Computer Literacy

Multimedia Foundations Chapter 2: ‘The Computer’

Image Source: Scifi Methods - A roundup of cool GlitchArt from around the World

What is Information: Atoms to Bits

"Negroponte discusses the differences between bits and atoms.

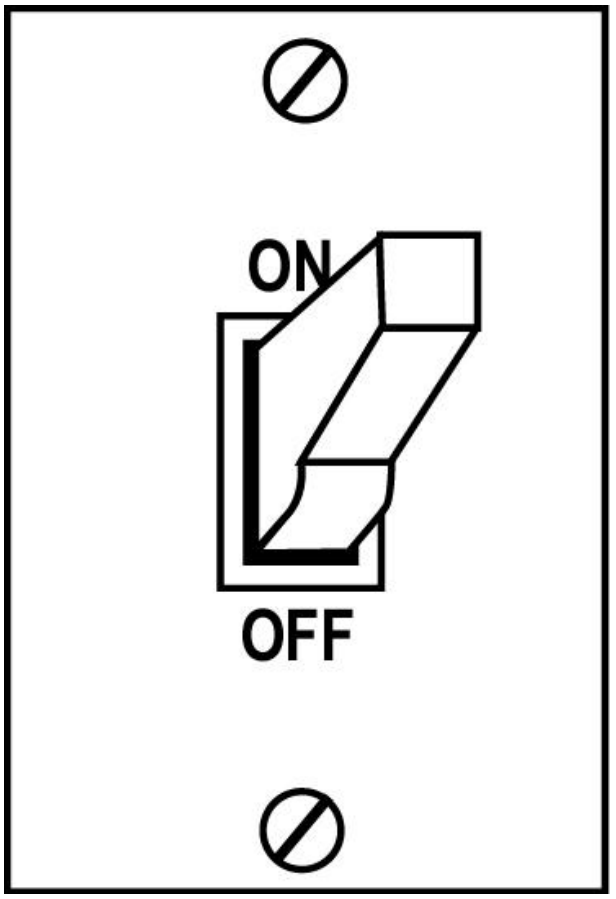
***Atoms** make up physical tangible objects such as CDs, books and letters.*

*Digital information, on the other hand, is made up of **bits**, the smallest unit of information on a computer.*

He believes that all forms of information that are now made of atoms (books, CDs, etc.) will eventually be made into bits." ~ Being Digital Wikipedia Entry

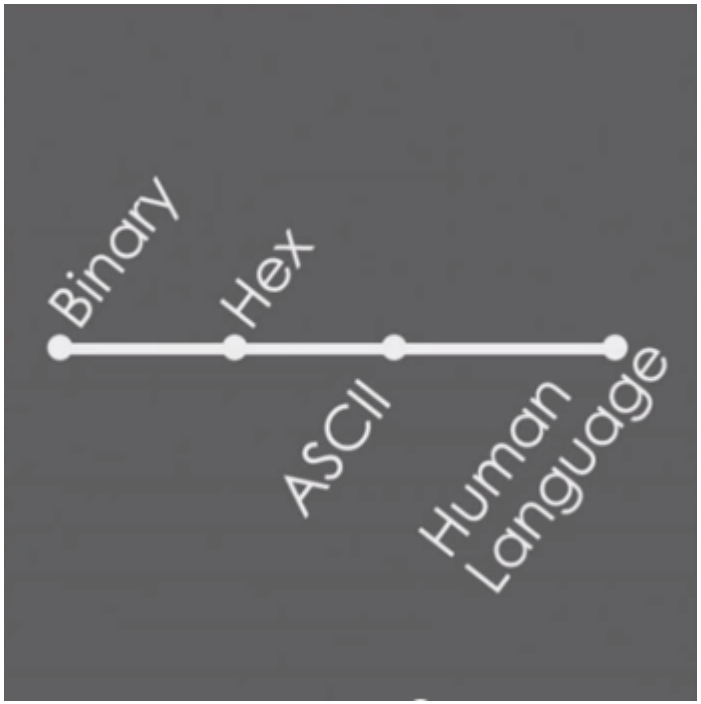
“There are only ten kinds of people in this world, those who understand binary and those who don’t”

“When researchers were looking at ways to use electricity to do mathematical calculations, they realized that they could harness the fact that an electrical circuit was either on or off”



BIT

“In a computer, each instance of a zero or one is called a ‘bit’. Binary numbers (bits) are still at the heart of how the computer stores and processes information, even if contemporary computers shield us from them.”



BYTE

“A string of eight consecutive bits is called a ‘byte’ and is used as one of the basic building blocks for encoding information into digital form.”

A byte can be arranged 256 different ways by altering the order of the zeros or ones in the string.”

ASCII

"Early computers often used different schema for converting letters into digital form, making it difficult to share information between systems."

In the early 1960's, the American Standards Association began to work on ASCII (pronounced as-KE), the ***American Standard Code for Information Interchange"***

Bit & Counting in Binary

binary digit = bit

1001

Exponent	Number	PlaceName
2^0	1	Ones
2^1	2	Twos
2^2	4	Fours
2^3	8	Eights
2^4	16	Sixteens
2^5	32	Thirty-Twos
2^6	64	Sixty-Fours
2^7	128	OneHundredTwentyEights

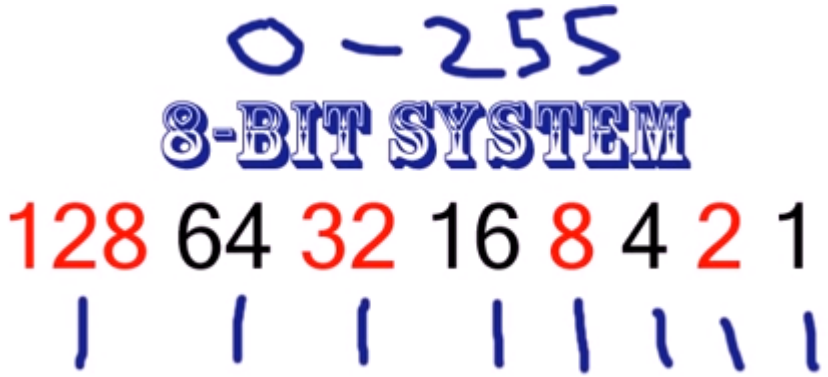


Image Source: The New Boston - Computer Tutorial How Binary Code Works

Image Source: WikiBooks - Assembly Language Computer Organization/Introduction and Overview

Binary & numbers

Base 10 vs Base 2

After replicating this table, convert the following numbers into binary. Use the top row of numbers to either turn ‘on’ or turn ‘off’ the numbers adding up to the sum. Write your answer below transforming the ‘on’ to ‘1’ and the ‘off’ to ‘0’. See the example below.

#	8	4	2	1
ex. 3	off	off	on	
9				
14				

3	0011
9	*(your turn)*
14	*(your turn)*

Counting Higher

Exponent	Number	PlaceName
2^0	1	Ones
2^1	2	Twos
2^2	4	Fours
2^3	8	Eights
2^4	16	Sixteens
2^5	32	Thirty-Twos
2^6	64	Sixty-Fours
2^7	128	OneHundredTwentyEights

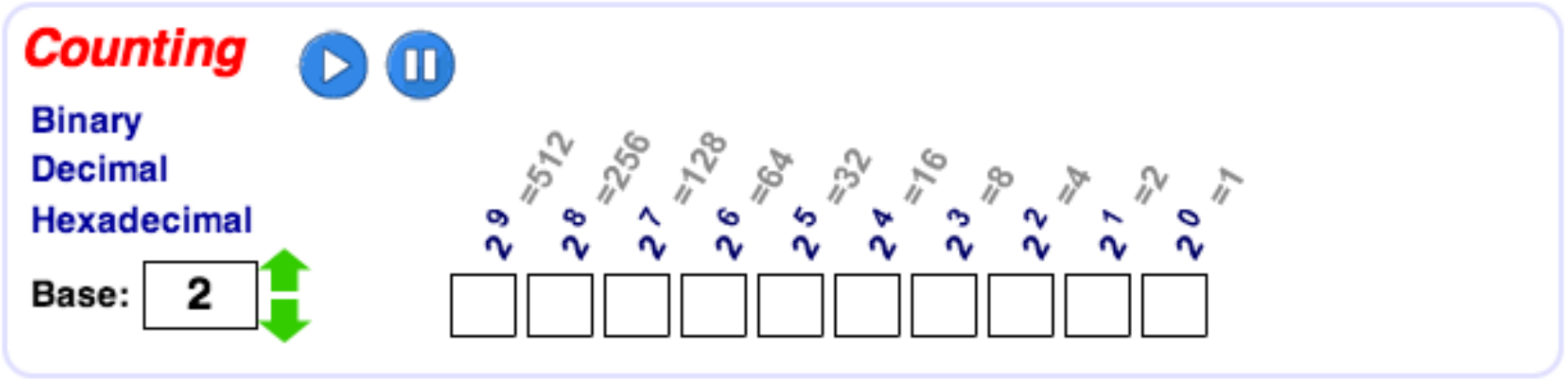


Image Source: Math is Fun - Binary

Convert this Message from Binary

01101000 01100001 01110000
01110000 01111001

01101101 01100001 01110010
01100100 01101001

01100111 01110010 01100001
01110011

Binary & letters ASCII

ASCII - Binary Charact Table

Letter	ASCII Code	Binary	Letter	ASCII Code	Binary
a	097	01100001	A	065	01000001
b	098	01100010	B	066	01000010
c	099	01100011	C	067	01000011
d	100	01100100	D	068	01000100
e	101	01100101	E	069	01000101
f	102	01100110	F	070	01000110
g	103	01100111	G	071	01000111
h	104	01101000	H	072	01001000
i	105	01101001	I	073	01001001
j	106	01101010	J	074	01001010
k	107	01101011	K	075	01001011
l	108	01101100	L	076	01001100
m	109	01101101	M	077	01001101
n	110	01101110	N	078	01001110
o	111	01101111	O	079	01001111

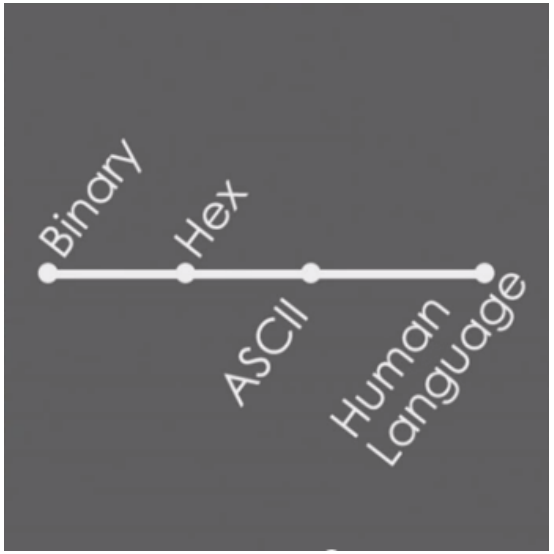
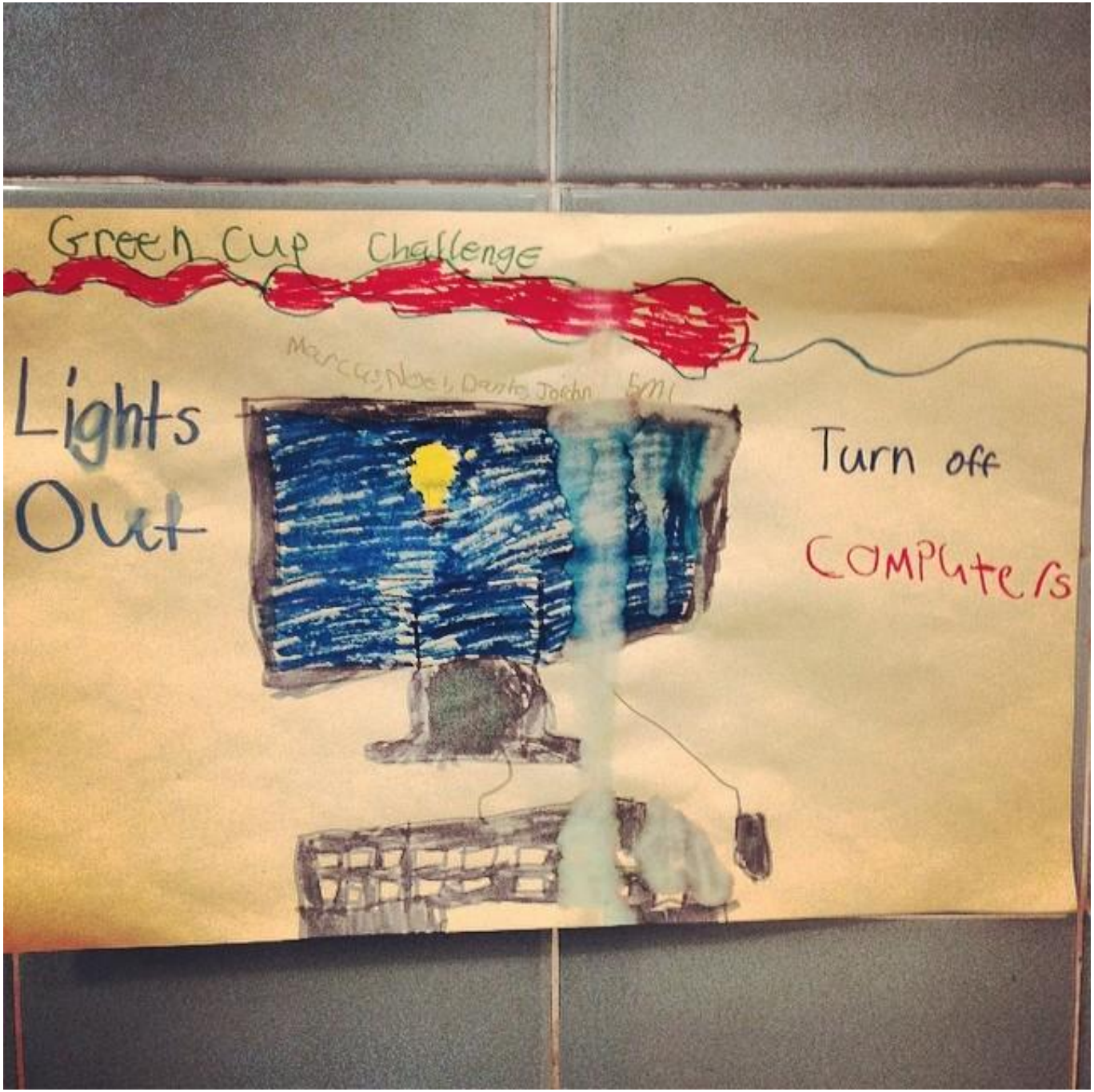


Image Source: [ASCII -> Binary Character Table]


Green Cup Challenge
Lights Out
Turn off
COMPUTERS