

eMPower**ME**

STUDENT RELEASED ITEM BOOKLET

2018

**Mathematics  
Reading  
Writing & Language  
Essay  
Grade 8**





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# Mathematics Session 1

## Directions

Today you will take a test in mathematics. For this test, you will answer selected-response and constructed-response questions. Some of the questions may look different from test questions you have seen before, and some may ask about material that is new to you, but it is important to do your best. If you are not sure of the answer to a question, you should still try to answer it.

**You may NOT use a calculator to answer the questions in this session.**

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1. The equation  $w = 3.1g + 6$  can be used to estimate  $w$ , the weight of a puppy in ounces that is  $g$  weeks old.

Based on the equation, which statement compares the expected weight of a 1-week old puppy to the weight of a newborn puppy?

- A The 1-week old puppy weighs 3.1 ounces more.
  - B The 1-week old puppy weighs 3.1 ounces less.
  - C The 1-week old puppy weighs 6 ounces more.
  - D The 1-week old puppy weighs 6 ounces less.
2. Rory is looking at a table of  $x$ -values and  $y$ -values. Which process could Rory use to determine if  $y$  can be considered a function of  $x$ ?
- A make sure the  $x$ -values follow a pattern
  - B make sure the  $y$ -values follow a pattern
  - C make sure no two distinct  $x$ -values correspond to the same unique  $y$ -value
  - D make sure each unique  $x$ -value corresponds to exactly one unique  $y$ -value

3. Which inequalities are true?

Select **all** that apply.

A  $\sqrt{5} > \sqrt{6}$

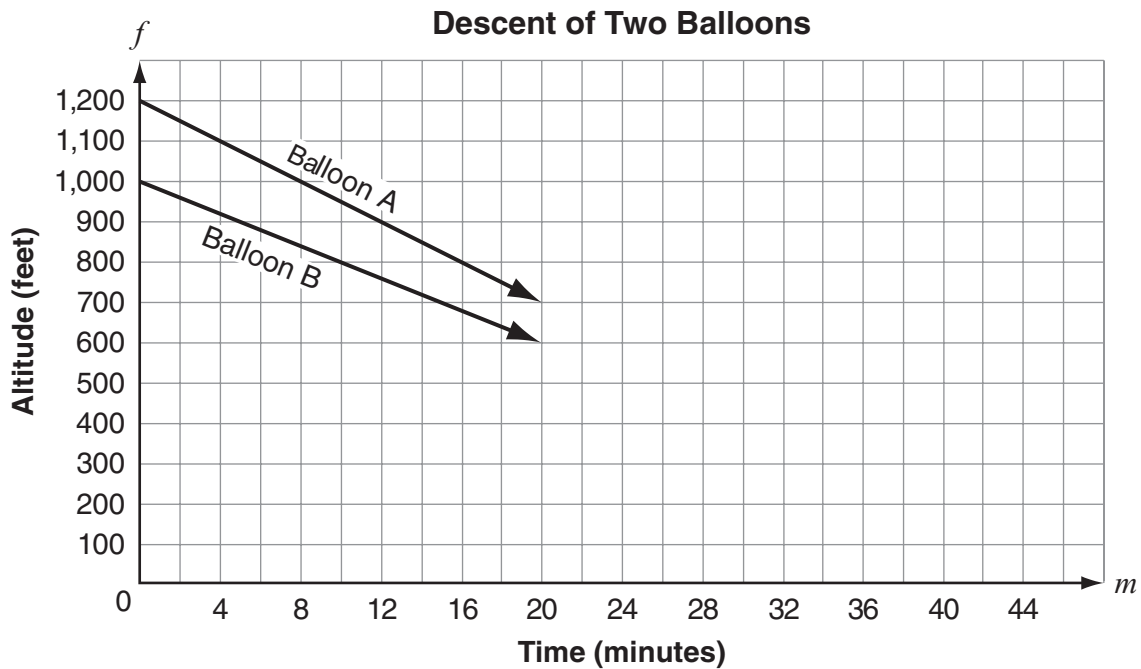
B  $\sqrt{3+4} > 3$

C  $\pi^2 > 9$

D  $-6 > -2\pi$

E  $\sqrt{22} > 5$

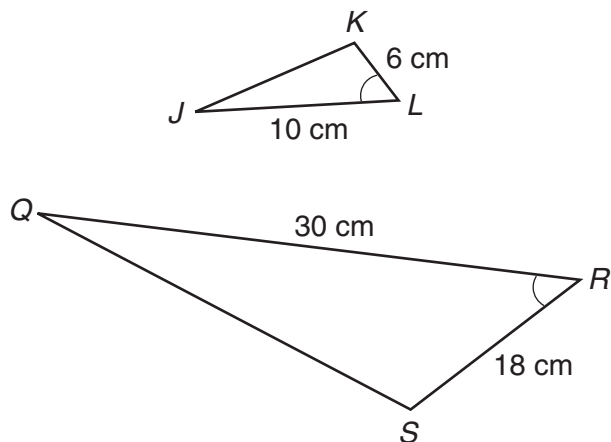
4. The graph models the altitude of two hot-air balloons.
- Balloon A's altitude is modeled by the equation  $f = 1,200 - 25m$ .
  - Balloon B's altitude is modeled by the equation  $f = 1,000 - 20m$ .



- What is the rate of descent, in feet per minute, for each of the two balloons? Justify your answer mathematically.
- If both balloons continue their current rate of descent, at what number of minutes will they be at the same altitude? Justify your answer mathematically.
- Determine the following.
  - the number of minutes it will take Balloon A to land from an altitude of 1,200 feet at its current rate of descent
  - the number of minutes it will take Balloon B to land from an altitude of 1,000 feet at its current rate of descent

Justify your answers mathematically.

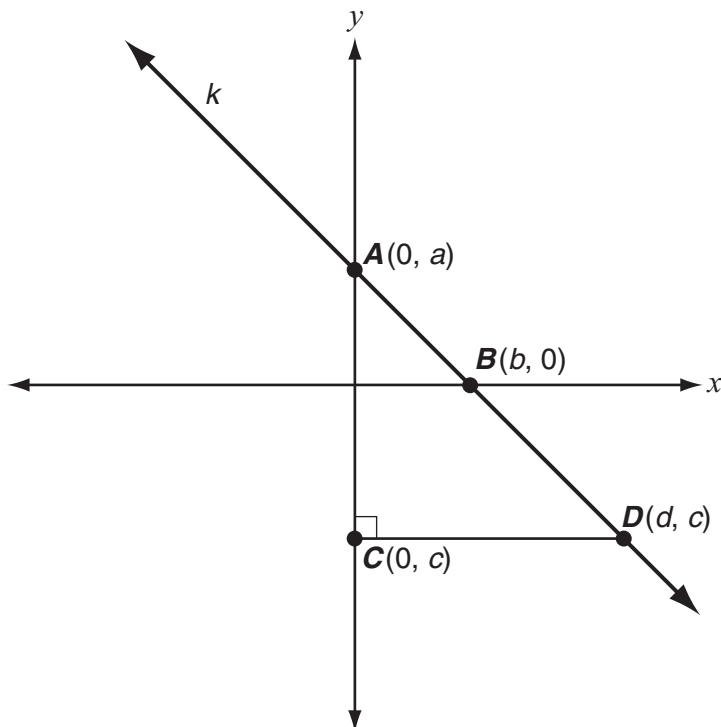
5. Triangle  $JKL$  is similar to triangle  $QSR$ , as shown.



Which statement is **not** true?

- A The length of line segment  $QS$  is three times the length of line segment  $JK$ .
- B The length of line segment  $KL$  is one-third the length of line segment  $SR$ .
- C The measure of angle  $Q$  is three times the measure of angle  $J$ .
- D The measure of angle  $L$  is equal to the measure of angle  $R$ .

6. Line  $k$  is shown on this coordinate plane.



Henry found that this proportion is true.

$$\frac{-a}{b} = \frac{-(a-c)}{d}$$

What does Henry's proportion prove about line  $k$ ?

- A  $\overline{AB}$  has the same length as  $\overline{BD}$ .
- B  $\overline{BD}$  has a greater length than  $\overline{AD}$ .
- C The  $x$ -intercept is the same as the  $y$ -intercept.
- D Different parts of the line have the same slope.

**STOP**

**You have completed  
this session.**



# Mathematics Session 2

## Directions

Today you will take a test in mathematics. For this test, you will answer selected-response and constructed-response questions. Some of the questions may look different from test questions you have seen before, and some may ask about material that is new to you, but it is important to do your best. If you are not sure of the answer to a question, you should still try to answer it.

**You MAY use a calculator to answer the questions in this session.**

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7. The table shows the total cost a telephone company charges its customers for calls.

**Long Distance Rates**

<b>Length of Call (minutes)</b>	<b>Cost for Call</b>
0	\$0.39
1	\$0.42
2	\$0.45
3	\$0.48
4	\$0.51

Based on the data in the table, what is the cost of a 25-minute long-distance telephone call?

- A \$12.75
- B \$9.75
- C \$1.14
- D \$0.75



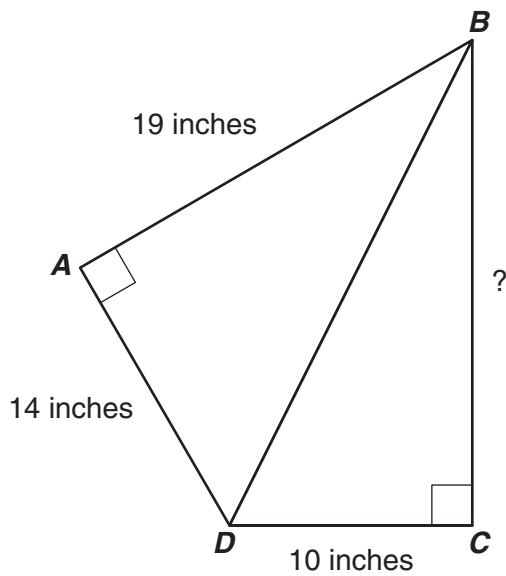
8. A counselor at Camp Chickadee surveys the campers to find out which morning activity they want to participate in. The results are shown in the table.

**Survey Results**

	Archery	Kayaking
Girls	96	54
Boys	79	72

What percentage of girls choose kayaking?

- A 18%
- B 36%
- C 43%
- D 75%
9. Quadrilateral  $ABCD$  is divided into two right triangles by one of its diagonals, as shown.



Which is **closest** to the length of side  $BC$ ?

- A 16 inches
- B 21 inches
- C 24 inches
- D 26 inches

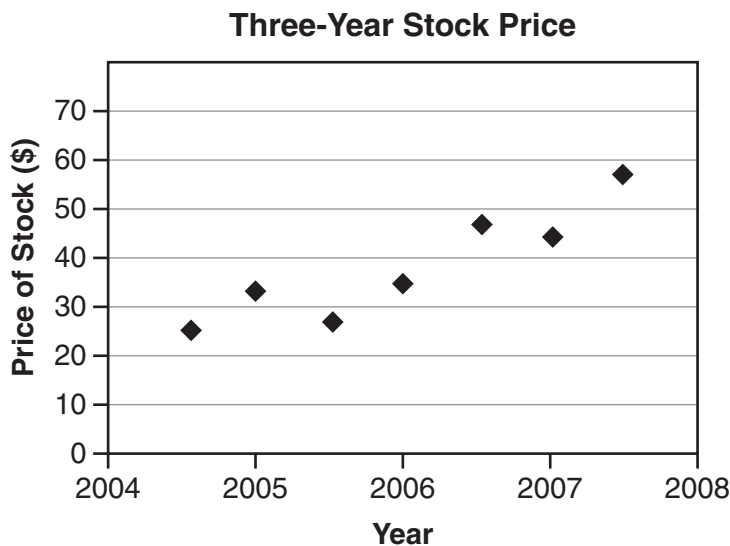


10. Wendi is trying to find this sum.

$$(1.2 \times 10^5) + (2.4 \times 10^4)$$

Which step will **best** help Wendi find the sum, if it is possible?

- A Multiply 4 and 5.
  - B Add 1.2 and 2.4.
  - C Rewrite  $2.4 \times 10^4$  as  $0.24 \times 10^5$ .
  - D Since the exponents are different, the sum cannot be determined.
11. Beginning in June 2004, Raphael noted the price of a stock at the same time twice each year. The graph shows the price of the stock during a three-year period.



Which statement is true about the data?

- A The price was constantly increasing.
- B The price rose at least 10% every six months.
- C The price more than tripled during the three-year period.
- D The price more than doubled during the three-year period.

**STOP**

**You have completed  
this session.**

# Reading

## Directions

Today you will take a test in reading. For this test, you will read passages and then answer questions about the passages. Some of the questions may look different from test questions you have seen before, and some may ask about material that is new to you, but it is important to do your best. If you are not sure of the answer to a question, you should still try to answer it.

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*You will now read two passages and answer the questions that follow. Some of the questions may ask you to compare the two passages.*

*This passage is about Louis Pasteur, a nineteenth-century French microbiologist and chemist, who conducted experiments on the theory of spontaneous generation.*

## Passage 1

### Spontaneous Generation

*by Jane Ackerman*

- 1 Scientists and philosophers had argued for centuries about whether living organisms could come from non-living substances, an idea called spontaneous generation. Before the 1700s, people believed that wasps and beetles were formed out of dung; mice and frogs from riverbanks, swamps, or slime; and maggots and flies from rotting meat. More scientific approaches were applied to the question of spontaneous generation in the 1700s. By the 1800s, animal reproduction was understood, but the origin of disease was still in question.
- 2 Despite warnings from Biot and Dumas<sup>1</sup> that it would be a waste of time to focus on a question so seemingly impossible to answer, Pasteur forged ahead. He wrote to his old friend Chappuis in January 1860: "I hope to make soon a decisive step by solving, without the least confusion, the celebrated question of spontaneous generation . . . it will require nothing less than the cogency<sup>2</sup> of arithmetical demonstration to convince my adversaries of my conclusions. I intend to accomplish even that."
- 3 Pasteur set up an experiment to test whether microbes generated spontaneously or were instead carried by dust in the air. He filled two flasks with yeast water, then heated them until boiling, killing any germs inside. He sealed the flasks tightly so no air could enter. He kept one flask intact and broke open the other flask so dust could enter. Soon microbes were growing, but only in the broken flask. Pasteur concluded that germs had entered on particles of dust. Thus, microbes did not grow spontaneously, but reproduced like other living things.

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<sup>1</sup> **Biot and Dumas:** Jean-Baptiste Biot and Jan-Baptiste-Andre Dumas were French scientists who mentored Pasteur during his studies and research

<sup>2</sup> **cogency:** persuasiveness, effectiveness

- 4 There were many scientists who doubted Pasteur's work, arguing that the sealed flask did not develop microbes because no oxygen was allowed to enter. Oxygen was thought to contain a life force required for spontaneous generation. Pasteur silenced those critics by repeating the experiment with swan-necked flasks, bottles with bends in the necks. The shape of the necks allowed air to enter, but gravity caused the dust in the air to settle in the curve of the neck, where it was trapped. The yeast water solution did not produce microbes until a bottle was tipped, allowing dust from the bend of the neck to enter the fluid.
- 5 In 1862, in a public lecture at the Sorbonne, Pasteur shone a beam of light into the dark auditorium, illuminating millions of dust particles floating in the air. Pale-faced, eyes shining through his glasses, he said:
- I have taken my drop of water . . . full of elements most suited to the development of small beings. And I wait, I observe, I question it, I beg it to be so kind as to begin over again just to please me, the primitive act of creation; it would be so fair a sight! But it is mute! . . . Ah! That is because I . . . have kept from it the germs that float in the air; I have kept it from life, for life is a germ and a germ is life. Never will the belief in spontaneous generation arise from the mortal blow that this simple experiment has given it.
- 6 The audience, which included Princess Mathilde, novelist and playwright Alexander Dumas, writer George Sand, and other great minds of the day, gave him a standing ovation. The still unbroken flask used in his famous experiment can be seen today in the Pasteur Institute's museum.

From Jane Ackerman, *Louis Pasteur and the Founding of Microbiology*. © 2004 Jane Ackerman.

## Passage 2

### Microbes

#### How long have microbes been around?

- The history of life on Earth is overwhelmingly microbial. As you can see from the timeline below, if the history of the Earth were condensed into a single year, microbes could be said to have originated around late February, while human beings didn't make their appearance until late in the evening on December 31!
- Fossil evidence of microbes has been found in some of the oldest rocks known to exist. The Earth is estimated to be about 4.5 billion years old. Microbes arose about 3.8 billion years ago, other animals about 700 million years ago, and modern humans less than 1 million years ago.

#### The Microbial Age - 3.1 Billion Years



#### How many microbes are there?

- Microbes are the most abundant organisms on the planet—way more numerous than human beings! The current human population is estimated to be about 6.33 billion. Let's put that in scientific notation, because we'll soon be talking about some very large numbers. Another way of writing 6,330,000,000 is  $6.33 \times 10^9$ .
- There's no way to count exactly how many microbes exist, but scientists estimate that there are approximately 55,000,000,000,000,000,000,000,000,000 microbes sharing the planet with us. That's  $5.5 \times 10^{31}$ .
- Let's try to put that in perspective. That's more microbes than there are stars in the Milky Way (which is only about  $4 \times 10^{11}$ ). That's 9 sextillion, or  $9 \times 10^{21}$ , microbes for every human. In fact, a dense microbial culture in the laboratory contains about 5 billion microbes per milliliter. So a test tube can easily hold about a dozen times the world's human population in microbes.

- 6 Admittedly, a test tube is not exactly a microbe's natural habitat. But microbes are pretty thick in the natural environment as well. A mere teaspoon of topsoil harbors about a billion bacterial cells, not to mention some 120,000 fungal cells and 25,000 algal cells. And direct microscopic counts of viruses indicate they are 10 times more abundant than bacteria in natural waters, with up to 100 million viruses in every milliliter.

Excerpt from "Microbe FAQs," *Delaware EPSCoR* @ <http://www.epscor.udel.edu/microbe-faqs>. © 2010 University of Delaware NSF EPSCoR.



1. In paragraph 3 of Passage 1, which step marks the difference between the two flasks?
  - A filling the flasks with yeast water
  - B heating the flasks to boiling
  - C sealing the flasks tightly
  - D keeping the flasks intact
  
2. Why did the author of Passage 1 include details of the experiment?
  - A to keep the reader in suspense
  - B to teach the reader about experiments
  - C to inform the reader how to repeat the experiment
  - D to convince the reader that the conclusion was valid

*This question has two parts. Be sure to answer both parts of the question.*

3. In paragraph 5 of Passage 1, what is the **most likely** meaning of the word “illuminating”?
  - A releasing into the air
  - B making visible with light
  - C activating by chemical reaction
  - D pointing out through description

Which choice provides the **best** evidence for the answer to the previous question?

- A “were instead carried by dust in the air”
- B “The yeast water solution did not produce microbes until a bottle was tipped.”
- C “Pasteur shone a beam of light into the dark auditorium.”
- D “That is because I . . . have kept it from the germs that float in the air.”

4. Which detail from Passage 1 is an example of speculation?
- A “He sealed the flasks tightly so no air could enter.”
  - B “The sealed flask did not develop microbes because no oxygen was allowed to enter.”
  - C “Pasteur shone a beam of light into the dark auditorium, illuminating millions of dust particles.”
  - D “The still unbroken flask used in his famous experiment can be seen today.”
5. Which of the following **best** states the central idea of Passage 1?
- A Pasteur disproved the idea of spontaneous generation.
  - B Pasteur disproved the effectiveness of sealed flasks.
  - C Pasteur disproved the existence of dust particles.
  - D Pasteur disproved the need for yeast water.
6. How does Passage 2 **best** illustrate the length of time microbes have been on Earth compared to that of humans and other animals?
- A by using an analogy of a calendar year to describe Earth’s history
  - B by describing the development of life on Earth in chronological order
  - C by breaking down the different kinds of life on Earth into different categories
  - D by showing how many more microbes there are on Earth than there are humans
7. In paragraph 5 of Passage 2, which text structure did the author use?
- A chronological
  - B order of importance
  - C compare and contrast
  - D sequence and process

8. Describe how the author of each passage discusses the importance of studying microbes. Cite textual evidence from **both** passages to support your answer.
9. You have read two passages that describe surprising information learned through scientific research.

Write a brief essay that analyzes how both passages show that scientific research changes our understanding of the world around us. In your essay, be sure to:

- Summarize the central idea of each passage.
- Explain how each passage shows a change in human understanding of the world achieved through scientific research.
- Use specific details from **both** passages to support your response.

**STOP**

**You have completed  
this session.**

# Writing & Language

## Directions

Today you will take a test in writing and language. For this test, you will read a passage and answer questions. Some questions might ask about how to improve the passage. Other questions might ask you to correct errors in the passage. Some of the questions may look different from test questions you have seen before, and some may ask about material that is new to you, but it is important to do your best. If you are not sure of the answer to a question, you should still try to answer it.

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*Read the passage. Then answer the questions that follow.*

## Stand Up!

1. Soon the classic command “Sit still!” may become obsolete in American classrooms.
2. Research suggests that fidgeting actually helps students learn.
3. With this new understanding, we should make school a place where students can move around a little while they work.
4. As schools have placed more emphasis on academics, students have been losing opportunities to move around during the day.
5. Recess time has been reduced in many school systems, and time spent in gym classes is frequently short as well.
6. To summarize, less than four percent of elementary schools give their students the amount of physical education recommended by health experts.
7. Traditionally, we’ve seen fidgeting in the classroom as a problem—a sign of distraction.
8. New studies show, however, that students need to move around in order to focus on difficult tasks, particularly ones that require them to analyze and retain information.
9. When our attention starts to wander, fidgeting wakes us up, and we are helped to concentrate.
10. Many teachers are catching on to this idea and using standing desks, exercise balls, music, and other tools to grow physical activity in their classrooms.
11. As a result, they see fewer discipline problems and calmer classrooms.
12. Being allowed to move around promotes students’ persistence and patience with learning tasks.
13. Fortunately, teachers have always been able to move in their classrooms.
14. License to move around also helps students’ grades go up.
15. A study that examined the effects of standing desks found that students who used them were more attentive and engaged.
16. Engagement, stresses an author of the study, is “the most important contributor to student achievement.”
17. Now that we know how much students benefit from moving around while learning, standing desks and similar adjustments should become the norm.
18. Even those who prefer to sit may find the changes interesting.

“Stand Up!” © 2015 by Measured Progress.

1. How should the underlined words in sentence 6 be changed to provide a transition from sentence 5?
  - A In the same way
  - B However
  - C Therefore
  - D In fact
  
2. Which is the **best** choice to replace the underlined portion of sentence 9?
  - A fidgeting wakes us up and concentration is helped.
  - B fidgeting wakes us up and helps us to concentrate.
  - C concentration is helped when fidgeting wakes us up.
  - D we are woken up by fidgeting which helps us concentrate.
  
3. In sentence 10, which is the **best** choice to replace the word “grow”?
  - A raise
  - B widen
  - C spread
  - D increase
  
4. Which sentence should be removed because it is not well connected to the topic of the paragraph?
  - A sentence 10
  - B sentence 11
  - C sentence 12
  - D sentence 13

5. How should the underlined words in sentence 14 be changed to maintain the style of the passage?
- A improves students' grades.
  - B bumps up students' grades.
  - C makes students' grades great.
  - D makes students' grades get better.

*This question has two parts. Be sure to answer both parts of the question.*

6. Which sentence is the **best** choice to replace sentence 18 as a concluding statement?
- A Instead of saying "Sit still!" we should command students to "Stand up!" to satisfy the fitness experts.
  - B Rather than "Sit still!" the better command to promote classroom learning is, almost certainly, "Stand up!"
  - C Asking students to "Stand up!" rather than "Sit still!" will improve teacher satisfaction in our nation's schools.
  - D We should say "Stand up!" rather than "Sit still!" to students so that they get more activity and have less need for gym classes.

Which statement provides the **best** support for the answer to the previous question?

- A Very few elementary schools give their students the amount of physical education recommended by health experts.
- B Teachers are catching on to the idea of encouraging physical activity in classrooms.
- C Students who use standing desks are more attentive and engaged.
- D Time spent in gym classes is frequently short as well.

**STOP**

**You have completed  
this session.**



# Essay

## Directions

Today you will take a test in writing. For this test, you will read two passages. You will then plan and develop an essay related to a prompt. It is important to do your best. If you are not sure exactly how to respond to the writing prompt, try to answer it the best you can.

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Read the two passages. Then plan and develop an essay related to the prompt.

## Passage 1

### Japan's High-Speed Rail Success

- 1 Over 10 billion passengers have taken advantage of Japan's high-speed rail system since it opened over 50 years ago. The Japanese high-speed rail system was the first of its kind in the world. It has served as a model of success for other nations developing their own high-speed passenger rail "bullet" trains. What makes Japan's train system such a sterling example?
- 2 According to a 2014 article in the *Economist*, Japanese bullet trains work partly because of Japan's geography. Most of Japan's 127 million people live in a few dense cities. Almost 40 million people live in the greater Tokyo area, and 20 million live in Osaka. The first bullet train allowed easy travel between these two heavily populated places. Later trains also connected large cities.
- 3 Financial management also made Japan's trains a success. The railways are run as for-profit businesses. Most of the people who use the bullet trains are business people whose companies pay for their expensive tickets. The most heavily used railway, JR East, completely pays for itself. In 2015, JR East reported a net profit of over \$1.5 million.
- 4 Japan's high-speed railway has brought numerous benefits. The *Japan Railway & Transport Review* reports that, per passenger, Japanese trains produce only 16 percent of the carbon dioxide pollution produced by cars. Because trains are green, they eliminate 113 pounds of carbon dioxide in our atmosphere for each passenger. A 2014 article in the *Atlantic Monthly* pointed out that Japan's extensive train system also encourages tourism and business development.

"Japan's High-Speed Rail Success." Copyright © 2016 by Measured Progress.

## Passage 2

### Will High-Speed Rail Come to the U.S.?

- 1 With U.S. highways overloaded, policymakers are considering more efficient modes of travel. Some believe high-speed rail may be the answer. A study published in *Environmental Research Letters* finds that trains are potentially cleaner than planes and cars. They can be powered by electricity. Trains also relieve traffic and reduce the number of planes in the air. Railway development could provide millions of jobs, too.
- 2 California and Texas already have plans for “bullet” trains. These efforts have met with resistance, though. Some express concern that Americans are too attached to their cars. Surveys suggest this may not be so, however. Over 60 percent of Americans say they would travel by high-speed rail if it existed. That number goes up when they are informed that it would save time and money over air and highway travel.
- 3 The locations of American cities present challenges as well. Unlike France and Japan, which already have high-speed rail, the United States is huge and sprawling. Most cities are far apart. High-speed rail may work, however, between cities like New York and Washington, D.C., which are only about 220 miles apart.
- 4 Financing the train system is another potential problem. The California High Speed Rail Authority claims that Los Angeles-to-San Francisco train service will make a \$700 million profit within two years of its completion. Others are not so sure. One 2012 report showed that the service will likely need \$1 billion per year from the government.
- 5 For some, high-speed rail is a beautiful dream. In the United States, though, it may remain only that.

“Will High-Speed Rail Come to the U.S.?” Copyright © 2016 by Measured Progress.

1. You have read two passages about high-speed rail.

Write an argumentative essay about whether or not high-speed rail could succeed in the United States. In your essay, be sure to:

- Explain the main claim clearly in the introductory paragraph.
- Distinguish your position from the opposing position.
- Use linking and transition words and phrases to organize the essay and create a sense of wholeness.
- Support the main claim with clear reasons and relevant evidence from **both** passages.
- Provide a conclusion that supports the main claim and restates the argument.

After you have written your first draft, use the checklist below to revise your essay.

### WRITER'S CHECKLIST

You have written a first draft of your essay. Use the following checklist to make corrections to your writing.

- I identified my topic.
- I clearly communicated my position.
- I supported my position and arguments with specific evidence from the passages.
- I organized the ideas in a logical way.
- I used precise words and phrases to help make a convincing argument.
- I used words and phrases to link my arguments with the evidence.
- I used simple, compound, and complex sentences.
- I used correct grammar.
- I spelled words correctly.
- I used correct punctuation.
- I used quotation marks to show direct quotations from the passages.
- I put the title of a passage in quotation marks when I quoted information from it.

**STOP**

**You have completed  
this session.**

