

Design movements:

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Bauhaus 1920- innovative, contemporary, functional, steel, wood, glass, black, white, brown and grey. Walter Gropius.

Art Deco 1920-1939 brought together several movement, geometric shapes, chevron patterns, sunburst motifs. Clarice Cliff.

Memphis 1981-1988 aesthetics rather than function, bright colourful shocking pieces, Ettore Sottsass.



Materials:

Wood-hard-soft-manufactured

Hard-deciduous trees-grow slower-grain closer-expensive

Oak attractive grain, light brown in colour, furniture

Soft-coniferous trees-grow fast-cheaper-grain far apart

Pine easy to work with, knotty, light in colour, simple joinery

Manufactured-fibres and resin-large sheets-don't warp,

cheaper, environmentally friendly

Plywood strong, layers, with the grain opposite, inner panelling

Metal-ferrous-non ferrous-alloy

Ferrous-contain iron, prone to rust are magnetic

Mild steel tough, high tensile strength, railway tracks

Non ferrous- no iron, isn't magnetic and doesn't rust

Aluminium ductile, soft, malleable and lightweight, ladders

Alloy-mixture of two or more different metals, to enhance

Plastics-thermoplastic-thermoset

Thermoplastic- can be reheated and reshaped.

ABS-tough material, lightweight, toys

PP- hygienic, used for food containers

PET- hygienic- used for plastic bottles

Thermoset-cannot be reheated/reshaped

UF-tough, durable, plug sockets

USING CAD Advantages

It is quick to produce/ saving money

It can be easily modified/do not need to redraw the design

It can be rendered to look like it is made in any material/ so you can visualise how it will look.

It can be emailed anywhere in the world/saving the time and expense of postage

It can be transferred to manufacture/saving time and money

It can be shared instantly with the client/reducing the time it takes to get a successful design

Disadvantages

Initial set up costs is expensive/design software are expensive

If there is a fault, your work can be lost/costly in terms of time/ money

Your idea can be hacked/ideas stolen

You need good IT skills to design in 3D/employing a different workforce or retrain the existing workforce

Soldering

Soldering iron- tip gets hot, used to heat up the legs of components, to join the solder.

Wires-

Rubber outside- doesn't conduct heat or electricity

Copper wire- good conductor of electricity, flexible

Research:

Primary- you have completed yourself.

Secondary- using someone research they have conducted.

Product analysis: ACCESSFM

Aesthetics, Cost, Customer, Ergonomics, Safety, Sustainability, Function, Material.

Year 9 RM Knowledge Organiser H/W

Specification: a detailed description of the design and materials used to make something, this is based on the research conducted.

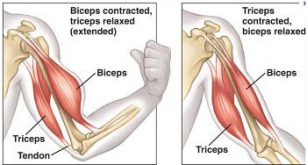
Evaluation: Designers evaluate their finished products or prototypes in order to test whether they work well and if the design can be corrected or improved.

Biomimicry: Designs that are inspired by nature

Example Anglepoise lamp:

George Carwardine-biomimicry inspired-muscles

Lamp to stretch and bend like an elbow, tension springs work the same as the biceps and triceps, when the lamp is lowered, one spring is relaxed, while the other is in tension.



Client: The client will ask the designer to produce ideas for the tables and chairs.

The client will fund the project.

Designer: The designer will produce ideas, the designer will research the needs of the user, present a range of ideas to the client, they will liaise with the manufacturer to find the most efficient method of manufacture.

Manufacturer: The manufacturer will make the product, The manufacturer will make the product to the specification

User: The users are the person that will use the product, the user will test the product.

Finishes:

Wax protects like a varnish against knocks, scuffs and scratches. The difference is in the finish - It leaves your wood looking and feeling natural.

Gloss Paint are generally more resistant to damage than flat paint, more resistant to staining, and easier to clean, adds colour to the material.

Matt Paint dull rather than shiny, adds some protection, adds colour to the material.

Linseed oil adds protection, enhances the grain, dries quickly.

Varnish is a transparent, hard, protective finish or film that is primarily used in wood finishing but also for other materials.

Stain achieve a great deal of different colours, which can be very helpful when matching your wood to existing or planned decorations.

Decoupage decorates the exterior of the product with images, these images can be protected by using glue or resin.

CAM:

Computer aided manufacture

Examples: laser cutter, 3d printer

Advantages-quicker, less waste, accurate, consistency, efficiency and safer.

Disadvantages- initial set up costs are high, staff require retraining, loss of technical skills

Electronics:

Polarised indicates whether a circuit component is **symmetric** or not.

Non-polarised a part without polarity, can be connected in any direction and still function the way it's supposed to function.



Resistor non polarised, determines the flow of current through a circuit.



Electrolytic Capacitor polarised, stores energy and releases it when needed.



Speaker polarised, converts electrical energy into sound



Battery snap polarised, a connection from the circuit to the power supply.



Slide switch polarised, when switched this allows the circuit to work.



LED (light emitting diode) polarised, converts electrical energy into light.



Buzzer polarised, converts electrical energy into sound.



Lamp polarised, converts electrical energy into light.



Motor polarised, converts electrical energy into rotary motion.



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Tools:

Wire cutters- tool used for cutting wire and stripping rubber off wire.

G clamp- used to clamp material in place, looks like the letter G.

Wood vice- a tool with movable jaws to hold work in place.

Machine vice- a tool with movable jaws to hold work in place when using a machine.

Vacuum former- a machine that heats the sheet of plastic to a forming temperature, stretch onto a mould with a vacuum.

Strip heater- heats the plastic in a straight line, so it can be bent by hand.

Hot air gun- used to heat up a material by means of a stream of very hot air.

Drill- a tool with a rotating cutting tip, used to create holes.



Year 9 RM Knowledge Organiser Test

Laser cutter

Technology that uses a laser to cut materials.

Speed and power settings can be changed for different materials and thicknesses.

Links to CAD program- 2D design.

Red line- etch

Blue lines- kiss cut

Black lines-cut

Modelling:

- Get a visual representation of the product before it has been made
- Notice any mistakes before fully manufactured.
- Cheaper materials to be used, less cost.
- See and manipulate designs in the 3d environment.
- This helps the client to imagine what their design will look like.
- Use of computer to test components before manufacture..

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Box wood joints:

Butt joint a weak joint, held together with glue and pins.

Finger joint interlocking joint, with a larger surface for gluing, strong.

Dowel joint easy to produce, uses aligned holes and pegs.

Lap joint stronger than a butt due to larger surface to glue, pins added for strength.



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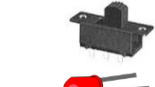
Evaluation: Designers evaluate their finished products or prototypes in order to test whether they work well and if the design can be corrected or improved.

Design Brief: a description of what you are planning to design and make and the problems you wish to solve.

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