Grade Seven English/Language Arts
Georgia Online Assessment Based
Formative Benchmark One
2014-2015

Common Core
Georgia Performance Standards

Read the passage and answer the questions that follow.

The Strange Abilities of Water

Can water remember the chemicals that have been dissolved in it? Can it store and pass along this information? The answer may surprise you. Scientists have been studying water for many years. They have noticed that water may have the ability to do some amazing things.

An Amazing (But Not-So-New) Discovery

In 1988, scientist Jacques Benveniste published a controversial article in the science journal *Nature*. Benveniste observed that blood cells seemed to be able to detect molecules no longer present in a solution. He diluted a liquid containing a chemical. The liquid was so watered down that there was no way any of the original chemical was left in the liquid. Yet when exposed to the dilute liquid, the blood cells behaved as though the chemical was still present. Clearly, something amazing had taken place. The liquid seemed to remember what was once dissolved in it.

Today, some people accept Benveniste's research, while others don't. Many scientists doubt there is a rational explanation for his results. However, nonscientists are more open-minded. For example, practitioners of a form of alternative medicine called homeopathy have believed for a long time that water has memory. In 1796, Samuel Hahnemann, the founder of homeopathy, recognized that large doses of medicines could be harmful. Instead of giving these medicines to patients, he diluted them first, adding more and more water until only an infinitesimal amount of medicine remained. He then tested it on patients and saw that over time, their symptoms disappeared.

Homeopathic medicine is based on the idea that "like cures like." In other words, a chemical that causes symptoms similar to a disease can cure that disease if tiny quantities are used. Adding extremely large amounts of water dilutes the chemical greatly. Dilute it enough and the solution will no longer contain the chemical that made it active. This makes the medicine as safe as water, but patients find the new medicine to be as effective as traditional treatments. Of course, because the medicine is not present, diluted, homeopathic medicines are much less expensive than medicines prescribed by traditional physicians.

Serial Dilution: Watering Down the Memory-Maker

The method Hahnemann used to reduce the amount of medicine dissolved in water is known as serial dilution. The process is quite straightforward, as shown in the steps below.

Step 1: A series of containers are set up and labeled. Ninety-nine milliliters of water are placed into each container.

Step 2: One milliliter of the medicine is added to the first container. It now contains one part medicine and ninety-nine parts water.

Step 3: The contents of the container are mixed vigorously. Homeopaths think that this violent shaking causes the medicine to affect the structure of the water molecules around them.

Step 4: One milliliter of this well-mixed solution is added to the second container, which contains 99 milliliters of pure water. Mixed together, the resulting solution is much weaker than the first. For every 10,000 molecules in the container, only one is likely to be the medicine. However, according to homeopaths, the medicine is still effective. They think that the shaking causes the water molecules to share information about the shape of the original medicine. That information is passed from water molecule to water molecule.

Step 5: Now 1 milliliter of the weak solution made in step 4 is added to a new container containing 99 milliliters of water. Again, it is mixed vigorously. Now 999,999 out of a million of the molecules in the container are water, and only one in a million are medicine.

Step 6: This dilution continues. After the next container in the series is mixed, only one molecule in one hundred million will be the original medicine.

By the end of the process, the chances of finding any medicine are tiny. In fact, mathematically speaking, there is no chance that any of the original medicine will be in the last, most dilute container.

A serial dilution of dye. Notice how the darkness of the liquid in the containers changes dramatically during the series of dilutions.

The Watery Road Ahead

Benveniste and other scientists have found that the structure of water is much more complicated than previously thought. It is not surprising then, that we are continuing to learn more about water's ability to remember chemicals that are no longer present. A recent video clip from a university in Germany shows that water seems to remember information about flowers that have been placed in it. The

structure of water droplets viewed under a microscope differs depending on which flower has been placed in the water.

This same video shows that photographs of the structure of water droplets differ, too.
The structure differs, depending on which student takes the photo. This is more evidence that data is being stored by the water. Perhaps each of us is passing information along to the water close to us. If so, think of all the information water contains. It could be that the medicines we need have been with us all along.

Answer the questions.

1. This question has two parts. First, answer Part A. Then, answer Part B.
   Part A

   Which **two** statements are central ideas of the passage?
   A. Water has been found to store information about the molecules dissolved in it.
   B. Scientists are unwilling to accept results they do not yet understand.
   C. Serial dilution is a key technique used in testing and applying water's ability to remember information.
   D. Hahnemann's medical preparations would benefit the health of the public.
   E. Benveniste's research was controversial.
   F. Water has been shown to remember information about flowers.

   Part B
   Choose one of the central ideas you identified in Part A. Cite two pieces of text evidence that support the idea.

2. The following question has two parts. First, answer Part A. Then, answer Part B.

   Part A
   Which sentence from the passage states a generalization?
   A. Clearly, something amazing had taken place.
   B. The liquid seemed to remember what was once dissolved in it.
   C. However, nonscientists are more open-minded.
   D Today, some people accept Benveniste's research, while others don't.

Part B

What does the generalization you chose in Part A indicate?

A. The author supports the idea that water can remember information.
B. The author rejects the idea that water can remember information.
C. The author thinks more testing needs to be done.
D. The author believes that scientists are difficult to work with.

3. Which excerpt from the passage does the photograph on page 149 **best** illustrate?

A. Adding extremely large amounts of water dilutes the chemical greatly.
B This is more evidence that data is being stored by the water.
C. The liquid seemed to remember what was once dissolved in it.
D. In fact, mathematically speaking, there is no chance that any of the original medicine will be in the last, most dilute container.

4. This question has two parts. First, answer Part A. Then, answer Part B.

Part A

Circle **two** text structures the author uses to organize the passage.

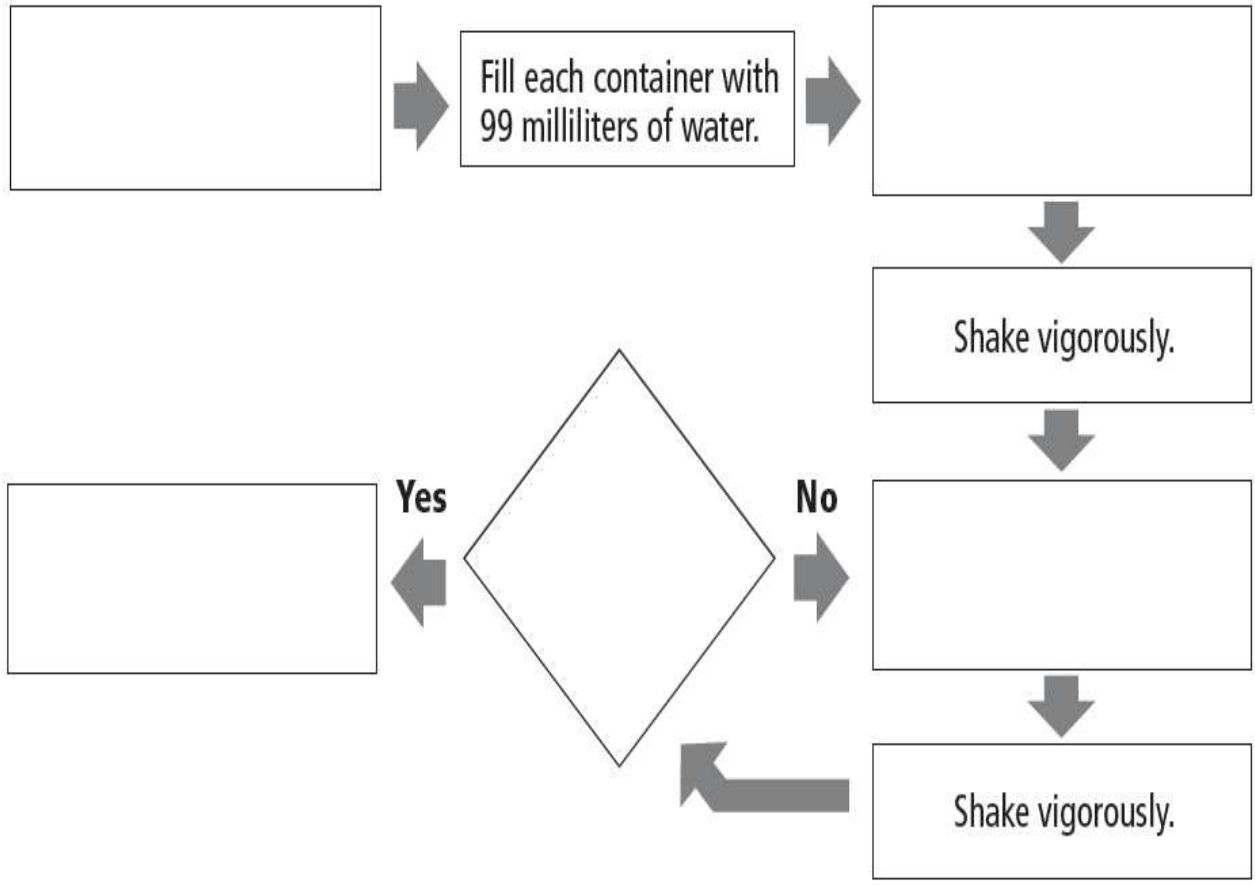
Text Structures	Sequence
	Part-to-Whole
	Compare and Contrast
	Whole-to-Part
	Spatial

Part B
Choose one structure you circled in Part A and describe how the author organized the text to reflect that structure. How does the structure help the reader better understand the text? Cite textual evidence to support your answer.

5. Some of the steps in creating a serial dilution are shown in the box.

Add one milliliter of medicine to a new container of water.
Set up and label containers.
Dilution series is complete.
Add one milliliter of dilute medicine to the container of water.
Test solution: Is it weak enough?

Complete the flowchart by writing each step in the appropriate shape in the chart.



Read the passage.

Does Water Have Memory?

What does a magician have in common with a chemist and a magazine editor? In the case of magician James Randi and scientists analyzing a controversial scientific paper, the answer is skepticism.

The paper in question was a 1988 article published by a popular and well-regarded scientist in the prestigious journal *Nature*. The author, Jacques Benveniste, observed that extremely weak solutions of an antibody molecule were recognized by white blood cells. However, the solutions were so diluted, or watered down, that no antibodies were present. According to Benveniste, this observation suggested that the water was remembering the molecules that had been dissolved in it. Furthermore, the observation gave support to the idea of homeopathy, an alternative medicine that uses extremely dilute substances to treat illness.

Confirming the Results

Repeating an experiment is not unusual in the sciences. In fact, it is a key part of the scientific method. If a result is real, another scientist should be able to do the same experiment and get the same results. If the results differ, something is wrong.

With this in mind, scientists in Benveniste's lab repeated his procedure several times before publishing. Each time the scientists observed the same thing. Extremely dilute solutions—so dilute that they no longer contained the molecule being studied—were detected by white blood cells. Repeating the experiment seemed to show that Benveniste's results were accurate. It was time to publish. As this was an important result, they chose to share their news in an important journal.

Putting Science to the Test

But where does the magician come into this story? Illusionist James Randi is well known for revealing the tricks behind both magic acts and real-life scams. Like most scientists, Randi is a skeptic, someone who doubts conclusions until he has examined the evidence for himself. Randi, chemist Walter Stewart, and *Nature* editor John Maddox got together to analyze Benveniste's results for themselves.

The men knew it was possible that the scientists in Benveniste's laboratory had somehow influenced the results. There was an easy way to rule out this possibility. Randi and his team would run a blind experiment. The scientists from the first tests were replaced. The containers containing the solutions were covered and hidden in a different location. Then the tubes were identified with a code. They were brought into the lab at the start of the experiment and were covered in paper so that their contents could not be seen. The new scientists would use the exact same procedure as before. However, this time, they would not know which container was which. Interestingly, the results differed this time. When the scientists could not tell the containers apart, there was no difference in the way the white blood cells behaved. This time, the very dilute solution seemed to "forget" what was once dissolved. It indicated that the water never had memories in the first place.

Controlling Bias

The results seen in this case are not unusual. If a scientist can distinguish between the samples in an experiment, the results may be biased. This is not the same thing as cheating, because this influence can happen without the scientist realizing it. For this reason, when new medications are being tested, neither the researchers doing the testing nor the patients receiving the drugs know exactly what they are getting. Some patients will get the drug being tested. Others will receive a placebo, a pill that looks the same as the drug, but which has no effect. If the patient and researcher are aware which pill is which, the results may be affected.

For instance, if the patient knew he was receiving a drug, he might decide he was feeling better, even if the drug was useless. However, if the patient thought he was receiving the drug, but was actually taking the placebo, he also might decide he was feeling better, even though the placebo is not a medicine. Likewise, if the researcher testing the drug knows which is which, he or she might accidentally say something to the patient to affect the results, or might skew the results based on the intended result.

In each case, it would be difficult to figure out whether or not the drug being tested really works. Keeping an experiment blind prevents these biases from contaminating the results.

Can Water Remember?

Because Benveniste's results were discredited, scientists cannot say that water has memory. From what scientists currently understand about water, it does not seem possible that water could remember what was once dissolved in it. The fact that water travels from Earth's atmosphere to Earth and back again helps refute this idea. If water did have memories of chemicals no longer present, it might remember *everything* it contacted on its many journeys through the water cycle. This would include pleasant and not-so-pleasant things, from foods and fragrances to sewage and poisons. How would our bodies tell these many memories apart? That answer is even less clear.

Despite the scientific community's rejection of his ideas about water, Benveniste was undeterred. Until his death, he continued to promote the idea that water has memory. He started a business, claiming he had developed a way to convert the characteristics of water's memory into an electronic signal. That signal could be sent by e-mail and introduced into a new container of water. The water could be used as a homeopathic treatment. The software claiming to accomplish these tasks is available commercially, but has not been tested by scientists outside the company. Scientists may have more analyzing to do.

Answer the questions.

6. Which are logical purposes for why the author might have written "Does Water Have Memory?" Choose **all** that apply.

A. to explain why Benveniste's research might have been flawed
B. to inform about the similarities between illusionism and science
C. to persuade readers that it is important for scientists to follow the scientific method
D. to entertain readers with the idea that water has a memory
E. to inform readers about a new product based on Benveniste's research
F. to explain the difference between credible and invalid research

7. Match the words from the passage in the first column with their antonyms in the second column. Each word has only one antonym.

A. Diluted	1. Weak
B. Skepticism	2. Pure
C. Placebo	3. Substitute
	4. Medicine
	5. Trust

8. Which statement **best** describes why James Randi and his team analyzed Benveniste's research?

A. They wanted to test their own method of research.
B. They wanted to disprove Benveniste's results.
C. They wanted to make sure Benveniste's results had not been influenced in some way.
D. They wanted to have an article published in the science journal *Nature*.

9. The following question has two parts. First, answer Part A. Then, answer Part B.

Part A
Which is the **most** likely inference a reader might make about the authors of the two passages?
A. The authors are scientists who have experimented with water.
B. The authors disagree on the validity of homeopathic medicine.
C. The authors hold different points of view on the properties of water.
D. The authors have written for science journals.

Part B
Complete the chart with two details from each passage that support your answer to Part A.

"The Strange Abilities of Water"	
"Does Water Have Memory?"	

10. Which sentence is unrelated to the topic of this paragraph?

> (1)My brother, Manuel, is studying aviation in college. (2) He is learning about the design, development, and production of aircrafts. (3) He is also learning how to operate an aircraft. (4) He is already spending several hours flying in an airplane with his instructor. (5)My cousin, Maria, is studying American history at the same college. (6) Manuel's goal is to someday become an international commercial pilot.

A. sentence 2
B. sentence 3
C. sentence 4
D. sentence 5

11. Which is the BEST closing sentence for the paragraph?

> Of all my school experiences, the most memorable was my sixth grade class trip to the Metropolitan Museum of Art. Our art teacher, Mrs. Cooley, had prepared us all year by introducing the works of many great artists. We studied paintings and sculptures by famous artists, and we learned the interesting history behind many works of art. When it came time to visit the museum, we saw many original pieces of art.

A. My day at the museum left a lasting impression on me.
B. For many of us, it was our first trip to the large city.
C. The large museum had a dome in the center of the building.
D. I was disappointed that there were not more paintings at the museum.

12. Which transition word would BEST fill in the blank?

> (1)Patrice had always been a confident speaker. (2) She had given speeches to hundreds of her elementary school classmates. (3) She never felt uneasy speaking in front of her

peers. (4)_____, this would be the first time she would speak to a large, unfamiliar audience, and she was beginning to doubt herself.

A. Finally
B. Although
C. However
D. Furthermore

13. What sentence repeats an idea already stated in the paragraph?

(1)Martin and Austin had been friends for many years. (2)When they were seven years old, Martin's family moved into the house next door. (3) From then on, they were always together. (4) They sat together on the school bus, ate lunch together in the cafeteria, and played together when they returned from school each day. (5)The two boys were never apart. (6) During the summer, they camped out in a tent in Martin's yard, played in Austin's tree house, or rode their bicycles to the park together.

A. sentence 1
B. sentence 2
C. sentence 5
D. sentence 6

(1) I really like my English teacher, Ms. Wily. (2)The first reason that I like Ms. Wily is that she has made me realize how much fun it can be to read. (3)She gets really excited when she talks about the books that we read. (4) She has given me a new respect for my own imagination. (5)She says it is a wonderful thing to imagine what the characters in a book look like and sound like. (6) Secondly, I like Ms. Wily, because she makes me want to learn as much as I can. (7)She has inspired me to work harder than I have ever worked. (8)Now, I read all the books that are assigned. (9)Then, I started reading some of the books. (10) Before, I didn't read any of the books that were assigned for English class. (11) Ms. Wily makes me want to learn. (12) Art class is fun, too. (13) Art is my second favorite class.

14. Which set of numbers represents a better order for sentences 7 through 10?

A. 7, 10, 9, 8
B. 9, 7, 8, 10
C. 8, 9, 7, 10
D. 10, 8, 9, 7

When the families of the neighborhood decided to build a playground they wanted to please everyone. So the toddlers got their sandbox. Similarly, the older children got swings and a slide. But what the teenagers wanted (and they were on the planning committee) was a safe place for in-line skating and skateboarding. They got their wish. Even some of the adults joined in.

15. Which words act as transitions in the paragraph?
    A. so, similarly, they
    B. when, similarly, but
    C. so, similarly, but, even
    D. when, similarly, they, even

16. *Use the paragraph below to answer this question.*

(1) I bought a jar of peanut butter, some milk, and some saltine crackers. (2) I was hungry after school. (3) I watched television, ate my snack, and waited for my mom to get home. (4)There was no good snack food in the cabinet at home, so I walked to the store on the corner.

In the paragraph above, how should the sentences be ordered?
A. 2, 4, 1, 3
B. 4, 3, 2, 1
C. 3, 4, 2, 1
D. 2, 3, 4, 1

Jonathan's dad gave him a list of chores to do. As it turned out, Jonathan had a basketball game at noon. Before he could play, he had to finish his chores. Jonathan decided to finish his chores. He went to his game and scored 15 points, and he was glad he finished his chores!

17. What is the unifying idea of the paragraph above?
    A. Jonathan's dad giving him chores to do
    B. playing well enough to score a lot of points
    C. Jonathan finishing his chores so he could play
    D. finishing the basketball game to go home and do chores

A quiet hush enveloped me as I slowly stepped through the big doors. People whispered. Feet shuffled. Heads were bowed in concentrated reading. It was very quiet. **Papers rustled as pages were turned**. The occasional staccato stamping of books by the librarian was the only other audible sound. The library was a world unto itself.

18. In the paragraph above, the underlined sentence is a
    A. topic sentence.
    B. closing sentence.
    C. redundant sentence.
    D. supporting sentence.

19. Which sentence should be the beginning of a second paragraph?

> (1) In October, our school has an annual food drive to support the local food pantry. (2)To encourage students to participate in the next food drive, teachers will offer rewards for bringing items. (3)For example, our math teacher told us he would give five fewer homework problems to any student who donated a can of soup. (4)October is also the time that we have our annual fall festival. (5) Each classroom is used as a booth for the festival.(6)Last year, our homeroom was used as the booth for selling tickets for the games. (7)Each of the students was assigned to sell tickets for fifteen minutes.

A. sentence 3
B. sentence 4
C. sentence 5
D. sentence 6

20. What organizational method is used in the paragraph?

> As the daylight hours begin to shorten in the fall, something spectacular happens to trees in many areas. The shorter days, cooler temperatures, and lack of rain cause some pigment levels in the leaves to drop. There is a decrease in the amount of pigment that reflects green light, while the amount of pigments that reflect other colors remains the same. Eventually, the leaves turn amazing shades of yellow, red, and orange.

A. cause and effect
B. order of importance
C. question and answer
D. comparison and contrast

Extended Response:

Both “The Strange Abilities of Water ” and “Does Water Have Memory?” discuss Jacques

Benveniste's research into the ability of water to remember. Write an essay that compares and contrasts how the two passages approach the topic. Consider the following when writing your response:

• How does the point of view of each passage affect the type of information presented?
• What discrepancies are evident within the information each passage presents? Are these discrepancies differences in facts or interpretation?
• Which passage do you consider more reliable? Explain your reasoning.

Remember to cite text evidence from each passage in your response.

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Item Number	Answer	Standard Addressed
1.	Part A- A, C Part B Students might cite the following text evidence for A: "Yet when exposed to the dilute liquid, the blood cells behaved as though the chemical was still present" and "For example,	*ELACC7RI1, ELACC7RI2*

	practitioners of a form of alternative medicine called homeopathy have believed for a long time that water has memory." Students might cite the following text evidence for C: "Instead of giving these medicines to patients, he diluted them first, adding more and more water until only an infinitesimal amount of medicine remained" and "The method Hahnemann used to reduce the amount of medicine dissolved in water is known as serial dilution."	
2.	Part A- C Part B- A	*ELACC7RI6, ELACC7RI8*
3.	D	*ELACC7RI2*
4.	Part A- Students should circle sequence and whole-to-part. Part B- Possible response for sequence: The author uses a sequential structure to organize the steps in the process of serial dilution. This structure makes it easier to follow each step in the order in which it's performed and better understand how a solution becomes diluted. Possible response for whole-to-part: The author uses a whole-to-part structure to organize the text that discusses Benveniste's research, beginning each paragraph with a central idea such as "Homeopathic medicine is based on the idea that "like cures like,'" and then supporting that idea with smaller details. This structure gives the reader a clear understanding of an overall topic or idea before presenting specific details that support it.	*ELACC7RI5*
5.	Students should complete the flowchart as follows, clockwise from top left: Set up and label containers; Add one milliliter of medicine to a new container of water; Add one milliliter of diluted medicine to the container of water;	*ELACC7RI3*

	Test solution: Is it weak enough?; Dilution series is complete.	
6.	6. A, C, F	*ELACC7RI6*
7.	7. A–2; B–5; C–4	*ELACC7L5b*
8.	8. C	*ELACC7RI3*
9.	9. Part A: C	*ELACC7RI1, ELACC7RI6*
10	D	*ELACC7W2*
11	A	*ELACC7W1*
12	C	*ELACC7W3c*
13	C	*ELACC7W2*
14	A	*ELACC7W5*
15	C	*ELACC7W2c*
16	A	*ELACC7W5*
17	C	*ELACC7W1*
18	D	*ELACC7W2*
19	B	*ELACC7W1*
20	A	*ELACC7W1*