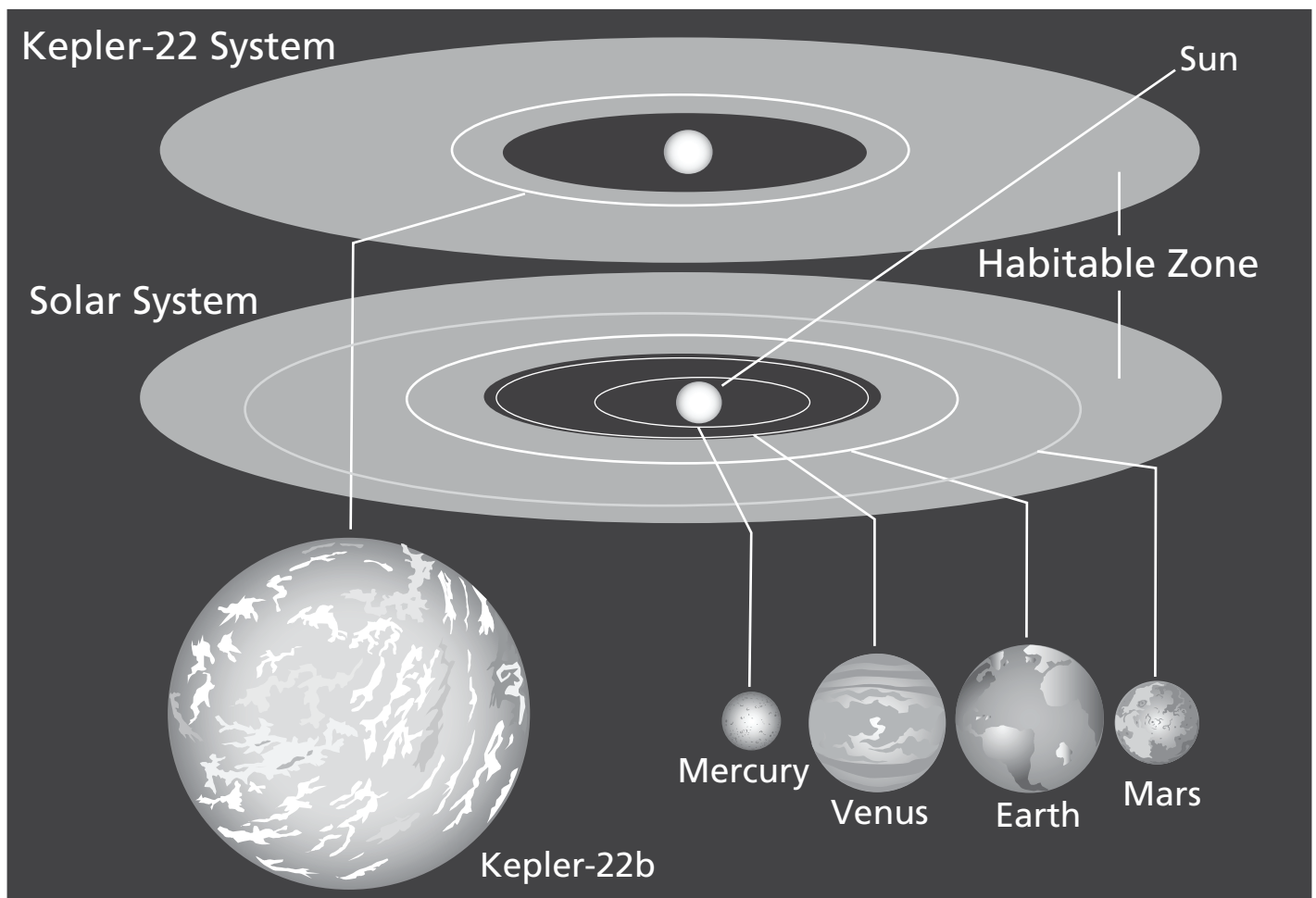




Read the article. Then answer the questions that follow.

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

by Lindsay Manez



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

## 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

- 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.

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This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.



The author makes several references to Goldilocks throughout the article. To whom or what does the author compare Goldilocks? How do these comparisons contribute to the development of the article as a whole? Write an essay of three to four paragraphs explaining your answer.

- explain to whom or what the author compares Goldilocks
- explain how these comparisons contribute to the development of the article as a whole
- use details and examples from the article in your answer

Check your writing for correct spelling, grammar, capitalization, and punctuation.

[illegible]

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