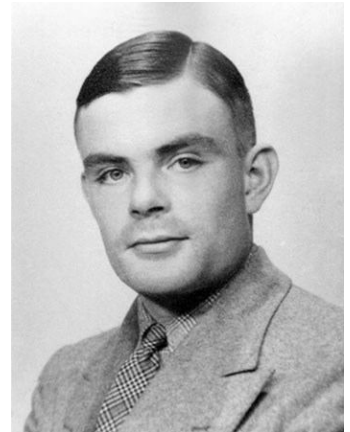


# Alan Turing — Biography

Adapted from <https://www.biography.com/scientist/alan-turing>

## Mathematician, Educator (1912–1954)

The famed code-breaking war hero, now considered the father of computer science and artificial intelligence, was criminally convicted and harshly treated under the U.K.'s homophobic laws.



### Who Was Alan Turing?

Alan Turing was a brilliant British mathematician who took a leading role in breaking Nazi ciphers during WWII. In his seminal 1936 paper, he proved that there cannot exist any universal algorithmic method of determining truth in mathematics, and that mathematics will always contain undecidable propositions. His work is widely acknowledged as foundational research of computer science and artificial intelligence.

### Early Life

English scientist Alan Turing was born Alan Mathison Turing on June 23, 1912, in Maida Vale, London, England. At a young age, he displayed signs of high intelligence, which some of his teachers recognized, but did not necessarily respect. When Turing attended the well-known independent Sherborne School at the age of 13, he became particularly interested in math and science. [...]

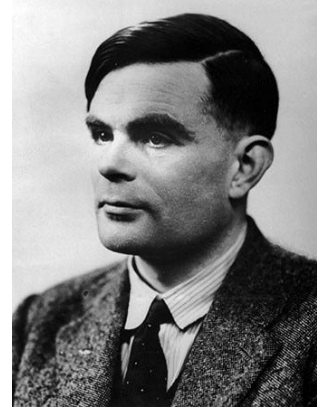
In 1936, Turing delivered a paper, "On Computable Numbers, with an Application to the Entscheidungsproblem," in which he presented the notion of a universal machine (later called the "Universal Turing Machine," and then the "Turing machine") capable of computing anything that is computable. It is considered the precursor to the modern computer. Over the next two years, Turing studied mathematics and cryptology at the Institute for Advanced Study in Princeton, New Jersey. After receiving his Ph.D. from Princeton University in 1938, he returned to Cambridge, and then took a part-time position with the Government Code and Cypher School, a British code-breaking organization.

### Cryptanalysis and Early Computers

During World War II, Turing was a leading participant in wartime code-breaking, particularly that of German ciphers. He worked at Bletchley Park, the GCCS wartime station, where he made five major advances in the field of cryptanalysis, including specifying the bombe, an electromechanical device used to help decipher German Enigma encrypted signals. [...] Turing moved to London in the mid-1940s, and began working for the National Physical Laboratory. Among his most notable contributions while working at the facility, Turing led the design work for the Automatic Computing Engine and ultimately created a groundbreaking blueprint for store-program computers. [...]

## Homosexuality, Conviction and Death

Homosexuality was illegal in the United Kingdom in the early 1950s, so when Turing admitted to police, called to his house after a January 1952 break-in, that he'd had a sexual relationship with the perpetrator, 19-year-old Arnold Murray, he was charged with gross indecency. Following his arrest, Turing was forced to choose between temporary probation on the condition that he receive hormonal treatment for libido reduction, or imprisonment. He chose the former, and soon underwent chemical castration through injections of a synthetic estrogen hormone for a year, which eventually rendered him impotent.



As a result of his conviction, Turing's security clearance was removed and he was barred from continuing his work with cryptography at the GCCS, which had become the GCHQ in 1946.

Turing died on June 7, 1954. Following a postmortem exam, it was determined that the cause of death was cyanide poisoning. The remains of an apple were found next to the body, though no apple parts were found in his stomach. [...]

## Awards, Recognition and Royal Pardon

Shortly after World War II, Alan Turing was awarded an Order of the British Empire for his work. [...]

In June 2007, a life-size statue of Turing was unveiled at Bletchley Park, in Buckinghamshire, England. A bronze statue of Turing was unveiled at the University of Surrey on October 28, 2004, to mark the 50th anniversary of his death. Additionally, the Princeton University Alumni Weekly named Turing the second most significant alumnus in the history of the school — James Madison held the No. 1 position. [...]

In 2013, Queen Elizabeth II posthumously granted Turing a rare royal pardon almost 60 years after he committed suicide. Three years later, on October 20, 2016, the British government announced "Turing's Law" to posthumously pardon thousands of gay and bisexual men who were convicted for homosexual acts when it was considered a crime. According to a statement issued by Justice Minister Sam Gyimah, the law also automatically pardons living people who were "convicted of historical sexual offenses who would be innocent of any crime today."

In July 2019, the Bank of England announced that Turing would appear on the UK's new £50 note, along with images of his work. The famed scientist was chosen from a list of nearly 1,000 candidates nominated by the general public, including theoretical physicist Stephen Hawking and mathematician Ada Lovelace.

