Alan Turing and the Enigma

Who Was Alan Turing?

Alan Turing was a British mathematician. During the Second World War, he worked as a codebreaker, cracking German codes created by Enigma machines. His work was pivotal in the Allies' victory.

Alan Turing was born on 23rd June 1912. He had an older brother called John. Their father worked for the British civil service in India.

Turing's parents wanted their sons to be raised in Britain so the boys stayed with family friends while their parents were in India.

Alan Turing's Education

When Turing was 13, he went to a boarding school called Sherborne School. At the time, the school did not place much emphasis on mathematics and science so Alan felt quite discouraged.

While at the school, his close friend Christopher Morcom died of a disease called tuberculosis. Turing's grief inspired him to dedicate himself to scientific discoveries.

He later won a scholarship to study mathematics at King's College, Cambridge. He obtained a degree in mathematics with distinction.
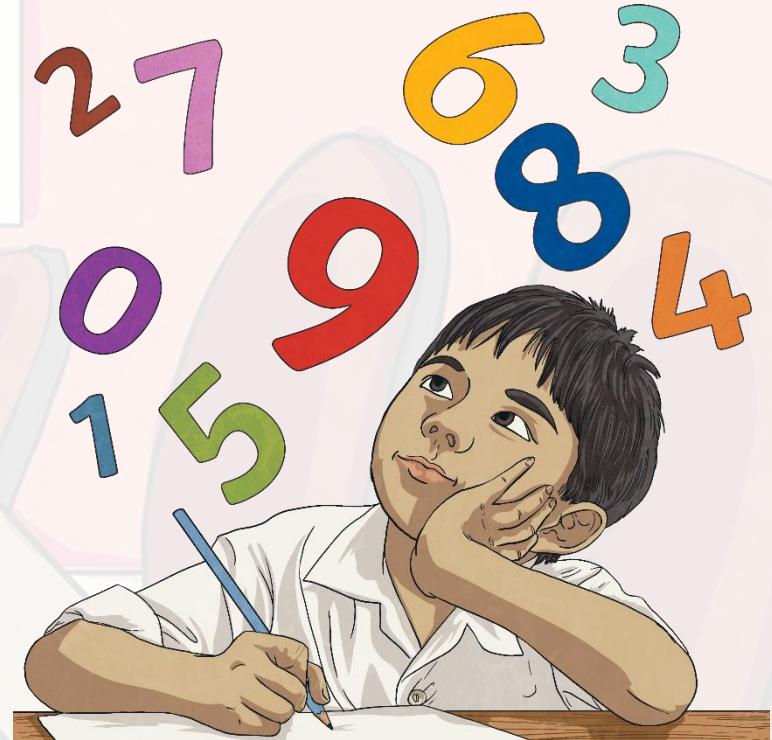
The Universal Machine

In 1936, Turing created the idea of a special machine that could follow simple codes. He called this the 'Universal Machine'.

These machines are now known as a 'Universal Turing Machine' and they formed a lot of the ideas behind computing.
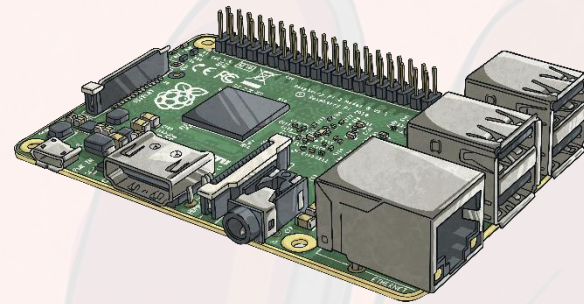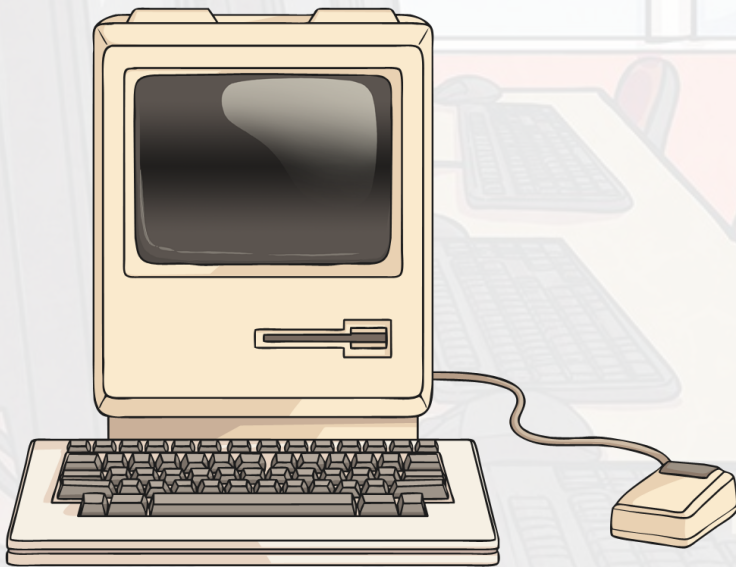
Second World War

Cryptanalysis is the study of **encrypted** messages. During the Second World War, Germany sent encrypted messages about its military strategies. To win the war, it was vital that the Allies were able to decode these messages.

A team of workers at a place called Bletchley Park were set the task of decoding these messages.

Encrypted – where information is changed into a code so it can only be understood by the recipient.

Second World War

Not long after the First World War, a German man named Arthur Scherbius invented a machine called the Enigma.

The Enigma was a machine that looked like a typewriter. As you typed in your message, a different letter lit up. The message was converted into a code using these illuminated letters. The person receiving the message also had an Enigma. When they typed in the coded message, the letters from the original message lit up and it could be read. This meant that orders could be passed secretly.

Bletchley Park

Bletchley Park is a stately home in Buckinghamshire. During the Second World War, it was the home of the Government Code and Cipher School (GC&CS).

Turing started work at Bletchley Park. Soon after his arrival, he had devised a way of cracking the German's code. He invented something called a 'Bombe', which tried out lots of different solutions for breaking a code before finding the correct one.

Although the 'Bombe' was successful, Bletchley Park didn't have enough machines or the workers to read all the German messages. Turing wrote to the prime minister, Winston Churchill. Before long, Bletchley Park had more workers and more 'Bombes'.

The Impact of Turing's Work

Breaking the German code meant the Allies knew when and where attacks were planned.

Without Turing's discovery, military experts believe that the Second World War could have carried on for another two years. Consequently, millions of lives were saved.
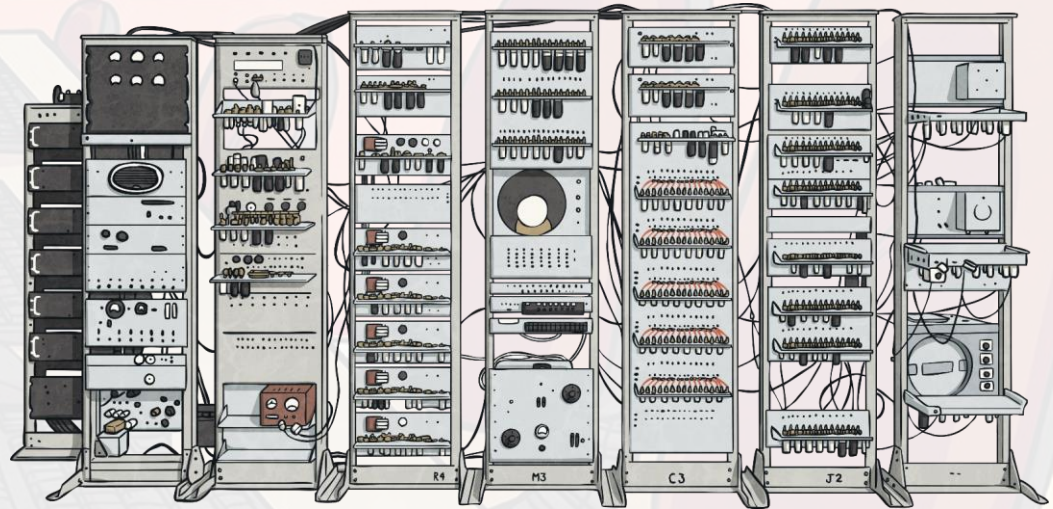
Turing's Work

Turing was awarded the OBE (Order of the British Empire) in 1946 for his wartime work.

He died on 7th June 1954.

On 15th July 2019, the Bank of England announced that Alan Turing's image will be featured on the new £50 note, which is due to enter circulation in 2021.
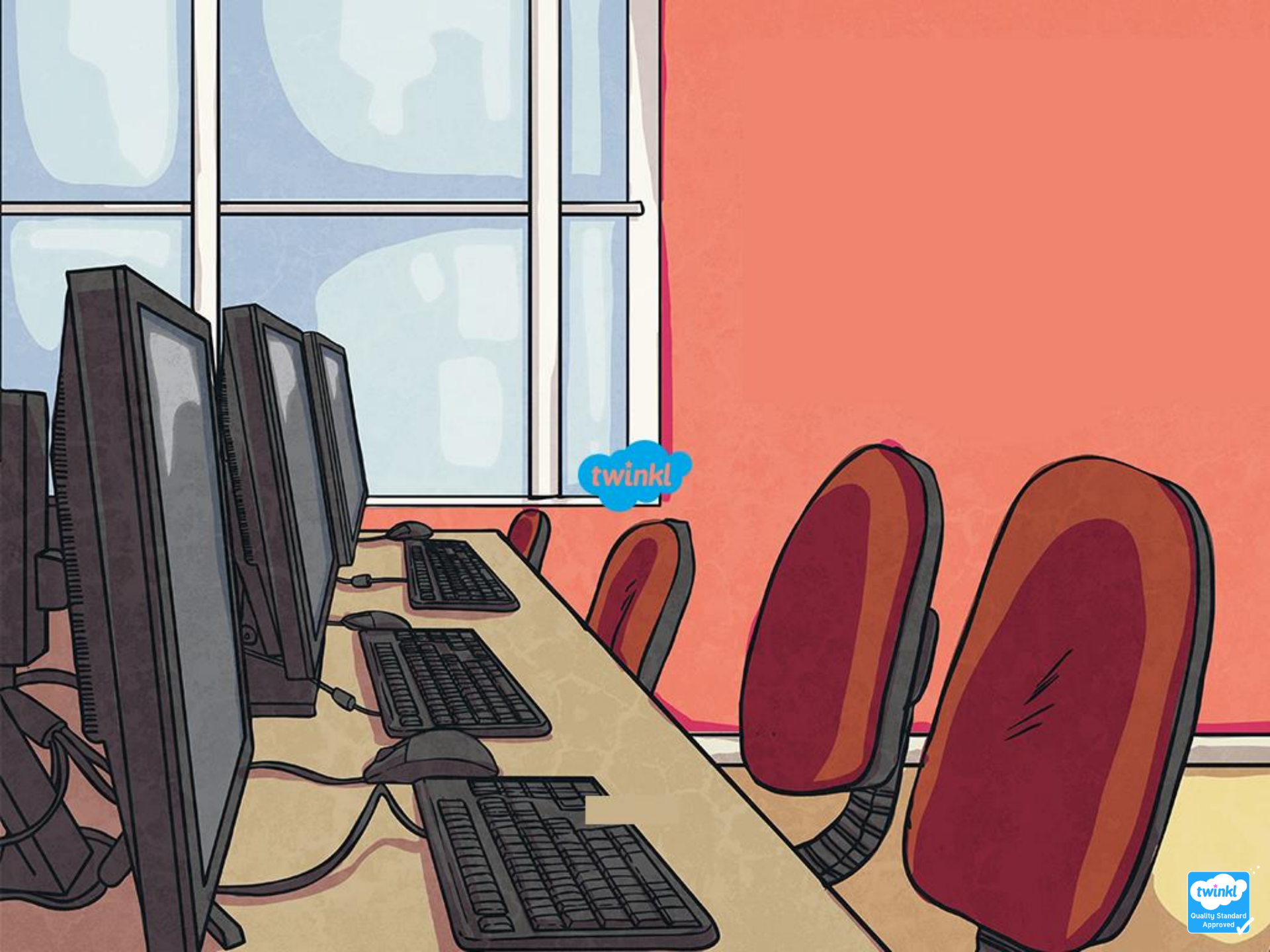
Try It!

Try making your own Enigma code. Swap each letter in the alphabet with another one. For example, 'A' might become 'Q' and 'R' might become 'E'.

Once each letter has been allocated a different letter, write a coded message to your partner. Give them some clues: tell them which letter represents 'E', 'T' and 'H'. Can your partner work out the message? They might need to be given a few more letters.

A = Q, R = E, T = B, H = O