Hexadecimal and Binary Conversions - Reading

The letter F in hexadecimal represents the number 15. In binary this is represented as 1111_2:

8	4	2	1
1	1	1	1

(8+4+2+1 = 15)

4 digits of binary perfectly represent 1 digit of hexadecimal. This makes converting between the two number systems really easy. It also means that 1 digit of hexadecimal can be stored in 1 nibble (4 bits) and 2 digits of hexadecimal can be stored in 1 byte (8 bits).

Hexadecimal to binary conversions

Question: Convert the number $4A_{16}$ to binary

1. Convert each digit to decimal numbers: 4, 10
2. Convert each of the digits of hexadecimal to 4 digits of binary:

				4								10 (A)			
8	**4**	**2**	**1**	**8**	**4**	**2**	**1**	**8**	**4**	**2**	**1**	**8**	**4**	**2**	**1**
0	1	0	0	1	0	1	0								

Answer: **$0100\ 1010_2$**

Question: Convert the number $F34A_{16}$ to binary

				15 (F)				3				4				10 (A)			
8	**4**	**2**	**1**	**8**	**4**	**2**	**1**	**8**	**4**	**2**	**1**	**8**	**4**	**2**	**1**	**8**	**4**	**2**	**1**
1	1	1	1	0	0	1	1	0	1	0	0	1	0	1	0				

Answer: **$1111\ 0011\ 0100\ 1010_2$**

Binary to hexadecimal conversions

Question: Convert $1011\ 1010_2$ to hexadecimal

1. Draw out the table and put in the binary digits

8	4	2	1	8	4	2	1
1	0	1	1	1	0	1	0

2. Convert each 4 binary digits to hexadecimal

				8+2+1 = 11 = B								8+2 = 10 = A			
8	**4**	**2**	**1**	**8**	**4**	**2**	**1**	**8**	**4**	**2**	**1**	**8**	**4**	**2**	**1**
1	0	1	1	1	0	1	0								

Answer: **BA_{16}**