LEVEL 1

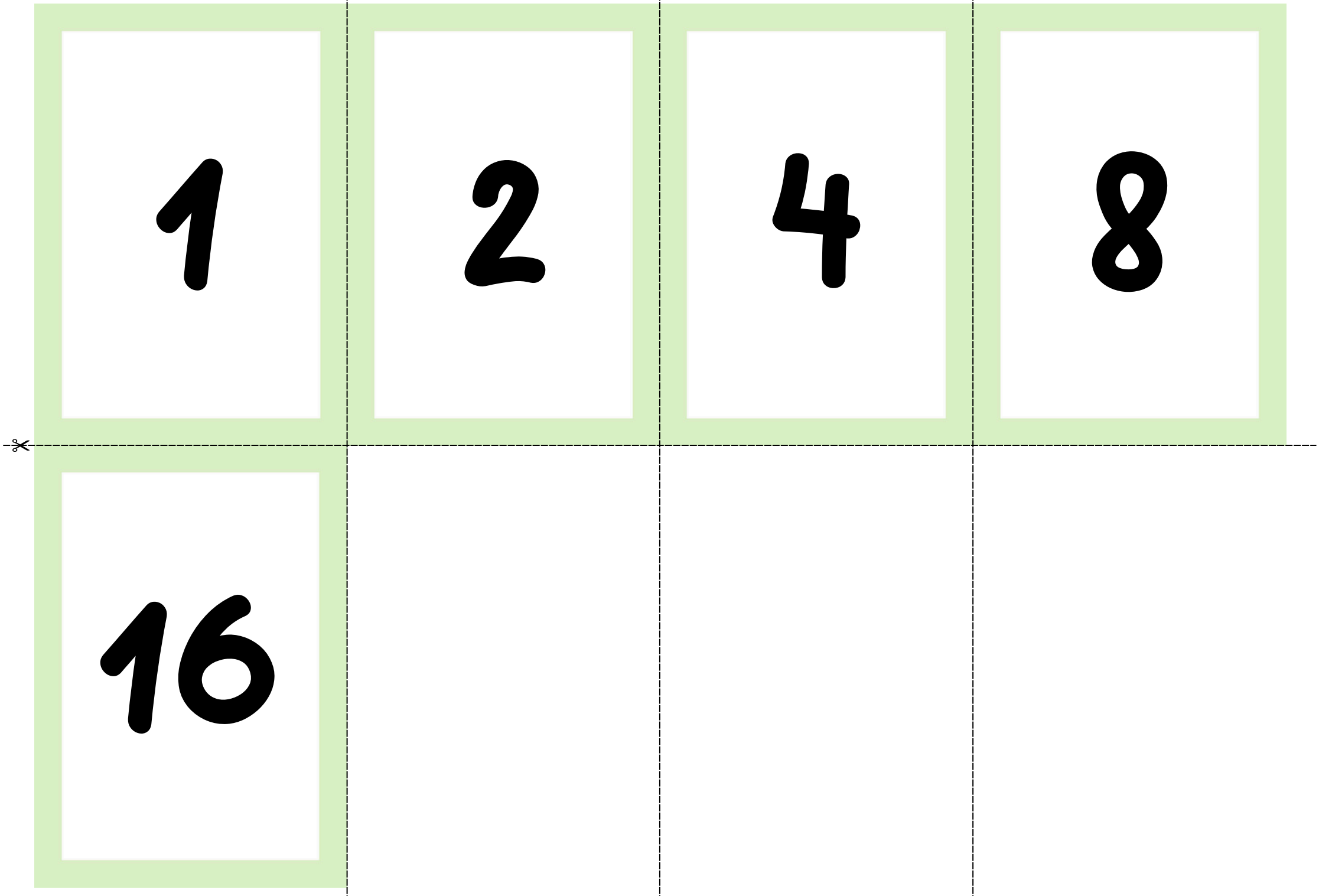
ACTIVITY 4

Break the code!



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1
2
4
8
16

LETTER-TO-BINARY EQUIVALENCE TABLE

LETTER	NUMBER	BINARY
A	1	
B	2	
C	3	00011
D	4	
E	5	
F	6	00110
G	7	
H	8	
I	9	01001
J	10	
K	11	
L	12	
M	13	001101
N	14	01110
O	15	
P	16	
Q	17	10001
R	18	
S	19	
T	20	
U	21	10101
V	22	
W	23	
X	24	11000
Y	25	
Z	26	



Mision sheet :

Break the code !

TOOLS

- 5 cards
- letter-to-binary equivalence table

STEP 1 : DISCOVERY OF BINARY

SETUP

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

16	8	4	2	1

RULES

You will need to express numbers as the sum of the numbers written on the cards. Each card can only be used once. Turn over the cards you are not using. Always start with the largest number.

Exemple : number 13

16 is too much : the card is turned over.
We keep number 8. 13-8 = 5.
We keep number 4. 5-4 = 1.
2 is too much.
We keep number 1. 1-1=0

	8	4		1

To sum up, we have to use cards 8, 4 and 1 (8+4+1=13).

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 be noted as follows : 01101

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

IT'S YOUR TURN !

Write the following numbers in binary :

7	18	4
0	15	43
63	20	35

STEP 2 : DECODE THE ALPHABET !

In 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 !

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 10110, will be represented as follows:



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.

