

## The Wright Brothers

When Wilbur Wright was 11 and his brother Orville was 7, their father gave them a toy helicopter that was powered by a rubber band. They played with it again and again. It was this amazing toy, Orville later recalled, that first sparked their interest in flight.

In 1892 the Wright brothers, now in their 20s, opened a shop in Dayton, Ohio, where they sold, repaired, and built bicycles. Once their business was well established, they began reading everything they could find on flying machines and on the principles of **aeronautics**. They were particularly interested in the experiments of Otto Lilienthal, a German engineer. Called "Flying Man," Lilienthal had made over 2,000 short flights hanging from gliders.

Wilbur and Orville learned that a heavier-than-air flying machine needed three things: wings to lift it into the air, a power source, and a system for controlling it. The biggest problem, still far from being solved, was finding a way to control the machine during flight. In 1899 the brothers came up with an important idea. They observed that birds make turns and balance themselves by changing the position and angle of their outstretched wings. This, they decided, might be the key to successfully maneuvering an aircraft through the air.

To test their idea, the brothers designed a kite with two long, flexible wings. Cords attached to these wings controlled their angles. Encouraged by the kite's performance, they then built a series of full-size gliders. Working tirelessly, they experimented with different wing and tail rudder designs. Finally, in the fall of 1902, the brothers succeeded in piloting a number of controlled glides. Now they were ready to build an airplane with an engine.

On December 17, 1903, the brothers stood alone on a sand dune at Kill Devil Hills, near Kitty Hawk, North Carolina. They had chosen this place for testing their airplane because it had plenty of open space and strong, steady winds. The brothers' airplane, named the *Flyer*, sat nearby. It had cloth-covered wings, two propellers, a lightweight gasoline engine they had built, and controls similar to those in their 1902 glider. Four men arrived to help haul the *Flyer* onto its takeoff rail and to act as witnesses. About to risk injury or even death, Orville lay down on his stomach in the center of the lower wing and started the engine. The *Flyer* moved down the rail, lifted into the air, and flew 120 feet before it thumped down on the sand.

The Wright brothers made three more flights that historic day. On the last and longest flight, Wilbur flew the *Flyer* a distance of 852 feet and was in the air for 59 seconds. The brothers were **elated**. They had become the first in the world to pilot and control a powered aircraft. As Orville and Wilbur wrote in a press release that they sent out to the newspapers, "The age of the flying machine has come at last."





- 1. What or who was called "Flying Man?"**
  - A. the toy helicopter that was given to Wilbur and Orville
  - B. Otto Lilienthal, the German engineer
  - C. the Wright brothers' powered airplane
  - D. Orville Wright
- 2. When Orville and Wilbur were in their 20s, they opened a shop where they sold, repaired, and built**
  - A. toys.
  - B. kites.
  - C. gliders.
  - D. bicycles.
- 3. The brothers' idea for a way to control an aircraft in the air was inspired by**
  - A. their observations of the flying performance of kites.
  - B. the articles and books they read on flying machines.
  - C. the experiments of Otto Lilienthal.
  - D. their observations of birds in flight.
- 4. In paragraph two, it says that the Wright brothers read materials on the principles of aeronautics. The term *aeronautics* refers to the science having to do with**
  - A. weather patterns and wind strengths.
  - B. the design, manufacture, and flying of aircraft.
  - C. the testing and operation of engines.
  - D. the balance requirements of bicycles.
- 5. What was one of the reasons that the Wright brothers tested their powered airplane at Kill Devil Hills?**
  - A. It was warmer in North Carolina than it was in Ohio.
  - B. They wanted their airplane to take off from the top of a hill.
  - C. It was an area that had a lot of open space.
  - D. It had the country's best equipped airport.
- 6. Which was the Wright brothers' longest flight on December 17, 1903?**
  - A. the fourth flight
  - B. the first flight
  - C. the third flight
  - D. the second flight
- 7. Based on what you read in this passage, you can conclude that**
  - A. very large crowds watched the *Flyer's* first flight on that December day.
  - B. the Wright brothers were also the first to fly in the air on gliders.
  - C. only Orville was daring enough to try piloting the *Flyer* on that December day.
  - D. Orville and Wilbur were very good mechanics.
- 8. In the last paragraph, it says that the Wright brothers were elated. Which of these is the best synonym for *elated*?**
  - A. ambitious
  - B. envious
  - C. thrilled
  - D. nervous

# Test Preparation

# Cumulative Review

Chapters 1–3

Choose the best answer.

1. In 10,234,567,890 which digit is in the ten-millions place?

- a. 0            b. 1  
c. 3            d. 9

8. Choose the standard form of the number.

seven billion, three hundred six thousand

- a. 7,000,306,000  
b. 7,000,360,000  
c. 7,306,000,000  
d. 7,360,000,000

2. Which is ordered greatest to least?

- a. 8.524; 8.534; 8.53  
b. 8.534; 8.53; 8.524  
c. 8.53; 8.534; 8.524  
d. none of these

9. Which shows 15,695,823 rounded to its greatest place?

- a. 10,000,000  
b. 16,000,000  
c. 200,000,000  
d. 20,000,000

3. Estimate.

$$\begin{array}{r} 563,682 \\ 472,289 \\ + 186,451 \\ \hline \end{array}$$

- a. 130,000  
b. 930,000  
c. 1,100,000  
d. 1,300,000

10. Subtract.

$$\begin{array}{r} 726,423 \\ - 318,619 \\ \hline \end{array}$$

- a. 231,516  
b. 407,804  
c. 914,722  
d. 417,804

4. 
$$\begin{array}{r} 3046 \\ \times \quad 6 \\ \hline \end{array}$$

- a. 18,276  
b. 21,276  
c. 33,412  
d. 18,876

11.  $217 \times \$25.81$

- a. \$326.98  
b. \$1410.77  
c. \$5600.77  
d. not given

5. Which are divisible by 3?

- a. 18,585; 325,714; 1823  
b. 69,132; 276,204; 2301  
c. 418,608; 45,806; 2002  
d. 115,321; 35,432; 2106

12. Which compatible numbers are used to estimate

$$19 \overline{)3817} \ ?$$

- a.  $20 \overline{)4000}$   
b.  $9 \overline{)3600}$   
c.  $40 \overline{)2000}$   
d. not given

6.  $44 \overline{)112,928}$

- a. 810  
b. 2160 R1  
c. 2566 R24  
d. 2516 R14

13.  $32 \overline{)\$2398.40}$

- a. \$36.81  
b. \$112.14  
c. \$174.95  
d. not given

7. Compute.  
Use the order of operations.

$$2 \times 6 + 36 \div 9 - 5$$

- a.  $\frac{1}{3}$             b. 11  
c. 16            d. 24

14. Which number is 1000 more than

$$4 \overline{)81,608} \ ?$$

- a. 1242  
b. 3402  
c. 20,402  
d. 21,402