Year 9 term 1a Design Technology knowledge organiser - Part 1

Core

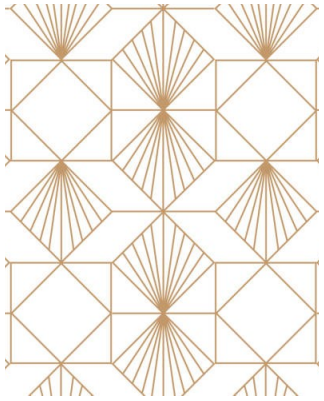
How to safely use tools and equipment in the workshop.

We measure in millimetres.

There are two categories of metal. These are ferrous and nonferrous. All ferrous metals must contain iron.

Characteristics	Ferrous Metals	Non-Ferrous Metals
Magnetic	✓	✗
Value	↓	↑
Resistance to Rust / Corrosion	✗	✓
Recyclable	✓	✓

Art Deco was popular in the 1920's and 30's. It was an ostentatious (bling) design style. It was made up of expensive looking materials and geometric shapes arranged in a symmetrical pattern. All sorts of products were made in this style including furniture, cloths, jewellery, buildings, cars etc.

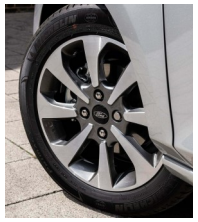


Good to know

Ferrous Metals	Non- Ferrous Metals
Iron	Aluminum
Low Carbon Steel	Copper
Medium Carbon Steel	Brass
High Carbon Steel	Bronze
Cast Iron	Zinc
Stainless Steel	Lead
Tool Steels	Tin

An alloy is where different metals are mixed together to create a new metal with better properties.

Stainless steel

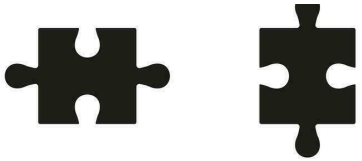


Aluminium/nickel alloy wheel

The 20's saw the discovery of Tutankhamun's tomb with its array of ancient Egyptian furniture etc. This helped inspire the look of Art Deco as it was on trend at the time.

Appling knowledge

Be able to measure accurately when doing practical tasks so that the parts fit together and make a successful product.



Know the characteristics of metal so the correct one can be used on a product.

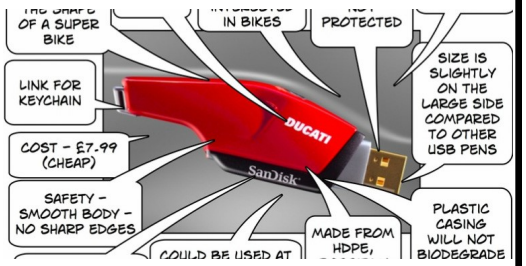
Metal	Properties	Uses
Aluminium	Low density, strong, resistant to corrosion, good conductor of electricity	Lightweight structures, aircraft, drinks cans, high voltage cables.
Copper	Good conductor of electricity, resistant to corrosion, easily shaped, flexible	Electrical wiring, water pipes.
Gold	Shiny, very resistant to corrosion, very unreactive, soft, easily shaped	Jewellery.
Steel	Very strong, very dense.	Large structures and heavy duty engineering such as bridges, trains, cars etc.

Have an understanding of a particular design style so that ideas can be created in a particular style.

Year 9 term 1a Design Technology knowledge organiser - Part 2

Core

Product analysis: Looking at existing products to see what is good and bad about them. This can be used to help a designer come up with their own ideas.



This is a short statement telling the engineering what they will be designing and making.

ENGINEERING SPECIFICATION

This is a list of things a product should do that is given to the engineer.

Metal work tools:

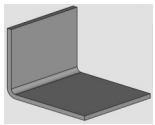
Engineers vice

Hacksaw

File

Die Stock

Annealing is the process that softens nonferrous metals so they can be bent to shape easily without shearing.



Good to know

Product analysis: To do a full product analysis the following areas should be considered:

Aesthetics means **what does the product look like?**
What is the: Colour? Shape? Texture? Pattern? Appearance? Feel? Weight? Style?

Cost means **how much does the product cost to buy?**
How much does it: Cost to buy? Cost to make?
How much do the different materials cost? Is it good value?

Customer means **who will buy or use your product?**
Who will buy your product? Who will use your product?
What is their: Age? Gender?
What are their: Likes? Dislikes? Needs? Preferences?

Environment means **will the product affect the environment?**
Is the product: Recyclable? Reuseable? Repairable? Sustainable? Environmentally friendly? Bad for the environment?
6R's of Design: Recycle / Reuse / Repair / Rethink / Reduce / Refuse

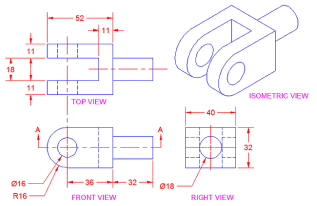
Size means **how big or small is the product?**
What is the size of the product in millimeters (mm)? Is this the same size as similar products? Is it comfortable to use? Does it fit? Would it be improved if it was bigger or smaller?

Safety means **how safe is the product when it is used?**
Will it be safe for the customer to use? Could they hurt themselves? What's the correct and safest way to use the product? What are the risks?

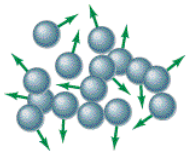
Function means **how does the product work?**
What is the products job and role? What is it needed for? How well does it work? How could it be improved? Why is it used this way?

Material means **what is the product made out of?**
What materials is the product made from? Why were these materials used? Would a different material be better? How was the product made? What manufacturing techniques were used?

3rd angle projection orthographic drawing: This is a technical drawing showing all of the sizes of the product being made.



Annealing the metal loosens the molecules inside the metal. As soon as you start to bend the metal it will start to harden up again.



Appling knowledge

Be able to understand an engineering brief/ specification to design and make a successful product.

Conduct a product analysis so ideas from existing products can be applied to your own ideas.

Use the correct tools to make a hook.

Able to read the sizes of a orthographic drawing of a hook to manufacture one to a given tolerance.

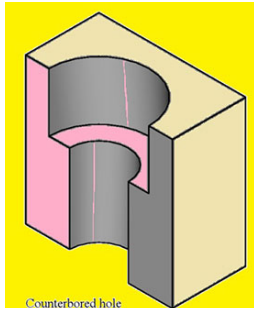
Year 9 term 1b Design Technology knowledge organiser

Core

The tool used to cut wood in straight lines or curves is called a coping saw.

The machine that accurately drill holes into wood is called a pillar drill

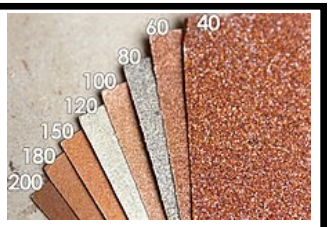
A counter bored hole is where you drill a hole half way through the wood only. This is easy to do using a pillar drill.



To get a good painted finish the wood needs to be sanded down smoothly. You should also sand the wood down lightly between coats of paint to remove any bumps in the painted finish.

Good to know

There are different grits of glass paper. This affects how roughly it sands the wood. The grit ranges from fine to course.



To get a clean painted line on a piece of wood paint the whole thing first with the lighter colour. When dry, mask off the parts you want to keep the base colour, then paint the darker colour over the top. When dry carefully remove the masking tape to reveal your final painted surface.

Once you have cut out your design out of a piece of wood it can be easily cleaned up using a linisher. This machine sands straight or outside curved lines into wood. A dust extractor needs to be on at the same time to reduce dust in the air. Don't forget eye protection!

To sand inner curved lines a spindle sander has to be used. Dust extraction is also needed.

Appling knowledge

Able to use the tools discussed to accurately make chosen developed design.