LEVEL 2

ACTIVITY 4

Break the code!



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1	2	4	8
16	32	64	128

LETTER-TO-BINARY EQUIVALENCE TABLE

LETTER	NUMBER	BINARY
0	48	0011 0000
1	49	
2	50	
3	51	
4	52	0011 0100
5	53	
6	54	
7	55	
8	56	0011 1000
9	57	
A	65	0100 0001
B	66	0100 0010
C	67	
D	68	
E	69	
F	70	0100 0110
G	71	
H	72	
I	73	
J	74	
K	75	0100 1011
L	76	
M	77	
N	78	
O	79	
P	80	0101 0000
Q	81	
R	82	
S	83	0101 0011
T	84	
U	85	
V	86	0101 0110
W	87	
X	88	
Y	89	
Z	90	0101 1010



Mission sheet :

Break the code !

TOOLS

- 8 cards
- letter-to-binary equivalence table

STEP 1 : DISCOVERY OF BINARY

SET UP

- **Cut** all the 5 cards
- **Put them** in a line in front of you, face up, in descending order, as follows :

128	64	32	16	8	4	2	1

RULES

IYou will have to express numbers as the sum of the numbers written on the cards. Each card can only be used once. Always start from the left (the highest number). Turn over the cards you are not using.

Exemple : number 45.
In order to express 45, we have to use cards 32, 8, 4 and 1 (32+8+4+1=45).
Let's turn over the cards that are not being used :

		32		8	4		1

To record your result, proceed as follows : if the card is face up, write a 1, if the card is face down, write a 0.
The result will therefore be written like this : **0010 1101**.

This notation is called **the binary representation of a number**.

IT'S YOUR TURN !

Write the following numbers in binary :

7	18	4
0	154	88
75	20	35

STEP 2 : DECODE THE ALPHABET !

n the attached table, each letter of the alphabet has been associated with a number, which is itself associated with its binary representation. Complete the table !

💡 *This specific association of a number with a character is called the ASCII code.*

In **electronics**, a number can easily be represented using small lights. A lit light represents the value 1, while an unlit light means 0.

For example, the letter V, associated with the number 0101 0110, will be represented as follows:



0 1 0 1 0 1 1 0

Using the table, identify the letters represented below :





Represent the following letters by coloring in the lit circles :



G



S

STEP 3 : FIND THE PASSWORD

A password locks the school files. Using the previous activities, find and decode the password hidden in the image.

