Classical Ciphers in Action — Hill Cipher & Enigma Machine

**Objective:**

Students will explore and break two classic encryption systems:

* **Hill Cipher** (Matrix-based substitution cipher)
* **Enigma Machine** (WWII rotor-based machine simulation)

Challenge 1: Hill Cipher Decryption

**Challenge Statement**

A secret message was encrypted using a **2x2 Hill Cipher matrix**.  
You intercepted the following ciphertext:

“Ciphertext: Z8IFN1CK8E7Q

Key Matrix:

[3, 1]

[2, 5]”

Task: Decrypt the message and retrieve the original plaintext.

**Solution**: <https://www.dcode.fr/hill-cipher>

Challenge 2: Enigma Machine Simulation

A spy used a WWII German Enigma Machine to encrypt the message:  
**"WETTER"** (German for "weather")  
Machine Settings:

* Rotors: I II III
* Rotor Positions: A A A
* Reflector: B
* Plugboard: A-M, F-R, G-L

You intercepted the ciphertext:  
**KGHRFQ**

Task: Decrypt the message using Enigma logic or a simulator.

**Solution**: <https://dencode.com/en/cipher/enigma>

<https://cryptii.com/pipes/enigma-machine>