CAD/CAM: Architecture

Why are Buildings Designed for Different Functions?

Appearance and Aesthetics – Creating an attractive, innovative and outstanding design for the external and internal space of a building. (making the building look good).

Sustainability – Using green technology and materials to reduce harmful impact onto the environment.

Functionality – creating a space or areas that are provides useful services so the building provides the function is was designed for. (no unnecessary features).

Occupant Safety – allowing safe access for everyone who uses the building or facility.

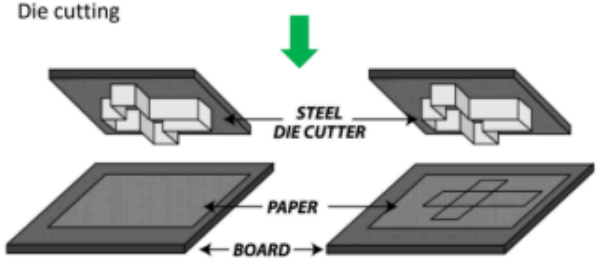
Product Sustainability

Sustainability	The impact of a process or product on the environment.
Sustainable	A process or material that can be used without causing permanent damage to the environment or using finite
Finite materials	Will run out and can not be replaced (eg. Metal/oil)
Non-finite materials	Will not run out, can be replaced (eg. Wood)
Carbon Footprint	Amount of greenhouse gas released into the atmosphere by making, using, and disposing of a product.
Global warming	Average earth temperature rising, causing damage to habitats leading to extinction.
Obsolete	No longer useful. Outdated.
Planned Obsolescence	When a product is designed to become outdated or useless quickly.

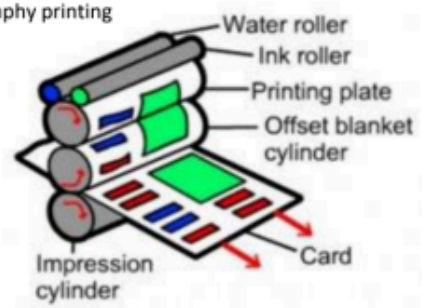
Tools & Manufacturing

Scissors	Used to cut paper and thin card
Knives	Used to cut paper and card. Metal cased knives for tough materials. Scalpels (very sharp) for precision cutting.
Guillotines	For cutting large sheets
Laser cutting	Programmed with 2D CAD software. Very accurate and precise. Cuts paper and card.
Die cutting	Like a cookie cutter. Sharp blades (cutting) and round edge blades (scoring) are mounted on a plywood board and pressed down onto card. Good for batch/mass production.
Scoring	Small indent along a line to make card easier to bend.
Net	2D plan for making a 3D object (usually a box for packaging)

Die cutting



Lithography printing



Paper and board is available in sizes from A0 (biggest) to A7 (smallest).
The most common size is A4.
Each size is half the one before, eg A4 is half the size of A3.
They are also sold by weight:
GSM – grams per square metre.

Card thickness or calliper is traditionally measured in **Microns**. 1000 **Microns** = 1mm, so the higher the value, the thicker the **card** or paper.

Techniques

Lithography	Uses oil-based ink and water, relying on the fact that oil and water do not mix. Fast and high quality for printing a large number of items
How lithography works	UV light transfers image onto printing plate, this image gets coated with a chemical that attracts oil (ink) and repels water.
Flexography	Used for printing large quantity (wallpaper, packaging, carrier bags etc)
How flexography works	Uses a flexible rubber printing plate. The image sticks out from the plate and presses the print onto the item being printed. Can print on rough surfaces such as cardboard, plastic bottles etc. Very fast.
Screen printing	Ink is spread over a stencil. Ink goes through and prints on material below. Low cost, printing in small numbers without fine detail. Paper, card, fabric
Digital printing	Normal printing on printer paper. Inkjet/laser printing. Easy low cost setup. More expensive per sheet. Four colours used (Cyan, Magenta, Yellow, Black)

Finishing

Finish	To improve the look of the printed product. Also helps protect it. Adds cost.
Laminating	Sandwiching a document between two layers of plastic e.g. menu to protect it from grease/damage
Embossing	Pushing a shaped die into the material to make it textured. Used to draw attention to product, gives it high quality finish
Varnishing	Gives a smooth, glossy or matt finish. Whole product (eg playing cards to protect them from damage) or just one side (e.g. postcard, as varnish can't be written on)
UV varnishing	Varnish cured under UV light for dry feel finish. Used to protect items such as magazine covers

Components

Standard components	Parts that come ready made for use. These are mass produced, so low cost. E.g. Screws, buttons
Advantages to manufacturer	Cheap per component, saves time during manufacture, less machinery needed as no need to make these parts (e.g. dowels/screws in flat pack furniture)
Advantages to product user	Standard components can be easily replaced.
Bindings	Hold pages together to make books/booklets. Types include 'comb', 'spiral', 'saddle stitching'
Seals	Use two strips of adhesive to seal together on contact (e.g. Envelope)
Tapes	Sticky tape, double sided tape etc
Adhesives	Glues. Used to bond paper/card.