Design and Technology - Year 8 Acrobat Toy - Knowledge Organiser.

Types of Timber

Hardwood - E.g. oak, beech, mahogany and balsa.
Deciduous trees with flat, green leaves.

Softwood - E.g. spruce, pine, cedar, redwood.
Coniferous trees with cones + needle like leaves.

Manufacture Board. Timber made in factories
E.g. MDF, plywood, chipboard, hardboard.

Tools and Equipment.

Chisel – a very sharp tool used to shape wood.
Mallet - a type of large wooden hammer.
Plane – has a sharp blade that smooths wood.
Marking Gauge – marks accurate parallel lines.
Hegner – a mechanical fret saw.

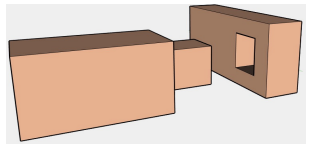
SAFETY RULES
Keep your fingers away from the sharp blade on the chisel.
Take care when using a plane as the blade is also-
VERY SHARP

Key Words

Anthropometric – Measurements in mm of the human body.
Ergonomic – A design/object that is shaped to fit the human body.
Isometric drawing – A 3D drawing that uses 30° lines.
Coniferous –An evergreen tree that doesn't loose its needles.
Deciduous – A tree that looses its flat, green leaves in winter.
MDF – Medium Density Fibreboard – a manufactured board.
Sustainable – With less damage to the environment.

Mortise and Tenon Joint

This is the name of the wood joint used to make the 'H' frame or handles. It is a strong joint also used in furniture making. The mortise is the hole and the finger of the joint is the tenon.



Spruce

Spruce is the name of the timber used to make the 'H' frame. It is easy to cut and shape, cost effective, attractive and can be a sustainable source of timber.
Spruce is a softwood–it comes from coniferous trees that have needle like leaves and cones.
Softwood grows faster than hardwood.

Design Ideas.

After doing some research, you will come up with 3 different design ideas for the acrobat character. You will then analyse them and decide which one will be your final design.
Designers start with a range of ideas to help them decide which is the most suitable, best looking and (hopefully) the most successful design.

What type of wood is spruce? Give 3 reasons why scissors must be ergonomic? Why do designers start with lots of ideas?

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Vacuum Forming

The vacuum former is used to heat the HIPs so that it can be transformed from a sheet into a box shape. The heat softens the Hips by making it easier for the polymer molecules to move around. The HIPs will cool and set hard in the new shape. Vacuum forming process is used to mass product food containers and packaging.

Input, Process, Output

The electronic circuit is a system that makes some thing happen.

Input- the switch and the wand. They starts the system.

Process – the components. The brain of the system that makes things work.

Output – What happens at the end of the system? The LED lights up and the buzzer sounds.

Components-

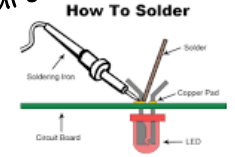
LED -Light Emitting Diode.
Buzzer – the sound output.
Switch – to control the circuit
Wires – join the components.
Resistor – protects the LED

Key Words

Mood Board – a presentation of images and text based on a theme.
Components – the individual parts of a circuit.
Circuit- components linked together in a circuit to allow the current flow.
Vacuum Forming – The heat process used to form the box.
Soldering Iron – The tool used to make a solder joint.
Thermoplastics – Polymers that can be heated, reformed and reheated.

Flux

Flux is the chemical inside cored solder that cleans any grease off the components and helps the solder to flow.
Flux fumes are toxic.



HIPs

High Impact Polystyrene is a thermoplastic.
It is the same chemical as polystyrene, but with the air removed.
It can be heated, reshaped several times and is expensive to buy.
It is durable strong and comes in many colours.
The origin of HIPs is crude oil. This is a finite resource. Not all thermoplastics can be recycled.

Soldering

Soldering is the process used to permanently join the components. The solder conducts electricity to enable the current to flow. Solder is an alloy – a mixture of metals (tin, lead, copper and silver) that have a low melting point. Solder is expensive and the fumes are toxic. The soldering process generates heat- care is needed when soldering. SAFETY- Do not touch the hot parts or inhale the fumes.

What does HIPs stand for? Why is Vacuum forming suitable for making the box? How can a Mood Board help a designer?