

1.2 Text, sound and images

Name: _____ Class: _____ Date: _____

Total: 9 marks

Objective

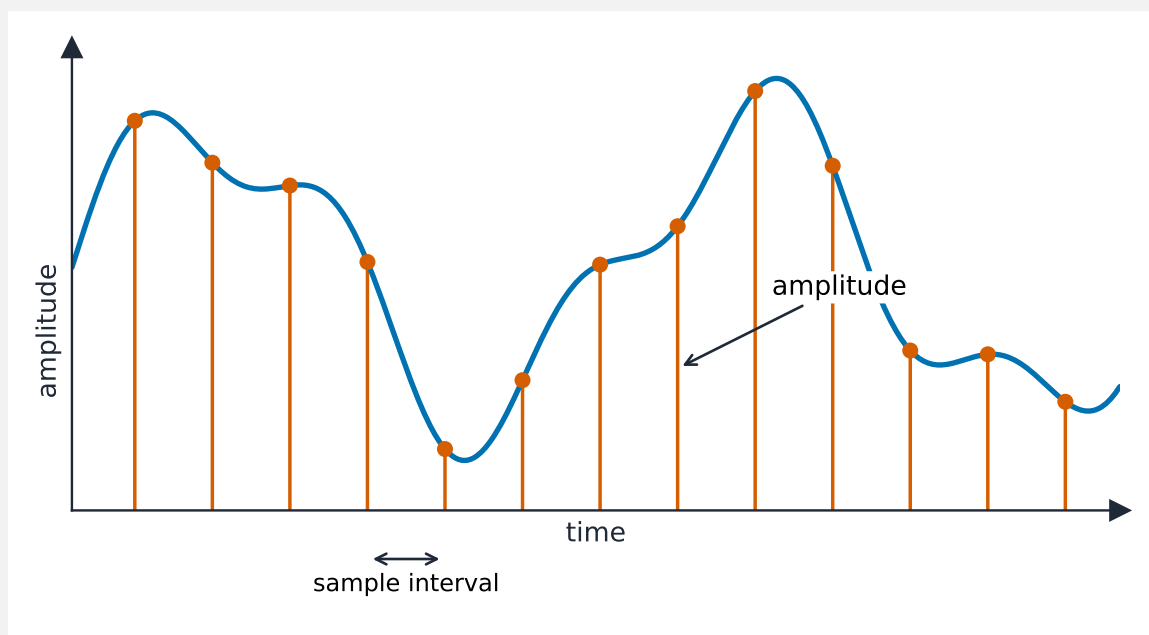
Build the skills to answer exam questions on **text, sound and images** 文本、声音与图像—character sets, **sampling** 采样, pixels, and file-size calculations.

You must be able to:

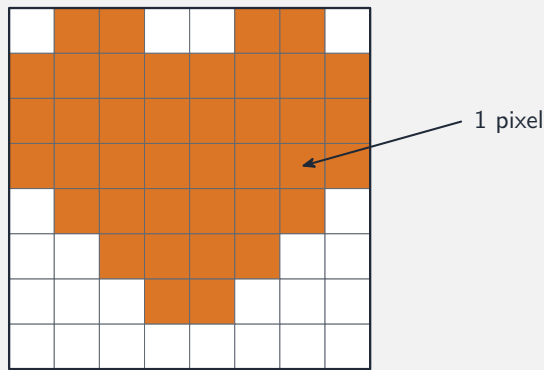
- compare ASCII and Unicode
- define sample rate, sample resolution, resolution and colour depth
- calculate image and sound file sizes

1 Worked examples

■ Sampling and pixels



Sampling records the wave's height (amplitude) at regular moments



resolution = 8×8 pixels

An image is a grid of pixels; resolution = number of pixels, colour depth = bits per pixel

- **image bits** = width $\times$ height $\times$ colour depth. **sound bits** = sample rate $\times$ resolution $\times$ seconds.

2 Practice

2.1 State the difference between ASCII and Unicode. [2]

2.2 Define sample rate. [1]

3 Exam-style questions

3.1 Increasing the colour depth of an image will: [1]

- **A** reduce the file size
- **B** increase the file size and quality
- **C** have no effect
- **D** reduce the resolution

3.2 An image is 200×100 pixels with a colour depth of 8 bits.

(a) Calculate the file size in bits. [2]

(b) Convert your answer to bytes.

[1]

3.3 A sound is recorded for 20 seconds at a sample rate of 10 000 Hz with a sample resolution of 8 bits. Calculate the file size in bits.

[2]

4 Go further

You are now ready for the real exam questions on this subtopic. Open the **1.2 Text, sound and images** past-paper sheet in the Library, or try these in **Practice mode**:

- 0478/11 N25 —Q3 (representing data)
- 0478/13 N25 —Q5 (sound / images)

Solutions

2.1 ASCII uses fewer bits (7) and fewer characters; Unicode uses more bits and can represent many more characters/languages.

2.2 the number of samples taken each second.

3.1 B. A greater colour depth increases the file size (and quality).

3.2 (a) $200 \times 100 \times 8 = 160\,000$ bits.

(b) $160\,000 \div 8 = 20\,000$ bytes.

3.3 $10\,000 \times 8 \times 20 = 1\,600\,000$ bits.