Computing

Lesson 2: A Splash of Colour

Data Representation

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OAK NATIONAL ACADEMY

Task 1 - Pick and mix colours

Steps	**Instructions**
Visit the RGB Colour Mixer (oaknat.uk/comp-csfg-rgb-mixer) on the Computer Science Field Guide website. website.	You **do not need to give specific values**; any shade of the colours will do. The point is for you to experiment with how mixing elementary colours produces the desired ones.

Task 1.1: Pick and mix colours

The table on the right contains specific values of red, green, and blue.

Write down the colour that you get when you mix red, green, and blue in these quantities.

Fill in the table below:

Red	Green	Blue	Composite colour
255	255	0	
160	0	160	
128	128	128	

Task 1.2: Pick and mix colours

The table on the right contains specific colours.

Write down the values of red, green, and blue that you need to mix in order to produce these colours.

Fill in the table below:

Red	**Green**	**Blue**	**Composite colour**
			Orange
			Brown
			White

Task 2 - Representation Size

The two factors that determine the representation size of an image are its **resolution** (how many pixels it comprises) and its **colour depth** (how many bits or bytes are used to represent the colour of a pixel).

Representation size of a bitmap image	=	Resolution number of pixels	×	Colour depth number of bits or bytes for each pixel's colour

If the colour depth of an image is not specified, you can assume that it is 24 bits. This is the most common value in contemporary bitmap images.

Task 2 - Worked example to compute image size:

What is the representation size, **in bits and bytes**, of a bitmap image with a resolution of 800×600 and a colour depth of 24 bits.

Representation size	=	resolution	×	colour depth
	=	800 × 600 pixels	×	24 bits per pixel
	=	480,000 pixels	×	24 bits per pixel
		11,520,000 bits (or 11.5 megabits)		

Task 2 - Worked example to compute image size:

You could convert bits to bytes by dividing by 8. You could also calculate the size in bytes directly, since 24 bits is 3 bytes:

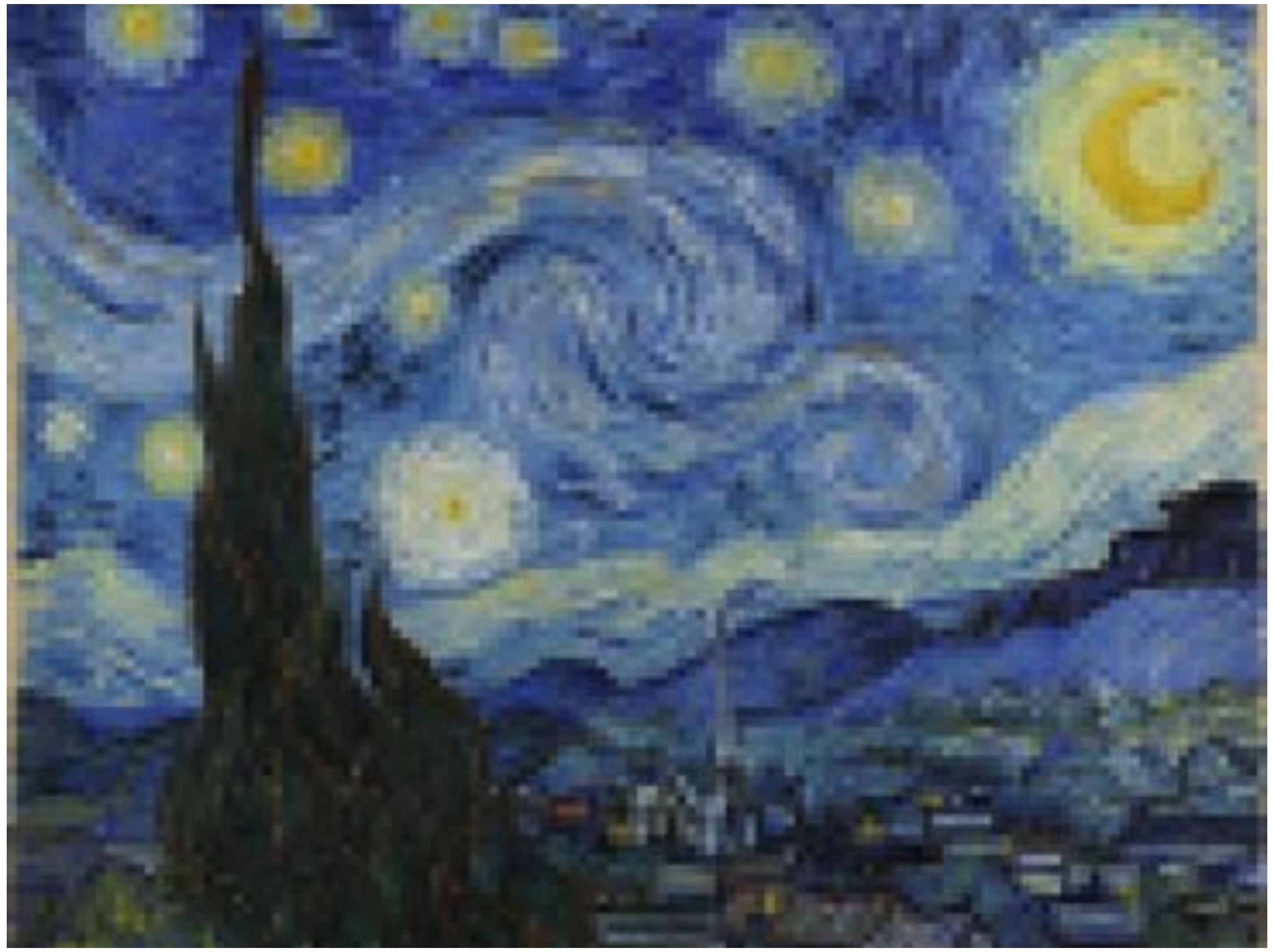
Representation size	=	resolution	×	colour depth
	=	480,000 pixels	×	3 bytes per pixel
		1,440,000 bytes (or 1.44 megabytes)		

Task 2 : Representation Size

- On the right you can see the image of Van Gogh's famous *The Starry Night* painting.
- This image has been reduced to a **resolution** of 640×500, with a **colour depth** of 3 bytes.

Tasks:

1. Use this information to **calculate** the number of **bytes** required to represent this image.
2. **Convert** this size to **megabytes**.



Credit: Van Gogh, The Starry Night image:Pixabay