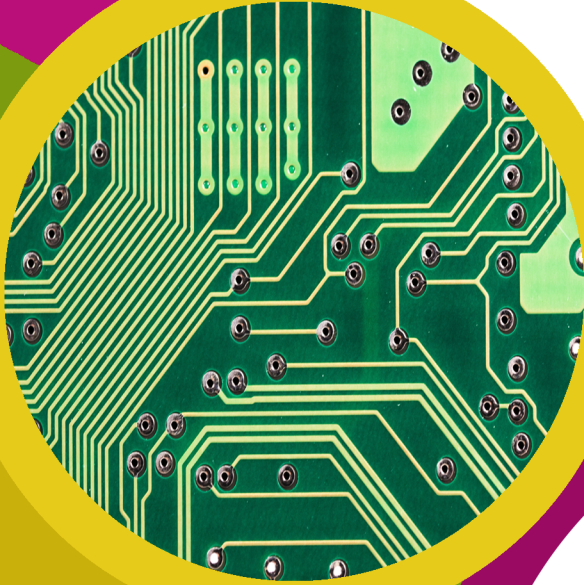


technocamps

Cryptography Workbook



Links to Science and Technology AoLE

Computation:

(PS4) I can explain the techniques used to store and transfer data and understand their vulnerabilities.

(PS3) I can explain the importance of securing the technology I use and protecting the integrity of my data.

Being Curious:

(PS4) I can describe the impacts of science and technology, past and present, on society.

(PS3) I can evaluate my methods to suggest improvements.

Links to Other AoLEs

Humanities:

(PS3) I have an understanding of how factors in the past and present have shaped my communities.

The Four Purposes and Cross-Curricular Skills

These activities provide opportunities for **Critical Thinking and Problem Solving** throughout. When evaluating each encoding and encryption method, you will recognise potential issues with the security of the methods and be able to suggest ways of improving upon them.

Some of the basic aspects of the **Data and Computational Thinking** strand of the **DCF** is covered in the resource with learners needing to follow decryption instructions in order to receive the plaintext messages. Any mistakes they make during the decryption process will allow them the opportunity to correct the mistakes they have made.

Why Is Learning This Important?

This resource allows you to explore the history of cryptography and learn the basic ways that information has been communicated secretly for millenia. The developments of different encoding and encryption techniques is explored and learners can apply the techniques to gain access to information hidden in code. Cryptography plays a big part in protecting people online, whether it be in protecting their authentication details for a website, or keeping their personal messages to friends and family private. This resource serves as an introduction to the world of cybersecurity and the importance of keeping safe online.

Spider Diagram

Draw a spider diagram of when and where you need to send and receive secret messages:



Define Steganography

Steganography is _____

It comes from the greek word _____ meaning _____

and the greek word _____ meaning _____

Steganography is used in:

- _____
- _____

Histiaeus's Servant

Use the space below to draw out the process Histiaeus used to send a secret message:



Problems with the System

1. _____

2. _____

3. _____

Bacon Cipher Example

Hidden message: Bacon is good

Regular message: I went to school today, it was raining. No I do not like it when it rains.

Font type A: UPPERCASE

Font type B: lowercase

Hidden message enciphered:

B	A	C	O	N	I	S
AAAAB	AAAAA	AAABA	ABBBA	ABBAB	ABAAA	BAABA
G	O	O	D			
AABBA	ABBBA	ABBBA	AAABB			

Hidden message inside regular message:

I WENTt TO SCHOOL tODay, iT Was RaInING. nO I dO NOt lIkE it WHen iT RAIns.

Bacon Cipher Practice

a: AAAAA	h: AABBB	o: ABBBA	v: BABAB
b: AAAAB	i: ABAAA	p: ABBBB	w: BABBA
c: AAABA	j: ABAAB	q: BAAAA	x: BABBB
d: AAABB	k: ABABA	r: BAAAB	y: BBAAA
e: AABAA	l: ABABB	s: BAABA	z: BBAAB
f: AABAB	m: ABBAA	t: BAABB	
g: AABBA	n: ABBAB	u: BABAA	

Try and decrypt these messages:

1. ChoCOLAtE CaKEs ArE TaSTY WE ALSo lOVE plE

2. THe grAsS IS GREEnEr WHERe yOU WAtER

3. ChEeSEY cHIps YUM

4. tHe qUIck brOWN FOX juMpS oVER tHE lAZy Dog aNd SO Did I. iT IS vERY fun

5. Extension: Create your own hidden message using upper and lower case.

Hidden message: _____

Enciphered message: _____

Regular message: _____

Hidden message inside regular message: _____

Problems with the Bacon Cipher?

- 1. _____

- 2. _____

Make Your Own Invisible Ink

Step 1:

Step 2:

Why does this work?

What Is Cryptography?

In your own words, write down what you think cryptography is below:

Define Cryptography

Cryptography is _____

It comes from the greek word _____ meaning _____

and the greek word _____ meaning _____

Cryptography is used in:

- _____
- _____
- _____

Cryptography is different from Steganography as _____

Make Your Own Code Book

In the spaces provided, write replacements for the words given

Beacons = _____ Fly = _____ Light = _____

Lit = _____ Fools = _____ Day = _____

Gondor = _____ Look = _____ Dawn = _____

Calls = _____ Coming = _____ East = _____

Aid = _____ First = _____ Fifth = _____

Translate the sentences using your code book:

1. The beacons are lit, Gondor calls for aid

2. Fly you fools

3. Look to my coming at first light on the fifth day. At dawn, look to the East

Extension: Come up with your own code words, write out the original sentence and the encoded sentences.

_____ = _____ _____ = _____ _____ = _____

_____ = _____ _____ = _____ _____ = _____

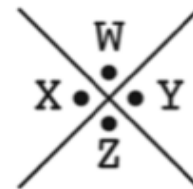
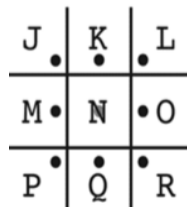
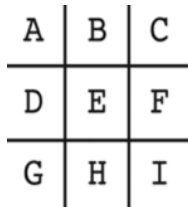
_____ = _____ _____ = _____ _____ = _____

Original sentence: _____

Encoded sentence: _____

Pig Pen Practice

Use the space below to encrypt and decrypt the messages:

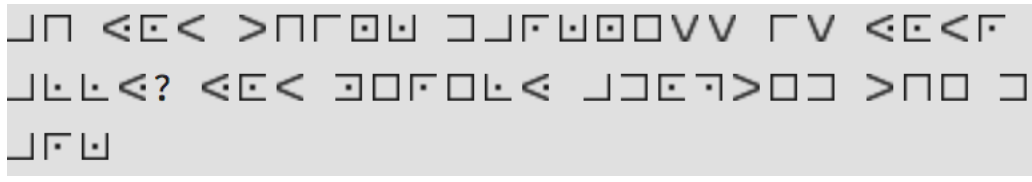


Encrypt:

- I'll be back : _____
- Mama always said life was like a box of chocolates

Decrypt:





Extension: Create your own secret messages on the extra pages at the back of the workbook.

Codes vs. Ciphers

In your own words, write down the difference between codes and ciphers:

Julius Caesar Fact File

Julius Caesar was born in _____ BC and died in _____ BC.

How did Julius Caesar die?

Which month is named after Julius Caesar?

How old was Julius Caesar when he was elected to Consul?

Interesting fact about Julius Caesar?

Shift Cipher Practice

Using the cipher wheels you have just made, decrypt the following messages:
Caesar cipher, key = 3:

- Whfkqrfdpsv lv ehwwhu wk dq vfkrrro zrun

- Brx'uh jrqqd qhhg d eljjhu erdw

Key = 9:

- Cxcx r'en j onnurwp fn'an wxc rw tjwbjb jwhvxan

Key = 21:

- Yj jm yj ijo. Oczmz dn ij omt

Extension: key not given

- Z druv r gifdzjv di wifuf. R gifdzjv. "Ufe'k pfl cvrmv yzd jrdnzjv xrdxv" reu z ufe'k dvre kf

Extension: create a message and encrypt it with your own choice of key:

Key = _____

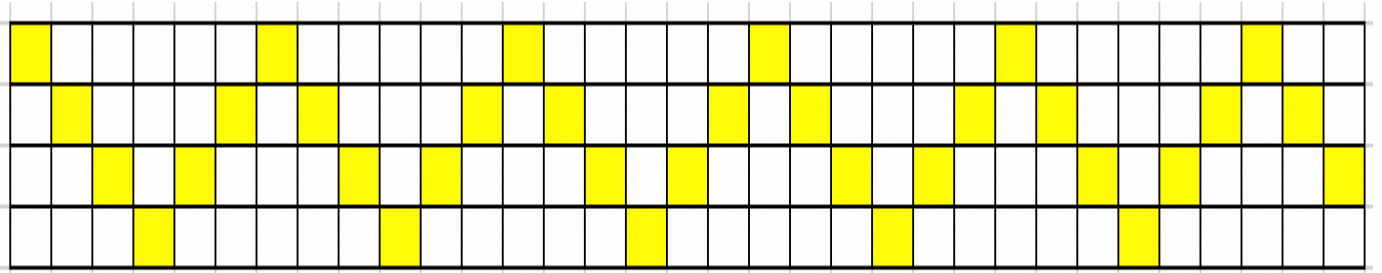
Message: _____

Rail Fence Cipher Practice

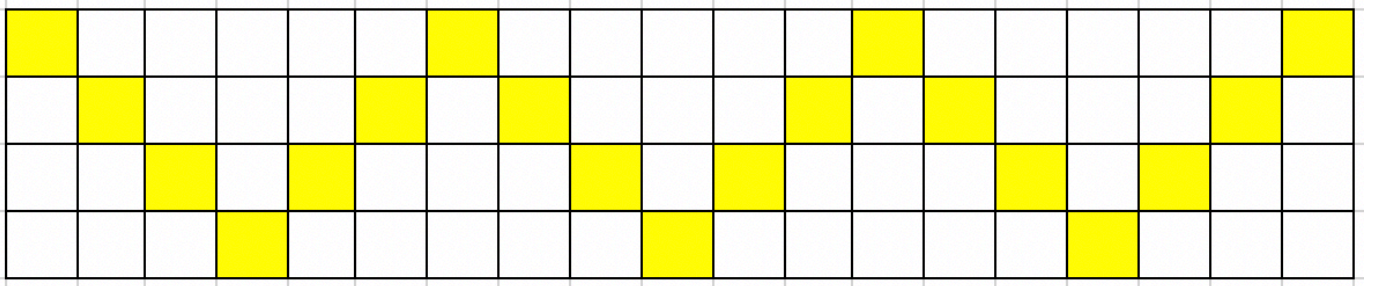
Use the rail fence cipher to decrypt the messages below:

Key = 4:

- TYTIWGHMSECANLANRASERATIAYAYTCPMS

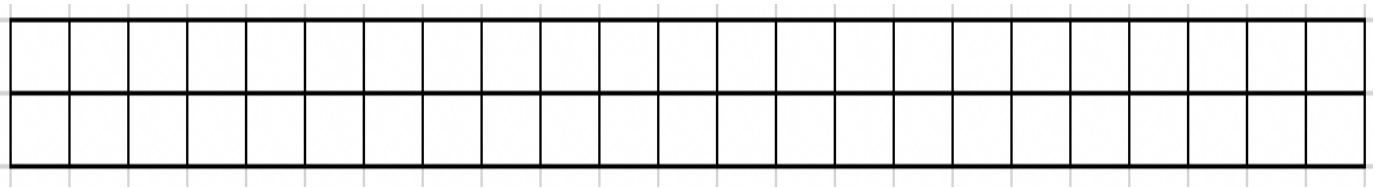


- TNDDOIINBNIFTAEONYY

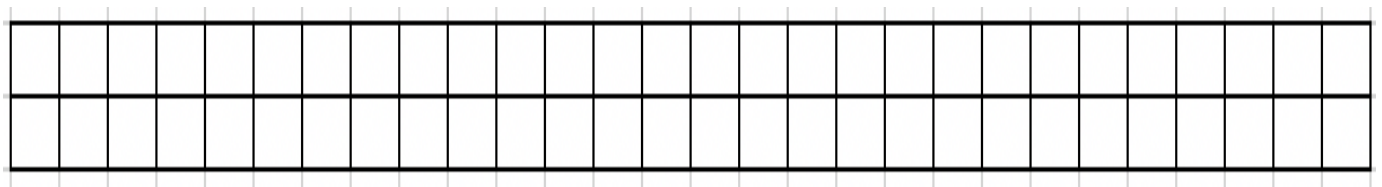


Key = 2:

- LOAMITEATINWOKTEMHCPANO

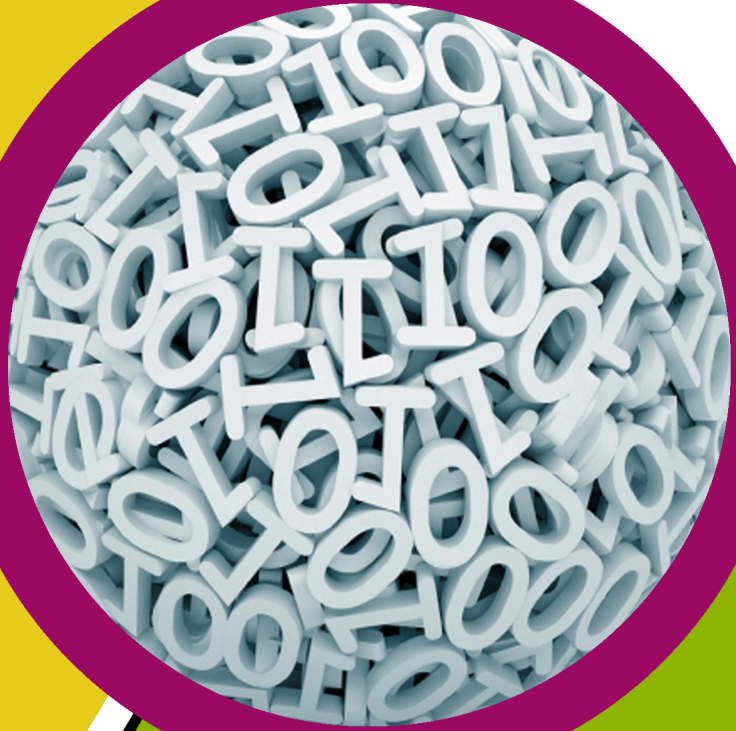


- MYHODBEEIYUFVUATEDSEVRNORAOR



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