COMPUTER BIT

ON   OFF

COMPUTER BYTE

0 0 1 1 0 1 0 1

THOUSANDS HUNDREDS TENS UNITS

3 1 4 0

CD QUALITY 44.1 kHz

VCPI QUALITY 8 kHz

A = 0100 0001

AUDIO → WMA OGG MIDI MP3 WAV AIFF

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KnowIT

DATA REPRESENTATION

4 8
5 9
6 A
7 B
0 1 2 3 C D E F

80 40
DO 90 50 00
EO AO 60 10
FO BO 70 20
CO 30

ORIGINAL JPG
824 KB

50% LOSSY
COMPRESSION
76 KB

80% LOSSY
COMPRESSION
38 KB

ADC

1   2
3   4
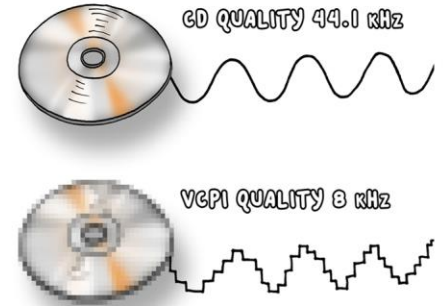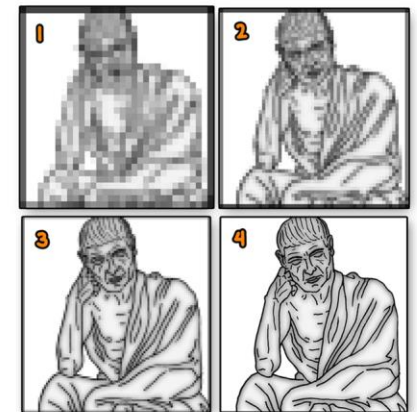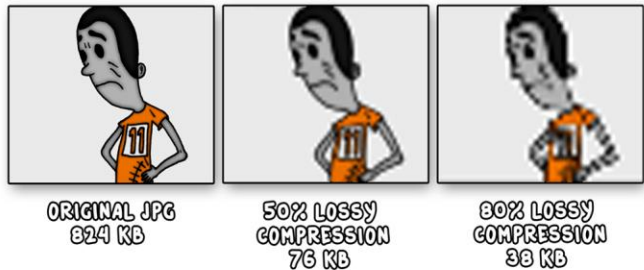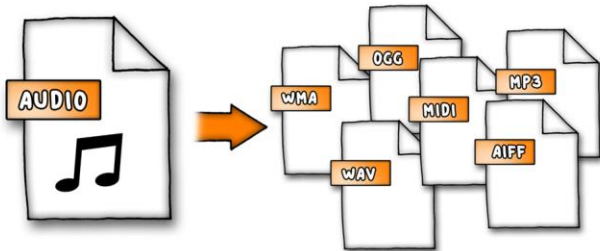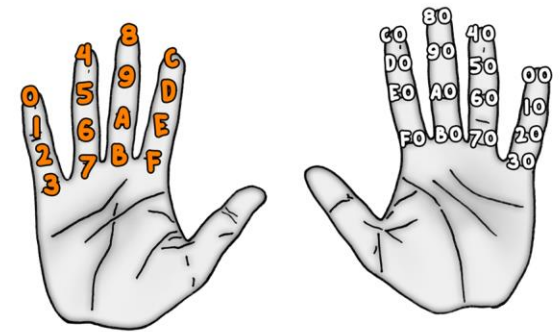
INCREASING RESOLUTION

Units

- Analyse the difference between a bit and a byte

- Specify how many megabytes are contained within a gigabyte of data

- Examine some of the reasons as to why some organisations will eventually need more than a yottabyte of data storage

- **Specify the amount of storage required to store 1 hour of film compressed in the MPEG4 file format**

Numbers

- Examine how and why most computers use two's complement to represent signed numbers

- Outline each of the stages involved in converting a denary number to hexadecimal and vice versa

- Analyse how computers represent and manipulate numbers

- **Add the two following binary numbers together: 00001011 and 00010010**

Characters

- Distinguish the difference between ASCII and extended ASCII

- Examine how character codes are commonly stored in encoding tables

- Compare how ASCII and Unicode are similar to each other

- **State the range of bits which are used to store characters within the Unicode character set**

Images

- Specify how the resolution of an image can be calculated

- Illustrate the difference between an image which has a 2-bit colour depth and one which has an 8-bit colour depth

- Analyse some of the problems that can arise from using a high image resolution to create and manipulate images

- **State the number of pixels contained within a 1 inch grid that measures 72 pixels by 72 pixels in size**
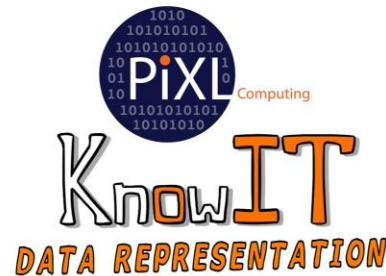
Sound

- Examine some of the reasons why VoIP services often use a lower sampling rate than the rate used to digitalise audio

- Produce a graph to demonstrate how you would sample an analogue audio signal

- Specify how to calculate the size of an audio file

- **Explain how the number of channels available can affect the size of an audio file**

Compression

- Specify with an example of when lossy file compression would be appropriate to use on an image

- Examine with an analogy how lossless file compression works

- Outline how to calculate the compression ratio of an image which has been compressed

- **Specify the file compression technique a photographer should use if he is getting his users to upload and download images from his website to print**

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