

Greenfaulds Technical Department



Wooden Car

Name: _____
Class: _____

Curriculum For Excellence
Level 3

What Will You Learn:

Knowledge & Understanding

- An understanding of safe working practices in the work shop
- To be able to identify the tools you are using.
- Where wood comes from and the different types.
- You will learn about sustainability.
-

Skills

- How to mark out neatly and accurately.
- How to use the appropriate tools and equipment in a safe manner.
- How to cut and shape wood
- How to apply a neat finish to your model.
- How to make a sequence of operations.

Attributes & Capabilities

- Successful Learner
- Confident Individual
- Responsible Citizen
- Effective Contributor

Four Capacities

At the end of the unit come back to this page and tick 2 boxes in each category which you feel best fits the task you were asked to do.

Successful learners	
I can reflect on my own learning	<input type="checkbox"/>
I am open to new ideas and ways of learning	<input type="checkbox"/>
I can use literacy, numeracy and communication skills	<input type="checkbox"/>
I can use technology for learning	<input type="checkbox"/>

Confident Individuals	
I can assess risk and make informed decisions	<input type="checkbox"/>
I am aware of my physical well-being	<input type="checkbox"/>
I can relate to the needs of others	<input type="checkbox"/>
I can achieve success in new activities	<input type="checkbox"/>

Responsible citizens	
I can make informed choices and decisions	<input type="checkbox"/>
I can evaluate environmental issues	<input type="checkbox"/>
I have respect for others in my group	<input type="checkbox"/>
I can participate responsibly within the workshop	<input type="checkbox"/>

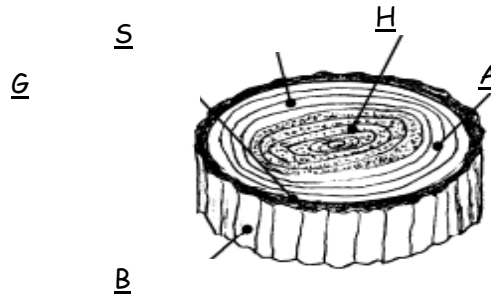
Effective contributors	
I can apply critical thinking in new contexts	<input type="checkbox"/>
Communicate in different ways	<input type="checkbox"/>
Take the initiative for my own learning	<input type="checkbox"/>
Solve problems in unfamiliar situations	<input type="checkbox"/>

Pick one of the statements above and briefly explain below why you ticked this.

Wooden Car Unit: Wood

Each summer new growth is made from cells just beneath the bark. The cells produce new bark on the outside and new wood on the inside. One year's growth of wood is shown as a ring called an annual ring, which is often used to see how old a tree was when it was cut down.

Older wood in the middle of the trunk dies and becomes harder, darker and drier and is called Heartwood, this is the best wood in the tree. The younger wood is still used for transporting food (sap) from the leaves to the rest of the tree and is lighter in colour and a lot wetter than heartwood and is called Sapwood. The Bark is used for protecting the tree.



Softwood

Coniferous trees (trees that keep their needle-like leaves throughout the year) provide softwood. They can grow quickly with straight trunks. They are often grown in plantations and are replaced when they are cut down.
Examples: Pine, Spruce, Cedar



Hardwood

Deciduous trees (trees that lose their large leaves every winter) provide hardwood. They grow slowly and sometimes have twisted trunks. They are often not replaced when cut down.
Examples: Mahogany, Oak, Beech

Note: The difference between softwood and hardwood is a biological difference, not one of softness and hardness. The softest wood is Balsa -it is a hardwood!

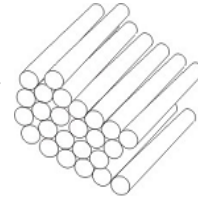


Manufactured Boards

These are made from the waste wood left over from conversion. They use thin sheets (plywood), small blocks (blockboard), wood chips (chipboard) and wood fibres (fibreboard). They are generally cheaper than solid wood and can be made into large sheets that do not warp or twist easily.
Examples: MDF, Chipboard, Plywood, Blockboard

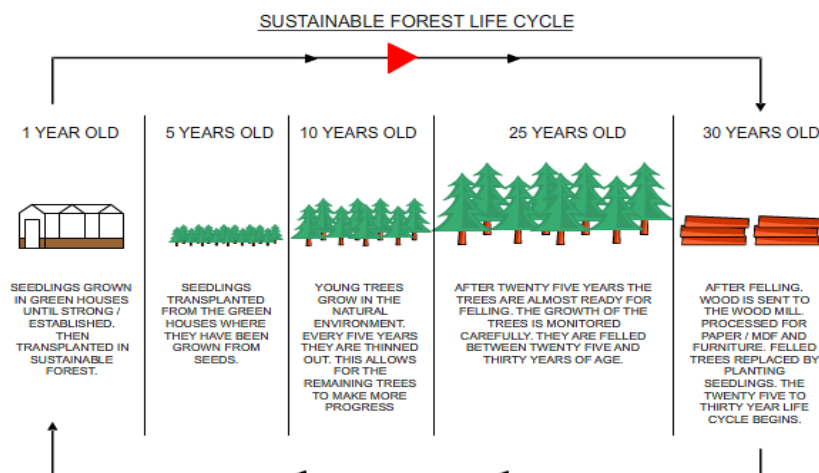
Grain

All timber is composed of cells and wood fibres packed closely together. The term "grain" refers to the arrangement or direction of the cells and fibres in the timber. Try to imagine holding a bunch of drinking straws, this is basically very similar to how the grain of wood would look like if we looked at it through a microscope.



Sustainability

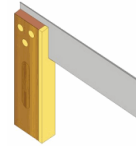
A sustainable forest is a forest that is carefully managed so that as trees are felled they are replaced with seedlings that eventually grow into mature trees. This is a carefully and skilfully managed system.



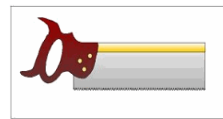
Explain in your own words below how using a softwood such as pine is more sustainable than using an exotic hardwood.

Name the Tool

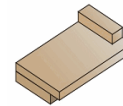
The t_____ s_____ is used to test the squareness of material and mark out lines at right angles to a given surface on wood or plastic. The stock is made from rosewood with a tool steel blade.



The T_____ S_____ is used for general sawing in wood. The fine teeth 12 - 14 per 25mm ensure a fine saw cut or KERF. The Tenon Saw has a brass or steel Stiffening Rib to strengthen the back of the blade and prevent it from being too flexible.

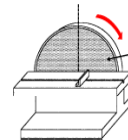


The use of the s_____ b_____ prevents the workbench from being damaged by continual cutting. It also allows timber to be held in a steady position whilst cutting is taking place.



D_____ S_____

A very useful machine for sanding down the end grain of wood and the edges of sheet plastic.



Woodworkers B_____ V_____

This vice is fixed to the bench so that the top of the wooden jaw facing the bench is level with the top of the bench, it is used for holding wood.



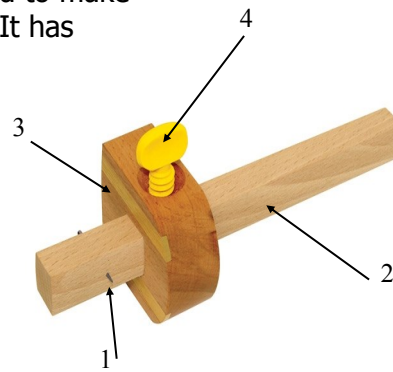
P_____ is probably the most common type of wood glue used in the school workshop. It is a white water based liquid adhesive (i.e. it is mainly made of water). It is supplied to schools in plastic containers. It is easy to apply, non-staining (although excess glue should be wiped off with a damp paper towel) strong and attains its maximum strength usually after twelve hours.



What does P _____ stand for: _____

The m_____g_____ is used to make parallel lines to the end of the wood. It has several parts to the gauge which are:

1. S _____
2. S _____
3. S _____
4. T _____ S _____



The C_____M_____ usually used in carpentry to knock wooden pieces together, or to drive dowels or chisels.



The B_____E_____C_____ can get into acute angles with its bevelled edges and used for wood joints.



Preparing & Finishing Your Wood

Wood has a finish applied for the following reasons:

- To stop the wood from absorbing moisture, so that it is less likely to become stained and also less likely to warp.
- To protect against rot and insect attack.
- To improve the appearance of the wood's surface.

Preparation

The wood must be made clean and smooth before the finish is applied.

Glass-papering (sanding)

Glass paper comes in various grades of coarseness:

A coarse paper should be used first, then a medium paper and finally a fine paper.

Always sand in the direction of the grain.

The glass paper should be wrapped around a sanding block. A proper block is made of cork or has a cork layer stuck to the bottom, cork is a soft springy wood and can help stop the glass paper wearing away too quickly. However, a piece of waste wood can be used instead.

Varnish

Plastic based clear varnishes (polyurethane and acrylic) are sold in:

- Matt finish - non shiny
- Satin finish - slightly shiny
- Gloss finish - very shiny

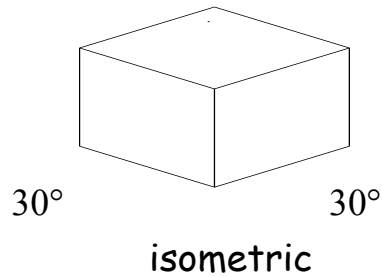
A clear varnish allows the pattern of wood grain to show through and will normally darken the wood, giving it a deep, interesting colour. It is also water and heat resistant.

The varnish can be applied with a brush (brush inline with the grain for the best finish). At least two coats are required.

- i) Apply the first coat thinly and let it set fully. This coat soaks into the pores of the wood and then sets. The wood is now sealed.
- ii) Use a fine grade of glass paper to lightly sand the surface because the first coat tends to make the surface rough as it sets.
- iii) Apply the second coat also thinly, check for any runs or drips and let it set to a smooth finish.

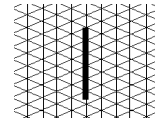
Isometrics

Isometric drawing has an edge nearest to you and shows all three surfaces in one view.

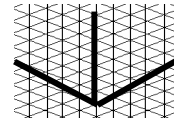


Isometric drawings are always on a 30° angle, to begin with you can use **isometric grid paper** laid under your A4 blank to act as a guide.

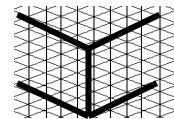
Step 1: Always start with a **straight vertical line**. This is the front edge of your box.



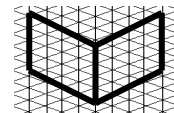
Step 2: draw 2 lines at 30° at the bottom of the line.



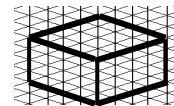
Step 3: Add another 2 lines at 30° at the top of the



Step 4: Complete the two sides by Drawing **straight, vertical lines** Between the angled edges.

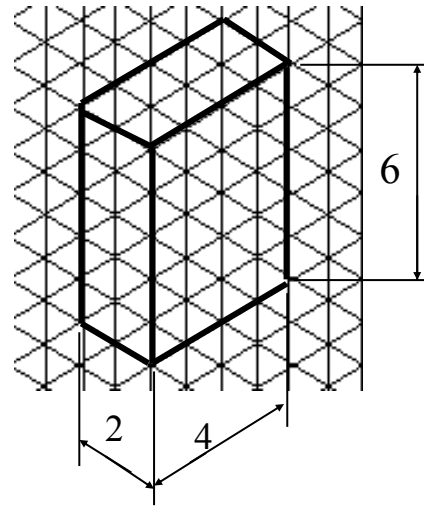


Step 5: Add the top and back edges to complete the box.

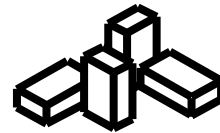
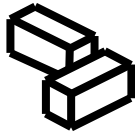


Isometrics

The graphic to the right shows an isometric box drawn using the isometric grid as a guide. Look at the sizes and how they are used



Complete a page of different sized isometric boxes adding tonal rendering to finish the exercise.



Draw the two graphics shown without using grid paper.

Presentation Drawing

Use the skills you have learned in class to sketch an isometric view of the Wooden Car. Use tonal scales to give the drawing more depth and make it look more realistic. Use thick and thin and a colour boundary to improve the effect.

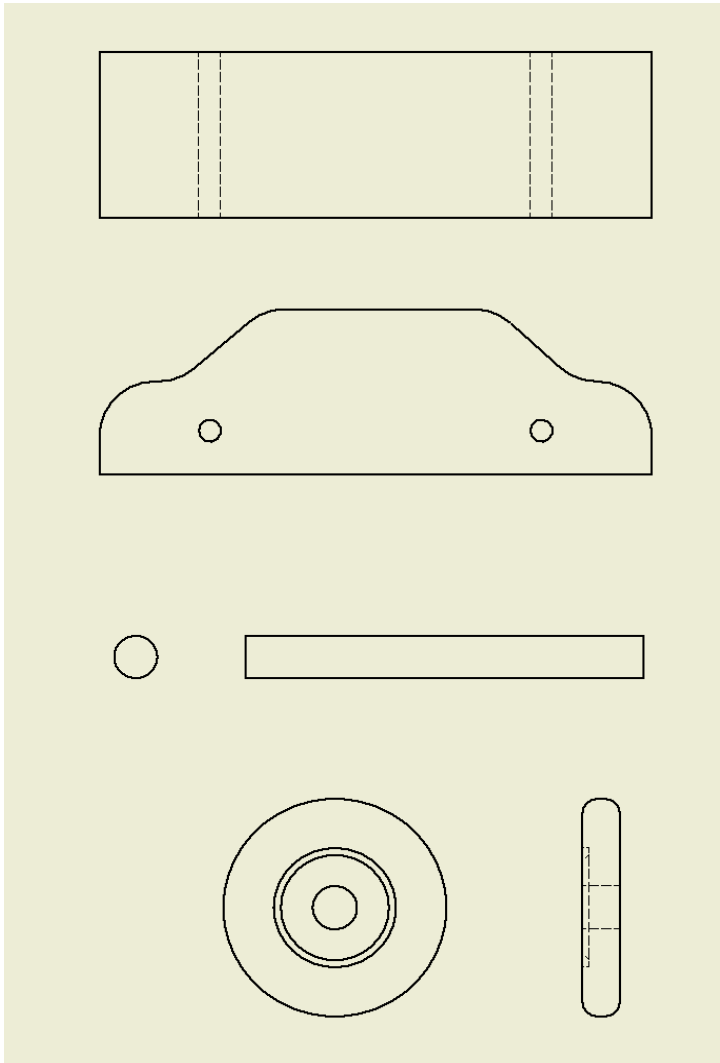
Wooden Car — Components Part

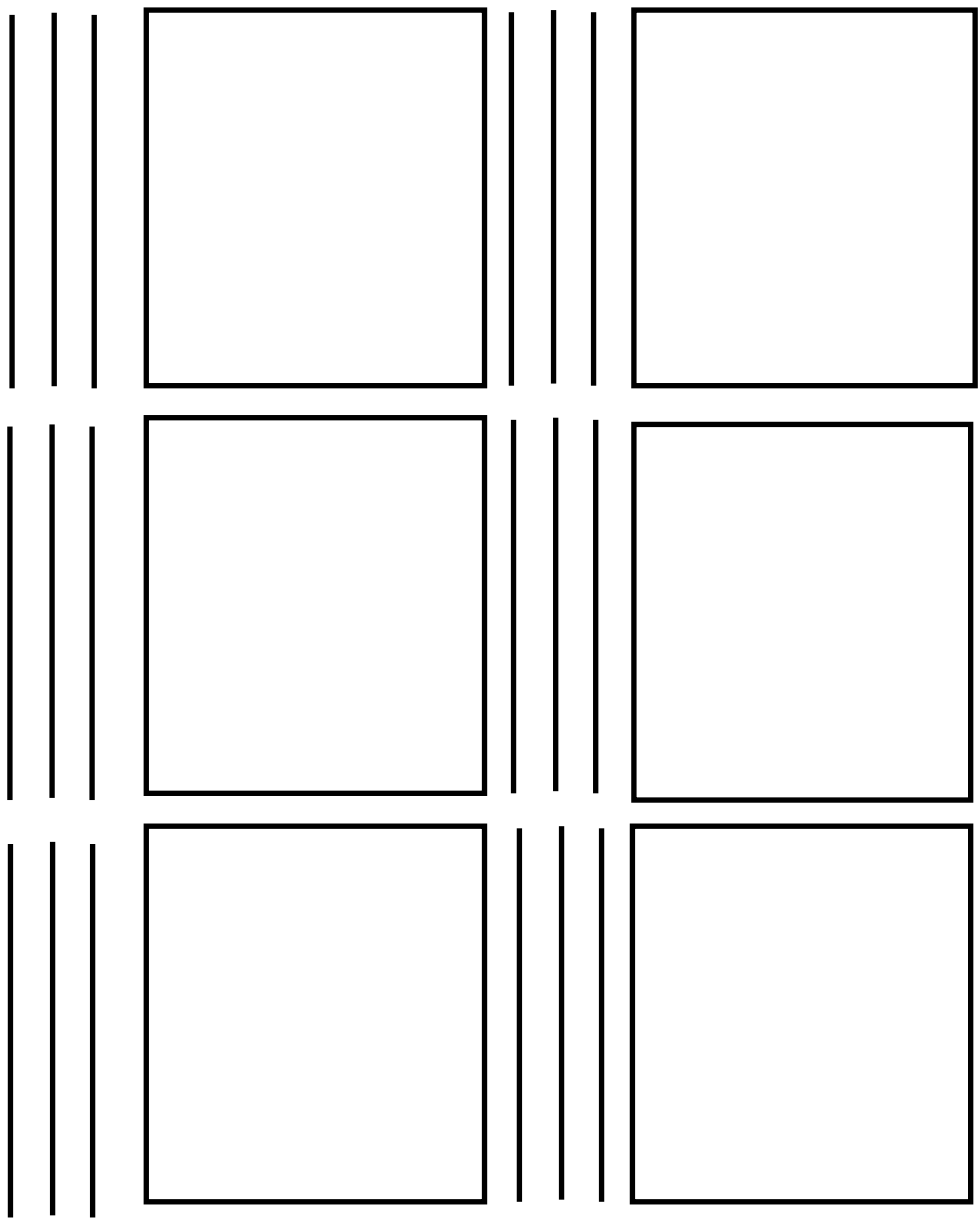
What is the wood/joints that were used to make your wooden car. Fill in the gaps below

1 Name the wood used on the frame S..... P.....

Is it: SOFTWOOD HARDWOOD MANUFACTURED BOARD




Below are the three parts of the car, on the drawings below, dimension them to British Standards.





How I made my Wooden Car

How Well Did I Do:
Knowledge & Understanding

- | | | | |
|---------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| |  |  |  |
| I understand safe working practices in the work shop | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| I am able to identify the tools being used. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| I know where wood comes from and the different types of wood. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| I understand what sustainability means. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Skills

- | | | | |
|---------------------------------------------------------------------------------------|--------------------------|--------------------------|--------------------------|
| How to mark out neatly and accurately. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| How to cut and shape wood using the appropriate tools and equipment in a safe manner. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| How to apply a neat finish to your model. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Critical Comment (You must write about two things you have done well and one thing that you can improve.)



How Much Did I Enjoy This Unit?





