Cracking Cryptography Worksheet

Learning Outcomes

You'll learn the basics of cryptography and code cracking skills used in cyber security and you'll learn more about jobs that use these skills.

Introduction

What is cryptography?

Do you know of any code cracking methods?

When do you think it is necessary to be able to crack codes?

Let's have a look at the basics of cryptography and become familiar with some key terms such as encrypt and decrypt. Watch this video (1) before we start the activities.

We've also produced a video guide for this activity, and you can view it here (2).

Activity

Caesar cipher

Cryptography has been used throughout history, as early as the time of the Roman empire! Julius Caesar created his own method to encrypt and decrypt messages – this is known as the Caesar cipher. Let's make our own Caesar cipher by following this easy video tutorial (3).

So, the key is how many times you move the inner circle clockwise.

Alternatively, why not use this website which has a Caesar cipher already made for you (4).

Can you crack the following codes?

Clue, they are delicious types of food!

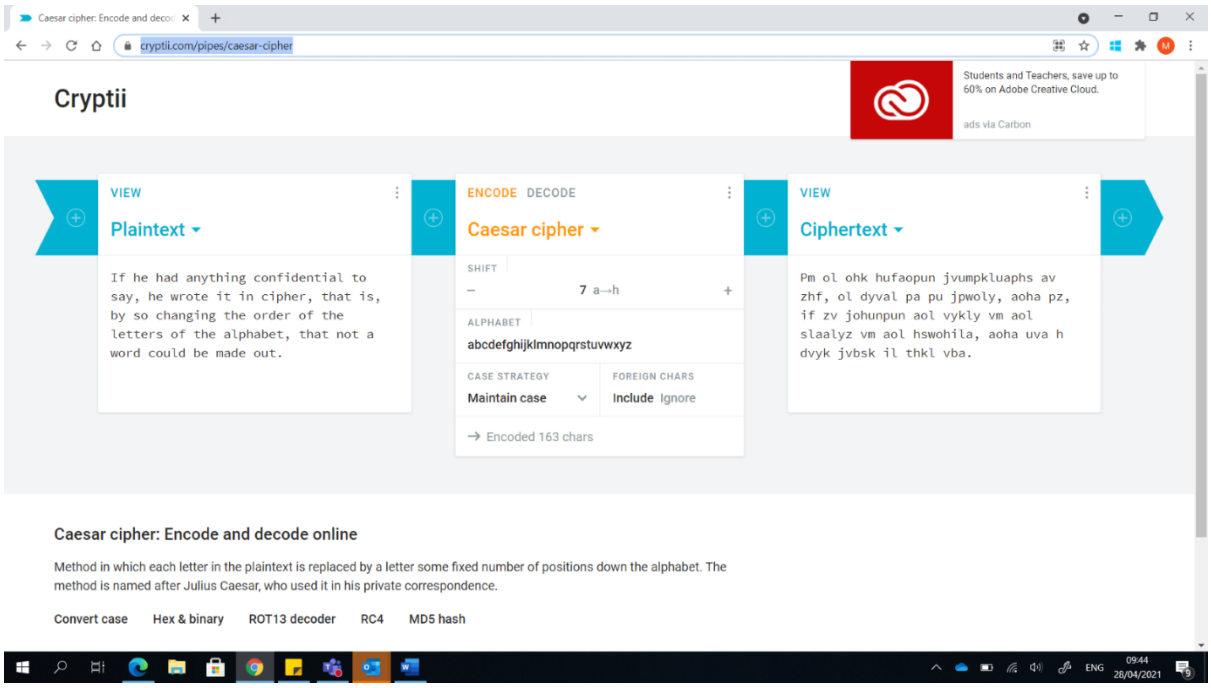
1. Fuuqj (key = 5)
2. Ova kvn (key = 7)
3. Lxxtrn (key = 9)

Now try making some of your own codes!

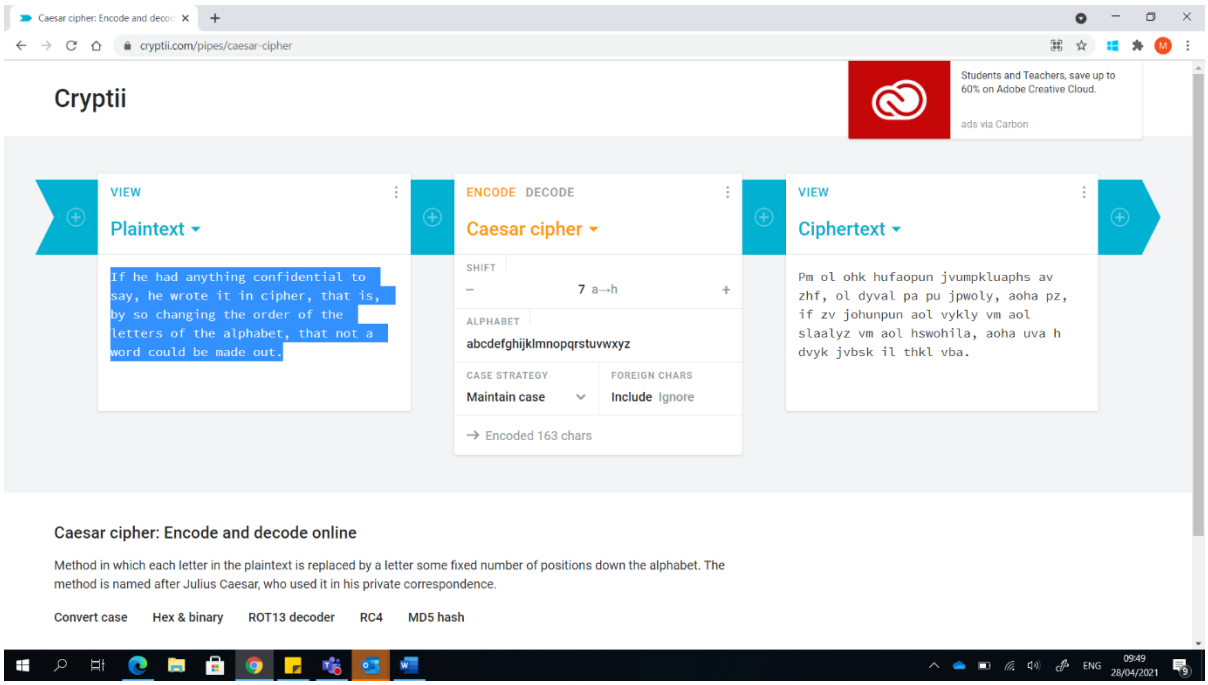
Online Activity

Let's go one step further. Now it's time to crack some codes using an online computer program called Cryptii (5).

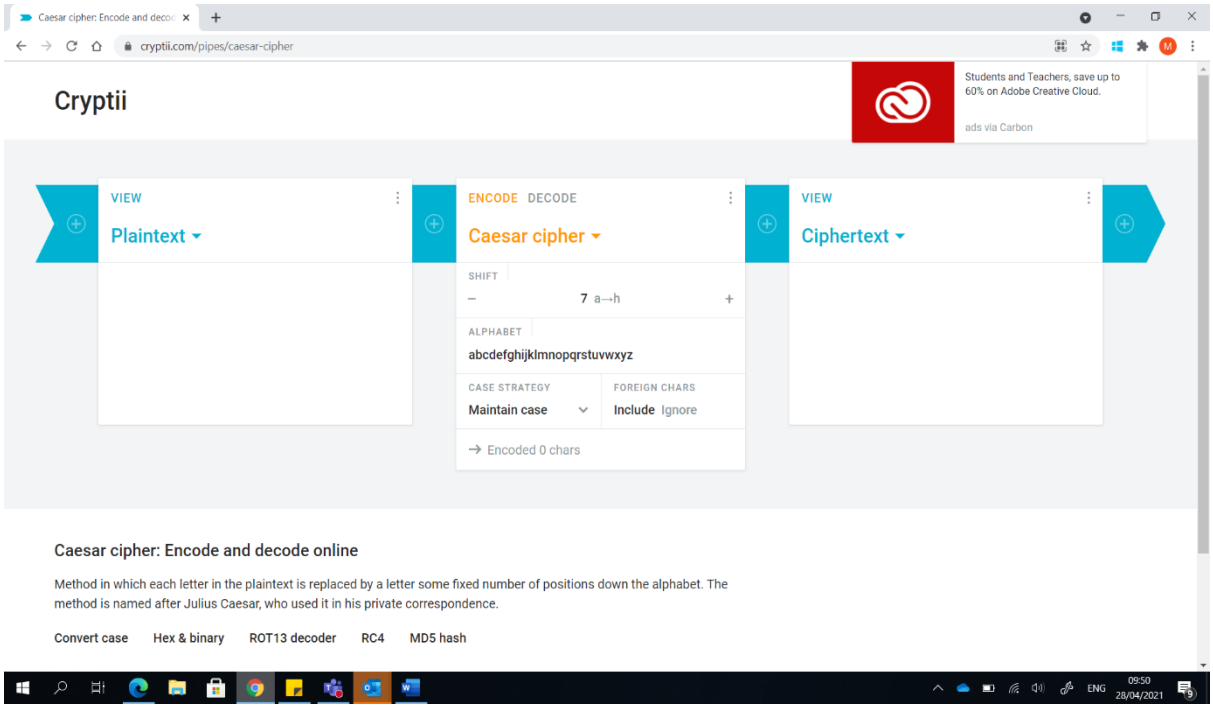
1: Your screen should look like this:



2: Highlight the text in the **Plaintext** box and delete it away.

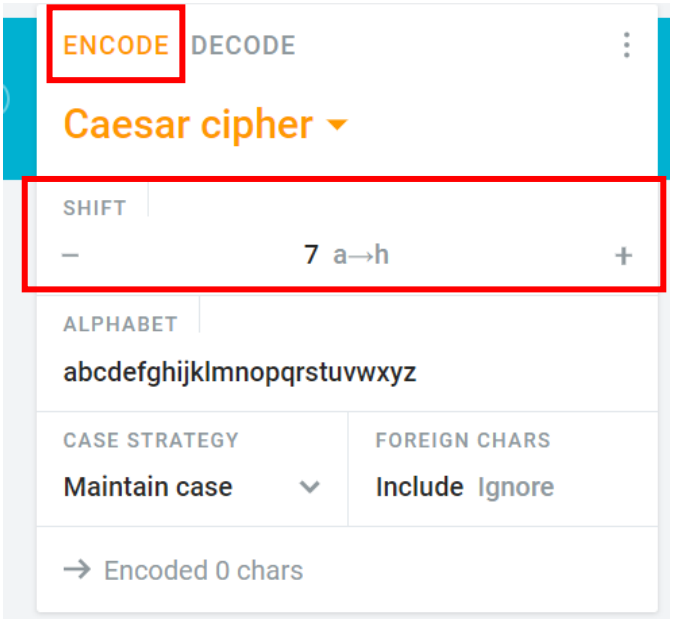


You should now be left with an empty **Plaintext** box and an empty **Ciphertext** box.

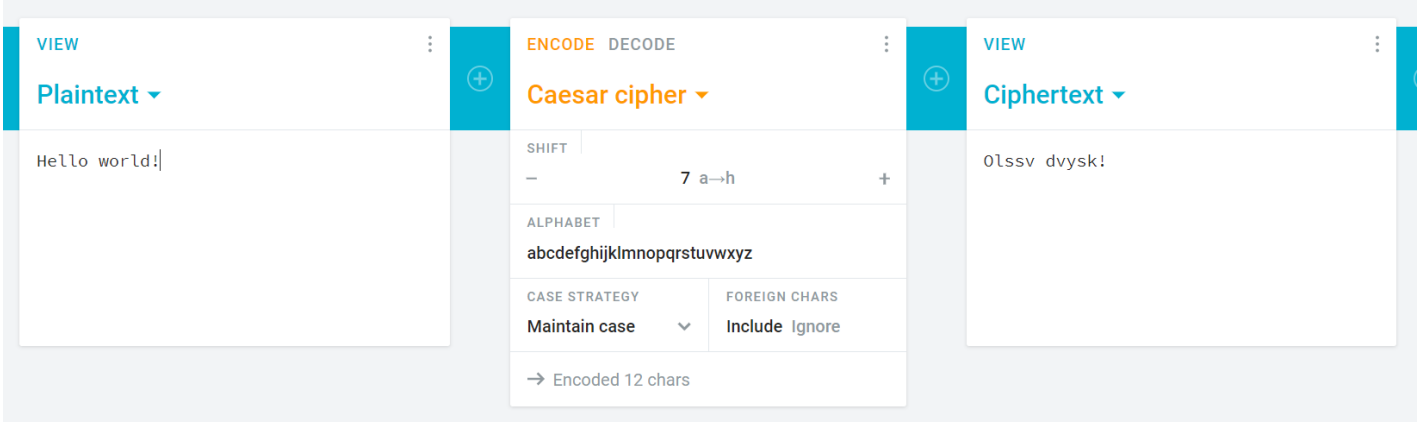


3: **To Encrypt a message**:

- Make sure the cipher is set to **ENCODE**
- Choose a key number by typing in or using the + or – buttons to select

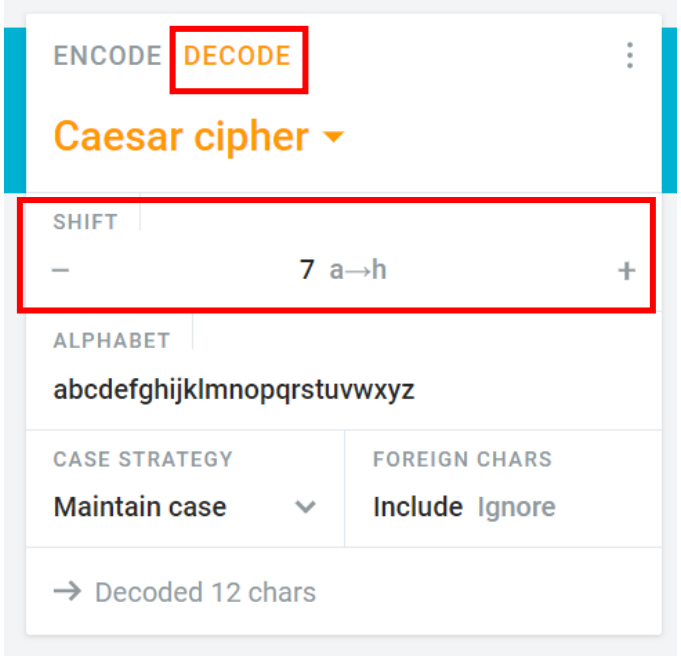


Example: type your message in the **Plaintext** box (on right), make sure you have the **ENCODE** option chosen and a key number.
The encrypted message will appear in the **Ciphertext** box (on left).



To Decrypt a message:

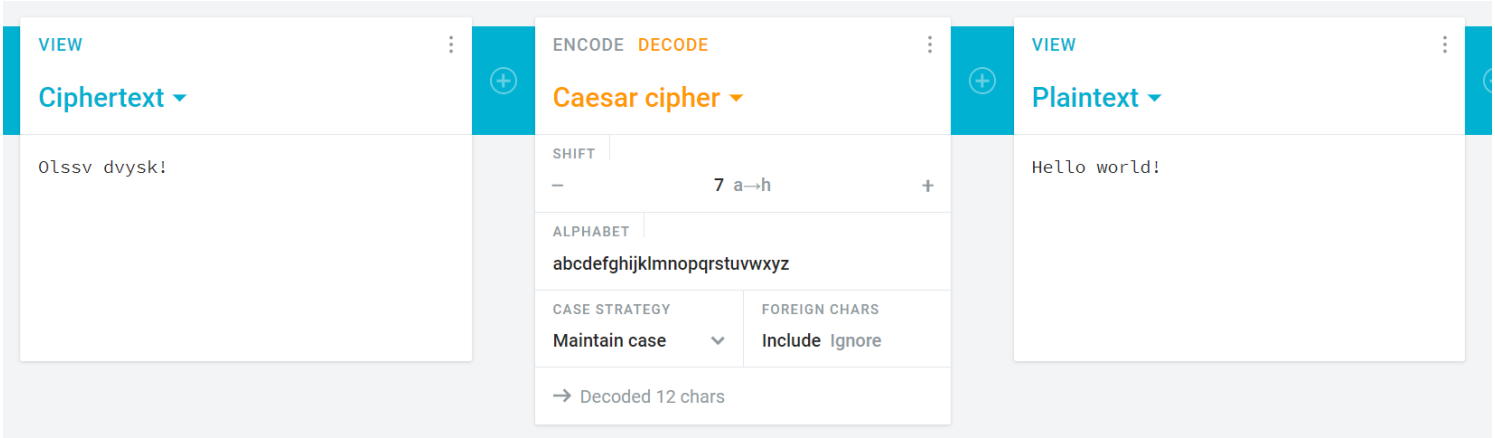
- Make sure the cipher is set to **DECODE**
- Choose a key number by typing in or using the + or – buttons (or use the same key number if you are decoded your original encrypted message)



Remember - to code each message you must choose a "key" number

If you are decrypting/decoding the same message that you encrypted/encoded, you must use the same key number!

Example: select the **DECODE** option and now type your encrypted message into the **Ciphertext** box (on right) and select your key number.
The decrypted/decoded message will appear in the **Plaintext** box (on left).



The computer programme can crack messages much faster than the Caesar cipher. Well done! You have successfully used coding to encrypt a secret message. Now it's your turn to encrypt and decrypt your own messages.

The activity looks at roles in computer science, cyber security and digital forensics.

Forensic computer analyst(6), Software developer(7), Ethical Hacker(8)

You've used some skills that these roles use on a daily basis and you can find out more about the job roles by exploring the My World of Work website (9).

Website References

1. What is Cryptography? https://bit.ly/2Mg9MN8
2. Cracking Cryptography video guide https://bit.ly/37pwA81
3. How to make a Caesar cipher https://bit.ly/3cra26q
4. Caesar cipher wheel http://inventwithpython.com/cipherwheel/
5. Cryptii https://cryptii.com/pipes/caesar-cipher
6. Forensic computer analyst https://bit.ly/3gETTxP
7. Software developer https://bit.ly/3eGczvg
8. Ethical Hacker https://bit.ly/2ZYWbC0
9. My World of Work https://www.myworldofwork.co.uk/