

# TEACHING CHARACTER

THROUGH THE PRIMARY CURRICULUM

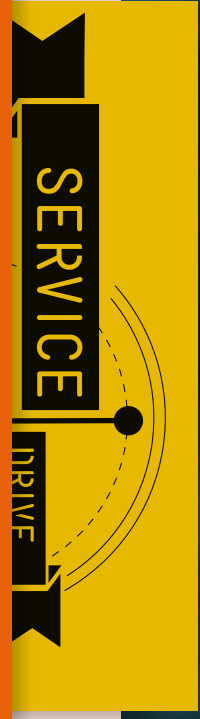
A CROSS-CURRICULA APPROACH  
TO TEACHING CHARACTER

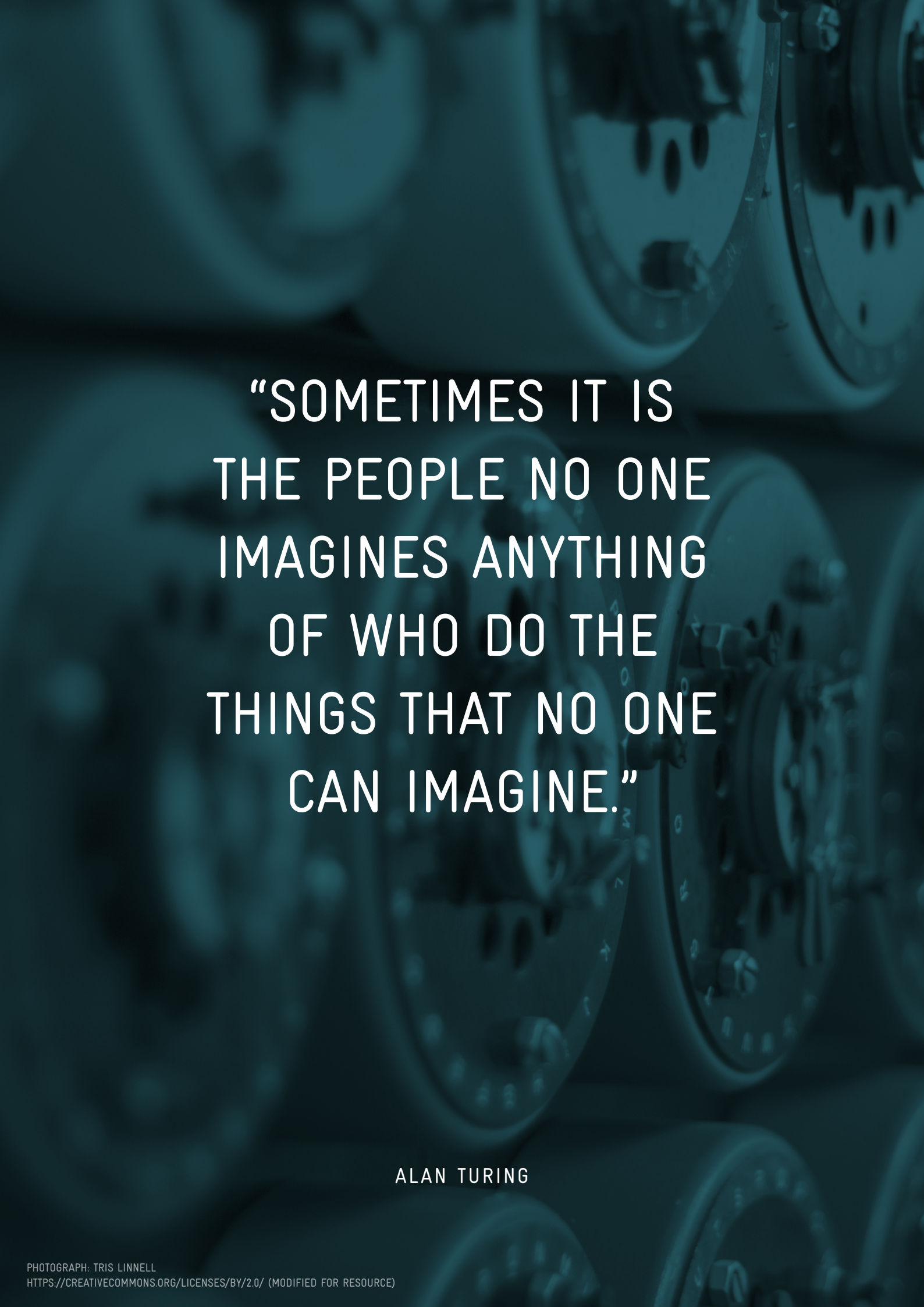
## CODEBREAKER

VIRTUE: SERVICE - SUBJECT: COMPUTING



THE  
JUBILEE CENTRE  
FOR CHARACTER & VIRTUES





“SOMETIMES IT IS  
THE PEOPLE NO ONE  
IMAGINES ANYTHING  
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ALAN TURING

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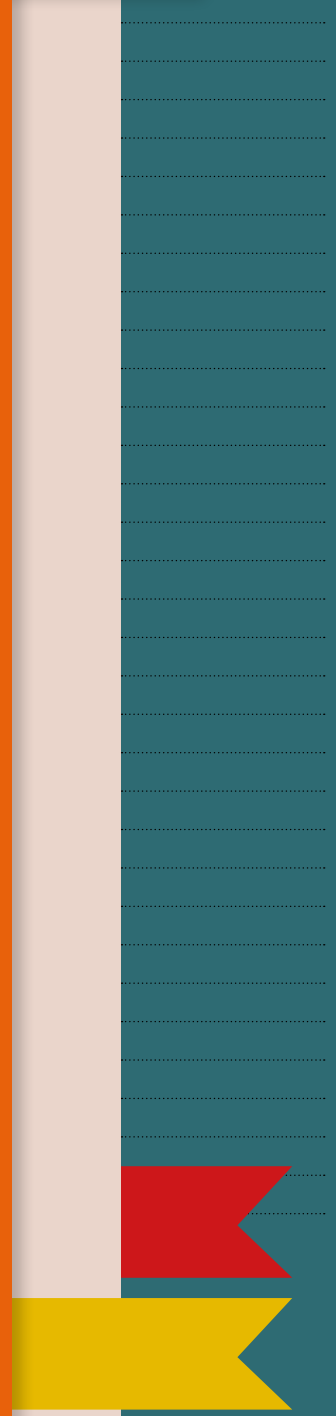
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TEACHER'S NOTES

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# TEACHING CHARACTER



## CODEBREAKER — ALAN TURING

### TEACHER'S NOTES

The purpose of this pack is to reaffirm and develop pupils' knowledge and understanding of character virtues, with particular reference to the primary virtue of **service** and the secondary virtues of resilience, drive and curiosity. These virtues should be highlighted as important to a successful transition from Year 6 (Key Stage 2 Primary) to Year 7 (Key Stage 3 Secondary). To accompany these Teacher's Notes, Codebreaker – Pupil Activity, Codebreaker Narrative and a PowerPoint are downloadable via the Jubilee Centre for Character and Virtues website.

#### THE FOLLOWING SUPPORTING DOCUMENTS ARE ALSO PROVIDED ONLINE:

- Teaching Character Through the Primary Curriculum Introduction Materials
- Pre-lesson Virtue Toolkit including activities on the following virtues: Curiosity, Courage, Focus, Resilience, Integrity, Drive, Charity and Service.
- Service PowerPoint
- Other narratives in the programme including: John Simpson, Winston Churchill, Emmy Noether, Luz Long, Wangari Maathai, Gertrude Elion and a Local Hero.

#### BACKGROUND INFORMATION FOR TEACHERS:

This information is to supplement the Service PowerPoint, which provides opportunities to discuss the virtue of service. The 'Codebreaker' Narrative is available online and can be printed off for pupil use. The 'Codebreaker' Narrative in this pack gives an abridged account of Alan Turing's life during the Second World War. For reasons of space, this version focuses, in the main, on the challenges Turing faced and his use of the virtue service. The main emphasis of the narrative is to provide sufficient evidence of Turing's service and dedication to codebreaking during World War II for classroom discussion. The extract provides opportunities to discuss Turing's virtues and disposition. The aim is for this lesson to open a discussion about service and the secondary virtues in focus (resilience, drive, curiosity). Children should be given the opportunity to reflect on their learning and how these virtues are present in their own life.

Teachers may well wish to expand and develop work here, using direct links to the Computing curriculum and cross-curricula links to English, History or Maths. These resources and lesson plans provide a guide and teachers are encouraged to adapt them to best suit the needs of their classroom.

#### OTHER RESOURCES

- <http://www.bbc.co.uk/timelines/z8bgr82> – BBC iWonder Alan Turing: Creator of modern computing
- <http://www.biography.com/people/alan-turing-9512017> – Biography
- <http://www.bletchleypark.org.uk/> – Bletchley Park official website
- <http://www.history.co.uk/study-topics/history-of-ww2/code-breaking> – Codebreaking during WW2



# LESSON PLAN

## CODEBREAKER

This lesson plan, with accompanying PowerPoint, is a guide for teachers in how to best use the pupil resources provided. This plan should provide inspiration and is a suggested way to conduct a lesson to meet the objectives stated. Teachers are encouraged to adapt and develop this plan to best suit their class. The corresponding Virtue Toolkit lesson should be taught pre-lesson and the Virtue Glossary could be provided throughout the lesson to aid pupils' understanding. Teachers should use a selection of different methods and processes to facilitate discussion and reflection on the primary and secondary virtues in focus. It is important pupils become aware of the virtues and their meaning, but discussion and reflection will also aid pupils' understanding of them. Teachers may need to differentiate this lesson to best suit their pupils' needs; paired, shared, group or guided work is encouraged where needed.

**TITLE: CODEBREAKER – ALAN TURING**

**PRIMARY VIRTUE: SERVICE**

**CURRICULUM LINK: COMPUTING – CODING**

**POSSIBLE CROSS-CURRICULA LINKS:**

ENGLISH – BIOGRAPHIES AND AUTOBIOGRAPHIES

ENGLISH – REPORTS AND JOURNALISTIC WRITING

HISTORY – A STUDY OF A THEME IN BRITISH HISTORY

MATHS – CODEBREAKING/ALGEBRA

### LEARNING OBJECTIVES

1. To understand what the virtue of service means in the life of Alan Turing.
2. To accurately identify vocabulary that illustrates the virtue of service in the 'Codebreaker' Narrative.
3. To begin to be able to retrieve information from the narrative that illustrates a wider selection of virtues.

### LEARNING OUTCOMES

1. To be able to identify and describe the virtue of service and begin to relate it to their own lives.
2. To begin to discuss how different virtues occur together in positive or negative ways.
3. To begin to be able to relate the virtue of service to the period of transition from Year 6 to Year 7.

### RESOURCES

Provided: Codebreaker Narrative, Codebreaker Teacher's Notes, Codebreaker Pupil Activity, Service PowerPoint, I Will cards.

Not Provided: Interactive White Board, Flipchart, Pens, Paper

### INTRODUCTION

Introduce/affirm the meaning of character and virtue. Introduce the definition of service (beginning of Service PowerPoint).

5 MINUTES

### TEACHER LED ACTIVITY

20 MINUTES

Show PowerPoint slide and get children to discuss in partners or groups how the people in the 6 photographs have shown service. Also, ask children who they are showing service towards. Give children time to reflect and ask them if these people are likely to show any other virtues (glossary provided). Why? How? Ask if showing too much service could have negative consequences. Can children think of examples? Move on to next slide and get children to reflect on their lives. When and how do they show service? Encourage discussion as a class. Introduce Alan Turing and tell the children he was a codebreaker. Do not reveal too much information.

### CHILD LED ACTIVITY

25 MINUTES

Allow pupils time to read/or read to the pupils the 'Codebreaker' Narrative, instructing them to look closely for when the virtue in focus is displayed (provide highlighters if appropriate). Children must also reflect on secondary virtues (resilience, drive, curiosity) in the narrative and how these may have helped or hindered Turing and his codebreaking. Were these virtues always positive? Did they have any negative consequences? Children then answer questions from the activity sheet. Model if necessary.

### PLENARY

10 MINUTES

Bring the group together to discuss the examples of service found within the life of Alan Turing and how these may have developed or clashed with other virtues. Invite them to share their examples. Explain how this virtue will be important for when the children transition to Year 7. Provide 'I will' cards and get the children to write a statement of intent – one thing they will now do in regards to this virtue. Make sure they are achievable.

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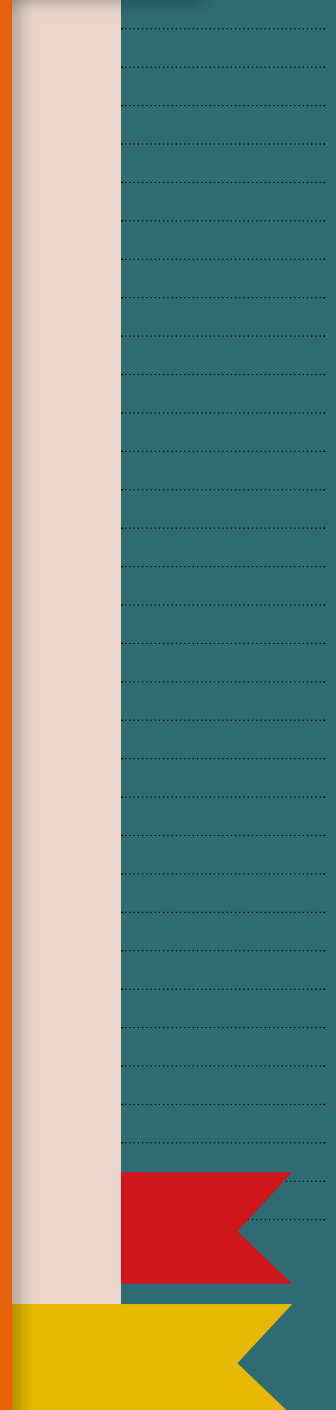
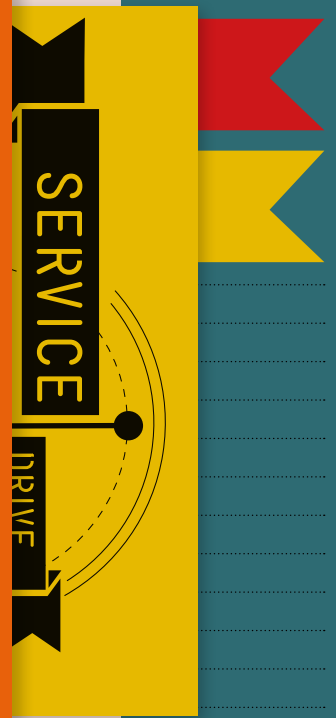
## CODEBREAKER

MAIN NARRATIVE

VIRTUE: SERVICE – SUBJECT: COMPUTING



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## ALAN TURING

It was clear to many who knew him from an early age that Alan Turing was meant to achieve special things. Turing was born in 1912 and while still at school, he was able to solve complex problems without needing to be taught how to tackle them. Many of his teachers did not know what to do with Turing.

How could they teach a boy who did not need to be taught to find the right answers? Turing showed a great curiosity to learn new things. However, even though Turing showed a great skill for solving problems, he struggled in other subjects and failed several of his exams.

Turing went on to study at Cambridge University and Princeton in the USA. He had a strong interest in mathematics and computing. In the 1930s, computing was a brand new subject and Turing's ideas were **ground-breaking**. Many believe the concept of modern computing was based on Turing's ideas. Turing had a great future ahead of him. With his **innovative** ideas and **intellect**, he could pick any job he wanted to, and companies would pay large amounts of money for his skills and ideas.

In 1938, with lots of options available to him, Turing chose to work for the government at the Government Code and **Cypher** School – the UK's codebreakers. The world was on the brink of a second global war, and it was evident to Turing that his abilities could be used to help his country.

For many years, even before the war, the German government and military had been using a cypher machine to **encrypt** secret messages. This machine was known as Enigma. It looked like a typewriter but when a message was written it had a second line of letters, which then encrypted the message. Only other people with an Enigma machine could read it. Originally, scientists and mathematicians from Poland broke the Enigma code as the cypher was only changed once every few months. When World War II broke out, Germany began changing the cypher more than once a day. The Polish code no longer worked so they asked Britain for help.

A day after the war began, Turing reported to Bletchley Park to begin work on breaking the German Enigma machine. Secrecy surrounded the work being done at Bletchley Park. Turing worked tirelessly, day after day, to try and break the code. He knew that being able to read secret German messages would play a vital role in helping Britain to win the war. Turing's contribution at Bletchley Park was crucial. He made the first breakthroughs, allowing Britain's food and supplies to be shipped across the Atlantic. While working with a colleague called Gordon Welchman, Turing designed a machine to break Enigma. The new machine, called Bombe, could find the new Enigma cypher in 15 minutes.

The news that Britain had found a way to break the Enigma codes was kept top secret. The British government did not want to alert the Germans. Turing and his fellow codebreakers worked day and night to **decode** messages and



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send them to London, who then sent them on to the Armed Forces fighting abroad. At the beginning, many Commanders in the Armed Forces did not believe the decoded messages they were being sent. However, they soon began to take them seriously when a series of enormous successes, based on the codebreakers' information, occurred. British Prime Minister Winston Churchill knew the importance of the work being done at Bletchley Park, and of Alan Turing in particular. He said, 'Make sure they have all they want on extreme **priority** and report to me that this has happened.'

Turing continued to work at Bletchley Park throughout the war, writing several mathematical papers explaining codebreaking and helping mould the new generation of computer **programmers**. By 1942, Turing's machine had contributed to the great success of the North Africa Campaign and when a new German cypher machine was introduced, he and his fellow codebreakers managed to master and decode that as well. Shortly after the war Turing was awarded an Order of the British Empire (OBE) medal for services to his country during the war. Most of the detail of the work Turing did during the war was kept secret, until the official release of National Archive documents in 2012.

Turing's legacy is still evident even today. The computers we all use are based on the **pioneering** work Turing did. In 1999, Time Magazine named him one of the '100 most important people of the 20th century'. Turing dedicated his life to helping further his country's war effort, and the development of useful technology. There were many other jobs he could have chosen, but he understood the importance of working hard for his country and breaking the Enigma code.

## GLOSSARY

**CYPHER**

A secret or disguised way of writing

**DECODE**

To make a coded message readable

**ENCRYPT**

To hide something by turning it into code

**GROUND-BREAKING**

a new creative idea

**INTELLECT**

An ability to think cleverly

**INNOVATIVE**

Introducing new ideas and creative thinking

**PIONEERING**

New ideas or methods

**PRIORITY**

Something that is more important than others

**PROGRAMMERS**

A person who writes computer programs or code



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RESOURCES FOR PUPILS

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