

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!

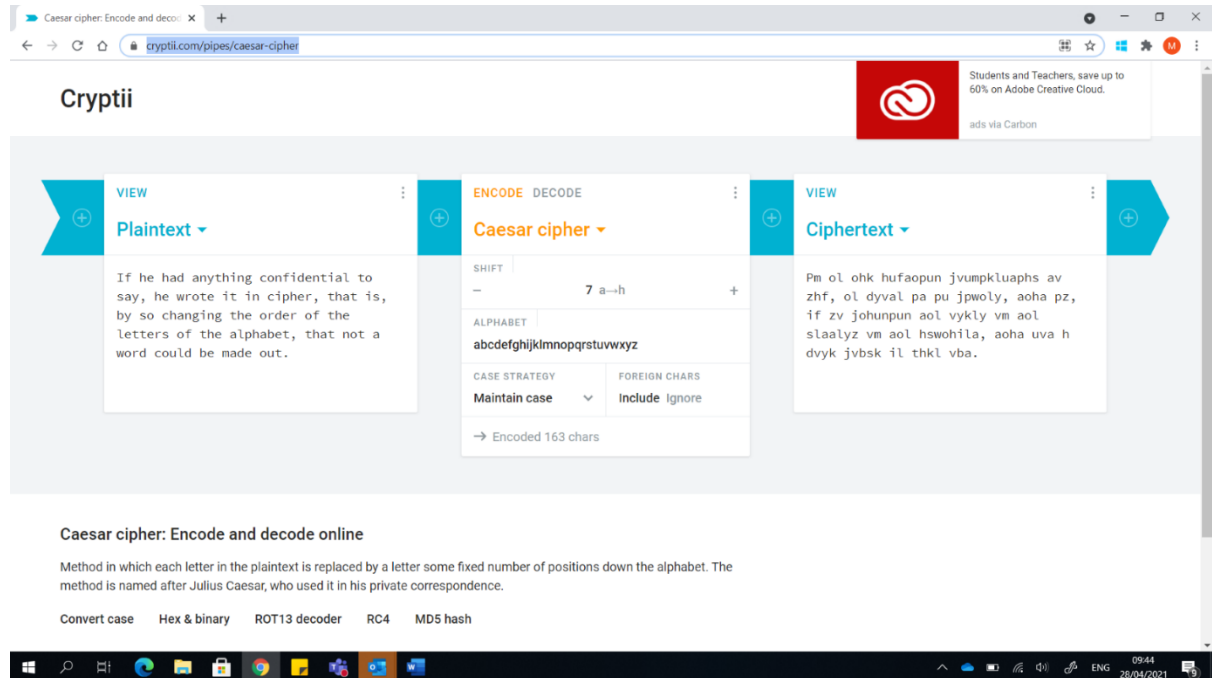
1. Fuuqj (key = 5)
2. Ova kvn (key = 7)
3. Lxxtrn (key = 9)

Now try making some of your own codes!

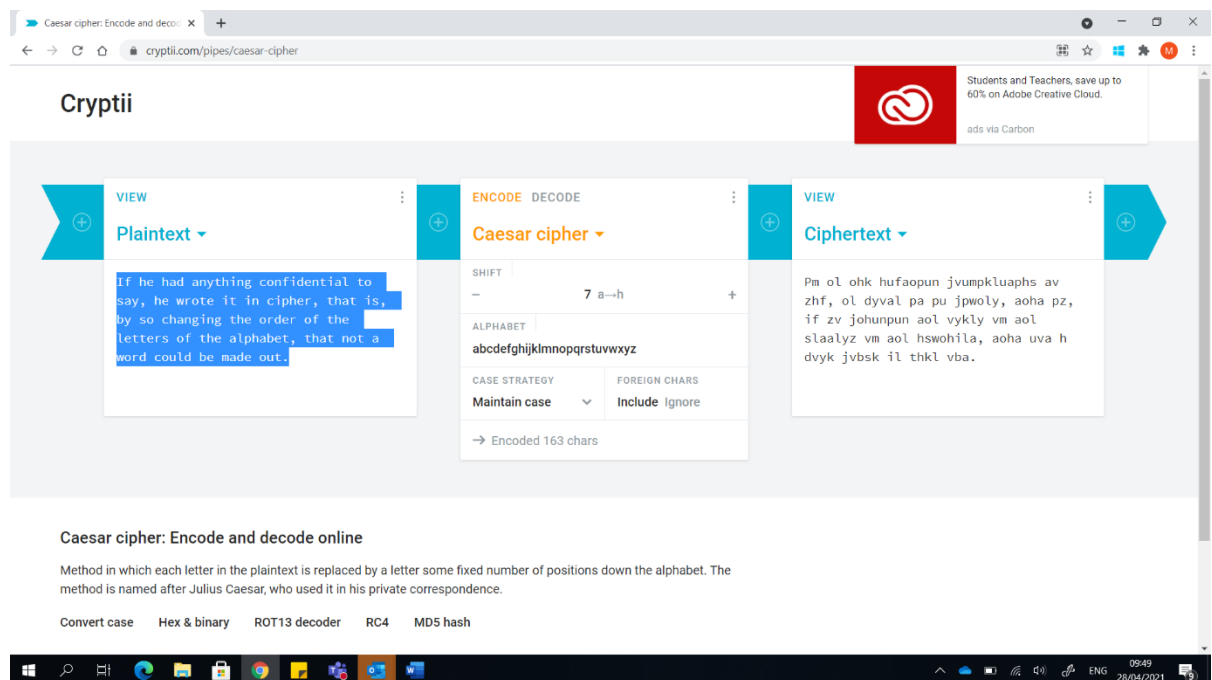
Online Activity

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

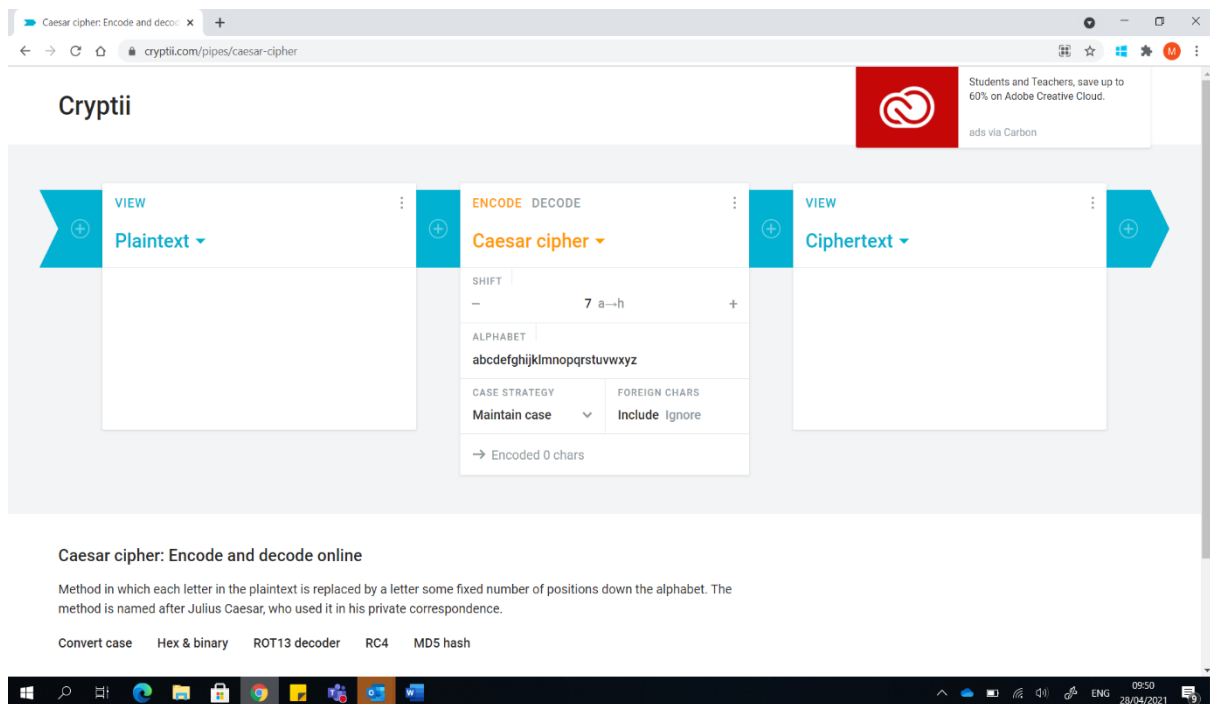
1: Your screen should look like this:



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).

The screenshot shows the Caesar cipher tool interface. On the left, the 'Plaintext' box contains 'Hello world!'. In the center, the 'ENCODE' tab is selected, and the 'Caesar cipher' is chosen. The 'SHIFT' section shows a key of 7, with 'a' mapping to 'h'. Below this, the 'ALPHABET' is listed as 'abcdefghijklmnopqrstuvwxyz'. The 'CASE STRATEGY' is set to 'Maintain case', and 'FOREIGN CHARS' are set to 'Include'. At the bottom, it indicates 'Encoded 12 chars'. On the right, the 'Ciphertext' box displays 'Olssv dvysk!'.

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 decoding your original encrypted message)

This close-up screenshot focuses on the central controls of the tool. The 'DECODE' tab is highlighted with a red box. Below it, the 'Caesar cipher' is selected. The 'SHIFT' section, also highlighted with a red box, shows a key of 7, with 'a' mapping to 'h'. The 'ALPHABET' is 'abcdefghijklmnopqrstuvwxyz'. The 'CASE STRATEGY' is 'Maintain case' and 'FOREIGN CHARS' are 'Include'. At the bottom, it says 'Decoded 12 chars'.

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 screenshot shows a web-based Caesar cipher decoder. On the left, the 'Ciphertext' box contains the encrypted message 'Olssv dvysk!'. In the center, the 'Caesar cipher' settings are configured with a 'SHIFT' of 7, the standard 'ALPHABET' 'abcdefghijklmnopqrstuvwxyz', 'CASE STRATEGY' set to 'Maintain case', and 'FOREIGN CHARS' set to 'Include Ignore'. On the right, the 'Plaintext' box displays the decoded message 'Hello world!'. A status bar at the bottom of the central panel indicates 'Decoded 12 chars'.

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/>