

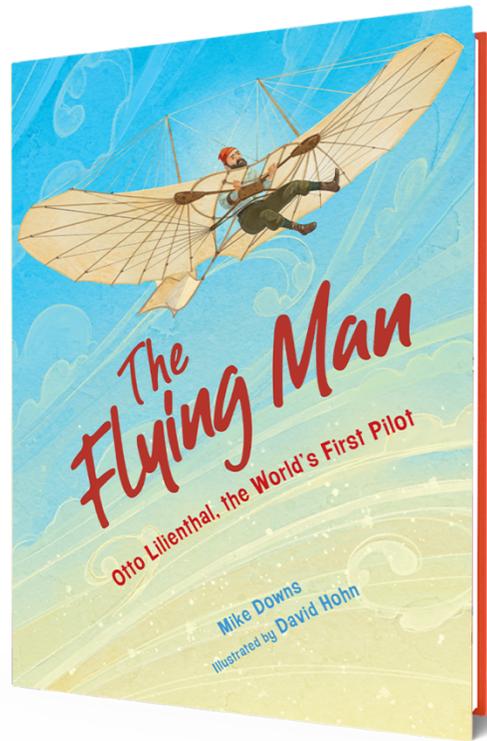
DISCUSSION GUIDE

THE FLYING MAN: OTTO LILIENTHAL, THE WORLD'S FIRST PILOT

Written by Mike Downs
Illustrated by David Hohn

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Grades: 2–5
Ages: 7–10



ABOUT THE BOOK

From a young age, Otto Lilienthal worked tirelessly with his younger brother, Gustav, to realize their dream of flight. Naysayers said flying was impossible, but Otto was convinced they could find a way. For thirty years, Otto and Gustav developed new ideas, created innovative designs, and attempted to fly. And one day, Otto did.

Mike Downs's dramatic and vivid text, along with David Hohn's beautifully detailed artwork, illuminate how the brothers' creativity, curiosity, and tenacity drove the Flying Man to new heights—and inspired others in the nascent field of aviation. Young readers will enjoy taking this soaring journey through the life of a relatively unknown visionary from the early days of attempted flight.

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PRAISE FOR *THE FLYING MAN*

★“Readers will marvel at Lilienthal’s perseverance of his dream over the span of his life and the research he did into the flight of birds as it related to his designs. . . . [and] will enjoy learning about a not very well-known designer and inventor of flying machines, making this book a missing link in collections about aviation and flight.” —*School Library Journal*, starred review

“A soaring tribute to a pioneering German aviator who had a dream and the perseverance to achieve it. . . . The author chronicles years of determined research, observation, trial and error, and crashes as Otto and younger brother Gustav work hard at attaining their goal despite skepticism from those around them.” —*Kirkus Reviews*

DISCUSSION QUESTIONS AND RESEARCH

1. Otto and his younger brother, Gustav, often practiced flying at night in their hometown of Anklam, Germany. Why?
2. What was the only way people could reach the sky in 1862?
3. After the brothers realized their early wing design would not work, they “came up with a new plan.” What were they planning to construct? How long did it take to build?
4. The flapping machine was a “fantastic invention.” How was it made? Did it work?
5. Over the next two years, the brothers “sketched and planned” a new design. Where did the brothers have to build this machine because of its size?
6. The brothers couldn’t make their six-wing machine fly. But they didn’t give up. Months later, Otto was inspired to try a different approach. What inspired him? What did he decide to do differently?

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7. On vacations, Otto and Gustav “continued to test new ideas.” What were some of the ideas they tested? What did they discover about the shape of birds’ wings?
8. “It was twenty years before Otto and Gustav built another full-size flying machine.” What was different about their latest invention? What happened while Gustav and Otto were bringing the new wing to a field to try it out?
9. As Otto practiced and practiced with the new wing, he learned more about how to control it. What were some of the things he had to do to stay aloft?
10. Eventually, Otto’s control of the wing improved, and he soared for longer. Who came to watch him? How often did he practice?
11. What happened on August 2, 1896? Describe Otto’s biplane. What steps did Otto take to get the plane airborne?
12. What did the newspapers nickname Otto?

CURRICULUM CONNECTIONS

- Look at the opening pages of the book again. What are some of the words the author uses to illustrate how physically demanding Otto and Gustav’s early efforts were?
- Otto and Gustav “practiced flying at night so nobody would laugh at them.” Why do you think they thought people would laugh at them?
- “Scientists, teachers, and news reporters everywhere said flying was impossible.” Did Otto believe them? Think of some things that are part of your everyday life now—from cell phones to microwave ovens. Do you think the inventors of those objects encountered doubters along the way? What are some inventions that seem impossible now that could be part of your future?

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- At the end of the book, there is a spread titled, “Trial and Error.” On these two pages, the author summarizes Otto and Gustav’s repeated attempts to create something that would enable them to fly. As early innovators with “no books or instruction manuals on flight,” Otto and Gustav had to rely on their own knowledge and experiments to figure out a machine that would allow them to fly. What are some examples of trial and error in the book? What qualities made Otto and Gustav successful inventors?
- Otto and Gustav’s time working on their invention was limited because they had to earn a living. What were their occupations? Do you think those occupations complemented their interest in flight? Why or why not?
- “The brothers learned an important lesson that day—flying could be dangerous!” In fact, Otto did most of the flying after Gustav once lost control and fell to the ground. Why was flying with the wing unpredictable? What adjustments did Otto make as he glided? What were some of the ways the wind affected his gliding?
- In the afterword, the author shares that Otto died from injuries sustained after he crashed to the ground while flying on August 9, 1896. He was forty-eight years old. He spent over thirty years of his life sketching and designing flying machines and building and testing his inventions. Imagine if Otto were still alive. What would he think about the world of aviation today?

EXTRA CREDIT

- “[T]he force of gravity had held him earthbound.” What is gravity? How do modern aircraft overcome gravity? To learn more, visit [this link](#).
- In the afterword, the author wrote, “[t]he Wright brothers cited Otto Lilienthal as their greatest inspiration.” Who were the Wright brothers?

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- Look at the picture on the back cover of the book. This photograph of Otto Lilienthal is a powerful addition to firsthand accounts of his attempts at flight. When was the camera invented? How were early cameras different from cameras today?
- Today, Otto's hometown of Anklam, Germany, is home to the Otto Lilienthal Museum. Visit the museum's website [here](#).
- An article in *Smithsonian* magazine highlighted Otto Lilienthal's contributions to the field of aviation: "Recently, engineers at DLR, the German aerospace agency, conducted wind-tunnel tests of a full-scale replica of Lilienthal's glider built by the Anklam museum, and came away with renewed respect for what the Flying Man accomplished 125 years ago. Project leader Andreas Dillmann said in a release: 'From an aerodynamic perspective it is an absolutely flawless construction, inherently stable in all flight ranges.' In fact, Dillmann adds, 'Lilienthal's machine was more stable than early Wright brothers' designs tested in NASA wind tunnels.'" Visit [this link](#) to find out more.
- Otto Lilienthal was inspired by the graceful soaring of a stork and by the shapes of birds' wings. Many inventors turn to the natural world for ideas. For more information on inventions inspired by plants and animals, read *Beastly Bionics: Rad Robots, Brilliant Biomimicry, and Incredible Inventions Inspired by Nature* by Jennifer Swanson. See if you can come up with your own idea for an invention inspired by the animal kingdom.

READING LIST

Blast Off! How Mary Sherman Morgan Fueled America into Space by Suzanne Slade

Fearless Flyer: Ruth Law and Her Flying Machine by Heather Lang

Jack Knight's Brave Flight: How One Gutsy Pilot Saved the US Air Mail Service by Jill Esbaum

Wood, Wire, Wings: Emma Lilian Todd Invents an Airplane by Kirsten W. Larson

Guide written by Jane Becker