



## WORKSHOP ROI

Workshop step-by-step:

1. Pupils will begin the workshop by performing a quick survey. Ask them if they ever sent a secret message to a friend (ask the pupils to put their hands up) but got into somebody else's hands and their secret was revealed (ask to put their hands up). Ask, who wants to know the method of writing the secret message, that only they, and their special friends would be able to read. Talk to children about different methods of encrypting, laying special emphasis on writing backwards and substitution shifts, as the pupils are going to need this knowledge to solve tasks that are prepared for them. Discuss why, and where encoding can be used. Tell them the story of John Herivel, and how important role cryptography played during WW2.
2. Activity I:  
Divide pupils into groups of 2. Hand out the first activity (page 3). This is a short poem written by Julia Fletcher Carney written backwards.  
*Little deeds of kindness,  
Little words of love,  
Help to make earth happy  
Like the heaven above.*  
  
- Julia Fletcher Carney  
*Little Things*  
  
Activity II:  
Pupils are still working in groups of 2. Hand out cyphers (page 4) and another encrypted message (page 5). The message is: "Mathematics is the Queen of all Sciences" - Carl Friedrich Gauss (German mathematician)
3. Walk around and assist them if needed.
4. Discuss the exercise with children, was it difficult, which part was the hardest, which was the easiest. out of it.
5. Activity III:  
Hand out the last activity (page 6), one per pupil. Beforehand, cut it into 6 pieces to make a jigsaw puzzle out of it.

## Encryption facts for the workshop:

- Story of Dr Richard James Hayes, Irish code-breaker, whose cryptoanalysis helped defeat the Nazis.



- Hayes was born in Abbeyfeale in Co. Limerick in 1902 and grew up in Claremorris, Co. Mayo. He was educated at Clongowes Wood College and Trinity College Dublin. His day-job was as Director of the National Library of Ireland - but during wartime, he secretly led a team of cryptanalysts as they worked feverishly on the infamous "Görtz Cipher" - a fiendish Nazi code that had stumped some of the greatest code breaking minds at Bletchley Park, the centre of British wartime Cryptography. Hayes was admired by MI5. Hayes died in 1976, leaving behind a collection of papers and manuscripts that is now catalogued in the National Library.

Documentary on Radio 1: Richard Hayes, Nazi codebreaker.

<https://www.rte.ie/radio1/doconone/2017/1003/909437-richard-hayes-nazi-codebreaker/>

- A code is a system of symbols, letters, words, or signals that are used instead of ordinary words and numbers to send messages or store information. A code is used to keep the message secret. Codes and ciphers are forms of secret communication. The science that studies such secret communication is called cryptology. The term cryptology is derived from the Greek *kryptós* ("hidden") and *lógos* ("word").
- Encryption techniques: numbers stand for letters, signs stand for letters, writing backward, mirror writing( Leonardo Da Vinci), invisible ink, Morse code, pigpen cipher, transposition cipher (e.g. Caesar cipher, one of the most ancient forms of encryption).

For more info visit [mathsweek.ie](http://mathsweek.ie)



Attention Secret Agents!

Can you decrypt the message below?

,SSENDNIK FO SDEED ELTTIL

---

,EVOL FO SDROW ELTTIL

---

YPPAH HTRAE EKAM OT PLEH

---

.EVOBA NEVAEH EHT EKIL

---



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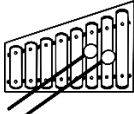

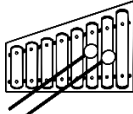

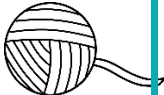

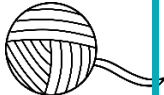




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.EVOBA NEVAEH EHT EKIL

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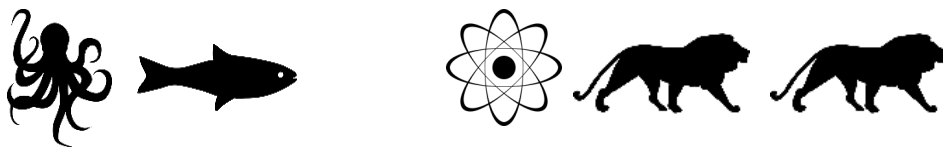




	A		N		A		N
	B		O		B		O
	C		P		C		P
	D		Q		D		Q
	E		R		E		R
	F		S		F		S
	G		T		G		T
	H		U		H		U
	I		V		I		V
	J		W		J		W
	K		X		K		X
	L		Y		L		Y
	M		Z		M		Z

Attention Secret Agents!

Can you decrypt the message below?





**Congratulations!**



**You have completed all the tasks.**

**You would make an excellent secret agent!**



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