

Kemnal Technology College – Computer Science Kemnal Key – Year 10 Term 3

Computers understand only two states: power on, or power off

- This is represented by switches, and computers are essentially calculators made up of billions of switches
 - Power on = 1
 - Power off = 0



Binary	Hex	Decimal
0000	0	0
0001	1	1
0010	2	2
0011	3	3
0100	4	4
0101	5	5
0110	6	6
0111	7	7
1000	8	8
1001	9	9
1010	A	10
1011	B	11
1100	C	12
1101	D	13
1110	E	14
1111	F	15

KEMNAL KEY QUESTIONS

- Give one reason why data is represented in binary in a computer.
- What are the bases for the numbering systems: Binary, Denary and Hexadecimal?
- What is the purpose for using encryption?
- Describe the term Caesar cypher and give an example
- What is meant by the character sets ASCII and Unicode?

Number Bases	<ul style="list-style-type: none"> Binary Denary Hexadecimal
Characters	<ul style="list-style-type: none"> Character set. <ul style="list-style-type: none"> Definition ASCII Unicode
Sound	<ul style="list-style-type: none"> Metadata Sample rate <ul style="list-style-type: none"> Quality of sound Filesize Sample interval Bit rate
Binary Manipulation	<ul style="list-style-type: none"> Addition Subtraction Logical Shifts Sign and Magnitude Arithmetic Shifts
Instructions	<ul style="list-style-type: none"> Fetch-Execute cycle Op-code Operand Accumulator
Compression	Need for: <ul style="list-style-type: none"> Lossy Lossless
Characters	Character set. <ul style="list-style-type: none"> Definition <ul style="list-style-type: none"> ASCII Unicode
Hexadecimal (hex) numbers	<ul style="list-style-type: none"> Hex – base 16 Converting between hex and denary. Converting between hex and binary.

Should I show my working for binary / hex conversions?

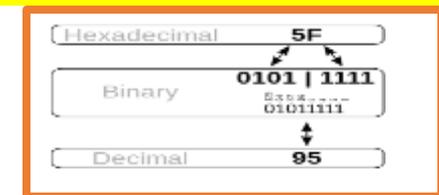
- Yes, always show your working. It helps you spot easy errors that may mean you miss out on a mark. Sometimes there are marks in the question for working out too.

Encryption and Decryption

- When data is encrypted and is then decoded, this is called decryption, not unencrypted.

Is there one type of encryption?

- There are many types of encryption, public key encryption is used to send data securely across the Internet, usually for online bank transaction and payments. But you need to be able to explain, describe and use a Caesar cypher.



Misconceptions

- Binary place values double each time (they don't follow the 2 times table)
- The Caesar cypher is not just a wheel that moves, but you need to be able to describe what happens.
- Encryption isn't just used to stop people from seeing information. It is used to only allow people with access to the key to decrypt it to view it, thus stopping unauthorised users from seeing it.