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Weekly Test Lesson 19

Read the passage. Then answer the questions.

Building Big

Buildings come in many different sizes. Some buildings are tiny one-room huts. Others are giant structures that dwarf the buildings around them. Some buildings are so big, they seem to scrape the sky! That is why we call tall buildings skyscrapers. Skyscrapers can take many months or even years to build. These buildings are complex structures; building them creates many challenges.

The problem with building a tall building is that the lower floors have to support the weight of the floors above them. That means the base of the structure has to be thicker than the top. Think of how a pyramid of cheerleaders has more people on the bottom than at the top. In the past, the base of a building was made of thick walls of stone or brick. However, there wasn't enough room to make these walls thick enough to support very tall buildings. That's why, until the late 1800s, buildings were no more than ten stories, or floors, tall.

By the late 1800s, people figured out how to make long columns out of iron or steel. These columns weighed a lot less than heavy bricks. This lesser amount of weight allowed builders to extend steel columns up to the sky. Now they could build taller buildings because the steel supported the weight of each floor.

A skyscraper is supported by a wide steel structure at the base. This structure may be underground and out of sight. Tall steel columns rise up from the base. At each floor, horizontal steel beams called girders stretch out from the vertical columns; these girders support the weight of that floor. Using a framework of steel spreads the weight of the building over all of the steel beams and columns. This makes it possible to build taller buildings.

Of course, big buildings can face big problems! One of the biggest problems is the wind. All buildings are designed to flex and move a little in the wind. However, a building cannot sway too much, for if it did, people would not feel comfortable inside of it. To solve this problem, the girders are welded tightly to the central columns to keep the building steady. Tight welding and support also allows buildings to remain standing during an earthquake.

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Another problem with big buildings is how people travel from one floor to another. No one wants to climb 100 flights of stairs! Fortunately, elevators were invented in the mid-1800s. This was just before people figured out how to make steel beams. The two inventions went together hand in glove. Elevators could quickly move people from one floor to another. Today, most buildings have an elevator shaft at the center of the building. These shafts can hold dozens of elevators. The elevators travel quickly between floors. The elevators in New York City's Empire State Building can travel from the lobby to the 80th floor in just 45 seconds!

How tall can buildings go? No one really knows. One thing is sure, however: Just as in the past, new technology will help us build buildings that soar to new heights!

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1 Mark the boxes to match each solution to its problem.

	Problem: The lower floors need to support the weight of the floors above them.	**Problem: There is not enough room to make stone and brick walls thick enough to support tall buildings.**
Solution: Lightweight columns can extend farther up into the sky.		
Solution: The base of the structure is thicker than the top.		

2 How did builders solve the problem of the wind and its effect on very tall buildings?

Ⓐ They built a strong base to support the buildings.

Ⓑ They made sure the buildings could move in the wind.

Ⓒ They made sure the girders and columns were welded tightly together.

Ⓓ They used a system of girders and columns to create a framework to bear the building's weight.

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3 Read the dictionary entry.

> **shaft** *noun* **1.** a long, narrow part that forms the handle of a tool or club. **2.** a long, narrow, vertical hole. **3.** harsh or unfair treatment. *verb* **4.** to shine in beams.

Now, read the sentence from the passage.

> Today, most buildings have an elevator shaft at the center of the building.

Which meaning **best** fits the way the word shaft is used in this sentence?

Ⓐ meaning 1

Ⓑ meaning 2

Ⓒ meaning 3

Ⓓ meaning 4

4 Read the sentences from the passage.

> Fortunately, elevators were invented in the mid-1800s. This was just before people figured out how to make steel beams. The two inventions went together hand in glove.

What does the phrase hand in glove mean?

Ⓐ Elevators need steel beams to operate.

Ⓑ The two inventions fit together perfectly.

Ⓒ One invention will not work without the help of the other.

Ⓓ Steel beams and elevators are both found in tall buildings.

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5 This question has two parts. First, answer part A. Then, answer part B.

Part A

What conclusion can be drawn about building skyscrapers?

Ⓐ Building skyscrapers is a lot of work.

Ⓑ Building skyscrapers is not very common.

Ⓒ Skyscrapers are built only in New York City.

Ⓓ Skyscrapers were built only in the late 1800s.

Part B

Which detail from the passage **best** supports the answer to part A?

Ⓐ Some buildings are small.

Ⓑ Building skyscrapers takes years and creates many challenges.

Ⓒ The Empire State Building is a large skyscraper in New York City.

Ⓓ In the late 1800s, people figured out how to make lightweight columns for skyscrapers.

6 Why did people begin to build taller buildings after the mid-1800s? Use details from the text to support your answer.

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7 Read the paragraph.

> The doves in my backyard make a joyful sound. I listen to them when the business of the day is done. They are always there, unless it is raining. They make a soft cooing noise which brings me a lot of enjoymint.

Which change should be made to correct a spelling error?

Ⓐ Change unless to unles.

Ⓑ Change joyful to joyfull.

Ⓒ Change business to busyness.

Ⓓ Change enjoymint to enjoyment.

8 Read the sentences.

> This is the street. It always has the big New Year's party.

Which of the following **best** combines the two sentences?

Ⓐ This is the street when always has the big New Year's party.

Ⓑ This is the street where always has the big New Year's party.

Ⓒ This is the street that always has the big New Year's party.

Ⓓ This is the street with always has the big New Year's party.

9 Read the paragraph. Underline the sentence that contains an error in grammar usage.

> That is the lady who helped us when we were on vacation last week. We were late to catch a train and could not find the right track. She rides the train a lot and helped us figure out where to go. We were so happy that we met her whenever we did!

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10 Abigail is writing a story about visiting a pond. She wrote down the following notes.

- beautiful there
- go early before too hot
- ducks in pond and swan near nest
- picnic lunch
- saw frogs and birds
- home, worth visiting

Use Abigail's notes to write a personal narrative about visiting the pond. Organize the events in time order and use descriptive details.