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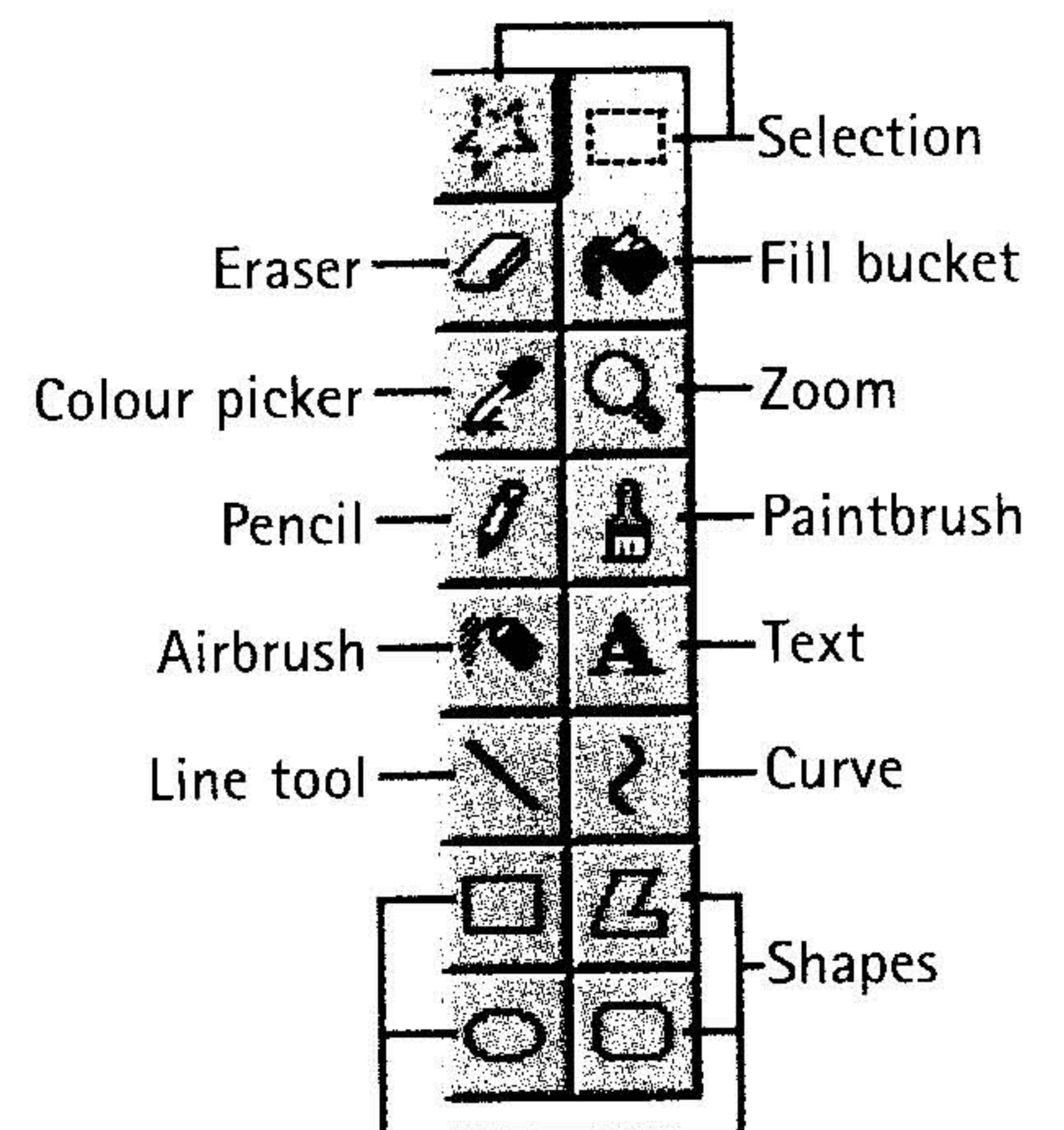
Types of graphics software

Computer graphics are pictures created, changed or processed by computers. There are two categories.

- 1 **Bitmapped graphics** represent images as **bitmaps**; they are stored as pixels and can become a bit distorted when they are manipulated. The density of dots, known as the resolution and expressed in dots per inch, determines how sharp the image is.
- 2 **Vector graphics** represent images as mathematical formulae, so they can be changed or scaled without losing quality. They are ideal for high-resolution output.

There are different types of graphics software.

- **Image manipulation programs** let you edit your favourite images. For example, you can scan a picture into your PC or transfer a photo from your camera and then add different effects, or **filters**.
- **Painting and drawing programs**, also called **illustration packages**, offer facilities for freehand drawing, with a wide choice of pens and brushes, colours and patterns. One example is *Windows Paint*.
- **Business graphics programs**, also called **presentation software**, let you create pie charts, bar charts and line graphs of all kinds for slide shows and reports. You can import data from a database or spreadsheet to generate the graphs.
- **Computer-aided design (CAD)** is used by engineers and architects to design everything from cars and planes to buildings and furniture. First they make a **wireframe**, a drawing with edges and contour lines. Then if they want to colour the objects and add texture, they create a surface for the object; this is called 'filling the surface'. Finally, the design is **rendered** to make the object look realistic. **Rendering** is a process that adds realism to graphics by using shading, light sources and reflections.
- **Desktop publishing (DTP)** is based around a page layout program, which lets you import text from a word processor, **clip-art** (ready-made pictures) from graphics packages, and images from scanners or cameras, and arrange them all on a page. It is used to design and publish books, newspapers, posters, advertisements, etc.
- **Digital art, or computer art**, is done with applets that use mathematical formulae to create beautiful bright shapes called **fractals**. A **fractal** is a geometrical figure with special properties, e.g. the Koch snowflake or the Mandelbrot set. Fractals can also be used to model real objects like clouds, coastlines or landscapes.
- **Computer animation** uses graphics programs (e.g. digital cartooning systems) to create or edit moving pictures. Each image in a sequence of images is called a 'frame'.
- **Geographic information systems (GIS)** allow cartographers to create detailed maps.



Windows Paint Toolbox



The original photo has been processed with Adobe Photoshop using effects **filters**



3D wireframe drawing