

## A Computer Scientist in the Navy

Fill in the circle to complete the sentence. Then answer questions 3, 4, and 5.

1. Which two words are antonyms?  
 A infancy, babyhood  
 B jumpstart, energize  
 C disapproved, welcomed  
 D fundamental, basic
2. During World War II, the U.S. military needed computers that could \_\_\_\_\_.  
 A command the troops  
 B create accurate data quickly  
 C learn to fire weapons accurately  
 D earn money for the war effort
3. Reread the quotation under the title. In your own words, explain what it means.  


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4. What facts suggest that the navy was probably glad they didn't turn Dr. Hopper down?  


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5. Use the passage to infer some of Grace Murray Hopper's personality traits.  


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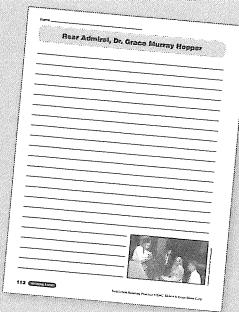
  


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### Write About the Topic

Use the Writing Form to write about what you read.

Summarize the article by explaining how Dr. Hopper ended up in the navy and if you think she made the right decision.

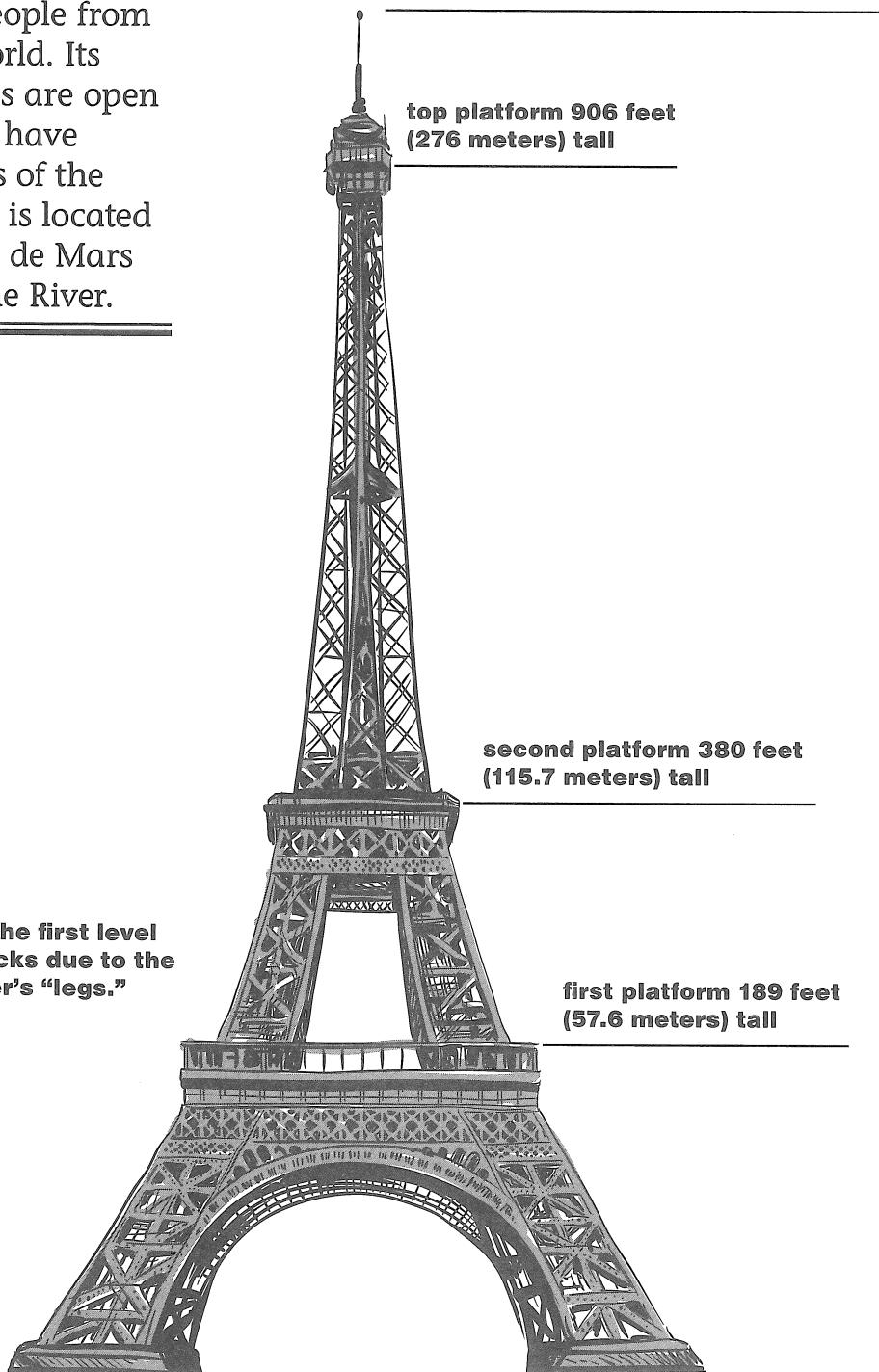




# Dimensions of the Eiffel Tower

Built by Gustave Eiffel for the 1889 World's Fair in Paris, the Eiffel Tower is visited by people from all over the world. Its three platforms are open to visitors and have exquisite views of the city. The tower is located on the Champ de Mars beside the Seine River.

The Eiffel Tower stands 1,063 feet (324 meters) tall.



The four "legs" of the tower are positioned at the four points of a compass (North, South, East, West).

Name \_\_\_\_\_

## La Tour Eiffel, Paris's Iron Lady

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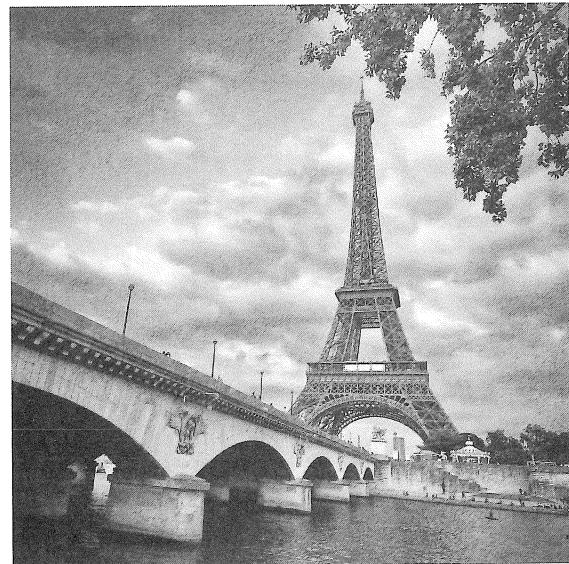
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### **Words to Know**

#### **The Eiffel Tower Triumphs**

iron-lattice  
giddy  
dominating  
initially  
Monsieur  
observatory  
“at its disposal”  
telecommunications  
intercepting  
ruthless  
obligingly  
edifice

### **Words to Know**

#### **A Strong Yet Flexible Tower**

establishes  
boast  
dizzying  
French Revolution  
entrants  
Centennial  
employees  
puddled iron  
forged  
assemble  
alteration  
iron-lattice  
flexibility

### **Words to Know**

#### **The Iron Lady of Paris**

barbarous  
degrading  
venerable  
Notre Dame Cathedral  
iron-lattice  
spire-like  
monument  
entrants  
structural engineer  
toppling  
edifice

**The Eiffel Tower ■**

**The Eiffel Tower ■ ■**

**The Eiffel Tower ■ ■ ■**



# The Eiffel Tower Triumphs

Along with hundreds of other engineers, architects, and builders, Gustave Eiffel built the Eiffel Tower for the 1889 World's Fair in Paris. The iron-lattice structure did not fit in well with Paris's ancient stone castles and churches. In fact, it towered over them. Rising 1,063 feet (324 meters) into the air, the Eiffel Tower was the tallest structure in the world. The Washington Monument had once held this record, standing 555 feet (169 meters) in height.

## Disapproving Artists and Writers

The first threat to the tower came from French artists and writers. They banded together to protest its ugliness. In a letter to the French newspaper *Le Temps*, they called it a "giddy, ridiculous tower dominating Paris like a gigantic black smokestack." Yet about two million fairgoers came to admire the Eiffel Tower. By the end of the World's Fair, criticism had died down.

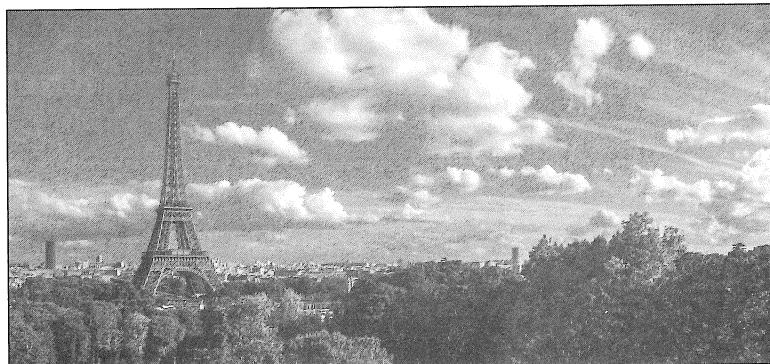
Eiffel's firm designed the tower as a contest entry. The World's Fair in Paris was scheduled to celebrate the hundredth anniversary of the French Revolution. City leaders wanted an impressive monument to mark the day. More than 100 entrants submitted plans to the Centennial Committee. Eiffel's design won.

## Only a Temporary Tower?

The original plan was to tear down the tower 20 years after it was built. Eiffel had initially paid most of the building expenses, but tourists' entry fees soon paid him back. After that, the tower began to enrich its owner. From the first, clever Monsieur Eiffel plotted to save his building. If he could link his tower with scientific research, he figured, French authorities would spare it. "It will be an observatory and a laboratory such as science has never had at its disposal," Eiffel boasted.

He was correct. People in power recognized how useful the tower could be as a radio tower. Since the early 1900s, the Eiffel Tower has been a useful tool for telecommunications. For example, during World War I, the French military used the tower as a "giant ear." Intercepting radio messages led to the arrest of one of the war's most ruthless spies. The tower has also broadcast TV shows and gathered weather data. The tower that has become known as "The Iron Lady" has obligingly helped scientists to make astronomical observations and conduct physics experiments.

In 2010, the Eiffel Tower received its 250 millionth visitor. Of all the tourist attractions in the world that charge a fee, Eiffel's beloved edifice receives the greatest number of guests.



## The Eiffel Tower Triumphs

Fill in the circle by the correct answer. Then answer questions 3, 4, and 5.

- Which two words from the passage are antonyms?  
 A enrich, deplete  
 B giddy, impressive  
 C dominating, intercepting  
 D monument, edifice
  - Critics disliked the Eiffel Tower mainly because the tower was \_\_\_\_\_.  
 A flimsy and liable to fall down  
 B designed by engineers, not artists  
 C a contrast to older Paris buildings  
 D a stone church that was centuries old
  - Use the headings to list two threats that the Eiffel Tower faced.
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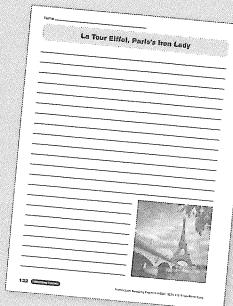
- Explain each paragraph's main purpose or topic in one to two words.
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- Why does the author end the article with facts about tourism at the Eiffel Tower?
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### Write About the Topic

Use the Writing Form to write about what you read.

Use the text, the photos, and the diagram on page 122 to write a detailed description of the Eiffel Tower. Include your opinions.



# A Strong yet Flexible Tower

You have probably seen photos of the Eiffel Tower; the tower appears in many movies, too. Showing this structure in a film instantly establishes Paris as the setting. Few tourists come to Paris without visiting it, or seeing it from afar. The tower is 1,063 feet (324 meters) tall, so you can see it from a distance.

## How Popular Is the Eiffel Tower?

Millions of people climb the tower every year. To reach the first-level viewing platform, you must climb over 300 steps; about the same number will take you to the second-level platform. Tourists who are unable or unwilling to climb stairs can ride up on one of three elevators. There is a separate elevator to the third level, the highest one that is open to the public. The Eiffel Tower has several restaurants that boast amazing views of the city. Glass floors on the first level allow visitors to look down without even looking out a window—for some, looking hundreds of feet down on ant-like tourists below can be a dizzying experience!

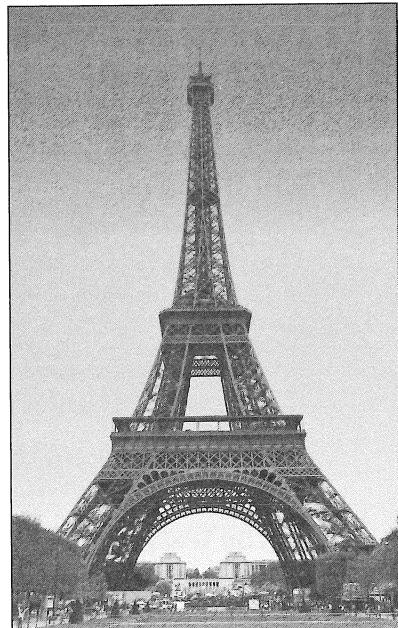
The Eiffel Tower weighs over 10,000 tons, counting its shops, restaurants, elevators, and antennas. Its iron structure alone weighs about 7,300 tons. Every seven years, workers add about 50 tons of fresh paint to this total. Frequent repainting protects the iron structure from rust, bird droppings, and weather.

## How Did the Tower Get Its Name?

In the 1880s, Gustave Eiffel's engineering firm entered a contest to design a monument. The structure would celebrate the hundredth anniversary of the French Revolution. More than 100 entrants submitted plans to the Centennial Committee, and Eiffel's design won. In French, its name is La Tour Eiffel [la TOOR ay-FELL]. Its nickname is La dame de fer [la DAWM duh FAIR], "The Iron Lady."

## What Makes the Tower So Strong?

Since their four-legged design was so tall, Eiffel and his employees knew that the tower would need to stand up to strong winds. They chose high-quality "puddled iron" for its great strength. About 100 ironworkers forged over 18,000 separate parts for builders to assemble. The parts were so well made that not one needed alteration. Its iron-lattice construction gives the tower just the right amount of flexibility, so it sways a few inches in the wind. The tower twists, too. This occurs when the iron on the sun-facing side heats up and expands. The tower's top then twists up to seven inches away from the sun. The Eiffel Tower's height varies, too. In hot weather, it grows up to six inches taller; when temperatures drop, it shrinks back to normal.



## A Strong yet Flexible Tower

Fill in the circle by the correct answer. Then answer questions 3, 4, and 5.

1. Which two words are synonyms?
    - A establishes, identifies
    - B entrants, tourists
    - C forged, assembled
    - D alteration, sameness
  
  2. In paragraph 4, which phrase tells what the word “Centennial” means?
    - A “engineering firm”
    - B “hundredth anniversary”
    - C “French Revolution”
    - D “100 entrants”
  
  3. Explain each paragraph’s main purpose or topic.
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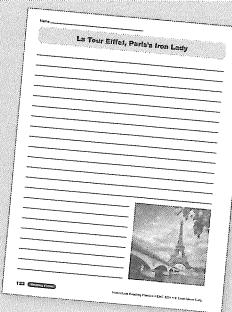
4. What maintenance do you think is required to keep the millions of annual visitors safe?
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5. Explain why it is important for the Eiffel Tower to be flexible as well as strong.
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### Write About the Topic

Use the Writing Form to write about what you read.

Summarize the text by explaining why designing and building the Eiffel Tower were impressive feats.



# The Iron Lady of Paris

When it was built for the Paris World's Fair of 1889, the Eiffel Tower had many critics. Famous French writers and artists banded together to protest its ugliness. In a letter to a leading newspaper, they called the tower a "barbarous mass." They accused it of degrading venerable buildings such as Notre Dame Cathedral. They described the tower as "this truly tragic street lamp." Yet, about two million fairgoers came to admire the iron-lattice, spire-like structure during the five months that the fair lasted. Criticism soon died down.

Rising 1,063 feet (324 meters) into the air, taller than an 85-story building, the Eiffel Tower was the tallest structure in the world for 41 years. When builders completed New York City's Chrysler Building in 1930, Paris's "Iron Lady" lost her tallest-building crown. Today, an antenna makes the Eiffel Tower taller than the Chrysler Building. However, other skyscrapers are far taller than both.

## How Did the Tower Get Its Name?

In the 1880s, Gustave Eiffel's engineering firm entered a contest to design a monument to the hundredth anniversary of the French Revolution. The anniversary would be celebrated at the World's Fair. More than 100 entrants submitted plans to the Centennial Committee, and Eiffel's entry won. Equal credit for the tower's design should go to structural engineer Maurice Koechlin, Eiffel's employee. Many other architects and engineers also worked on the Eiffel Tower project.

## A Revolution in Structural Engineering

In designing their tower, Koechlin and Eiffel allowed for the fact that it would need to stand up to strong winds. It needed to be mighty strong—and flexible, but not too flexible—to make up for its lofty height and slenderness. Its foundation had to be very strong indeed; the tower had to be deeply rooted in the earth with no possibility of toppling over. Though the tower is over 125 years old, French workers have maintained it well. Every seven years they paint the iron structure to protect it from rust, bird droppings, and other threats.

The original plan was to tear down the tower 20 years after it was built. When that deadline approached in 1909, Eiffel was determined that his edifice should remain standing. Eiffel had initially paid most of the building expenses, but tourists' entry fees soon compensated him. Luckily for Eiffel, French authorities recognized how useful the tower could be as a radio tower. Since the early 1900s, Eiffel's tower has functioned as a telecommunications tower.

Equipment atop the tower has intercepted messages from World War I spies, broadcast France's first radio music and TV shows, gathered weather data, and more.

