The binary system has a base number of two (2). In every day life, we use the decimal system which has a base number of ten (10).

To convert a decimal number to binary, first subtract the largest possible power of two, and keep subtracting the next largest possible power from the remainder, marking 1s in each column where this is possible and 0s where it is not.

An easy way to look at a binary number is to use the following table:
(We will use the binary number 192 for this example)

- **Start on the right side and go left as far as you have bits.**

2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0
128	64	32	16	8	4	2	1

- **Then take your decimal number (192) and, starting on the left, go through and subtract the number from your decimal number. If it can be subtracted, then place a 1 in that place, and if it cannot, place a 0. Basically, you ask yourself can this number be subtracted from my number? 'Yes' becomes 1, and 'no' becomes 0.**

2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0
128	64	32	16	8	4	2	1
192	64	0	0	0	0	0	0
1	1	0	0	0	0	0	0

- **Therefore 192 = 11000000**

Now, let's try another number …

154 = 10011010

2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0
128	64	32	16	8	4	2	1
154	26	26	26	10	2	2	0
1	0	0	1	1	0	1	0

And another number …

78 = 01001110

2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0
128	64	32	16	8	4	2	1
78	78	14	14	14	6	2	0
0	1	0	0	1	1	1	0

*** When you have a number that starts with a 0, you can leave it off because you go only as far left as you have bits.**

01001110 = 1001110

To convert a binary number to a decimal, it follows much of the same format. You take your binary number and place it into the same type of table. Only you add the numbers that the space fits.

11001000 = 216

2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0
128	64	32	16	8	4	2	1
1	1	0	0	1	0	0	0
128	64	0	16	8	0	0	0

128 + 64 + 16 + 8 = 216

10100111 = 167

2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0
128	64	32	16	8	4	2	1
1	0	1	0	0	1	1	1
128	0	32	0	0	4	2	1

128 + 32 + 4 + 2 = 167

11010 = 26

2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0
128	64	32	16	8	4	2	1
			1	1	0	1	0
0	0	0	16	8	0	2	0

16 + 8 + 2 = 26

*** Remember that you always start from right to left when placing the numbers in the table. 11010 is the same as 00011010.**