Counting in Decimal

- Humans are conditioned to count in decimal.
- For each ‘column’ in a number we have 10 possible choices, from 0 to 9.
- Every time we add a column to the left, the value is multiplied by 10.
- We start with ‘1s’ as the furthest right column.

1000’s	100’s	10’s	1’s

Counting in Decimal

- 236 is two 100's, three 10's, and six 1's.

1000's	100's	10's	1's
0 (236)	2 (36)	3 (6)	6 (0)

236

Counting in Binary

- Computers work in binary.
- Electrical impulses are either off or on, so there's only two choices (0 or 1), unlike 10 in decimal (0 to 9).
- For each 'column' in a number we have 2 possible choices, 0 or 1.
- Every time we add a column to the left, the value is multiplied by 2.

128	64	32	16	8	4	2	1

Counting in Binary

- 236 in binary is 11101100

256	128	64	32	16	8	4	2	1
0 (236)	1 (108)	1 (44)	1 (12)	0 (12)	1 (4)	1 (0)	0 (0)	0 (0)
0	1	1	1	0	1	1	0	0

128 + 64 + 32 + 8 + 4 = 236

Counting in Binary

- What is 179 in binary?

256	128	64	32	16	8	4	2	1
0 (179)	1 (51)	0 (51)	1 (19)	1 (3)	0 (3)	0 (3)	1 (1)	1 (0)
0	1	0	1	1	0	0	1	1

179 in binary is 10110011