



## Highsted Knowledge Organiser

### Computer Science: Spreadsheet - Year 8

#### What I need to know

- What a spreadsheet program looks like and its different parts such as the workbook, the active cell, the cell reference
- How to enter data into spreadsheet cells
- How to do calculations using formulae and functions
- How to use the if tool to test hypothesis

#### Key Vocabulary

- Spreadsheet	- Cells
- Workbook	- Active cell
- Reference cell	- Formula
- Function	- Value
- Data type	- Fill
- Formula bar	- Label
- Name box	- Formatting

#### Student reference point

<b>Common functions</b>	<b>=SUM</b>	Adds a range of cells together	<b>Common formulas</b>	<b>Addition</b>	=A1 + B1
	<b>=AVERAGE</b>	Finds the average of a range of cells		<b>Subtraction</b>	=A1 - B1
	<b>=MIN</b>	Returns the smallest value from a range of cells		<b>Multiplying</b>	=A1 * B1
	<b>=MAX</b>	Returns the largest value from a range of cells		<b>Dividing</b>	=A1 / B1
	<b>=IF</b>	Returns a value if a condition is true and another if the condition is false		<b>Percentage</b>	=(A1/B1)*100

#### Challenge question

- How could a spreadsheet help you when you are planning some shopping?
- How could you use a spreadsheet to add up values?
- How would you add a formula so that the cell shows the product of two other cells?
- Explain what a spreadsheet model of a real-life situation is and what it can be used for?

#### Suggested reading

- <https://www.bbc.co.uk/bitesize/guides/z8f82hv/revision/3>



## Highsted Knowledge Organiser

### Computer Science: Binary Data Representation - Year 8

#### What I need to know

- What is a bit
- What is binary representation
- Why does the computer need binary representation to represent data
- How to represent number in binary digits
- How to represent images in binary digits

#### Key Vocabulary

- Data units	- Bit (0 and 1)
- Binary system	- Denary
- Decimal	- Hexadecimal
- ASCII	- Pixel
- Resolution	- Metadata

#### Student reference point

##### What is binary?

- Binary is a number system that only represents two digits 0 and 1.
- All data that we want a computer to process needs to be converted in this binary format.
- The binary system is also known as the base 2 number system, where data is converted using the power of 2.

$2^7$	$2^6$	$2^5$	$2^4$	$2^3$	$2^2$	$2^1$	$2^0$
128	64	32	16	8	4	2	1

##### Binary to Denary Conversion

128	64	32	16	8	4	2	1
1	0	1	0	1	1	0	1
$128+32+8+4+1 = 173$							

##### Denary to Binary Conversion

Convert 199 to binary

128	64	32	16	8	4	2	1
199-	70-	6-	6-	6-8	6-4	2-2	1-
128=	64	32	16	= -2	= 2	= 1	1=0
70	= 6	= -	= -				
		26	10				
1	1	0	0	0	1	1	1

##### Hexadecimal

- Hexadecimal uses 0-9 and A-F digits.
- It uses on 4 bits called a nibble.

##### Hexadecimal to Binary

3 C  
 $3 = 0011$  C = 1100  
 00111100

##### Binary Images

Images are made up of pixels, the tiny dots on the screen. Each pixel is represented by a binary number.

0	1	0	1
1	0	1	0
1	0	1	0
0	1	0	1

Each pixel has a binary bit representing either black (1) or white (0).  
 If an image has more colour, there will be more bits in each pixel.

11	01	11	00
10	11	00	11
01	10	11	00
00	01	10	11

##### Binary to Denary

128	64	32	16	8	4	2	1
0	0	1	1	1	1	0	0
$32+16+8+4 = 60$							

The bits there are in a pixel, the file size will be greater and the quality will be better.

Colour depth is how many bits are there is in one pixel.

Metadata is data about an image, like the time it was created, the resolution, the colour depth.

#### ASCII – Representing Text

The code used to represent text is called the ASCII code.

Each character (from a traditional keyboard) is converted to an ASCII number.

A = 65, a = 90, space = 31 and so on

An ASCII table has 128 characters. Unicode which has more characters are used for emojis and other languages.

#### Challenge question

- Explain lossy and lossless compression?
- Show that the hexadecimal equation  $10 + 25 + 3A = 6F$  is correct.

#### Suggested reading

- <https://www.bbc.co.uk/bitesize/topics/zgv8dp3/articles/z9j2jsg>
- <https://learningcontent.cisco.com/games/binary/index.html>