To Do To Go: Teens

Try a new To Do To Go activity each month!

Make a Cipher Wheel

Solve the code! Write a secret message!

Cryptography (cryptology) is a study of ways to conduct secure communication. Cryptography has been used from ancient times since there was always a need for keeping certain messages private. One of the more popular substitution ciphers, Caesar cipher, was invented by Julius Caesar as a way to send secret messages to his generals. It is also known as Shift Cipher: it uses the key (number) that shifts plaintext by the key number of letters (example: A becomes D if the key is 3). This key should be kept private between people involved in communication. While this key is simple, it's not very secure!

In modern history, the most famous encrypting example was the Enigma machine which Germany used to encode their messages during World War 2. The British bombe was a decrypting machine envisioned and developed by Alan Turing at Bletchley Park, which had a tremendous impact on ending World War II.

Works Cited: This summary used information from

ROT13. (2021, January 6). In Wikipedia.

https://en.wikipedia.org/w/index.php?title=ROT13&oldid=998646046

Leder, V. (2020, August 13). How to make and Use Cipher Wheel. STEM Little Explorers, Medium. https://medium.com/stem-little-explorers/how-to-make-and-use-cipher-wheel-a87de6ffa4c7

More books on the back!

The Enigma Game by Elizabeth Wein



MAKE IT

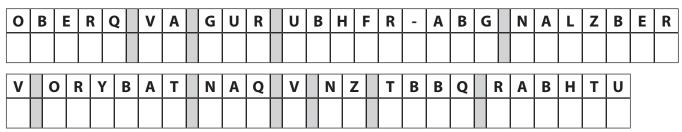
- 1. Cut out one big circle and one smaller circle. You'll want enough space on the big circle to write in your alphabet/symbols and be seen around the smaller circle.
- 2. If you are using blank circles, the alphabet needs to be written on both the smaller circle and larger circle.
- 3. Push the brad/fastener through the centers of the circles to join them together, with the smaller circle on top. Your cipher wheel is assembled!
- 4. Now you can use your key pair the circles so that the letters match. Then rotate the small circle to the right however many letters as the key indicates.
 - For ROT13, first line up the circles so that A=A. Then spin the small circle 13 spaces to the right so that A=N. The A on the large circle will line up with the N on the small circle.
- 5. Crack the codes on the next page! Write a short sentence and encode it then share it with other people to decode.
 - The big circle is the coded (encrypted) alphabet while the small circle is the answer (decrypted) alphabet.

CODE IT

The Caesar Cipher is a simple letter substitution cipher that replaces a letter with the 3rd letter after it in the alphabet. Using the Caesar Cipher, encode your name!
Try the name of your school.
TI TIME
下
D G P F F P X
20 0 1 1 1 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0

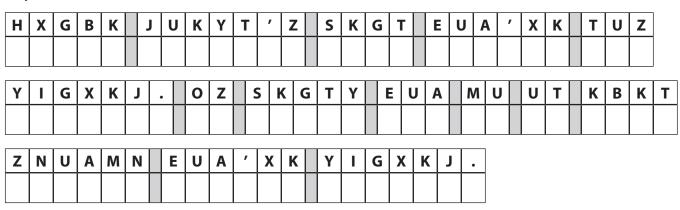
SOLVE IT

ROT13 ("rotate by 13 places", sometimes hyphenated ROT-13) is another common shift cipher that replaces a letter with the 13th letter after it in the alphabet. Use that key to decrypt these codes!



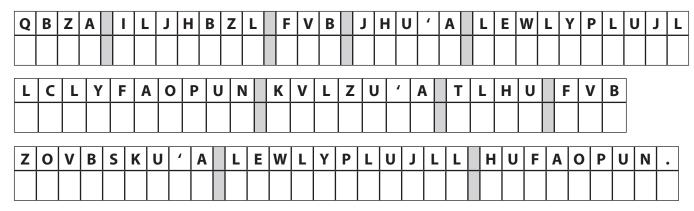
Decrypt these book quotes! The keys are listed above the codes.

Key 6



⁻ from The Hate U Give by Angie Thomas

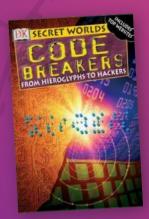
Key 19



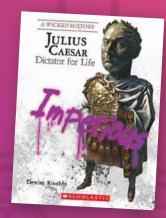
⁻ from Everything, Everything by Nicola Yoon

How could we make this cipher even more secure? One way would be to jumble up the alphabet first, before you write it on the two wheels.

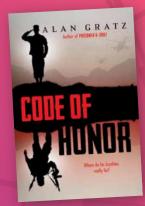
READ ABOUT IT!



Code Breakers – From Hieroglyphs to Hackers



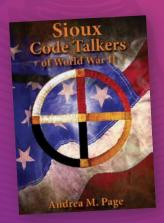
Julius Caesar – Dictator for Life by Denis Rinaldo



Code of Honor by Alan Gratz



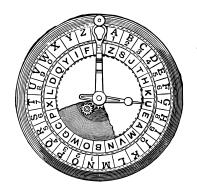
Traitor Angels by Anne Blankman



Sioux Code Talkers of World War II by Andrea M. Page



Finding Paris by Joy Preble



- from Everything Everything by Nicola Yoon
- from The Hate U Give by Angie Thomas
 Just because you can't experience everything doesn't mean you shouldn't experience anything.
 - Brave doesn't mean you're not scared. It means you go on even though you're scared.
 - · I belong and I am good enough
 - Rored in the house not anymore

EITOA

:syewsnA