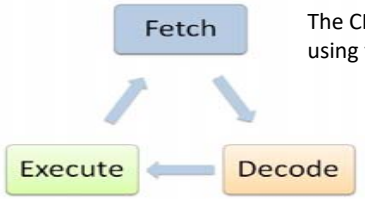
Knowledge Organizer — Computers and Binary — The Oaks Academy

Overview of topic: You will learn about the basics of computer systems and how binary is used in a computer system to represent data. You will be able to convert between binary and numbers as well as create bitmap images using binary numbers.

Key content/ ideas/ concepts

Every computer system takes an input, processes it to give an output.

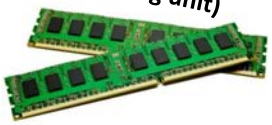


The CPU processes data in a computer, using the fetch, decode, execute cycle.

CPU (Central processing unit)

Motherboard
Connects all hardware together

Hard Drive (HDD)
Long term storage



RAM
(Random access memory)
Short term memory

Peripheral devices

Keyboard

Optical mouse

Image scanner

Inkjet printer

Laser printer

LCD projector

Units	Capacity
Bit	1 or 0 (Smallest unit of data)
Byte	8 bits
Kilobyte	1000 bytes
Megabytes	1000 Kilobytes
Gigabytes	1000 Megabytes
Terabytes	1000 Gigabytes

Binary to Decimal

128	64	32	16	8	4	2	1
0	0	0	1	0	1	0	1

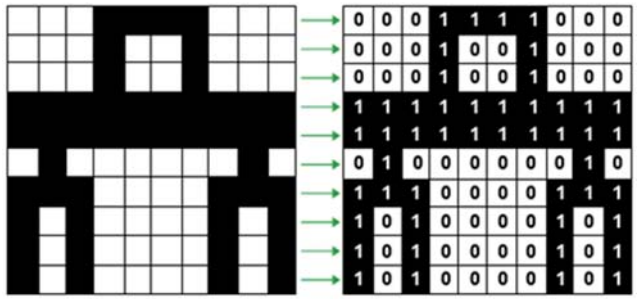
Adding these together gives 21

Decimal to Binary

82	82	18	18	2	2	2	0
-	-	-	-	-	-	-	-
128	64	32	16	8	4	2	1
0	1	0	1	0	0	1	0
	18		2			0	

82 = 0101 0010 in binary.

Bitmap images



Keywords/ Glossary

Hardware: The physical components that make up a computer.

Software: The programs installed on a computer.

Input: Putting data into a computer system. E.g Text, click a button.

Process: The action that is taken with the input data. E.g a calculation, loading.

Output: Data that is given by the computer system. E.g sound, images.

Storage: An area that saves data and documents.

Peripheral: A device connected to a computer to allow inputs or outputs.

Decimal: Base 10 number system used by humans.

Binary: Base 2 number system used by computers.

Bitmap: An image made up of dots (pixels) represented by binary.

Pixel: Smallest part of a bitmap image.

Resolution: How many pixels are in a bitmap image.

Bit depth: How many bits are used in each pixel.

Useful sites

https://www.bbc.com/bitesize/guides/zwsbwmn/revision/3

https://www.bbc.com/bitesize/guides/zws8d2p/revision/1

https://www.bbc.com/bitesize/topics/zmpsgk7

Bronze -Quiz Questions	Silver -Quiz Questions	Gold—Quiz Questions
1. What is hardware?	11. What do we mean by input?	21. What is stored on the RAM?
2. What is software?	12. What do we mean by process?	22. What is stored on the hard drive?
3. What does every computer system do?	13. What do we mean by output?	23. How many bytes in a Megabyte?
4. Wat does CPU stand for?	14. What is the job of the motherboard?	24. What base system is decimal? WHY?
5. What is the job of the CPU?	15. What is the job of the hard drive?	25. What base system is binary? WHY?
6. Name 3 peripheral devices.	16. What is the job of the RAM?	26. Convert 0011 1101 to decimal.
7. What is a bit?	17. How many bytes in a kilobyte?	27. Convert 245 to binary.
8. How many bits are in a byte?	18. Convert 1110 1111 to decimal.	28. Convert 99 to binary.
9. Convert 1001 0011 to decimal.	19. Convert 1101 1100 to decimal.	29. How does the resolution affect an image?
10. What is a pixel?	20. Convert 102 to binary.	30. How does the bit depth affect an image?
Total -	Total -	Total -