

Numbering Systems

Study the following comparisons of binary and decimal systems.

Name:	Binary
Base:	2
Character set:	0, 1
Possible values at each place value location	0,1

Name:	Decimal
Base:	10
Character set:	0, 1, 2, 3, 4, 5, 6, 7, 8, 9
Possible values at each place value location	0, 1, 2, 3, 4, 5, 6, 7, 8, 9

Now look at this system.

Name:	Hexadecimal
Base:	16
Character set:	0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, F
Possible values at each place value location	0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15

Why are there letters mixed with the numbers?

To convert values from hexadecimal to decimal and vice versa, first you need to complete a place value chart. This will be similar to your binary place value chart, but it will be for a base 16 system.

Place value locations	16^3	16^2	16^1	16^0
Decimal equivalent	4096	256	16	1

Use the following videos to help you learn how to convert values.

- Khan Academy has a great set of [number conversion instructional videos](#).
- Another link to a good [number conversion tutorial video](#) from Joe James on Youtube.com

Try these problems

BA_{hex} = _____ decimal

58_{dec} = _____ hexadecimal

What are two common uses for hexadecimal values?