



# Teacher's Guide Wright Brothers



## Dear Educator,

**G**et ready to soar and be inspired by a pair of brothers who chased their dreams and changed the world forever! While reading **KIDS DISCOVER** *Wright Brothers*, your young aviators will learn about the fascinating topics at right

This Teacher's Guide is filled with activity ideas and blackline masters to help your students enjoy and learn more from *Wright Brothers*. Select or adapt the activities that suit your students' needs best.

Thank you for making **KIDS DISCOVER** a part of your classroom.

Sincerely,

**KIDS DISCOVER**

P.S. We would love to hear from you!  
E-mail your comments and ideas to [teachers@kidsdiscover.com](mailto:teachers@kidsdiscover.com)

## Meeting the Standards

- ✓ Science and Technology
- ✓ Physical Science  
– *National Science Education Standards*
- ✓ Visit [www.kidsdiscover.com/standards](http://www.kidsdiscover.com/standards) to find out more about how **KIDS DISCOVER** meets state and national standards.

## PAGES WHAT'S IN WRIGHT BROTHERS

- 2–3 **The Wright Brothers**  
Flapping, feathered, and failed flying machines through the years
- 4–5 **The Bat and the Bicycles**  
The early years of the Wright brothers and their family
- 6–7 **Soaring and Sinking**  
Giant balloons, gliders, and airships
- 8–9 **Countdown at Kitty Hawk**  
Flight tests in North Carolina from 1900 through 1903
- 10–11 **Success!**  
An illustration of the brothers' historic first flight on December 17, 1903
- 12–13 **The Challenge of Flight**  
How do gravity, thrust, drag, and lift play a part in flight?
- 14–15 **France, Fame, and Fortune**  
What was life like for Orville and Wilbur after the first flight?
- 16–17 **And Away We Go**  
An intriguing time line of important dates in flight history
- 18–19 **Student Activities**  
Experiments with air pressure, an acrostic, and resources

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3 **Get Set to Read (Anticipation Guide)** 

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# PREREADING ACTIVITIES



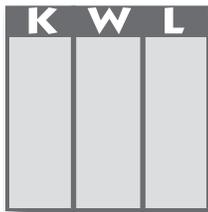
**B**efore distributing **KIDS DISCOVER** *Wright Brothers*, activate students' prior knowledge and set a purpose for reading with these activities.

## Discussion

To get students thinking about how this topic relates to their interests and lives, ask:

- ✓ *Have you ever been on a plane? What was it like?*
- ✓ *In what ways do you think air travel has changed people's lives? Has it made life better, worse, or both?*

## KWL Chart



On chart paper, draw three columns and label them **K** ("What we Know"), **W** ("What we Want to know"), and **L** ("What we Learned"). Ask: *What do you already know about the Wright brothers?*

List students' responses in the **K** column. In the **W** column, list students' questions and comments about what they want to learn or what they think they will learn by reading *Wright Brothers*. (See box below for key terms students may bring up.) At the end of the unit, have students fill in the **L** column listing what they learned. Finally, ask students to correct any inaccurate information written in the **K** column.

KEY TERMS	
✓ Orville Wright	✓ gravity
✓ Wilbur Wright	✓ lift
✓ flying machine	✓ thrust
✓ Kitty Hawk	✓ drag
✓ Amelia Earhart	✓ rudder
✓ Chuck Yeager	✓ warp

## Get Set to Read (Anticipation Guide)



Copy and distribute the **Get Set to Read** blackline master (page 3 of this Teacher's Guide). Explain to students that this **Anticipation Guide** will help them find out what they know and what misconceptions they have about the topic. **Get Set to Read** is a list of statements—some true, some false. Ask students to write whether they think each statement is true or false in the **Before Reading** column. Be sure to tell students that it is not a test and they will not be graded on their answers. The activity can be completed in a variety of ways for differentiated instruction:

- ◆ **Have students** work on their own or in small groups to complete the entire page.
- ◆ **Assign pairs** of students to focus on two statements and to become "experts" on these topics.
- ◆ **Ask students** to complete the **Before Reading** column on their own, and then tabulate the class's answers on the chalkboard, on an overhead transparency, or on your classroom computer.
- ◆ **Review the statements** orally with the entire class.

If you predict that students will need assistance finding the answers, complete the **Page Number** column before copying **Get Set to Read**.

## Preview

Distribute *Wright Brothers* and model how to preview it. Examine **titles, headings, words in boldface type, pictures, charts, and captions**. Then have students add new information to the **KWL** chart. If students will only be reading a few pages at one sitting, preview only the selected pages.

## BE WORD WISE WITH POWER VOCABULARY!

**Y**ou have exclusive access to additional resources including Power Vocabulary blackline masters for every available KIDS DISCOVER title! These activities introduce students to 15 specialized and general-use vocabulary words from each KIDS DISCOVER title. Working with both types of words helps students develop vocabulary, improve comprehension, and read fluently. Follow the links from your Teacher's Toolbox CD-ROM and find your title to access these valuable resources:

- ◆ Vocabulary cards
- ◆ Crossword puzzle
- ◆ Word find
- ◆ Matching
- ◆ Cloze sentences
- ◆ Dictionary list

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**Use the following questions as oral discussion starters or for journaling. For additional in-class discussion and writing questions, adapt the questions on the reading comprehension blackline masters on pages 5 and 6.**

### Pages 2–3

Before Orville and Wilbur Wright’s time, most people thought flying machines were fantasy or only inventions for the distant future. Ask:

- ✓ *What inventions do you think people today believe are fantasy or something that will be only a thing of the very distant future?*
- ✓ *How would you feel if someone invented one of these “fantasy” machines? Would you trust that it worked unless you saw it with your own eyes?*

### Pages 4–5

The Wright brothers said that their fascination with flying began with a toy their father bought them. Experiences can also cause a person to want to achieve something specific. For example, watching a baseball game could make a person want to be a ball player, or owning a toy doctor kit could make a person want to be a doctor. Ask:

- ✓ *Is there one experience or object that caused you to want to do or achieve something? What is it?*

### Pages 6–7

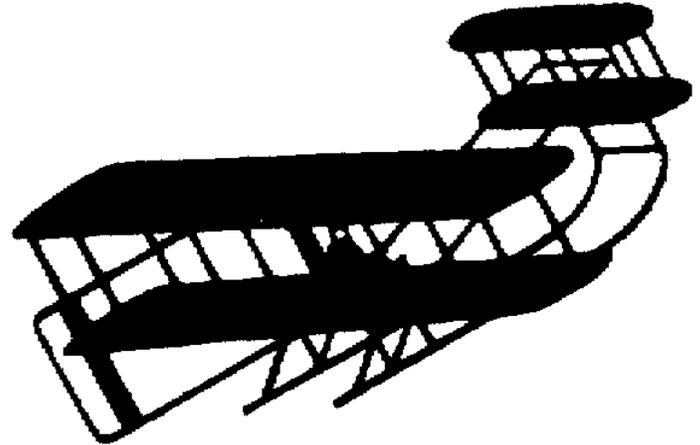
- ✓ *Has anyone seen a glider or hot air balloon? What did it look like? What are some similarities and differences between a glider or hot air balloon and the Wright brother’s plane or modern planes?*



### Pages 8–9

From 1900 to 1903, the Wright brothers made several trips to Kitty Hawk to test their gliders and back to Ohio to make improvements. At the same time, many people laughed at them for wanting to build a flying machine. Ask:

- ✓ *What qualities do you think the brothers had that enabled them to follow their dream despite years of failed test runs and people laughing at them?*



### Pages 10–11

- ✓ *Why do you think only a few newspapers printed the story about the Wright brothers’ flight? If you read the story at that time, how do you think you would have reacted?*

### Pages 12–13

- ✓ *Why do you think the author chose to use pictures of wrestlers to demonstrate the four forces that affect an airplane? Do these pictures help you understand or remember the forces and how they work? What other images would help you understand and remember them?*

### Pages 12–13

- ✓ *Has anyone ever used a rudder on a boat or other object or machine? How did you use it and how does it affect how the object works?*

### Pages 14–15

- ✓ *Would you want to have been one of the first people to see the Flyers in action? How would you have described it to people who hadn’t seen it?*
- ✓ *Would you want to be one of the first passengers to use this machine? Why?*

### Pages 16–17

- ✓ *Looking at the time line on pages 16–17, which event do you think is the most important in the history of flight?*
- ✓ *What other events dealing with flight would you like to add to the time line?*



Name \_\_\_\_\_ Date \_\_\_\_\_

## It's in the Reading

After reading KIDS DISCOVER *Wright Brothers*, choose the best answer for each question. Fill in the circle.



*Find your answers on the pages shown in the book icon next to each question.*

**1. One thing that many early inventors of flying machines accomplished was \_\_\_\_.**

- A. controlling an aircraft
- B. creating unique wings
- C. staying in the air
- D. powering the craft



**2. The most accurate description of Wilbur and Orville Wright as young adults is \_\_\_\_.**

- A. fun-loving but irresponsible
- B. scholarly and unathletic
- C. creative and hardworking
- D. antisocial but brilliant



**3. The main reason no one flew an engine-powered craft before 1900 was that \_\_\_\_.**

- A. no one attempted it
- B. those who attempted to were careless
- C. inventors did not cooperate with one another
- D. the technology for a heavier-than-air craft did not exist



**4. The wind tunnel that the Wright brothers built was helpful because \_\_\_\_.**

- A. it kept their craft's wings from being damaged
- B. it showed them how air would affect their craft's wings
- C. it proved that an engine-powered craft could fly
- D. it helped the wings of their craft get enough lift



**5. December 17, 1903, was an important day in aviation because \_\_\_\_.**

- A. it was the first time people had stayed in the air over 30 seconds
- B. it was the first time people had flown over an ocean
- C. it was the first solo air flight
- D. it was the first flight of a heavier-than-air craft powered by an engine



**6. An airplane's thrust is created by \_\_\_\_.**

- A. curved wings
- B. the elevator swinging up or down
- C. its propeller
- D. friction as the plane goes through the air



7. The definition of *rudder* is \_\_\_\_\_.

- A. an instrument that steers an airplane right or left
- B. the forward motion of a plane
- C. the force that pulls an airplane toward the ground
- D. an aircraft part that moves the plane left or right



8. After the Wright brothers' 1903 flight at Kitty Hawk, they \_\_\_\_\_.

- A. stopped flying because they had reached their goal
- B. carried out test flights in Ohio
- C. focused on business instead of flying
- D. went on speaking tours around the world



9. The probable reason the U.S. Army was not interested in the Wrights' plane at first was \_\_\_\_\_.

- A. they thought airplanes would not be useful
- B. they doubted the Wrights had built an effective plane
- C. they already had plenty of airplanes
- D. they had no trained pilots to fly it



10. The Wright brothers grew rich and successful because they \_\_\_\_\_.

- A. took advantage of their fame
- B. learned to do exciting airplane stunts
- C. were clever businessmen
- D. continued to make better planes



11. On the first solo flight across the Atlantic, Charles Lindbergh averaged about \_\_\_\_\_.

- A. 50 miles per hour
- B. 100 miles per hour
- C. 250 miles per hour
- D. 600 miles per hour



12. Judging by the time line, which is not a reason people have flown throughout history?

- A. to fight in wars
- B. to avoid danger
- C. to challenge themselves
- D. to entertain people



13. What do you think the most remarkable feat in the history of aviation was? Explain why.

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Name \_\_\_\_\_ Date \_\_\_\_\_

# Everything Visual

A diagram can show how something works. It uses pictures and labels to explain this. Study the diagrams of the plane parts and terms on pages 12–13. Then answer the questions.

1. Describe how air flows over and under the airplane wings that the Wright brothers made. What is the result of this airflow?

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2. What is the effect of drag on an airplane's movement?

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3. What kind of motion does the wing warp cause in the tips of the wing? What is the purpose of this airplane part?

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4. Explain how the rudder of the Wrights' glider worked.

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5. In the photograph on pages 12–13, is the pilot facing the elevator or in the opposite direction?

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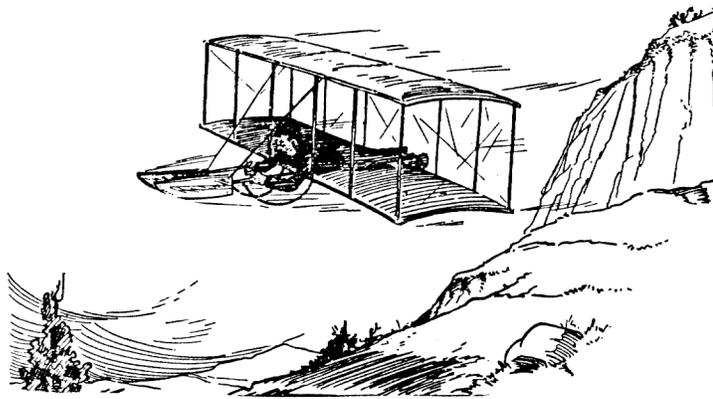
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**H**ave students try these activities to expand their knowledge and interest in the Wright brothers.

## Math, History

Several dates are mentioned throughout the issue. Have students recreate the time line on pages 16–17, with appropriate spacing between the dates. Then have students add to the time line other events mentioned in the issue, such as the year of the Hindenburg disaster, and Orville and Wilbur's birth years. As an alternative, students can simply write events on sticky notes and add them to the time line in the issue. Ask students to create word problems that use the time line, such as "How old was Orville when Lindbergh flew across the Atlantic?"



## Science

Have students research various paper airplane designs. Students can then create some of these planes. Take students outside on a calm day, or to the gymnasium to try out the planes. Encourage students to experiment with the wing, nose, and tail designs by folding parts of the paper planes to see how the flight pattern changes. For example, if you fold the tip of the right wing up, does the plane fly left, right, up, down, or haphazardly? While students experiment, encourage them to share ideas and write their findings on chart paper so other students can try the ideas.

## Language Arts, Art

Have each student find and choose a quotation that mentions flight, such as one about planes, space flight, birds, insects, leaves flying in the air, or how time flies. Here are a few to share:

*O human race, born to fly upward, wherefore at a little wind dost thou so fall?* –Dante

*Our joys as winged dreams do fly;/Why then should sorrow last?/Since grief but aggravates thy loss,/Grieve not for what is past.* –Anonymous

*My words fly up, my thoughts remain below:/ Words without thoughts never to heaven go.* –Shakespeare

*Time is flying never to return.* –Virgil

Students can then write a short paper telling what they think the saying means and how it applies to their lives. Finally, ask students to draw a picture that they feel represents the quote and incorporate the quotation in the picture. As an alternative, students can write and illustrate their own poems about an aspect of flight.

## Social Studies, Language Arts

Have students research a famous flight event, such as the Hindenburg disaster, Amelia Earhart's disappearance, Chuck Yeager's flight, or the landing on the moon. If possible, students should use the Internet to find newspaper articles reporting on the event. Then students can choose to write their own newspaper article on the event, or write and act out a script of a radio or television reporter describing the event.



**Students will love reading KIDS DISCOVER during silent reading time.**



Name **ANSWER KEY** \_\_\_\_\_ Date \_\_\_\_\_

## Get Set to Read

Who were the Wright Brothers? What do you know about them? In Before Reading, write *true* if you think the statement is true. Write *false* if you think the statement is not true. Then read **KIDS DISCOVER *Wright Brothers***. Check back to find out if you were correct. Write the correct answer and the page number where you found it.

**CHALLENGE:** Rewrite each false sentence in a way that makes it true.

Before Reading		After Reading	Page Number
_____	1. Before building flying machines, the Wright brothers repaired bicycles.	<i>True</i>	<i>p. 5</i>
_____	2. A rooster, a duck, and a sheep were passengers on one of the world's first balloon flights.	<i>True</i>	<i>p. 6</i>
_____	3. The Wright brothers chose Kitty Hawk for test flights because of its strong winds.	<i>True</i>	<i>p. 8</i>
_____	4. The brothers tossed a coin to see who would fly on one of their first flights.	<i>True</i>	<i>p. 9</i>
_____	5. After the brothers' first successful flight, <del>they were swamped by attention from the press and public</del> <b>few newspapers printed the news and most readers doubted it.</b>	<i>False</i>	<i>p. 11</i>
_____	6. The Wrights used birds' flight as a model for their planes.	<i>True</i>	<i>pp. 12-13</i>
_____	7. Others before the Wrights had <del>figured out how to control an aircraft</del> <b>solved problems of wing and engine design, but not control.</b>	<i>False</i>	<i>p. 12</i>
_____	8. The purpose of an elevator is to <del>lift a plane off the ground</del> <b>keep it level and steady.</b>	<i>False</i>	<i>p. 13</i>
_____	9. <del>The Wright brothers never got hurt on their test flights.</del> <b>Orville got hurt on a test flight.</b>	<i>False</i>	<i>p. 15</i>
_____	10. The Wright brothers got rich from making airplanes.	<i>True</i>	<i>p. 15</i>



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- B. to avoid danger (*draw conclusions*)
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13. What do you think the most remarkable feat in the history of aviation was? Explain why.

*Answers will vary, but students should provide reasons for their opinion.*



Name **ANSWER KEY** \_\_\_\_\_ Date \_\_\_\_\_

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*The air flows in a curve up and over the top part of the wing and straight under the bottom part. This produces the greatest lift.*

2. What is the effect of drag on an airplane's movement?

*Drag pulls the plane back; it resists the airplane's forward movement.*

3. What kind of motion does the wing warp cause in the tips of the wing? What is the purpose of this airplane part?

*The wing warp makes the wing tips twist or turn up or down. The purpose is to help the pilot control the plane.*

4. Explain how the rudder of the Wrights' glider worked.

*The rudder swung one way or the other. It helped the plane turn right or left.*

5. In the photograph on pages 12–13, is the pilot facing the elevator or in the opposite direction?

*The pilot is facing the elevator.*