's impossible to know how long this drought will last, and some scientists are beginning to fear the worst.

Answer Form

- 1 (A) (B) (C) (D)
 2 (A) (B) (C) (D)
 3 (A) (B) (C) (D)

Number Correct **3**

- 1 Read these two sentences.

Some people believe that droughts are the fault of nature, which we can't control. These people say that Earth has always experienced water shortages and that we do not need to worry about the issue.

How does the author of "A Dire Shortage of Water" reveal a point of view that differs from the statement above?

- A She mentions recent scientific discoveries about ocean temperatures, global climate, and drought.
- B She refers to historical records of droughts in the western part of the United States.
- C She explains that ocean temperatures cause drought, but human settlements make the problem worse.
- D She reports that the rate of water flow in the Colorado River Basin has decreased to about one-third of its original rate.

2 Which sentence from the text **best** shows the author's intent to describe how both human and natural factors contribute to drought?

- A "Such a change in weather causes, among other things, floods in Peru and droughts in Australia and Indonesia."
- B "When water is warm in both the North Atlantic and the North Pacific at the same time, conditions can get mighty dry in the American West."
- C "Although ocean temperatures may be an important factor in starting a drought, people are making the problem of water shortages much worse."
- D "As more people move in, the demand for water continues to grow—even as the supply of water rapidly dwindles."

3 How does the content of the passage reflect the author's point of view?

- A It shows that the author approves of ongoing scientific research.
- B It provides facts and statistics showing that the problem of water shortages is growing.
- C It shows that the author feels hopeless about the fate of our planet.
- D It shows that the author dislikes the fact that cities are growing faster in the southwest than elsewhere.

4 In your own words, describe the author's point of view about the water shortage and tell how you determined it. Use at least **two** details from the article to support your answer.

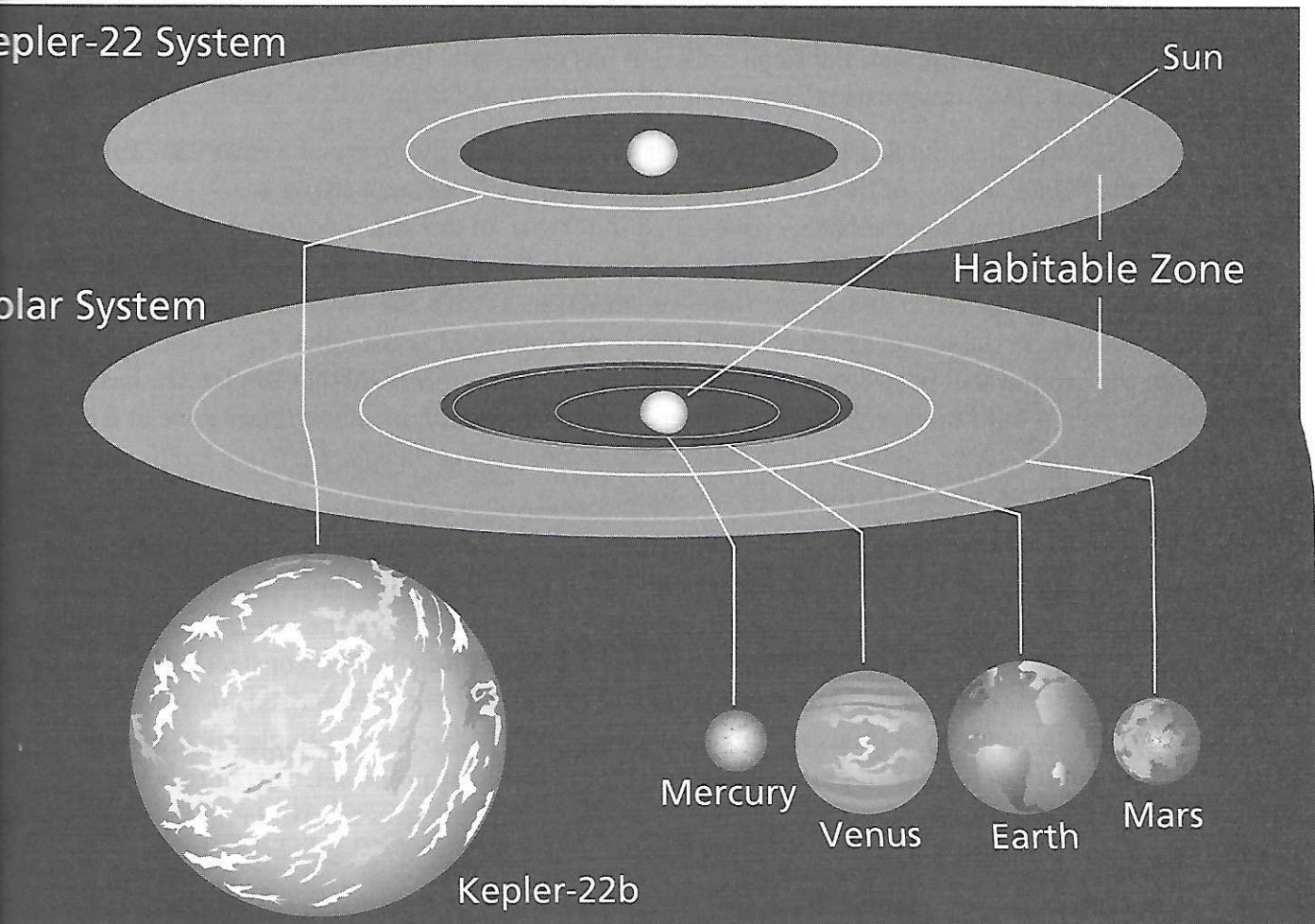
**Self Check**

Go back and see what you can check off on the Self Check on page 86.

Read the article. Then answer the questions that follow.

“Goldilocks” and Life on Other Planets: Just Right or a Lot of Hype?

by Lindsay Manez



Most children and adults are familiar with the classic story “Goldilocks and the Three Bears.” In the story, a very particular little girl slips into an empty house looking for the perfect bowl of porridge. She wants one that is neither too hot nor too cold but instead is “just right.” Scientists in the National Aeronautics and Space Administration (NASA) are also searching for “just right” perfection. Their focus is on planets located in habitable zones, which they call “Goldilocks zones.” These are regions in the space around a star where temperatures are neither too hot nor too cold for water to exist on the planet’s surface. Scientists think that these zones may be “just right” for supporting life.



2 The Kepler space mission is tasked with finding such planets. The team of NASA scientists monitors the findings of the Kepler spacecraft, with its unblinking eye in the sky. The astronomical telescope observes from a fixed position, more than 100,000 sun-like stars at the same time. Launched in March 2009, the Kepler detects transits, or occasions when a planet crosses in front of a star and causes the star's brightness to dim. By interpreting information about a transit, NASA scientists on Earth can calculate a lot of data. Some of this data includes the period of a planet's orbit around its star, the mass of the star, the size of the star, the size of the planet, the temperature of the star, and the likely temperature of the planet.

3 Interpreting data from transits provides a limited amount of information, however. For example, the mass and density of the planets cannot be determined until scientists conduct further research using instruments on Earth. Nonetheless, the Kepler mission has uncovered hundreds of possible planets. One in particular has many NASA scientists talking.

4 In December 2011, the Kepler space mission announced the discovery of Kepler-22b. This planet is at the center of the habitable zone of the star around which it orbits. The planet shares many characteristics with Earth, including a star that some at NASA have called the "twin" of our sun. Located about 600 light years from Earth, Kepler-22b is double the size of Earth but smaller than Neptune. Its 290-day year—the amount of time it takes to completely circle its star one time—is similar to Earth's 365-day orbit around the sun. Most remarkable, however, is the planet's perfect Earth-like temperature: 72° Fahrenheit (22° Celsius). Further studies from the ground will be necessary before scientists can determine whether Kepler-22b has an atmosphere or even a solid surface. However, Kepler-22b's ideal location in a Goldilocks zone and its perfect temperature for the presence of water have many scientists considering the idea that, like Earth, this planet may be able to support life . . . and perhaps already does!

5 Some think that the idea of discovering life on other planets is thrilling. Imagine humanlike creatures who can communicate with each other, build cities, care for families, and make discoveries—beings who are as curious about us as we are about them. I think it is vital to consider the scientific definition of life, however, and to take the recent excitement with a grain of salt. In science, "life" is considered ANY organism that can take in nutrients and use them to make energy, grow, react to events in the outside world, and reproduce. Humans, along with animals and plants, are forms of life. However, a single microscopic bacterium is also a form of life. It can perform these very same complex processes. Therefore, while Kepler-22b may be located in an ideal Goldilocks zone with the perfect temperatures to sustain life, that life may be nothing more than some bacteria.

6 At present, the Kepler spacecraft can determine only whether other planets exist, not whether life exists on those planets. Because Kepler-22b is trillions of miles from Earth, evidence to prove the presence of any form of life on the new planet is unlikely to arise in this lifetime—if ever. NASA's discovery of a new planet is certainly cause for excitement, but I believe that theorizing about the existence of life on newly discovered planets should be left to the writers of science fiction. Scientific researchers should be more concerned with scientific facts. NASA and the Kepler mission can continue the pursuit of life on other planets in habitable zones. I, however, will remain like the choosy Goldilocks of children's fiction and reserve my enthusiasm until the time is "just right"—upon the discovery of a planet that can sustain human life.



Answer Form

1	(A)	(B)	(C)	(D)	5	(A)	(B)	(C)	(D)
2	(A)	(B)	(C)	(D)	6	(A)	(B)	(C)	(D)
3	(A)	(B)	(C)	(D)	7A	(A)	(B)	(C)	(D)
4	(A)	(B)	(C)	(D)	7B	(A)	(B)	(C)	(D)

Number
Correct **8**

Answer the questions. Mark your answers to questions 1–7 on the Answer Form to the right.

1 Read these sentences from the article.

The team of NASA scientists monitors the findings of the Kepler spacecraft, with its unblinking eye in the sky. The astronomical telescope observes, from a fixed position, more than 100,000 sun-like stars at the same time.

The word “fixed” in this sentence **most** closely means

- A** influenced
- B** mended
- C** ready
- D** stationary

2 Which sentence from the text **best** shows the author’s intent to describe the type of information the Kepler mission is gathering?

- A** “The astronomical telescope observes, from a fixed position, more than 100,000 sun-like stars at the same time.”
- B** “Some of this data includes the period of a planet’s orbit around its star, the mass of the star, the size of the star, the size of the planet. . . .”
- C** “Interpreting data from transits provides a limited amount of information, however.”
- D** “For example, the mass and density of the planets cannot be determined until scientists conduct further research. . . .”

3 How does the information in the fourth paragraph help to develop the article?

- A** It explains what scientists hope to learn about Kepler-22b.
- B** It provides a comparison between Kepler-22b and Earth.
- C** It emphasizes events that led to the discovery of Kepler-22b.
- D** It identifies challenges in researching Kepler-22b from Earth.



4 Read this sentence from the article.

Imagine humanlike creatures who can communicate with each other, build cities, care for families, and make discoveries—beings who are as curious about us as we are about them.

Why does the author **most likely** include this sentence in the article?

- A to challenge a common opinion about life on other planets
- B to highlight the impossibility of finding life on other planets
- C to describe how many people think of life on other planets
- D to suggest why people are interested in life on other planets

5 With which statement would the author of this article **most likely** agree?

- A NASA scientists should focus on interpreting the data they have collected about newly discovered planets.
- B NASA scientists should develop technology that can determine whether life is present in habitable zones.
- C NASA scientists should conduct more research on the conditions that are suitable for life on other planets.
- D NASA scientists should consider classifying more planets in the solar system as part of the habitable zone of the sun.

6 Which statement **best** describes how the illustration contributes to the content of the article?

- A It depicts what a habitable zone is.
- B It shows how the Kepler spacecraft works.
- C It maps the exact location of planet Kepler-22b.
- D It illustrates the data the Kepler mission has produced.



7 Answer Parts A and B below.

Part A

What does the word “particular” mean in this sentence from paragraph 1 of the passage?

In the story, a very particular little girl slips into an empty house looking for the perfect bowl of porridge.

- A** specific
- B** unusual
- C** special
- D** choosy

Part B

Which phrase from paragraph 1 of the passage **best** helps the reader understand the meaning of “particular”?

- A** “neither too hot nor too cold”
- B** “focus is on planets”
- C** “regions in the space around a star”
- D** “planets located in these zones”

8 Read this sentence from the article.

I think it is vital to consider the scientific definition of life, however, and to take the recent excitement with a grain of salt.

Explain the meaning of the phrase “with a grain of salt” as it is used in the sentence. Use details from the article to support your answer.



Read the story. Then answer the questions that follow.

Welcome Home

by Joyce Mallery

1 As far back as I could recall, basketball has been my passion. My father had set up a basketball hoop in our backyard, and my older brother Andy had started showing me how to play basketball from the time I was small. As I grew older, playing basketball became the focus of my life.

2 In most situations, I tend to be a shy and timid person, but I become someone completely different when I'm on the basketball court. It's almost like a switch turns on inside of me, and I can shut out everything else. When I'm playing basketball, my brother calls me Fast and Furious Fi. *Fi* rhymes with *see*, and *Fi* is short for Fiona. When I'm playing basketball, the spectators love to chant rhymes during the game: "What do you see, Fi?" "Score one for me, Fi!" and even "Hey Fi, make it three!!"

3 My brother has always been my best friend. While we did all the things that kids generally do to annoy each other, we always seemed to know what was in each other's hearts. But the past year has been so hard for me because my brother enlisted in the Air Force, and shortly after, he was deployed to the Middle East. My heart still thumps when I think back to the night before he left—the night we sat together and silently stared at the stars. "I don't know what I'll do without you," I blurted out, despite my feeble attempt to put on a brave face.

4 Andy was quiet, which is totally unlike him. "I'm scared to leave," he admitted quietly. "But it will be easier for me to be away if I know you're okay, and we can always text and email. I just have to know that you're going to be all right while I'm gone, Fiona—that you're going to be the star of your basketball team and work to get good grades."

5 I hugged him and I couldn't stop crying. My passion is basketball, and I'll work hard to get good grades because I know those things are important to my brother. "Hang in there, Fast and Furious," he whispered, trying his best to reassure me. But instead of fast and furious, I felt lost and lonely.

6 My life just wasn't the same after Andy left. My friends didn't seem to comprehend how I felt now that my brother was not around and how I worried about him. "I'd love to have my brother leave for awhile," my best friend Chloe once said. It took all the strength I had not to start crying, and I could tell that Chloe immediately regretted her remark. "I guess that was a thoughtless thing to say," she mumbled apologetically. "I know how much you love Andy."

7 The following week, Chloe and I were at the library when she called me over to her computer and pointed to a website. "Fiona, look at this," she said excitedly. "My mom told me about this: Troop Greeters official website. People assemble at the airport and greet the troops that pass through." We read the mission statement together: The mission of Troop Greeters is to express the nation's gratitude and appreciation to the troops, for those going overseas and for those heroes coming home.



8 The website said we could contact the group for additional information. “Let’s go outside and call,” Chloe suggested. I grabbed my cell phone and dialed the number. A woman answered, and she explained it all to us. “We’ll let you know when flights are arriving,” she said. “Have at least one parent accompany you. The welcome means so much to our returning and departing military personnel.”

9 That night I discussed it with my parents. “This sounds like a wonderful idea,” Mom said. “And we’ll bring Chloe, too, since it was her idea.”

10 Then, the night before we were scheduled for our first meet-and-greet, I started to get really nervous about talking to strangers. Finally, I called Chloe. “I can’t do this. I’ll have no idea what to say!” I moaned.

11 “Wait a minute—you can’t back out now!” Chloe snapped. “What happened to ‘Fast and Furious Fi’ of the basketball court? You’re acting more like a foolish and flighty fan in the bleachers!” Then, in a softer voice, she added, “I’ve got an idea. Why don’t you bring your basketball with you. That way the troops will know something about you right from the start, and you’ll have something to talk about.”

12 The next morning we stood in line with the other troop greeters. Suddenly, there was a rush of footsteps and uniforms, and we could feel an electric buzz of excitement and energy. The first man in line looked at me, smiled, and shook my hand. “Thank you for coming,” he said. “And you’re a basketball player! Can I borrow this?” He grabbed the ball and started dribbling and laughing. Then he passed it to his friend.

13 I took a deep breath and forced myself to ask, “Did you play basketball in high school? I play for my varsity team.” That remark brought a grin to several faces.

14 After that, it was easy for me to talk to the troops. Each one said hello and asked about my basketball. And every time I said, “Welcome home!” I knew in my heart that someday soon I would be uttering those words to my own hometown hero—my brother.

Answer the questions. Mark your answers to questions 1–3 on the Answer Form to the right.

Answer Form

1 (A) (B) (C) (D)

2 (A) (B) (C) (D)

3 (A) (B) (C) (D)

**Number
Correct**

/ 3

1 What effect does the author’s use of rhyme have in paragraph 2?

- A The spectators’ rhymes reflect the excitement at Fi’s basketball games.
- B The spectators’ rhymes add a musical quality to the paragraph.
- C The spectators’ rhymes foreshadow which team will win the next game.
- D The spectators’ rhymes reinforce Fiona’s strong bond with her brother.



2 Why has the author chosen to use phrases such as “silently stared at the stars” and “lost and lonely” in the scene that took place the night before Andy left?

- A to highlight similarities between the feelings of the brother and sister
- B to build up the mood of stillness and sadness
- C to create suspense about what will happen after Andy leaves
- D to emphasize the close relationship between Fiona and her brother

3 How does Chloe’s use of the phrase “Fast and Furious Fi” help Fiona to rethink her feelings about meeting strangers?

- A It helps Fiona see the differences between basketball players and the arriving troops.
- B It suggests that Fiona should remember what Andy said the night before he left.
- C It emphasizes that Fiona should think up rhymes to chant for the soldiers.
- D It reminds Fiona to draw on the confidence she gained from playing basketball.

4 A student made this claim: The author uses repetition and alliteration to draw the reader’s attention to Fiona’s feelings at different points in the story. Write a paragraph explaining how you can tell that the claim is true. Use at least **two** details from the passage to support your response.



Self Check

Go back and see what you can check off on the Self Check on page 120.