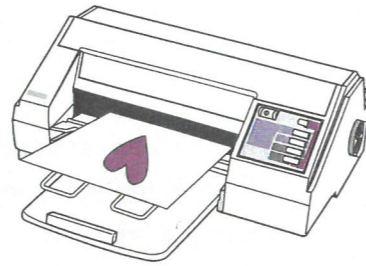


Printing Techniques

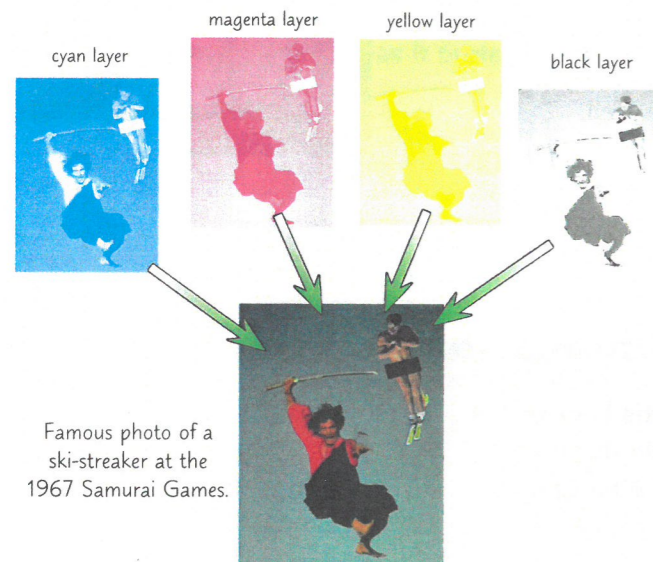
Digital Printing Doesn't Use Printing Plates

- 1) Digital printing is done using **inkjet** and **laser** printers.
- 2) You don't have to make any printing plates, so it's **less fiddly** than many other methods.
- 3) There are **no set-up costs** apart from buying a printer and ink/toner cartridges (which will need replacing when they run out).
- 4) Digital printing is **expensive** per sheet but for **short** print runs (hundreds of copies) it's **cheaper** than setting up the plates for another printing process, e.g. lithography.
- 5) It's used to print **posters, flyers, digital photos**, etc.



Digital Printers Use Four Colours in Layers

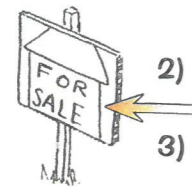
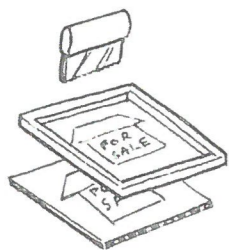
- 1) Digital printers use four colours — **cyan (C)**, **magenta (M)**, **yellow (Y)** and **black (K)**. These are also referred to as CMYK and are known as **process colours**.
- 2) Anything that's printed in colour is made up of a **mixture** of these colours.



The 'K' stands for '**key**' — it means black. You can make black by **mixing** the other three colours, but using **black ink** usually looks better, and it works out **cheaper** if you're printing a lot of black.

- 3) When the computer is instructed to print, the printer recognises the required colour and adds **layers** of cyan, magenta, yellow and black to make the final colour.
- 4) Some printers use special **spot colours** (e.g. PANTONE® colours) as well — to print particular colours that **can't be achieved with CMYK**.
- 5) There's no set **order** in which the colours are put onto the paper. Most printers stick to the CMYK order while others go from **lightest to darkest** — YMCK.

Screen Printing Uses... a Screen



- 1) In screen printing, a **stencil** is put under a **fine mesh screen**, and **ink** is spread over the top. The ink goes through the stencil and prints onto the material below.
- 2) It's a **low-cost** process, ideal for **short** print runs of up to a few hundred copies where **fine detail** isn't needed.
- 3) You can use it to print onto **various surfaces** (e.g. paper, card, fabric) — so it's great for printing **posters, estate agents' signs**, etc. It can also be used on **textiles** — take a look at p.84.

Paper and Board Finishes

Once you've printed your product, you can choose a **finish** to... you've guessed it... finish your product. There are lots of different finishes to choose from, so you need to think about which **properties** you'll need.

Varnishing Makes Things Shiny or Matt



- 1) Varnishing is used to make things look **smooth** and **glossy** or **matt**, so they look more exciting and high-quality.
- 2) You can varnish the **whole product**, e.g. **playing cards** — this makes them slide over each other.
- 3) Or you can varnish **specific areas** (e.g. **titles on book covers**) to draw attention to them — this is called **spot varnishing**.
- 4) Varnish **can't be written on**, so varnish is sometimes **only applied to one side of the paper** — e.g. postcards.

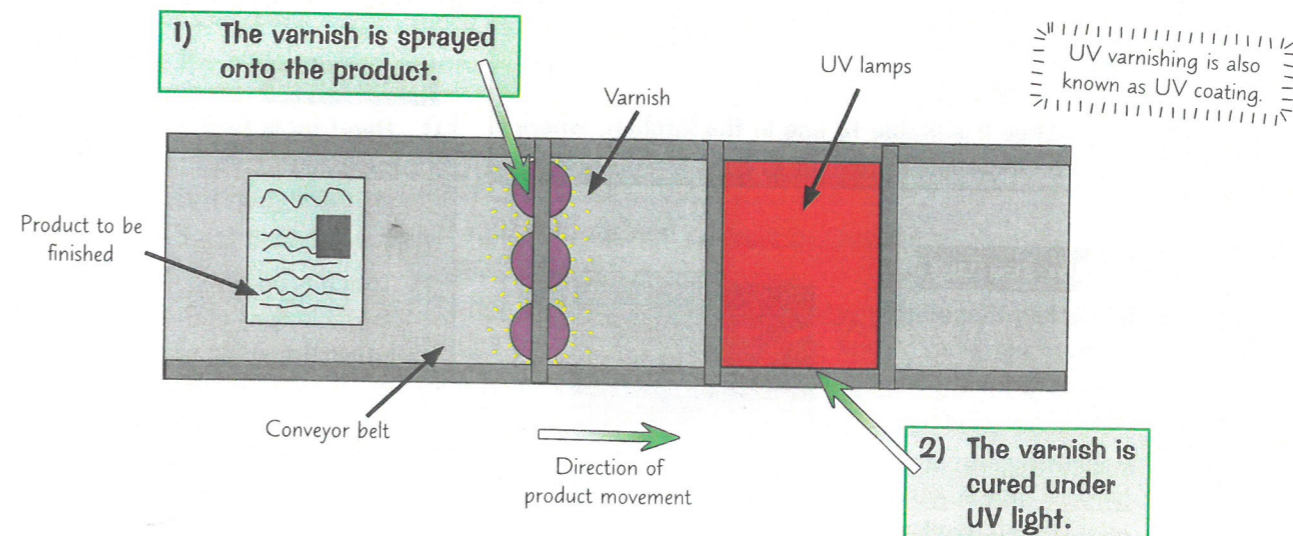
Embossing Leaves a Raised Impression

- 1) **Embossing** means pushing a **shaped die** into the back of the material to leave a slightly **raised impression** on its surface.
- 2) It's often used to **draw attention** to a particular bit of a product, e.g. the **title** of a book, a **logo** or an **image**.
- 3) It's an **expensive** process but it adds **texture** and can suggest **quality**.
- 4) Industrial embossing machines use a **rolling die** to emboss the **same pattern** onto **large amounts** of paper and card.



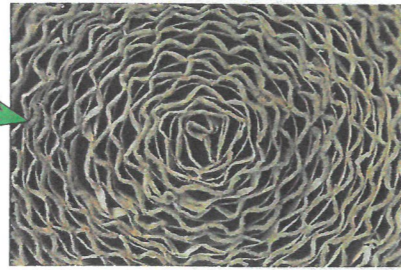
UV Varnishing

- 1) In **UV varnishing**, a varnish is **applied to the surface** of the paper. The varnish is then **cured under UV light** — this makes it feel **dry to the touch**.
- 2) A **glossy**, shiny finish or a **matt** finish can be applied.
- 3) UV varnishing can be applied to the **whole page** (**flooding**) or to **certain areas** (**spot UV varnishing**).
- 4) UV varnishing is a good finish for items that are going to be **handled frequently** as it protects the paper. It's often used for **business cards** and **magazine covers**.
- 5) The **varnish cures very quickly** when it is exposed to UV light. This **speeds up** the printing process and **reduces production times**.

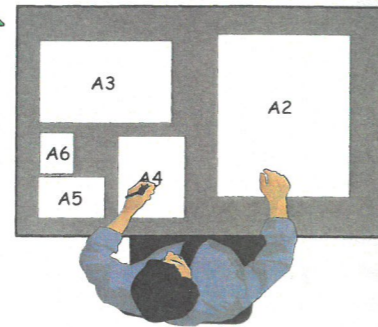


Paper and Board Come in Different Shapes and Sizes

- 1) There are **various types** of paper and board available (take a look back to p.16).
- 2) Paper and board can be bought by the **sheet** and in **rolls** — these are known as **stock forms** (also see p.60).
- 3) Sheets of paper and board are sold in **standard sizes**. Sizes go **from A0** (which has an area of 1 m²) to **A1**, **A2**, and so on — halving in size (area) each time.
- 4) Many other sizes are also available — **A4** is **half** the size of **A3**, **A5** is **half** the size of **A4**, **A6** is **half** the size of **A5**, etc.
- 5) As the size gets smaller the number **increases**.
- 6) The most common paper sizes used in schools are **A4** and **A3**. The **width** of A3 paper is the **length** of A4. The **length** of A3 paper is **double the width** of A4.
- 7) Paper and board are also available in different **weights** (see p.16), **thicknesses** and **colours**.
- 8) You can choose the **ply** of your material too. Ply means how many **layers** it is made out of — 1-ply is one layer, 2-ply is two layers and so on.



A roll of corrugated board



Card based food packaging

- 1) Cardboard food packaging needs a **combination of properties**. It needs to be **printable**, so that the customer can see the advertising and nutritional information for what they are buying. But it often also has to be **waterproof** and **airtight**, to prevent the food inside from going bad.
- 2) A combination of **aluminium foil** and **board** can be used to package food, e.g. soup cartons. It keeps **flavours in** and **air out**. You can also print graphics onto the paper. Duplex board (look back to p.16) is often used for food packaging because it is **strong** and **easy to print on**.
- 3) **Pizza boxes** are made of corrugated cardboard that is **strong** enough to withstand other boxes being **stacked on top of it**. It's **thick**, so it's **good at retaining heat**, which keeps the pizza warm.



If you laminate paper by adding a layer of another material, you get a composite (see p.33) with different properties.

Toxicity and sustainability

- 1) Recycled paper and board may contain **toxic chemicals** which mean they're not suitable for use as food packaging.
- 2) **Laminated paper and board** (see p.56) can be **hard to recycle** because it's hard to separate the paper/board from the other materials.