

Hex, decimal and binary

Hexadecimal uses 16 digits: 0 to 9, then A to F for 10 to 15. Each hex digit is exactly 4 bits, which is why programmers use hex as a short way to write binary.

Example. $2F = 2 \times 16 + 15 = 47$. In binary, 2 is 0010 and F is 1111, so $2F = 0010\ 1111$.

0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0000	0001	0010	0011	0100	0101	0110	0111	1000	1001	1010	1011	1100	1101	1110	1111

A Convert hex to decimal

- 1F = _____
- 2A = _____
- 64 = _____
- 7B = _____
- C8 = _____
- FF = _____

B Convert decimal to hex

Divide by 16. The answer is the first digit and the remainder is the second.

- 16 = _____
- 30 = _____
- 75 = _____
- 128 = _____
- 171 = _____
- 250 = _____

C Convert hex to binary

- 3 = _____
- A = _____
- F = _____
- 9C = _____
- E5 = _____

D Color codes

A web color like #FF8800 is three hex pairs: red, green and blue. Write each pair in decimal.

COLOR CODE	RED	GREEN	BLUE
#FF0000			
#008000			
#FFA500			

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Answer key

Example. $2F = 2 \times 16 + 15 = 47$. In binary, 2 is 0010 and F is 1111, so $2F = 0010\ 1111$.

0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0000	0001	0010	0011	0100	0101	0110	0111	1000	1001	1010	1011	1100	1101	1110	1111

A Convert hex to decimal

- | | |
|---------------|---------------|
| 1. $1F = 31$ | 2. $2A = 42$ |
| 3. $64 = 100$ | 4. $7B = 123$ |
| 5. $C8 = 200$ | 6. $FF = 255$ |

B Convert decimal to hex

- | | |
|---------------|---------------|
| 1. $16 = 10$ | 2. $30 = 1E$ |
| 3. $75 = 4B$ | 4. $128 = 80$ |
| 5. $171 = AB$ | 6. $250 = FA$ |

C Convert hex to binary

- | | |
|----------------------|----------------------|
| 1. $3 = 0011$ | 2. $A = 1010$ |
| 3. $F = 1111$ | 4. $9C = 1001\ 1100$ |
| 5. $E5 = 1110\ 0101$ | |

D Color codes

A web color like #FF8800 is three hex pairs: red, green and blue. Write each pair in decimal.

COLOR CODE	RED	GREEN	BLUE
#FF0000	255	0	0
#008000	0	128	0
#FFA500	255	165	0