

# Inventor of the Computer Age: Alan Turing

The father of modern computer science.

**Genre:** History, Military, People, Science and Technology

**"A man whose ideas led to modern computing and cryptology."**

If someone were to list the great inventors and visionaries of the Computer Age, names like Steve Jobs and Bill Gates would probably be near the top.

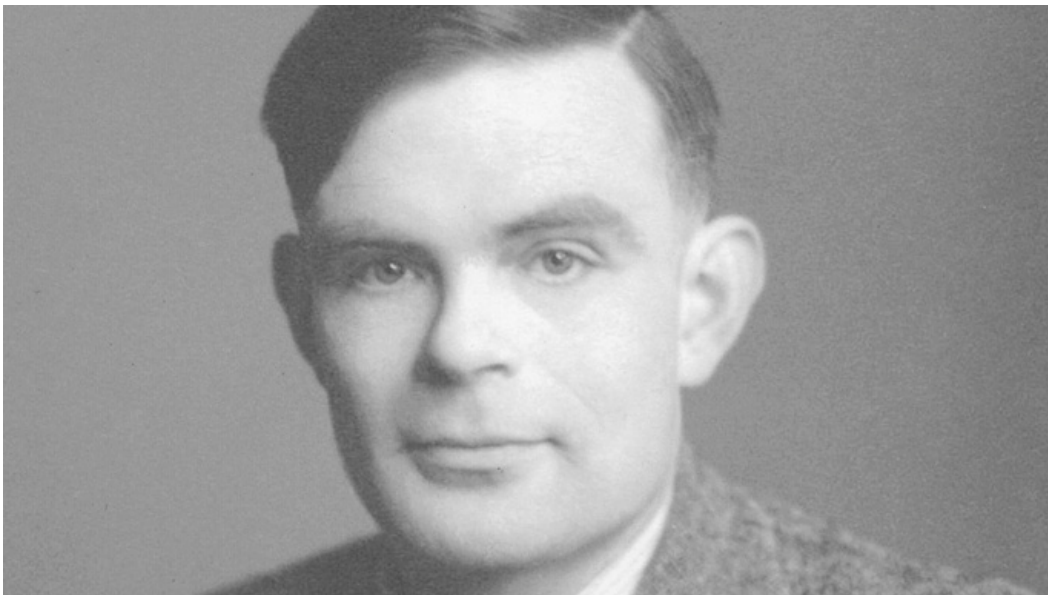


**Bill Gates (left) is the founder of Microsoft and Steve Jobs (right) is the founder of Apple.**

That makes sense as both Jobs and Gates helped popularize affordable home computers. But despite their fame, Gates and Jobs weren't the first people to actually invent computers. Like almost all inventions, their success in innovation was built upon the shoulders of those who came before.

Think of it like inventing pizza. Pizza couldn't come out of anywhere. To get to pizza, we first had to invent crust, sauce, cheese, and toppings. People like Gates and Jobs bring cheese and delicious toppings. Charles Babbage, credited as the inventor of the first computer, brought the crust.

But what about the secret sauce that keeps it all together? Well, look no further than Alan Turing.



**Alan Turing (1912-1954) was an English mathematician and computer scientist who is often credited as being the father of modern computer science.**

Turing was a hero of WWII and the innovative genius who laid the groundwork for all of computer science and the eventual development of the computers we know today. In other words, the secret sauce of the computer world.

# A Life of Education and Curiosity

Turing was born in London in 1912. At a young age, he displayed an incredible aptitude for science. This caused some friction with his teachers, who defined education as reading classic books in Latin and Greek. Despite pressure from his school, Turing refused to give up his scientific curiosity.



**Turing at 16 years of age at Sherborne School where he was mostly interested in learning mathematics and science.**

Eventually, he graduated with such high grades that the prestigious King's College in Cambridge sought him out to study mathematics. His teachers may not have seen it yet, but the world was changing.

After graduating in 1934, he became a fellow at the university in 1935. That means he went from student to working alongside professors in less than a year! He would eventually complete his Ph.D. in Mathematics at Princeton in 1938, making him one of the foremost mathematicians of the time.

## The Fight to End WWII and its Greatest Enigma

In 1939, WWII began in Europe. The United Kingdom quickly turned its attention to defeating Nazi Germany. To do his part, Turing joined what was called the Bletchley Park Code Breakers, a highly classified team of experts whom the UK government gathered to break the German Enigma machine.

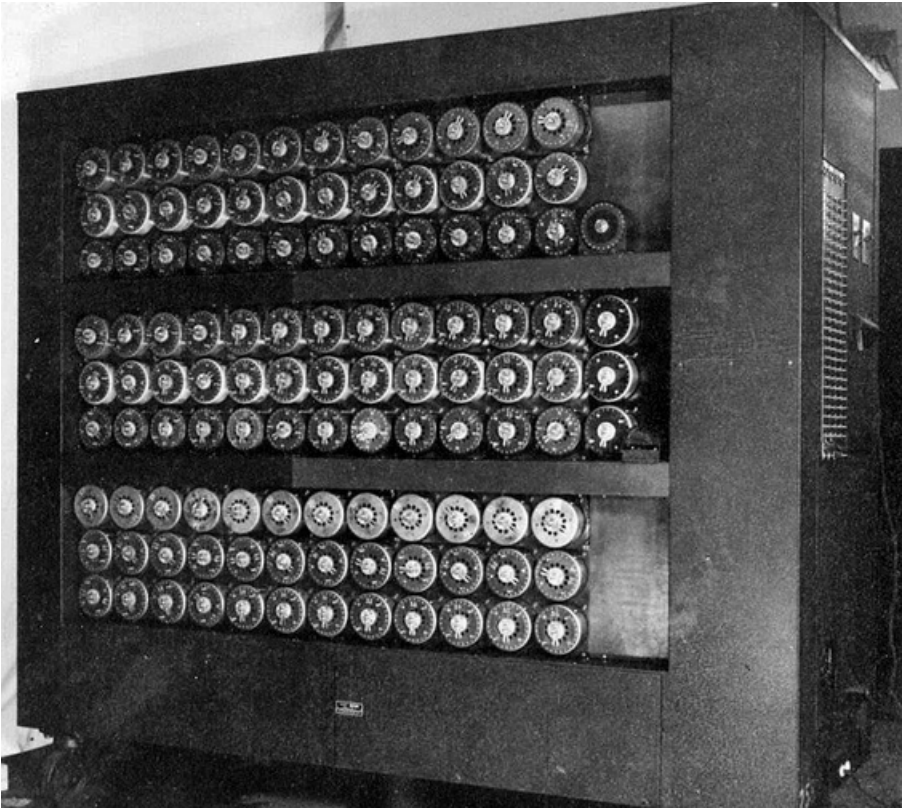


**One of the only photos of the Bletchley Park Code Breakers who worked as codebreakers at the height of the war.**



The Enigma machine encrypted German messages into a nearly unbreakable code. This meant the allied forces in Europe had no way of understanding the messages, even if they managed to steal them.





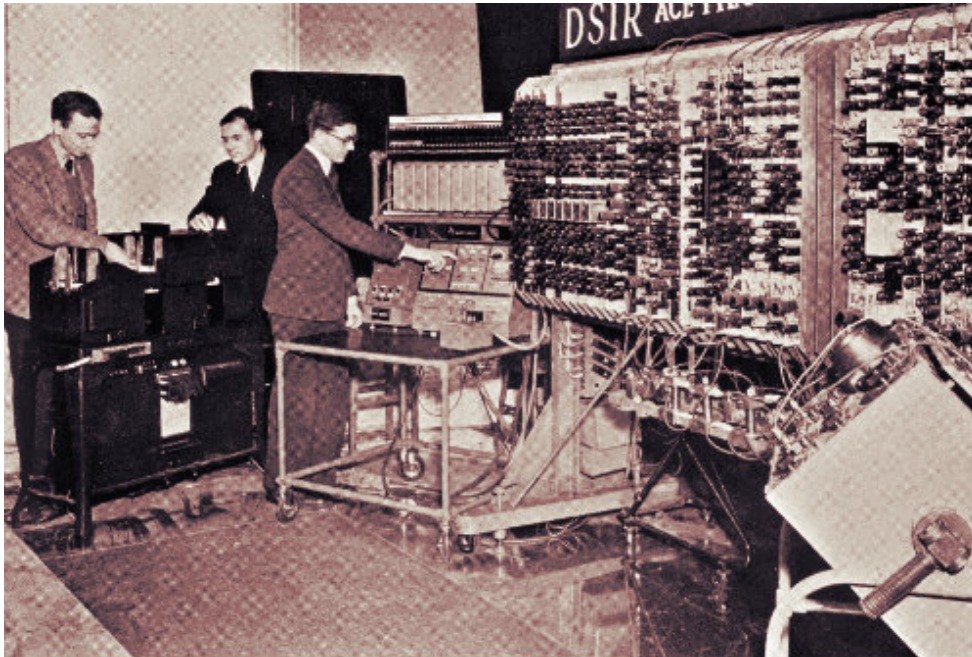
**The Bletchley Park Bombe was used by code breakers like Turing to decipher secret messages during World War II.**

Breaking Enigma was seen as an impossible task. However, Turing's hard work at Bletchley Park and curiosity to think outside the box are how they eventually cracked the code of Enigma. Essentially, their solution was to make the world's first search engine (sort of like Google) and use keywords to break Enigma down. By decoding secret Axis\* communications, the Allies\* finally had an advantage in the war.

Looking back, experts have outlined how Turing's work alongside other code breakers on his team likely shortened WWII by years because it allowed the allies to react to German plans before they happened.

## Post-War Work on Computers

After the war, Turing's fascination with the possibilities of computers only grew. At the time, computers were vastly different from what we know today. A computer was a machine capable of only computing – which meant it only performed basic mathematical tasks such as adding, subtracting, and dividing.



**By 1942 Alan Turing's team were decoding 39,000 messages made by the German Enigma machines per month.**

They were basically just machines with a series of buttons and levers rather than a keyboard. And instead of a screen to display the information, they printed punch cards to deliver the results of basic computations. A lot less than what the smartphone in your pocket can do.

Despite the primitive nature of computers at the time, Turing envisioned a future where computers could be intelligent and perform vast calculations in the blink of an eye. His interest in this "artificial intelligence (AI)" led him to develop the Turing Test – a way of determining if a machine was intelligent. To explain this test, Turing stated.

**"A computer would deserve to be called intelligent if it could deceive a human into believing that it was human."**

Sort of like a really convincing bot. Though computers were far from reaching this level of sophistication at the time, his work successfully predicted the levels of advancement computers would one day reach.

Today, AI is a growing field of study, and it's a constant wonder when and if machines will grow beyond our intelligence. If AI continues to advance as it does now, with things like AI art and writing, something like the Turing test may be necessary to determine humans from computers.

Weird to think about, isn't it?

# Reflecting on Turing

Although Turing was an extremely gifted student with a love for problem-solving and theoretical mathematics, he often struggled with social skills. This led some people to envision him as eccentric or a loner who struggled to work with others. But that wasn't the whole truth.



**Alan Turing and colleagues working on the Ferranti Mark I Computer, 1951.**



Turing also understood that great thinkers and inventors of the world are not isolated people. To him, nothing is ever invented alone – like pizza or computers.

To be a great thinker or inventor, it's important to surround yourself with people you can learn from. As the old adage goes: "If you're the smartest person in the room, find a different room." Turing added to that idea. He said

**"The isolated man does not develop any intellectual power. He must be immersed in an environment of others...The search for new techniques must be done by the human community as a whole, rather than by individuals."**

\*The Axis powers consisted of Germany, Italy, and Japan.

\*\*The major Allied powers consisted of Britain, the United States, and the USSR.

 **Good to Think About**



1. Who was Alan Turing?

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2. What did Alan Turing achieve during his lifetime?

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3. What is the "Turing Test"?

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4. What role did Alan Turing play in developing the computer technology we use today?

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5. What is Alan Turing most remembered for today?

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## Key Vocabulary

- inventor
- visionary
- popularise
- innovation
- aptitude
- calculation
- sophistication
- intelligence
- theoretical
- eccentric



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