Mathematics

Binary – the language of computers

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Try this

Complete the following calculations in base 2.

1 + 1 = 10

10+10 =

100 + 100 =

101 + 101 =

111 + 111 =

1010+1010 =

What do you notice about doubling in base 2?

Write each of the calculations in base 10.

Is it easier to double is base 2 or base 10?

Connect

Binary code

A binary code is any code that uses only 2 symbols.

Binary code is very useful in computing.

00100100 00110010 0011100 00100100 00110010 0011100 00100100 00110010 0011100

Connect

Computers read binary code in chunks and each chunk codes for a specific symbol.

Each chunk has a certain number of divisions (called bits).

If computer read the code in chunks of 2-bits, how many different binary codes can you make?

Independent task

1) A computer reads code in chunks of 3-bits. Show all the different binary codes the computer can read. One has been done for you.

000

2) A computer reads code in chunks of 4-bits. Show all the different binary codes the computer can read. One has already been done for you.

0000

What do you notice about the number of codes and the size of the chunks? What similarity does the number of codes possible have with the base 2 place value chart?

Explore

Reading binary code

Character	Binary Code	Character	Binary Code	Character	Binary Code	Character	Binary Code	Character	Binary Code
A	01000001	Q	01010001	g	01100111	w	01110111	-	00101101
B	01000010	R	01010010	h	01101000	x	01111000	.	00101110
C	01000011	S	01010011	i	01101001	y	01111001	/	00101111
D	01000100	T	01010100	j	01101010	z	01111010	0	00110000
E	01000101	U	01010101	k	01101011	!	00100001	1	00110001
F	01000110	V	01010110	l	01101100	"	00100010	2	00110010
G	01000111	W	01010111	m	01101101	#	00100011	3	00110011
H	01001000	X	01011000	n	01101110	$	00100100	4	00110100
I	01001001	Y	01011001	o	01101111	%	00100101	5	00110101
J	01001010	Z	01011010	p	01110000	&	00100110	6	00110110
K	01001011	a	01100001	q	01110001	'	00100111	7	00110111
L	01001100	b	01100010	r	01110010	(	00101000	8	00111000
M	01001101	c	01100011	s	01110011	)	00101001	9	00111001
N	01001110	d	01100100	t	01110100	*	00101010	?	00111111
O	01001111	e	01100101	u	01110101	+	00101011	@	01000000
P	01010000	f	01100110	v	01110110	,	00101100	_	01011111

Source: Science Friday

Use the binary code table to write your name in binary code. Leave a space after each 8-bit chunk.