

Kryptos 5 – Challenge 1: Solution

How appropriate for an art thief to use an image of a Van Gogh (Wheat Fields with Cypresses) for their phone's lock screen. However, Vincent certainly did not include the odd "blades of grass" along the border. These strange markings come in two sizes: large and small. There are 35 in all. If these represent some cipher, then a type of binary cipher comes to mind. Morse code is one example of a binary cipher, but without letter divisions it can be problematic to easily decode. If one wanted to represent 26 letters in binary, one would need at least five "bits" (four bits would only allow for 16 characters, five bits gives you 32). Since 35 is a multiple of 5, this is promising.

The simplest binary encoding of 26 letters is:

00000 – a	00110 – g	01100 – m	10010 – s	11000 – y
00001 – b	00111 – h	01101 – n	10011 – t	11001 – z
00010 – c	01000 – I	01110 – o	10100 – u	
00011 – d	01001 – j	01111 – p	10101 – v	
00100 – e	01010 – k	10000 – q	10110 – w	
00101 – f	01011 – l	10001 – r	10111 – x	

This is essentially the system that Bacon is known for (Bacon's Cipher) although he represented the 0's and 1's with a different font or typeface. [Note: In some implementations of Bacon's Cipher i/j are combined as well as u/v.]

If this is the underlying cipher two decisions must be made:

1. Does a tall blade of grass represent a 0 or 1?
2. Where does the cipher begin?

There are only two choices for Question 1 both of which should be easy to test. There are 35 choices for Question 2. One might first start with the "easy" choices: A) start reading across the top, B) start reading down the right side, etc.

Guess 1: Start reading along the top and let "short blade of grass" = 0.

Under these assumptions the plaintext begins: "wls" which is not looking like an English word (we are told that this individual typically uses simple words for passwords).

Guess 2: Start reading along the top and let "short blade of grass" = 1.

Under these assumptions the plaintext begins: "juni" which is promising. Continuing all the way around yields: "juniper".

The password is "juniper", which fits earlier patterns of words pertaining to nature.

Special Note: Several teams pointed out that a Juniper tree is a type of Cypress. This fact was unknown to the Kryptos Codemasters.... Or was it?