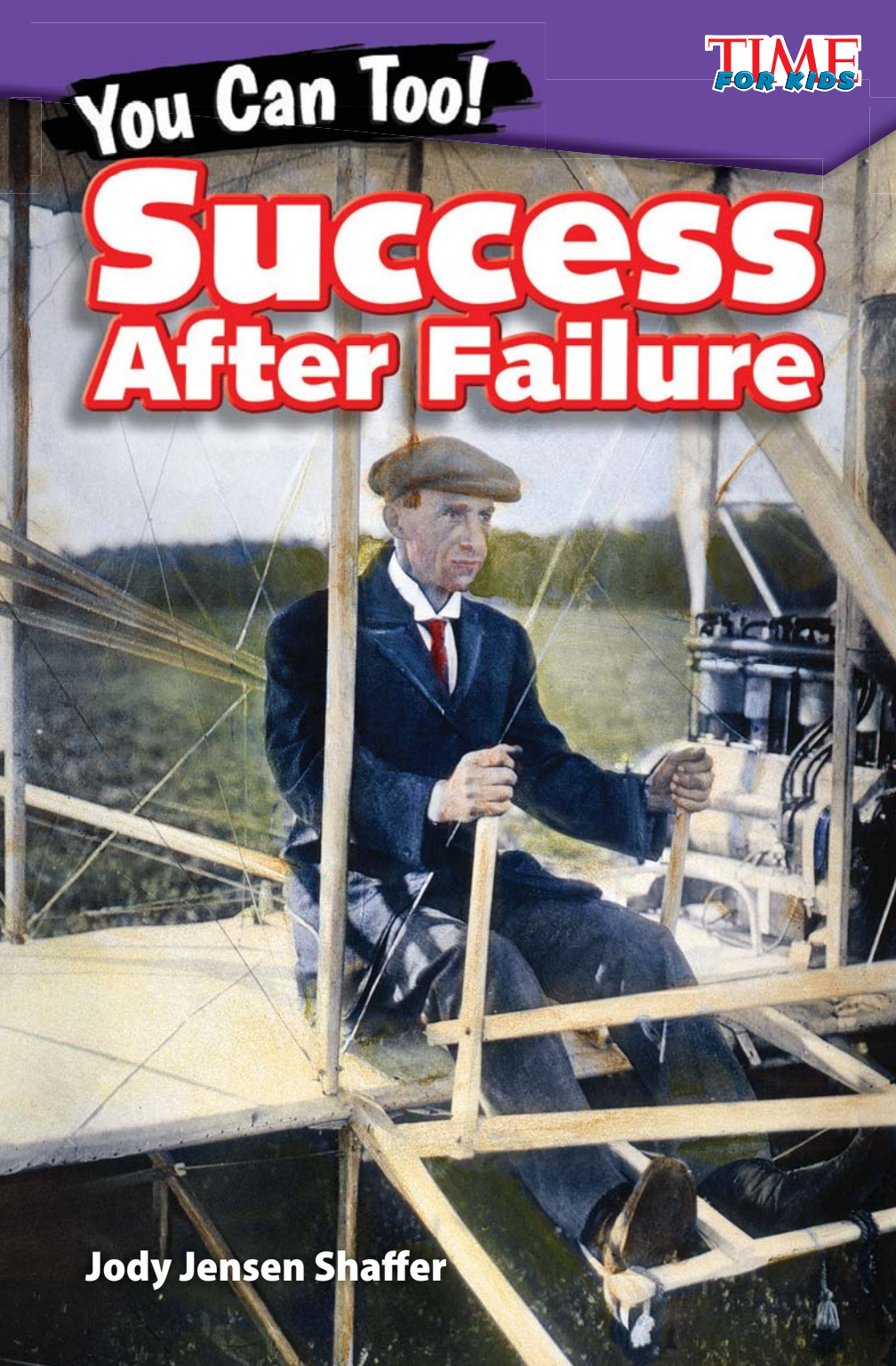
TIME FOR KIDS

You Can Too!

Success After Failure



Jody Jensen Shaffer

Table of Contents

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If at First… 4

1800s: Communication 6

Early 1900s: Convenience 16

Late 1900s and Beyond: Speed..... 28

A Future Like No Other 40

Glossary 42

Index..... 44

Check It Out! 46

Try It!..... 47

About the Author 48



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If at First...

You've probably heard it before: "If at first you don't succeed, try, try again." But what if you don't succeed on the second try or even the hundredth? Should you still keep trying? Definitely, according to the people you'll read about in this book. They all had questions they wanted to answer or problems they wanted to solve. But they didn't succeed on their first attempts. They tried new methods and materials, or they waited for science or technology to catch up with them. Many faced **criticism** and **ridicule**, but these inventors kept trying until they achieved success.

The Snowmobile

In 1922, 15-year-old Joseph-Armand Bombardier (ARE-mone BOM-bar-deer) strapped the engine of a Model T Ford to two wooden sleds. His vehicle traveled well through the snow. But Bombardier's dad made him take it apart. He thought it wasn't safe. Bombardier didn't let that stop him. In 1935, he built the first successful (and safe) snowmobile.



Bombardier's first vehicle on display



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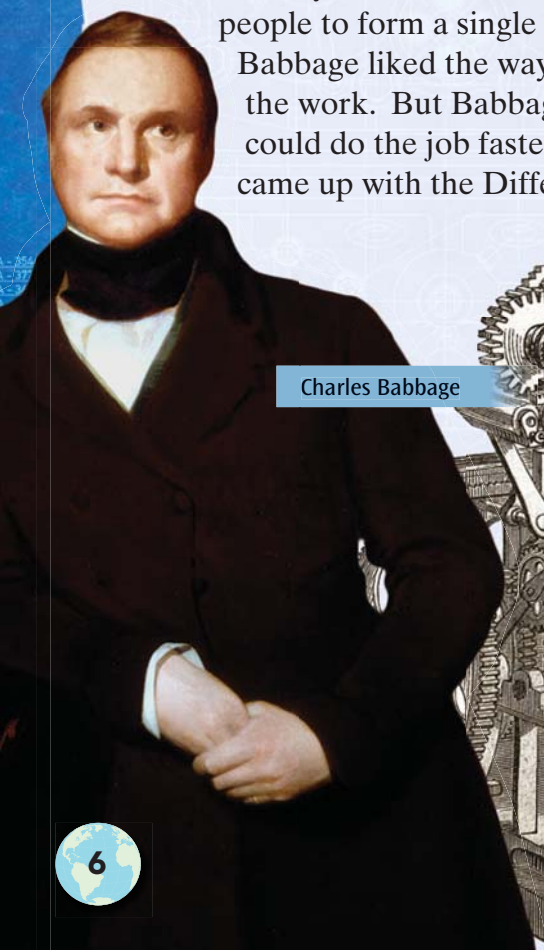
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1800s: Communication

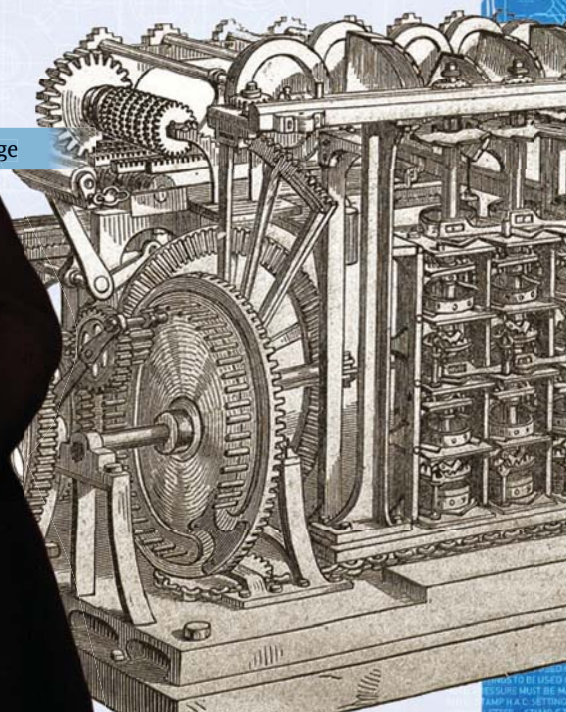
Mark Twain once wrote, "The man with a new idea is a **crank** until the idea succeeds." The inventors in this chapter would probably agree.

Babbage's Difference Engine

Around 1820, Charles Babbage saw a set of math tables that sparked an idea. A Frenchman named Gaspard de Prony (gas-PAHR DEE proh-nee)made the tables years before. He had hired hundreds of people to form a single system of measurement. Babbage liked the way de Prony had split up the work. But Babbage thought a machine could do the job faster and better. So, he came up with the Difference Engine.



Charles Babbage



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Making Her Mark

While building his machine, Babbage met a young woman named Ada Lovelace (shown below). She was amazed by Babbage's work. She had studied in London and was skilled in both math and science. Lovelace came up with a code for the engine that would allow it to handle letters and symbols as well as numbers, but it was never used. Some of her ideas are still used in computer programs today.



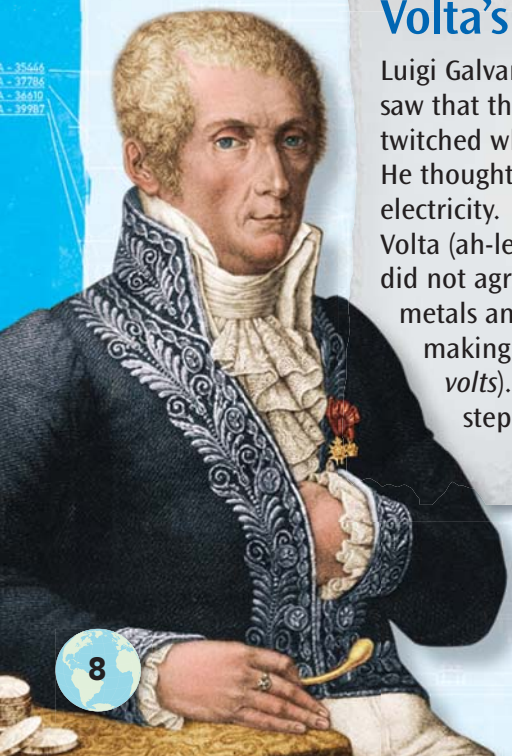
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Babbage's Difference Engine could add and subtract. But, it could not multiply or divide. In 1832, Babbage built a **prototype**. He spent the next seven years working on his project. Then he ran out of money. He was **dejected**, but he did not give up. Instead, he started to work on an even better machine that he called the Analytical Engine.

The new machine could multiply and divide. But, Babbage could not afford to finish this machine, either. So, he began work on the Difference Engine 2. Years passed, but Babbage never finished any of his engines. Some people might see this as a failure. However, his inventions paved the way for others to develop today's computers.

Volta's Volts

Luigi Galvani (loo-EE-jee gal-VON-ee) saw that the legs of dead frogs twitched when they touched metal. He thought the animals contained electricity. Another man, Alessandro Volta (ah-lee-SAHN-droe VOL-tuh), did not agree. He proved it was the metals and wet cloths that were making electricity (now called *volts*). Volta had taken the first step in making a battery.



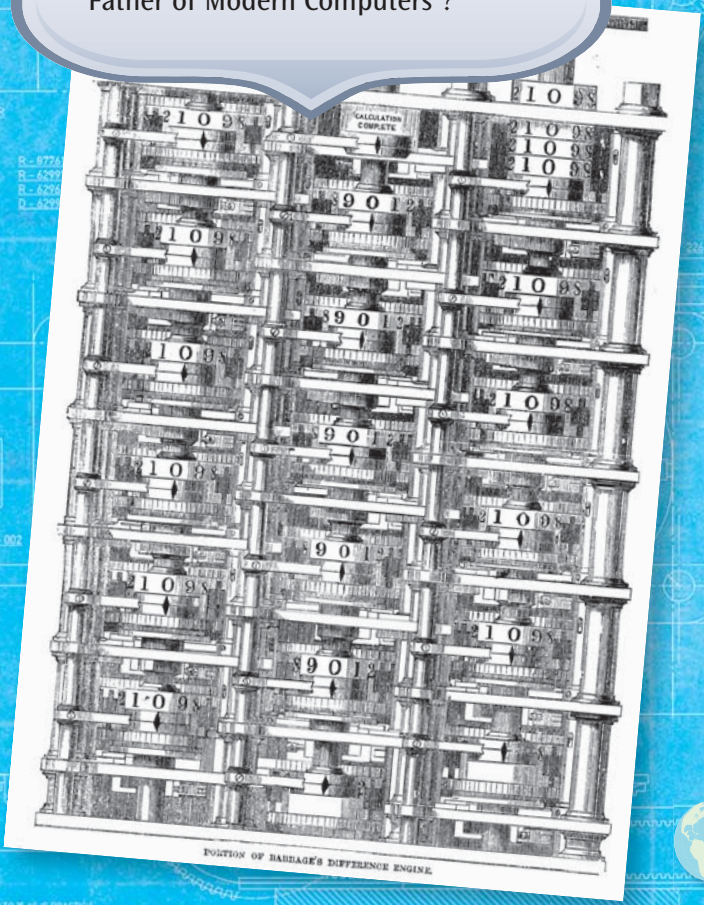
Alessandro Volta

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STOP! THINK...

This is a drawing of Charles Babbage's Difference Engine, a machine designed to **compute** numbers.

- What other machines does this drawing remind you of?
- How might the history of computers be different if he had finished this machine?
- Why might people call Babbage the "Father of Modern Computers"?



PORTION OF BABBAGE'S DIFFERENCE ENGINE.

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Reader's Guide

1. What are some advantages that cameras today have over Polaroid cameras?
2. Why did it take Joe Woodland's invention so long to become popular?
3. What were some of the obstacles Charles Babbage had to overcome with his inventions?
4. Why did Wilhelm Roentgen's wife think she had seen her own death after her hand was X-rayed?

