
1 11 21 31 41 51
3 13 23 33 43 53
5 15 25 35 45 55
7 17 27 37 47 57
9 19 29 39 49 59
2 11 22 31 42 51
3 14 23 34 43 54
6 15 26 35 46 55
7 18 27 38 47 58
10 19 30 39 50 59
4 13 22 31 44 53
5 14 23 36 45 54
6 15 28 37 46 55
7 20 29 38 47 60
12 21 30 39 52
8 13 26 31 44 57
9 14 27 40 45 58
10 15 28 41 46 59
11 24 29 42 47 60
12 25 30 43 56
16 21 26 31 52 57
17 22 27 48 53 58
18 23 28 49 54 59
19 24 29 50 55 60
20 25 30 51 56
32 37 42 47 52 57
33 38 43 48 53 58
34 39 44 49 54 59
35 40 45 50 55 60
36 41 46 51 56

INSTRUCTIONS :

THESE 6 CARDS ARE SPECIAL !

WITH THEM YOU CAN “MAGICALLY” FIND SOMEONE’S “SECRET NUMBER”;
AMAZING YOUR FRIENDS AND FAMILY !

HOW TO DO THE MAGIC :

1. Choose a Volunteer and ask them to select a 'Secret Number’ between 1 and 60.

2. Show the Volunteer the 6 cards and ask them to select the cards that have the ‘Secret Number’ printed on them.

3. The Volunteer selects the card(s) that contain the ‘Secret Number’.

4. The Magician looks at the selected card(s) and announces the ‘Secret Number’.

THE REAL “MAGIC” :

In Step 4 the Magician adds up the upper-left numbers of the selected card(s).
(The upper-left number will be a 1, 2, 4, 8, 16, or 32.)

That Sum will be the volunteer’s ‘Secret Number’.

PRETTY COOL TRICK :

If you want to know *HOW and WHY this “magically” happens* - The Explanation Pages which follow, will *TELL ALL* …

Go to jorgezimmerman.org and select ‘Magic Cards, Explained’ for hyperlinks and video.

EXPLANATION OF HOW and WHY IT WORKS : click for Help with NUMBERS.

Introduction: … numbers in different Bases (a number with a subscript)
Our numbering system is in what is called **BASE 10**. There are 10 symbols that can represent any number. Perhaps, we like 10 because that is how many fingers and thumbs we have! It is often called a "Decimal System", because there are 10 possible symbols, (Latin 'Deci' = 10).

The **BASE 10** symbols are:

0, 1, 2, 3, 4, 5, 6, 7, 8 & 9

A **BASE 10** number looks like **5608_{10}**: - The 'Place Value' is greater moving to the left.
We do not normally put the subscript 10 after the number, we assume base 10.
"**5608_{10}**" is saying that you take **5x1000**, and add it to **6x100**, and add it to **0x10**, and add it to **8x1**. We say that the value of 5608_{10} is five thousand, six hundred, and eight.

Place Value:	1000	100	10	1
Decimal:	5	6	0	8

A numbering system often used with computers is called **BASE 2**. There are 2 symbols that can represent any number. It is often called a "Binary System", because there are 2 possible symbols. (Latin 'Bi' = 2)

The **BASE 2** symbols are:

0 & 1

Sometimes 0 & 1 represent opposites: No/Yes, False/True, Off/On, Wrong/Right, Down/Up, Right/Left, Black/White … and so on.

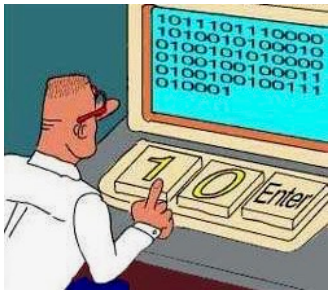
A **BASE 2** number looks like **1101_2**: - The 'Place Value' is greater moving to the left
"**1101_2**" is saying that you take **1x8** and add it to **1x4** and add it to **0x2** and add it to **1x1.**
We say that the decimal value of 1101_2 is thirteen.

Place Value:	8	4	2	1
Binary:	1	1	0	1

BASE 2 is ideal for dealing with conditions that can be ON or OFF. That is how a computer works. A "BIT" in a computer is like a switch, either ON (1) or OFF (0).

And Furthermore … **exponent notation (a number with a superscript)**

In **BASE *10***:
the right most digit represents how many 10s to the 0th power ($10^0 = 1$) there are.
the next digit to the left represents how many 10s to the 1st power ($10^1 = 10$) there are.
the next digit to the left represents how many 10s to the 2nd power ($10^2 = 10x10$) there are.
the next digit to the left represents how many 10s to the 3rd power ($10^3 = 10x10x10$) there are.
… and so on.



Exponent Notation	10^3	10^2	10^1	10^0
Place Value:	**1000**	**100**	**10**	**1**
How Many:	**5**	**6**	**0**	**8**

In **BASE 2**:
the right most symbol represents how many 2s to the 0th power ($2^0 = 1$) there are.
the next symbol to the left represents how many 2s to the 1st power ($2^1 = 2$) there are.
the next symbol to the left represents how many 2s to the 2nd power ($2^2 = 2x2$) there are.
the next symbol to the left represents how many 2s to the 3rd power ($2^3 = 2x2x2$) there are.
… and so on.

Exponent Notation	2^3	2^2	2^1	2^0
Place Value:	**8**	**4**	**2**	**1**
How Many:	**1**	**1**	**0**	**1**

More Furthermore … **binary representations (BASE 2)**

Here are some equivalent ways to represent the same value, in BASE 10 & in BASE 2.

BASE 10	**BASE 2**	**BASE 10**	**BASE 2**	**BASE 10**	**BASE 2**	
1	1	11	1011	21	10101	
2	10	12	1100	22	10110	
3	11	13	1101	23	10111	
4	100	14	1110	24	11000	
5	101	15	1111	25	11001	
6	110	16	10000	26	11010	
7	111	17	10001	27	11011	
8	1000	18	10010	28	11100	
9	1001	19	10011	29	11101	
10	1010	20	10100	30	11110	… and so on.

"What does this have to do with the Magic Cards?", I hear you ask. Well …

HOW the trick works :

1. The Volunteer Chooses a Secret Number between 1 and 60.
2. The Volunteer Selects the Card(s) that contain the Secret Number.
3. The Magician adds the Upper Left numbers on the Selected Card(s).
4. The Magician announces the Secret Number.

The Upper Left numbers are 1, 2, 4, 8, 16, & 32.
Which are the **BASE 2** "Place Values":

2 to the 0th power = 1 $1 = 2^0$ (a number to the 0th power is equal to 1)

2 to the 1st power = 2 $2 = 2^1$

2 to the 2nd power = 4 $2 \times 2 = 2^2$

2 to the 3rd power = 8 $2 \times 2 \times 2 = 2^3$

2 to the 4th power = 16 $2 \times 2 \times 2 \times 2 = 2^4$

2 to the 5th power = 32 $2 \times 2 \times 2 \times 2 \times 2 = 2^5$

Power of 2	Calculation	Value
2^0		1
2^1	2	2
2^2	2 * 2	4
2^3	2 * 2 * 2	8
2^4	2 * 2 * 2 * 2	16
2^5	2 * 2 * 2 * 2 * 2	32
2^6	2 * 2 * 2 * 2 * 2 *2	64
2^7	2 * 2 * 2 * 2 * 2 *2 * 2	128

WHY the trick works :

Look at the table on the next pages and notice what numbers are printed on each card:

All Numbers on the YELLOW card (2^0) have the right most symbol set to YES.

All Numbers on the GREEN card (2^1) have the next symbol to the left set to YES.

All Numbers on the RED card (2^2) have the next symbol to the left set to YES.

All Numbers on the BROWN card (2^3) have the next symbol to the left set to YES.

All Numbers on the PINK card (2^4) have the next symbol to the left set to YES.

All Numbers on the BLUE card (2^5) have the next symbol to the left set to YES.

Here is an Example :
Let's say your secret number is 20. - **20_{10} equals 10100_2.**

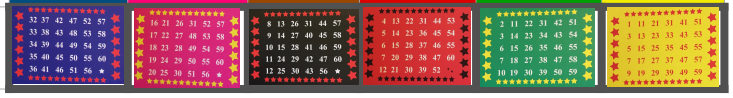
The number 20 appears only on the RED and PINK cards.
The upper-left number on the RED card is 4, which is the RED card PLACE VALUE.
The upper-left number on the PINK card is 16, which is the PINK card PLACE VALUE.

If we add 4 to 16, we get 20 = your "secret number"!
The "magic" is that the selected cards "spell out" the secret number in Binary language.

SECRET Number	PLACE VALUE ———>	32 (2^5)	16 (2^4)	8 (2^3)	4 (2^2)	2 (2^1)	1 (2^0)
DECIMAL	BINARY	Blue	Pink	Brown	Red	Green	Yellow
1	1						**YES**
2	10					**YES**	
3	11					YES	YES
4	100				**YES**		
5	101				YES		YES
6	110				YES	YES	
7	111				YES	YES	YES
8	1000			**YES**			
9	1001			YES			YES
10	1010			YES		YES	
11	1011			YES		YES	YES
12	1100			YES	YES		
13	1101			YES	YES		YES
14	1110			YES	YES	YES	
15	1111			YES	YES	YES	YES
16	10000		**YES**				
17	10001		YES				YES
18	10010		YES			YES	
19	10011		YES			YES	YES
20	*10100*		*YES*		*YES*		
21	10101		YES		YES		YES
22	10110		YES		YES	YES	
23	10111		YES		YES	YES	YES
24	11000		YES	YES			
25	11001		YES	YES			YES
26	11010		YES	YES		YES	
27	11011		YES	YES		YES	YES
28	11100		YES	YES	YES		
29	11101		YES	YES	YES		YES
30	11110		YES	YES	YES	YES	
31	11111		YES	YES	YES	YES	YES

32	100000	**YES**					
33	100001	YES					YES
34	100010	YES				YES	
35	100011	YES				YES	YES
36	100100	YES			YES		
37	100101	YES			YES		YES
38	100110	YES			YES	YES	
39	100111	YES			YES	YES	YES
40	101000	YES		YES			
41	101001	YES		YES			YES
42	101010	YES		YES		YES	
43	101011	YES		YES		YES	YES
44	101100	YES		YES	YES		
45	101101	YES		YES	YES		YES
46	101110	YES		YES	YES	YES	
47	101111	YES		YES	YES	YES	YES
48	110000	YES	YES				
49	110001	YES	YES				YES
50	110010	YES	YES			YES	
51	110011	YES	YES			YES	YES
52	110100	YES	YES		YES		
53	110101	YES	YES		YES		YES
54	110110	YES	YES		YES	YES	
55	110111	YES	YES		YES	YES	YES
56	111000	YES	YES	YES			
57	111001	YES	YES	YES			YES
58	111010	YES	YES	YES		YES	
59	111011	YES	YES	YES		YES	YES
60	111100	YES	YES	YES	YES		

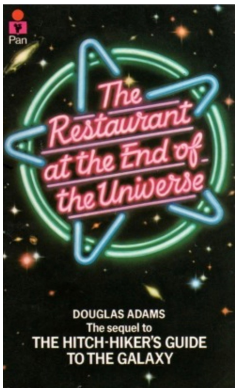
The Cards contain only the “YES” numbers…



I hope that you will think about this (with somebody else or alone) and recognize the beauty of the mathematics that this silly trick is based upon.

If you did … the reward can be life changing!
If you didn't … there will be many more opportunities!

Parting Thoughts:



The Book/Video/Radio Program "The Hitchhiker's Guide to the Galaxy; The Restaurant at the End of the Universe" suggests that **42** is the ultimate answer, and that the ultimate question is:
"What do you get if you multiply **six by nine**?".

This is valid mathematics if you are doing math in ***BASE 13***.

42 in ***BASE 13***, is the same as **54** in **BASE 10** ($42_{13} = 54_{10}$):

(**4**x13 + **2**x1) = 54 = (**5**x10 + **4**x1) = 6x9.

	BASE 10	**BASE 13**
Exponent	10^1 10^0	13^1 13^0
Place Value:	**10** **1**	**13** **1**
How Many:	**5** **4**	**4** **2**
	6_{10} times 9_{10} equals 54_{10}	**6_{13} times 9_{13} equals 42_{13}**
	(**5**x10 + **4**x1) = 54	(**4**x13 + **2**x1) = 54

Perhaps, suggesting that "Enlightenment" will be achieved if we count in the correct base!

What fun!

For More Exciting Information See :
Go to jorgezimmerman.org and select 'Magic Cards, Explained' for hyperlinks and video.

https://en.wikipedia.org/wiki/Decimal - for more about Decimal (Base 10)

https://en.wikipedia.org/wiki/Binary_number - for more about Binary (Base 2)

https://en.wikipedia.org/wiki/List_of_numeral_systems#Standard_positional_numeral_systems - for more more

https://en.wikipedia.org/wiki/The_Hitchhiker%27s_Guide_to_the_Galaxy - for less, but a good laugh!