WW2 - Top Secret!

Millions of people fought on the front lines in World War 2, but many more fought hard behind the scenes. Both men and women worked undercover, pretending to be ordinary people but in fact were working to undermine the enemy.

In occupied countries, people formed groups called the resistance. These were ordinary people who fought back against the enemy in secret. It could be anyone; men, women and even children would steal secrets, help wounded soldiers, hide people the Nazis wanted to kill, and send information back to Britain and the allies to help them win the war.

The danger of getting caught meant certain death. Many thousands of resistance operatives were caught and killed over the course of the war. If you wanted to get information back to Britain, you'd better make sure it was well disguised. Then if the Nazis found it, they would not understand what it was, nor where it came from.

Activity: Make Invisible Ink

For this you will need:

- 1 tablespoon of Lemon juice (fresh or bottled is fine)
- A cotton bud (the ones for your ears but make sure it's a clean one!)
- An adult to help with the revealing of the secret message. (And an iron)
- A sheet of paper

Method

1. Squeeze the lemon juice into an open neck pot.
2. Dip the cotton bud into the lemon and then write your message.
3. It'll completely disappear when it's dry!

To read the message, get an adult to help with this bit, heat an iron - but do not use the steam setting – and iron the paper…as it heats up the message will be revealed as the lemon juice 'ink' turns the paper brown!

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Activity: Breaking the Code

It wasn't just undercover agents who needed to send secrets. Armies sent information such as attack plans and troop numbers across vast distances by radio signals, which risked the enemy being able to hear them.

To prevent the enemy finding out about war plans, armies used codes. Just like today, where we use **encryption** to keep information safe on the internet, armies in WW2 used **encryption** to send information.

Encryption is just another way of saying **coded information**.

One of the most important breakthroughs of WW2 was when British scientists cracked the

A German Enigma Machine

German **Enigma Code**. It used a combination of wheels to randomly create a code which was different every time. Both the sender and the receiver had to have the same machine – called an **Enigma Machine** – in order to read the code.

Because the code was so incredibly complicated, it took months to crack. Once it was cracked, it meant that the Allies could understand German broadcasts and foil their plans.
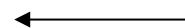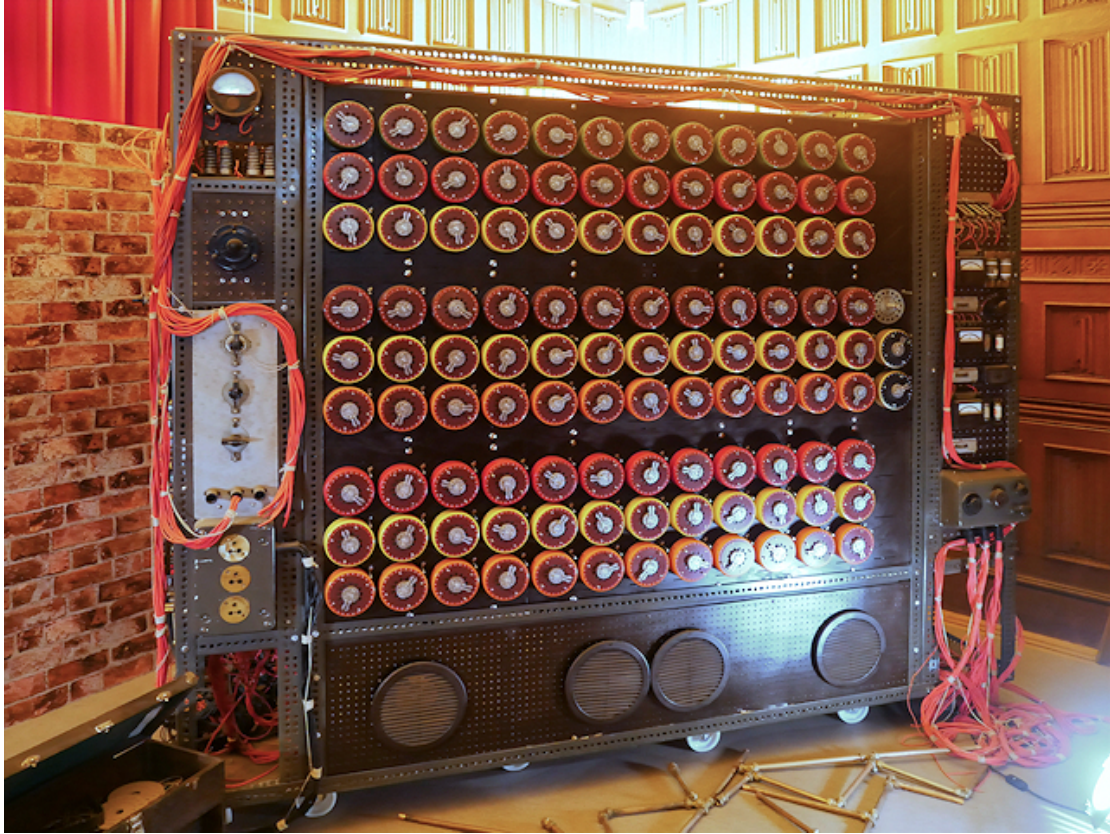

Alan Turing: The man who lead the team that cracked the enigma code. They had to invent the computer to break the code.

A *Viking School Visits/Gefjon's Gardens/Fox Historical* Resource

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Activity: Make A Cypher Disk

You don't need a room full of machinery to see how a code like Enigma worked. You can make a simple version yourself.

*The computer invented by Alan Turing to crack the Enigma Code*

You will need

- Cardboard
- Scissors
- Ruler
- Compass
- Protractor
- A paper-fastener
- Pencil

This activity must be done in pairs or small groups. Each person in the group must make an identical disk, and the letters and numbers on the small disk must be in *exactly* the same order, or the code won't work.

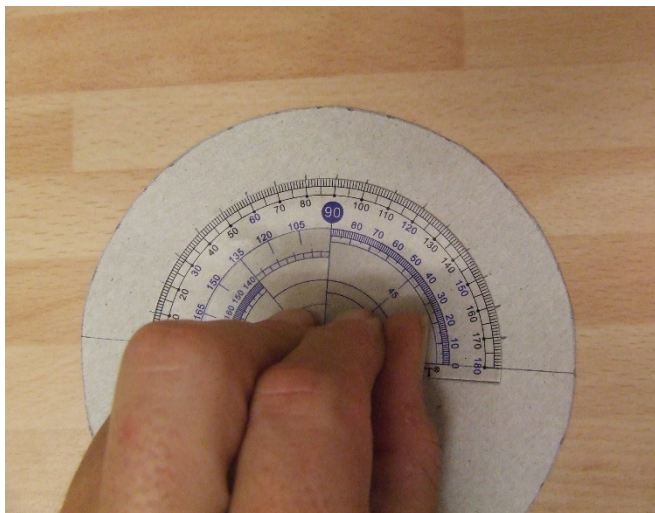# WW2 - Top Secret!

Instructions
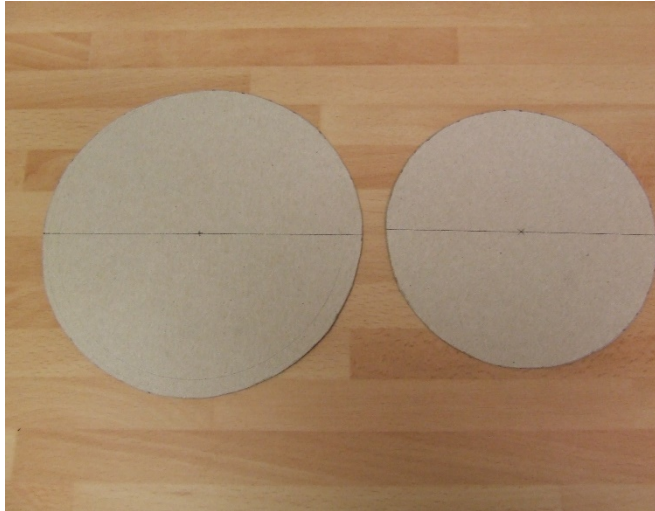
1

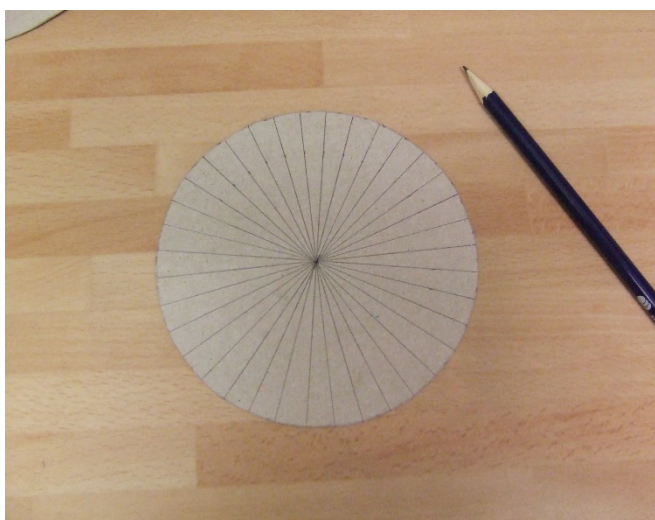Using your compass draw two circles on your card.

One should have a diameter of 15cm and one of 12cm.

Mark the exact centre of the each circle and cut them out to make two disks.
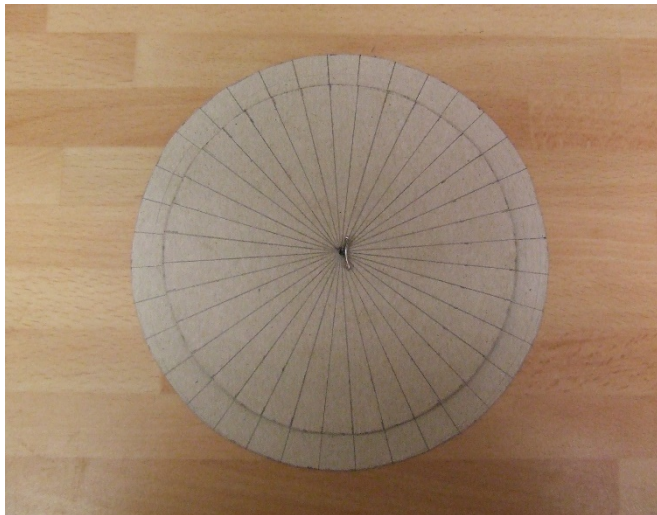

2

Next, draw a straight line crossing the exact centre of the smaller disk. Then, using your protractor, make a mark every 10° on one half of the disk

3

Draw a straight line through each mark to the centre of the disk, and extend each line to both edges of the disk. You should now have 36 spokes at equal intervals
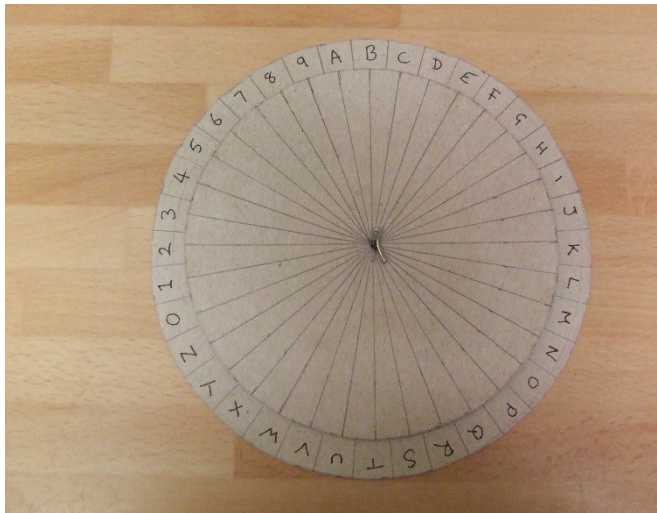
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4

Make a hole in the exact centre of each disk, and join the two disks together with a paper-fastener, with the small disk on top of the larger disk.

Next, being very careful to keep the disks lined up as you go, extend the spokes on the small disk to the edge of the larger disk.

5

On the larger disk, write the alphabet and the numbers 0-9 in between the spokes.

Make sure you can tell the difference between the letter O and the number 0 (zero), And the letter I and the number 1. You can do this by drawing a line through the number 0, and drawing top and bottom lines on the letter I
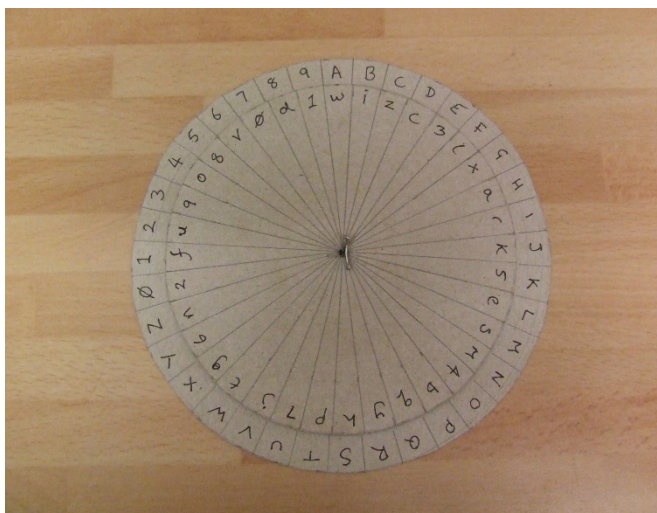
6

On the smaller disk, also write the alphabet and the numbers 0-9 in between the spokes, **but this time write them in a completely *random* order**.

Your partner's disk must also have these in the same random order.

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How to use your disk

To code your message

1. Select a random-letter or number as your **code letter**. It doesn't matter which letter or number this is.
2. Turn the small disk so that your **code letter** is lined up with the **letter A** on the larger disk.
3. Now each letter and number on the larger disk is lined up with a different letter on the smaller disk.
4. Start your message with the code-letter so that the person reading the message knows to line that letter up with A on their own disk.
5. Then write your message using the letters from the small disk in place of the letters on the larger disk. In the photo above you can see that the disk is set to the code-letter W, and in this position the word HELLO would be written as **A3EE4**.

To decode a message

1. Use the first letter or number in the message as the code letter. Turn the small disk so that the code letter lines up with the letter A on the larger disk.
2. Once you have the disk lined up, read the letters on the larger disk in place of the letters on the small disk. As long as you have the disk correctly aligned, you should be able to easily read the code.
3. Because the alphabet on the smaller disk is in a random order, it will be very hard for anyone who doesn't have a disk like yours to break the code. You can check this by trying to send or receive a message with someone from another group.

What makes the Cipher Disk really clever is that you can make your message even harder to break by changing the code part way through a message.

One simple way would be to simply change the code-letter after every few words. Let the person reading your message know that you've changed the code-letter by underlining it or writing it in a different colour ink, so they know when to turn their own disk. Another way would be to pre-arrange a system with the person that you are sending messages to, something like *'turn one space clockwise every ten letters'*.

Anyone who does not have a Cipher Disk the same as yours will find it impossible to break your code.