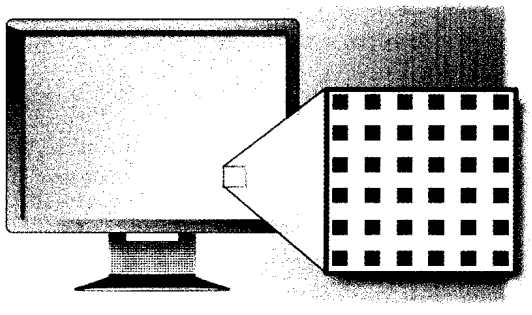
7 Output devices: display screens

A CRTs and LCDs

The screen of a computer is often known as the **monitor**, or VDU (visual display unit). Inside the computer, there is a **video card** which processes images and sends signals to the monitor.

When choosing a monitor, you have to take into account a few basics.

- Type of display – the choice is between a **CRT** or an **LCD** screen.
  The **Cathode Ray Tube** of a monitor is similar to a traditional TV set. It has three electron guns (one for each **primary colour**: red, green and blue) that strike the inside of the screen, which is coated with substances called **phosphors**, which glow and create colours. CRTs are cheap, but they are heavy, can flicker and emit radiation.
  A **Liquid Crystal Display** is made from flat plates with a liquid crystal solution between them. The crystals block the light in different quantities to create the image. **Active-matrix** LCDs use TFT (thin film transistor) technology, in which each pixel has its own transistor switch. They offer better quality and take up less space, so they are replacing CRTs.
- **Screen size** – the viewing area is measured **diagonally**; in other words, a 17" screen measures 17 inches from the top left corner to the bottom right.
- **Resolution** – the clarity of the image depends on the number of **pixels** (short for picture elements) contained on a display, horizontally and vertically. A typical resolution is 1,024 x 768. The sharpness of images is affected by **dot pitch**, the distance between the pixels on the screen, so a dot pitch of 0.28 mm or less will produce a sharp image.
- **Brightness** – the luminance of images is measured in cd/m^2 (candela per square metre).
- **Colour depth** – the number of colours a monitor can display. For example, a VGA monitor produces 256 colours, enough for home use; a SuperVGA can produce up to 16.7 million colours, so is ideal for photographic work and video games.
- **Refresh rate** – the number of times that the image is drawn each second. If a monitor has a refresh rate of 75 Hertz (Hz), it means that the screen is scanned 75 times per second. If this rate is low, you will notice a flicker, which can cause eye fatigue.

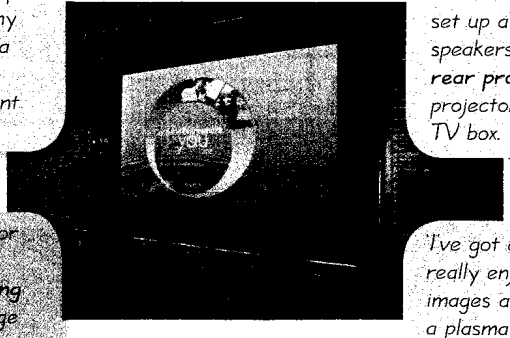


A colour pixel is a combination of red, green and blue subpixels

B Big screens: plasma and projection TVs

'I sometimes use a video projector in my Geography lessons. I prepare audiovisual presentations on my laptop and then connect it to a ***front-screen projector*** *which displays the images on a distant screen or white wall.'*

'I am a ***home cinema*** *enthusiast. I've set up a system with a DVD recorder, speakers for surround sound, and a* ***rear projection*** *TV, which has the video projector and the screen within a large TV box. It's a real cinema experience.'*



'I use a portable DLP projector for my business presentations. This is a ***digital light processing*** *device which creates the image with millions of microscopic mirrors arranged on a silicon chip.'*

'I've got a 52-inch ***plasma display*** *and really enjoy its advantages: high-contrast images and bright colours, generated by a plasma discharge which contains noble, non-harmful gases. Gas-plasma TVs allow for larger screens and wide viewing angles, perfect for movies!'*