



# Hexadecimal Tutorial

The simplest explanation of hexadecimal is this:

In "**decimal**" we have ten digits, 0 through 9. In "**hexadecimal**" we have sixteen digits, 0 through F. That is literally all there is to it. Everything else works exactly the same!

A point of clarification before the example. To differentiate between decimal and hexadecimal numbers, an "h" is appended to hexadecimal numbers. Hexadecimal is quite a jaw-breaker to repeat, so it is often simply called "hex".

Another point of interest is that hex numbers are usually presented as two digits, since one "byte" can have a hex value between 00h and FFh (0 through 255 decimal).

When counting in decimal, once we run out of digits we start combining them by putting a 1 to the left and starting at 0 on the right; thus 10 follows 9. In the same way, in hex once we run out of digits we do the same, thus 10h follows Fh.

**Decimal :** 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 etc.  
**Hex:** 0h 1h 2h 3h 4h 5h 6h 7h 8h 9h Ah Bh Ch Dh Eh Fh 10h 11h etc.

Note that 10h is not said aloud as "ten" because it is not ten, it is sixteen! Generally hex numbers are said as the individual digits; thus 10h is "one zero hex".

To convert between decimal and hex is quite simple with the following chart:

	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	Ah	Bh	Ch	Dh	Eh	Fh
0h	0	16	32	48	64	80	96	112	128	144	160	176	192	208	224	240
1h	1	17	33	49	65	81	97	113	129	145	161	177	193	209	225	241
2h	2	18	34	50	66	82	98	114	130	146	162	178	194	210	226	242
3h	3	19	35	51	67	83	99	115	131	147	163	179	195	211	227	243
4h	4	20	36	52	68	84	100	116	132	148	164	180	196	212	228	244
5h	5	21	37	53	69	85	101	117	133	149	165	181	197	213	229	245
6h	6	22	38	54	70	86	102	118	134	150	166	182	198	214	230	246
7h	7	23	39	55	71	87	103	119	135	151	167	183	199	215	231	247
8h	8	24	40	56	72	88	104	120	136	152	168	184	200	216	232	248
9h	9	25	41	57	73	89	105	121	137	153	169	185	201	217	233	249
Ah	10	26	42	58	74	90	106	122	138	154	170	186	202	218	234	250
Bh	11	27	43	59	75	91	107	123	139	155	171	187	203	219	235	251
Ch	12	28	44	60	76	92	108	124	140	156	172	188	204	220	236	252
Dh	13	29	45	61	77	93	109	125	141	157	173	189	205	221	237	253

<b>Eh</b>	14	30	46	62	78	94	110	126	142	158	174	190	206	222	238	254
<b>Fh</b>	15	31	47	63	79	95	111	127	143	159	175	191	207	223	239	255

Find the decimal number you want to convert and look at the top hex digit first then at the left hex digit and you have the hex equivalent!

Do the reverse to convert from hex to decimal, find the left hex digit on the top position and find the right hex digit along the left side; where the two meet is the decimal equivalent!

The more you work with hex the easier it will become.

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If you know for a fact that I have made any mistakes above, please let me know.

Feed back on clarity and semantics will also be greatly appreciated.

Thanks, [Eddie Lotter](#)

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