

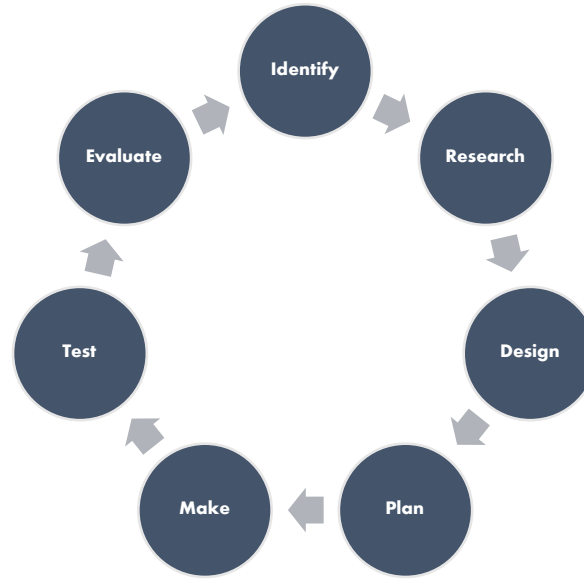


# Year 7 - Product Design - Topic: Air Car

## Key Vocabulary

Design Brief	A statement outlining what a product needs to be like
Design Specification	A list of success criteria for a product
Hardwood	A timber from deciduous trees
Softwood	A timber from coniferous trees
Manufactured board	Made from wood layers, chips or fibres compressed with glue
Ferrous metal	A metal containing iron
Non-ferrous metal	A metal that does not contain iron
Thermopolymer	A polymer that can be reshaped using heat
Thermosetting polymer	A polymer that cannot be reshaped using heat

## The Design Process



**Identify:** Identify design problems and contexts

**Research:** carry out research to support your design ideas

**Design:** produce design ideas (2D sketches, 3D drawings, CAD models, 3D models, etc)

**Plan:** plan how you will manufacture your design ideas

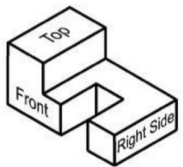
**Make:** manufacture your design ideas

**Test:** test how effective your design ideas are

**Evaluate:** evaluate how effectively your design ideas solve the design problem

## Key Skills

## Workshop Skills



Isometric drawing



Measuring and marking out

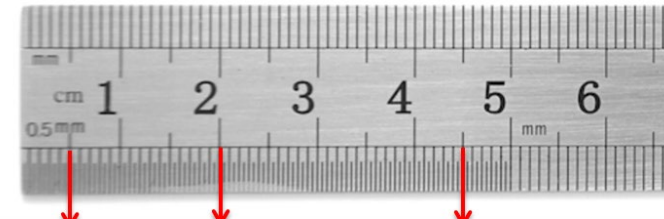


Cutting (wastage)



Drilling (wastage)

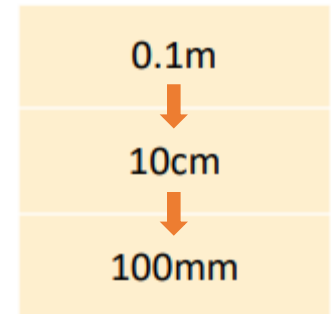
## Converting Units



5mm  
0.5cm

20mm  
2cm

45mm  
4.5cm



# Year 7 - Product Design - Topic: Air Car



## Tools and Equipment



Bench vice



Hand file



Steel ruler



Coping saw



Abrasive paper



Hot glue gun



Pillar drill



Jig



Template



Safety glasses

## Materials

### Styrofoam

A lightweight and rigid foam material. Used for packaging and construction industry.



### Plywood

A man-made board used for construction.



### Wooden Dowel

Round sections of timber available in different lengths and diameters.

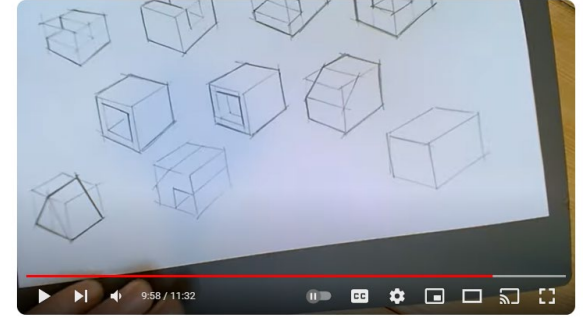


## Taking it Further

Work through the tutorial videos below to develop your sketching skills.



[Click Here](#)



Sketching 2 Point Perspective No VPs and Crating

[Click Here](#)

## Learning Checklist

- I can describe a range of papers and boards used in Product Design.
- I know the purpose of a Design Brief and Design Specification.
- I can explain the main stages of the design process.
- I can measure and mark out materials accurately.
- I can select the correct tools and equipment and use them safely in the workshop.
- I can use a range of design strategies to produce creative design ideas.
- I can use sketching to generate initial design ideas.
- I can use an isometric grid to produce presentation design ideas.

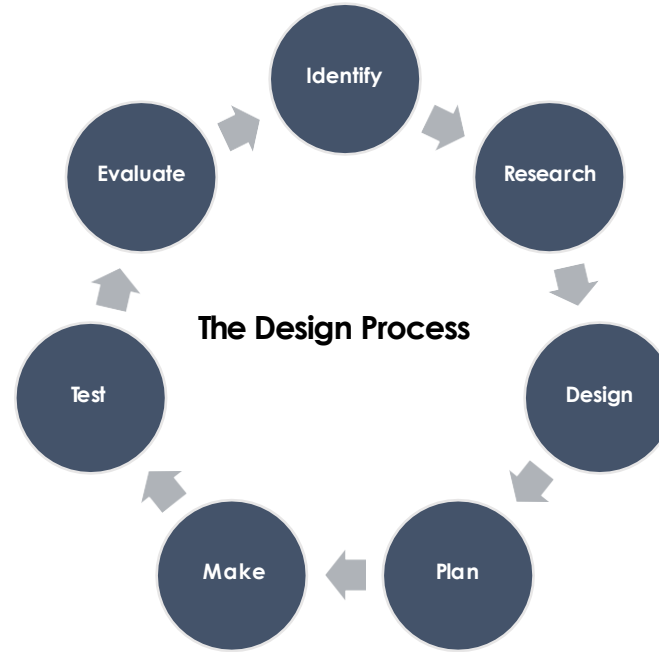


# Year 7 - Product Design - Topic: Over Plug Phone Holder

## Key Vocabulary

<b>Iterative Design</b>	To develop a design through testing modelling and changing in a cycle
<b>Sketch Model</b>	Quick 3D models used to represent your initial design ideas
<b>CAD</b>	Computer Aided Design
<b>CAM</b>	Computer aided Manufacturing
<b>CNC</b>	Computer Numerical Control
<b>Prototype</b>	An original model on which something is patterned
<b>Function</b>	<i>How well a product will fulfil the task that it has been designed for</i>

## The Design Process



**Identify:** Identify design problems and contexts

**Research:** carry out research to support your design ideas

**Design:** produce design ideas (2D sketches, 3D drawings, CAD models, 3D models, etc)

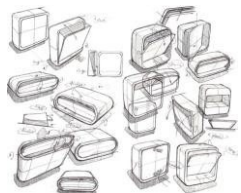
**Plan:** plan how you will manufacture your design ideas

**Make:** manufacture your design ideas

**Test:** test how effective your design ideas are

**Evaluate:** evaluate how effectively your design ideas solve the design problem

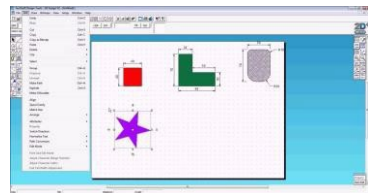
## Key Skills



Sketching



Modelling



CAD - 2D Design Tools

## Workshop Skills



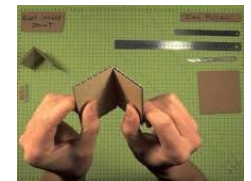
Measuring and marking out



Laser Cutting (Wastage)



Line Bending (forming)



Modelling



# Year 7 - Product Design - Topic: Over Plug Phone Holder

## Tools and Equipment



### Cutting Board

Used when using a craft knife for a better and safer cut



### Strip Heater

For bending thermo polymers in straight lines



### Steel Ruler

For measuring straight lines in mm



### Safety Ruler

M-shaped profile to keep fingers away from the cutting edge



### Craft Knife

Used for cutting thin materials accurately



### Masking Tape

A type of pressure-sensitive tape made of a thin and easy-to-tear paper,

## Materials

### Papers and boards

Made from wood pulp originally from trees.



### Polymers

#### Acrylic (PMMA)

Thermo (Change shape with heat)

Thermo setting (Can't change shape with heat)

Originally from crude oil.

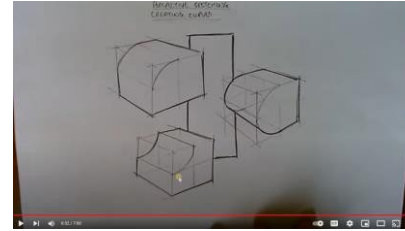


### Corrugated cardboard

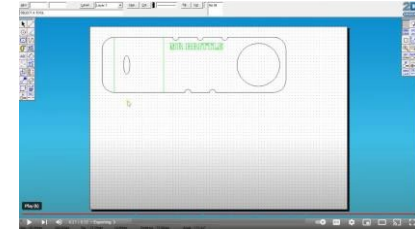


## Taking it Further

Work through the tutorial videos below to develop your sketching and CAD skills.



[Click Here](#)



[Click Here](#)

## Learning Checklist

- I can describe a range of common materials used in this project.
- I know the purpose of creating a prototype for this project.
- I can explain the main stages of the design process.
- I can measure and mark out materials accurately.
- I can select the correct tools and equipment and use them safely in the workshop.
- I can use sketching to generate initial design ideas.
- I know what a laser cutter can do.
- I can use a line bending tool to bend my acrylic.
- I can use CAD software (2D Design Tools) to produce design ideas.





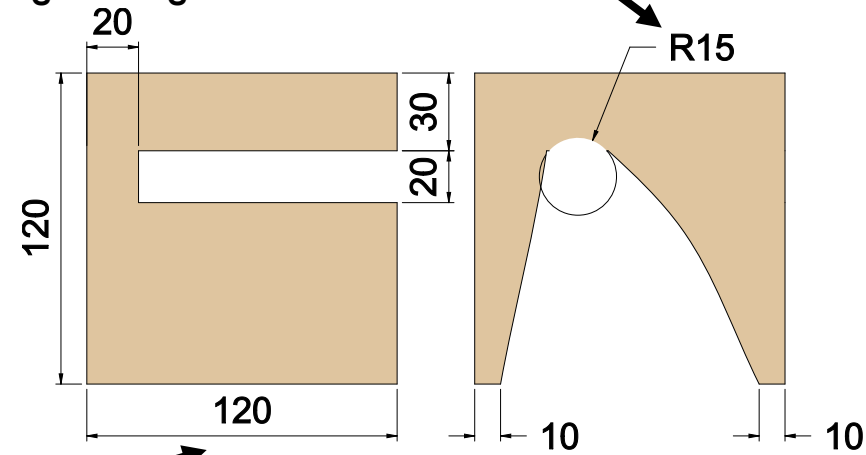
# Year 7 - Product Design - Topic: Passive Amplifier

## Key Vocabulary

Hardwood	A timber/wood from deciduous trees
Softwood	A timber/wood from coniferous trees
Manufactured Board	Made from wood layers, chips or fibres glued together
Addition	Manufacturing by adding material
Wastage	Manufacturing by removing material
Finish	Added to a product's surface to improve its function and/or aesthetics
Isometric Drawing	Accurate drawing technique that uses 90° and 30° lines, measurements can be taken directly off them

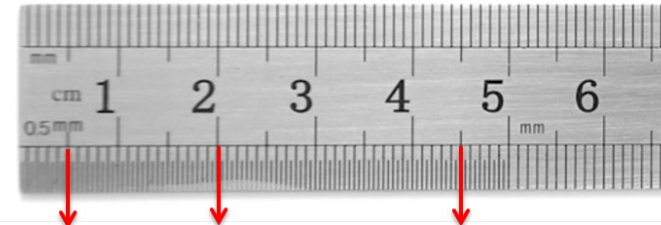
**Radius** - Dimension from the centre of a circle to its edge

## Reading Drawings

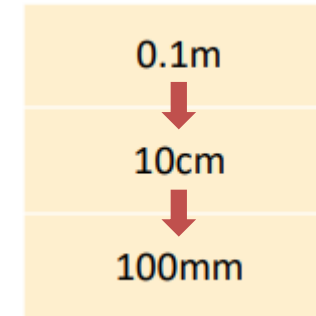


**Millimetre** - 10mm in a centimetre (cm).  
This dimension is 120mm or 12cm.

## Converting Units

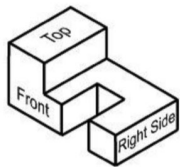


**5mm**      **20mm**      **45mm**  
**0.5cm**    **2cm**      **4.5cm**



10mm → 1cm → 0.01m  
100mm → 10cm → 0.1m  
1000mm → 100cm → 1m

## Key Skills



Isometric drawing

## Workshop Skills



Measuring and marking out



Cutting (wastage)



Gluing (addition)



Sanding (wastage)

# Year 7 - Product Design - Topic: Passive Amplifier



## Tools and Equipment



Bench vice



Hand file



Steel ruler



Tenon saw



Try square



Coping saw



Pillar drill



Disk sander



Belt sander

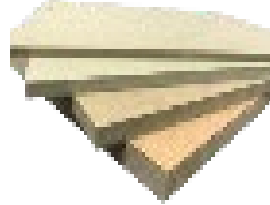


Safety glasses

## Materials

MDF

Medium Density Fibreboard - a manufactured board used for low-cost furniture and prototypes



## Taking it Further - Sketching

Work through the tutorial videos below to develop your sketching skills.



**Isometric Drawing -**  
<https://www.youtube.com/watch?v=O37S4J3540U>



**2 Point Perspective - Cuboid Sketching**  
<https://www.youtube.com/watch?v=4dTMF2iL0es&list=PLJdglIj816Ryk30CnzWAaX1kbn6LR3F3L&index=1>



**D&T Futures** - There are plenty of tutorials on the D&T Futures YouTube channel

## Learning Checklist

- I can describe a range of common materials used in Product Design.
- I can explain a variety of different wood saws.
- I can measure and mark out materials accurately.
- I can select the correct tools and equipment and use them safely in the workshop.
- I can use an isometric grid to produce presentation design ideas.
- I can explain and understand an isometric drawing.