

Binary, Denary and Hexadecimal

Complete the following in your exercise books (write the question out for each one!):

1. Convert the following binary numbers to denary

- | | |
|---------|--------------|
| a) 0010 | e) 0010 0000 |
| b) 0110 | f) 0010 1011 |
| c) 1011 | g) 0101 1010 |
| d) 1111 | h) 1011 0100 |

2. Convert the following denary numbers to binary

- | | |
|----------------|-------------------|
| a) 7 (4 bits) | e) 17 (8 bits...) |
| b) 12 (4 bits) | f) 68 |
| c) 14 (4 bits) | g) 162 |
| d) 15 (4 bits) | h) 217 |

3. Convert the following denary numbers to hexadecimal

- | | |
|-------|-------|
| a) 10 | c) 15 |
| b) 12 | d) 16 |

4. Convert the following hexadecimal numbers to denary

- | | |
|------|-------|
| a) B | c) 9 |
| b) D | d) 10 |

5. Convert the following binary numbers to hexadecimal

- | | |
|---------|--------------|
| a) 1000 | e) 0000 1000 |
| b) 1010 | f) 1010 0110 |
| c) 1101 | g) 0011 1011 |
| d) 1111 | h) 1010 1010 |

6. Convert the following hexadecimal numbers to binary

- | | |
|------|-------|
| a) D | e) 7A |
| b) F | f) C9 |
| c) 7 | g) F4 |
| d) A | h) 6D |

7. Convert the following denary numbers to binary and then to hexadecimal

- | | |
|--------|--------|
| a) 17 | c) 162 |
| b) 117 | d) 253 |

8. Convert the following hexadecimal numbers to binary and then to denary

- | | |
|-------|-------|
| a) 6A | c) 9F |
| b) DC | d) 62 |

9. Add the following pairs of binary numbers – in binary.

Hint:

Carry:	1	1	0	0	
First number:	0	1	1	0	
Second number:	0	0	1	0	+
Answer	1	0	0	0	

- | | |
|-------------------|-----------------------------|
| a) 1011
0010 + | e) 0101 1011
0010 0001 + |
| b) 0101
1010 + | f) 0011 1001
0000 0001+ |
| c) 0110
0101 + | g) 0110 0100
0011 1100 + |
| d) 1011
1011 + | h) 1010 1101
0111 0110 + |

10. Convert each binary number from question 9 into denary, and so check that your adding up was done correctly.

11. Convert the following hexadecimal number to binary

6 A 9

12. Convert the following denary number to binary

1705

Hint: 2048 1024 512 256 128 64 32 16 8 4 2 1

0 1 1 0 0 0 0 0 0 0 0 0 = 1536

13. Compare the answers to question 11 and question 12. Which was easier?

ASCII Table

Dec	Hex	Char	Dec	Hex	Char	Dec	Hex	Char	Dec	Hex	Char
0	00	Null	32	20	Space	64	40	@	96	60	`
1	01	Start of heading	33	21	!	65	41	A	97	61	a
2	02	Start of text	34	22	"	66	42	B	98	62	b
3	03	End of text	35	23	#	67	43	C	99	63	c
4	04	End of transmit	36	24	\$	68	44	D	100	64	d
5	05	Enquiry	37	25	%	69	45	E	101	65	e
6	06	Acknowledge	38	26	&	70	46	F	102	66	f
7	07	Audible bell	39	27	'	71	47	G	103	67	g
8	08	Backspace	40	28	(	72	48	H	104	68	h
9	09	Horizontal tab	41	29	)	73	49	I	105	69	i
10	0A	Line feed	42	2A	*	74	4A	J	106	6A	j
11	0B	Vertical tab	43	2B	+	75	4B	K	107	6B	k
12	0C	Form feed	44	2C	,	76	4C	L	108	6C	l
13	0D	Carriage return	45	2D	-	77	4D	M	109	6D	m
14	0E	Shift out	46	2E	.	78	4E	N	110	6E	n
15	0F	Shift in	47	2F	/	79	4F	O	111	6F	o
16	10	Data link escape	48	30	0	80	50	P	112	70	p
17	11	Device control 1	49	31	1	81	51	Q	113	71	q
18	12	Device control 2	50	32	2	82	52	R	114	72	r
19	13	Device control 3	51	33	3	83	53	S	115	73	s
20	14	Device control 4	52	34	4	84	54	T	116	74	t
21	15	Neg. acknowledge	53	35	5	85	55	U	117	75	u
22	16	Synchronous idle	54	36	6	86	56	V	118	76	v
23	17	End trans. block	55	37	7	87	57	W	119	77	w
24	18	Cancel	56	38	8	88	58	X	120	78	x
25	19	End of medium	57	39	9	89	59	Y	121	79	y
26	1A	Substitution	58	3A	:	90	5A	Z	122	7A	z
27	1B	Escape	59	3B	;	91	5B	[	123	7B	{
28	1C	File separator	60	3C	<	92	5C	\	124	7C	|
29	1D	Group separator	61	3D	=	93	5D	]	125	7D	}
30	1E	Record separator	62	3E	>	94	5E	^	126	7E	~
31	1F	Unit separator	63	3F	?	95	5F	_	127	7F	□

Binary Representation of Text – ASCII and Unicode

Complete the following in your exercise books (write the question out for each one!):

1. Convert the following binary numbers to denary and then to text.
Make sure you write down both the **binary & denary** values!

- | | |
|--------------|--------------|
| a) 0101 0101 | b) 0100 0011 |
| 0101 0011 | 0100 0100 |
| 0100 0010 | 0010 1101 |
| | 0101 0010 |
| | 0100 1111 |
| | 0100 1101 |

2. Convert the following binary numbers to hexadecimal and then to text.
Make sure you write down both the **binary & hexadecimal** value!

- | | | |
|--------------|-----------|-----------|
| a) 0100 0011 | b (cont.) | 0111 0011 |
| 0101 0000 | | 0110 1111 |
| 0101 0101 | | 0110 1110 |
| | | 0010 0000 |
| b) 0100 1101 | | 0110 1001 |
| 0111 0010 | | 0111 0011 |
| 0010 1110 | | 0010 0000 |
| 0010 0000 | | 0110 0111 |
| 0100 0011 | | 0111 0010 |
| 0110 1100 | | 0110 0101 |
| 0110 0001 | | 0110 0001 |
| 0111 0010 | | 0111 0100 |
| 0110 1011 | | 0010 0001 |

3. Convert the following hexadecimal numbers to text.

- | | |
|-------------|----------------------------------|
| a) 52 41 4D | c) 44 56 44 |
| b) 52 4F 4D | d) 48 61 72 64 20 64 72 69 76 65 |

4. Convert the following words and phrases to hexadecimal (including punctuation!)

- | | |
|--------------|-----------------------------------|
| a) GCSE | c) X Factor is a load of rubbish! |
| b) Computing | d) And so is "I'm A Celebrity" |

5. If you have any time left, go to Teach ICT, GCSE Computing, Quizzes and have a go at the Representing Data quiz.

6. If you have even more time, have a go at some of the Computing Hardware quizzes.