



# Tiverton High School Year 9 Computing Summer Term Knowledge Organiser

## Storage Devices (Unit 9-5)

**Secondary storage devices** are used for **long term storage** of data and instructions.

Programs and data are stored in **files**. Files are stored **even when the computer is switched off**.

We say that secondary storage is "**persistent**" or "**non-volatile**".

<b>Magnetic Hard Disk Drive</b>	A <b>high capacity</b> device that can often store as much as <b>8 TB</b> of data on one drive. Data is stored using tiny <b>magnetised</b> areas on a rapidly spinning metal disk. Magnetic hard-disks can be <b>damaged</b> accidentally by a <b>sudden impacts</b> or if it is dropped. Data can be <b>corrupted</b> or <b>erased</b> accidentally by <b>magnetic fields</b> from <b>speakers</b> , or <b>heat</b> .
<b>Solid State Drive</b>	An alternative to using a magnetic hard disk drive, but does not contain any moving parts. Data is stored using <b>tiny components</b> in <b>solid-state circuits</b> called <b>flash memory</b> . Solid-state drives are not affected by magnetic fields or extreme temperatures. They are very <b>lightweight</b> and <b>impact-proof</b> , making them ideal for use in laptops. They cannot hold quite as much data as magnetic disk drives and are <b>more expensive per GB</b> . Solid State Drives can sometimes start to <b>wear out</b> after data has been written to the same area a large number of times. Areas of the drive can then become <b>less reliable</b> for storing your data.
<b>Flash Memory Card</b>	A tiny, <b>portable memory card</b> that can be used to <b>transfer data between devices</b> . They can usually store between <b>64 GB</b> and <b>512 GB</b> of data, although some hold even more. They are used in <b>digital cameras</b> and <b>mobile phones</b> , but can be read by many laptops and PCs. They are <b>impact-proof</b> but can be damaged by <b>static-electricity</b> if not handled carefully.
<b>USB Flash-Drive</b>	A <b>removable storage device</b> that can be used to <b>transfer files from one computer to another</b> . They are similar to solid-state drives and flash memory cards. Their data is held in <b>flash memory</b> . Flash drives are often <b>encrypted</b> to prevent <b>breaches of sensitive data</b> if they are lost.
<b>CD-ROM</b>	A <b>removable optical disk</b> that stores data as tiny <b>pits</b> , burnt into the surface by a <b>laser beam</b> . A single CD-ROM can store as much as <b>900 MB</b> of data. Highly <b>portable</b> , making it ideal for <b>backing up files</b> or <b>transferring data</b> to other computers. Very <b>cheap to manufacture</b> , making them ideal to <b>distribute software utilities</b> and <b>audio</b> . CDs are <b>not very durable</b> . A <b>scratch</b> can make individual files or the whole disk <b>unreadable</b> .
<b>DVD-ROM</b>	A <b>removable optical disk</b> , similar to a CD-ROM, but with a much larger storage capacity. A single DVD-ROM can store enough compressed data for a <b>whole feature-length movie</b> . It can usually store at least <b>4.7 GB</b> of data, although some types of DVD can store much more. Because a DVD can hold more data than a CD, they are used as <b>installation disks</b> for software.
<b>Blu-ray</b>	An <b>removable optical disk</b> that can store enough data for <b>several hours of HD video</b> .

## Laws That Govern How You Use Computer Technology (Unit 9-6)

The **Data Protection Act 2018** covers **how personal data may be used by companies and organisations**. It describes **the type of data can be collected, how long data can be kept for** and the need to **keep data up to date/accurate**. It sets out **restrictions on sending and using data**. It also **defines who is allowed to view or make use of data**.

The **Computer Misuse Act 1990** makes it **illegal to use or to attempt to use computers to access computer systems without permission**. It also **make it illegal to access computer systems with intent to commit a criminal offence**, or to **alter data without permission** (e.g. through the use of viruses, physical deletion etc).

## Compression and File Types (Unit 9-5)

Music and video files can contain a lot of data. Large files and streams of data can take a long time to transfer over the Internet. If the file can be **compressed**, either by **reorganising** or **reducing the amount of data**, then it can be sent and received **faster**.

**Compression** re-organises a file of data and saves it as a new compressed file. The compressed file usually has a **smaller file size** than the original.

It takes the computer **time** to compress the data – it's got to work out how to organise the data in a more **efficient** way. Before you can use the data again, the computer needs to **de-compress** the file. It must **re-organise the data** again into a form that can be used easily.

Sometimes, parts of the original data are **removed** during compression. When the file is uncompressed again, some of the data will be **lost forever**. This is called **lossy compression**. The data that was removed can **never** be recovered again.

When compressing **executable programs** and **text documents** we need to use **loss-less compression**. Otherwise, if a program instruction was lost, **the program would not be the same**. The **meaning** of a text document could also be **changed**.

## Text Documents

**.txt** is an uncompressed **plain text document**. The text file contains only **unformatted text characters**.

**.rtf** is an uncompressed **rich-text file**. The text file contains characters which can be **formatted** using **bold, italics, colour, font sizes** etc.

**.pdf** is an Adobe **Portable Document Format** file. It can hold **rich-text, font definitions** and high-quality **vector diagrams**. Because the file contains the **font definitions** for each font face used it is **portable** - the document will look the same, regardless of the type of computer or phone being used. PDF files can also compress text and pictures to reduce the amount of data that they hold.

## Images

**.bmp** is an uncompressed **bitmap image** format used widely by Microsoft Windows programs.

**.tif** is an uncompressed **high-quality bitmap image** that can contain **millions of colours**. TIFF file sizes can be very large as they often contain so much uncompressed data.

**.jpg** is a bitmap image that uses **lossy compression**. JPEGs are used widely for **photographs** and can include **millions of colours**, making pictures very **realistic**.

**.gif** is a compressed bitmap image that can only use up to **256 different colours**. This is only suitable for **simple graphics** and **animations**, or regions of **flat colour** that are all the same.

**.png** is a **Portable Network Graphic**. This stores high-quality graphics using one or more separate layers.

## Audio/Sound/Music

**.wav** is an **uncompressed audio waveform**. These files are often very large, but result in high-quality audio.

**.mp3** is an **audio file** that uses **lossy compression**. The MP3 file is usually approximately 10 times smaller than their original. The sound quality can be quite low.

## Video/Movies

**.avi** is an **uncompressed video file** used widely by Microsoft Windows programs.

**.mp4** is a **video file** that uses **lossy compression**.

## Programs

**.exe** is an uncompressed **executable program file**.