

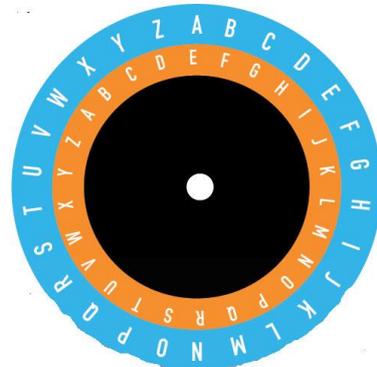
How2 use a cryptograph wheel to encrypt a message

What is a cryptograph wheel?

A cryptograph wheel has two circles, one inside the other (known as concentric) each with an alphabet around the edge. It is used to encrypt messages by sliding one of the circles around by a number of places/letters. The cipher is in the outer wheel, and the plaintext message is in the inner wheel.

The image on the right of a cryptograph wheel shows a blue circle on the outside, which is the cipher, and the orange circle on the inside, which is the plaintext.

The wheel has been moved here four places. It starts with the alphabet matching (A aligned with A, B aligned with B, and so on) and then it is moved a number of steps – the blue circle rotates clockwise.



Look at the picture and count the number of steps that have been moved, so the A in the outside circle now lines up with the E in the orange circle. This is a four step shift.

Using the cryptograph wheel

If I want to encrypt a message now using the cryptograph wheel above, I find the plaintext letters in the orange wheel, and look at the equivalent letter in the blue wheel.

The word 'CODE' is encrypted as YKZA – check that you can see how this works!

When someone wants to decrypt the message, they use the blue wheel to find the orange wheel letters. Plus, of course, they need to know how many steps the wheel has been shifted. Your receiver will need to know the number of steps the outer wheel has turned clockwise to decrypt your message.

Now work out what this says 'DWRA BQJ!'

Making a cryptograph wheel

You will need two pieces of cardboard, a ruler, protractor and pencil, and a split pin. Not sure what a split pin is? They look like the image on the right!



1. Take two circles of cardboard, one with a diameter of 15 cm and the other with a diameter of 20 cm.
2. Use a protractor to divide each circle up into 26 equal segments. This makes each segment around 13.8 degrees each! Use these 26 segments for the alphabet in both circles, making sure the alphabet is listed clockwise (use the image above as a guide)
3. Secure the two circles of cardboard together by pushing the split pin through the centre of both – you might find it easier to make a small hole first.
4. Before you start to use the wheel, line up the alphabet letters so they match. Then choose the number of shifts you want to make clockwise before encrypting your message. You can move as many steps as you want! Remember, the receiver of your message will need to know this number if they are going to decrypt your message.