












## Topic: Data Storage and Measurements

### Understanding Data Storage Measurements

Data storage is measured using various units, based on binary (powers of 2) or decimal (powers of 10) systems. For this class, we will focus on binary-based units:

-  **Bit:** The smallest unit of data storage, representing a single binary digit (0 or 1).
-  **Nibble:** A group of 4 bits.
-  **Byte:** A group of 8 bits.
-  **Kibibyte (KiB):** 1 KiB = 1,024 bytes.
-  **Mebibyte (MiB):** 1 MiB = 1,024 KiB.
-  **Gibibyte (GiB):** 1 GiB = 1,024 MiB.
-  **Tebibyte (TiB):** 1 TiB = 1,024 GiB.
-  **Pebibyte (PiB):** 1 PiB = 1,024 TiB.
-  **Exbibyte (EiB):** 1 EiB = 1,024 PiB.

These units are used to measure the size of data storage devices or digital files.

### Calculating File Size for Image and Sound Files:

**Image File Size:** To calculate the file size of an uncompressed image, use the formula:

File size (in bytes) = Image Width (pixels) x Image Height (pixels) x Color Depth (bits per pixel) / 8

Convert the file size to the desired units (e.g., KiB, MiB) by dividing by the appropriate power of 1024.

**Sound File Size:** To calculate the file size of an uncompressed sound file, use the formula:

File size (in bytes) = Sample Rate (samples per second) x Sample Resolution (bits per sample) x Length of Track (seconds) / 8

Convert the file size to the desired units as before.

