Writing a Design brief

The starting point for any design is the design brief. The brief outlines what problem a design will solve. It should be referred to throughout the project to make sure what you are working on will solve this problem.

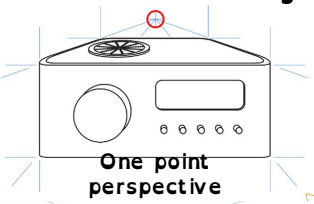
Your design brief should cover:

- ✓ The type of product you are aiming to make or the problems you are trying to solve
- ✓ The target market
- ✓ The purpose and specifics such as safety standards, styles, budgets

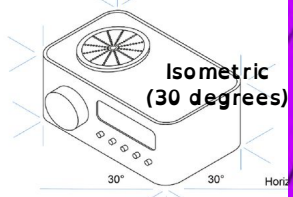
Do not:

- × Write about a final product in mind.
- × Create an overambitious idea such as design an airport-this is too broad and would need a team of designers.
- × Select inspiration that is too open ended such as the sea but choose specifics like shells, anemones etc.

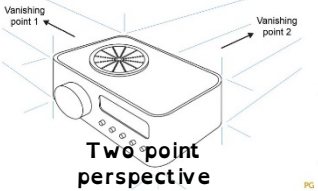
Drawing techniques



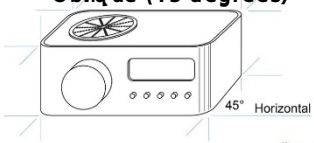
One point perspective



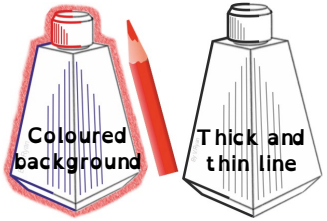
Isometric (30 degrees)



Two point perspective

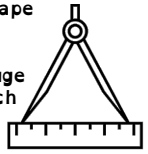


Oblique (45 degrees)



Marking out tools

Engineers dividers
Measuring tape
Safety rule
Try square
Marking gauge
Centre punch
Micrometer
Steel rule



Wastage Processes

Chisel
Smoothing plane
Rasp
Surform
Files
Wet and dry paper
Glass paper
Wood turning

Manufactured boards

- Medium density fibreboard (MDF)
- Plywood
- Chipboard
- Hardboard
- OSB

Polymers

Thermoforming
Polyethylene terephthalate (PETE)
High density Polyethylene (HDPE)
Polyvinyl Chloride (PVC)
Low density polyethylene (LDPE)
Polypropylene (PP)
High impact polystyrene (HIPS)
Acrylic (PMMA)
ABS
Nylon polyamide

Thermosetting
Epoxy resin (ER)
Melamine Formaldehyde (MF)
Urea formaldehyde (UF)
Polyester resin (PR)
Phenol formaldehyde (PF)

Biopolymers
All fully biodegradable
Polylactic acid (PLA)
Polymorph
PHB/Biopol™

Natural timber

Softwoods
Larch
Pine
Spruce

Hardwoods
Ash
Beech
Mahogany
Oak
Balsa

Papers & boards

Papers Bleed proof paper, cartridge paper, Grid paper, layout paper, tracing paper

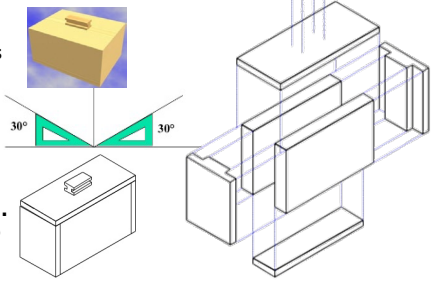
Boards Corrugated cardboard, Duplex board, foil lined board, foam core board, inkjet card, solid white board

Passive engineer

CAD	CAM
Software: 2D Design, tinkercad, fusion 360, Autodesk inventor, solidworks	Machinery: Laser cutter, 3D printer, vinyl cutter, CNC milling machine
Advantages: Designs can be altered easily, can be faster to draw designs and complex shapes, designs are easily saved and shared, designs can be easily copied or repeated, can be worked on by lots of people at once, can be used to gain feedback, can be simulated, can be stress tested	Advantages: Creates identical products, drawings can be easily repeated for new batches, enables high accuracy on a large scale, usually speeds up production when compared to traditional tools, machinery can run longer than people
Disadvantages: Complex to learn, software can be expensive, danger of hacking or corrupted files, need for RAM, memory and graphic capabilities, data can be lost in power cuts	Disadvantages: Software expensive and initial costs are high, Expensive to repair machinery, Users have to trained which costs time and money, can lead to unemployment

Exploded drawings

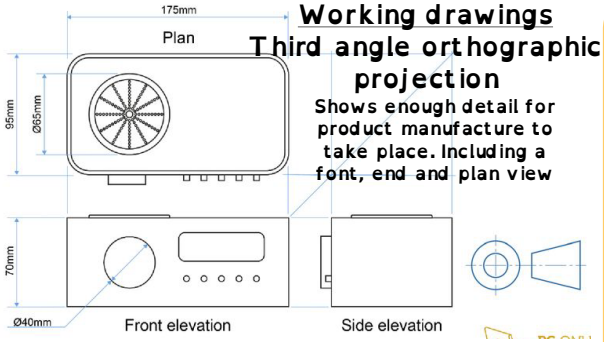
Shows how component parts fit together, often showing hidden parts.
We start off drawing using 30 degrees. Draw an isometric version of your product. Redraw each piece as if it has been pulled apart. The pieces should all line up with their original place.



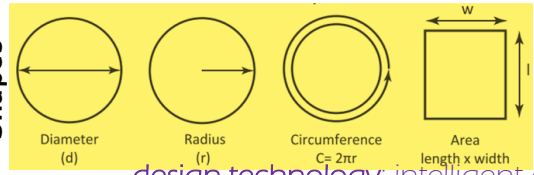
Working drawings

Third angle orthographic projection

Shows enough detail for product manufacture to take place. Including a font, end and plan view



Shapes



Writing a Design Specification

A design specification is a list of criteria your product needs to address. A specification can only be written when some research has taken place. It can used throughout the iterative design process to evaluate your success.

Your specification points should be:

- ✓ A technical point
- ✓ Be measurable in some way
- ✓ Well justified linking to the clients needs/wants

Areas you could include:
Function, safety, working environment, aesthetics, materials, sustainability, waste consideration, manufacture, proportion, scale, layout, size/dimensions, textures, social issues, economic considerations, packaging, labelling, cost, sensory considerations, finish, quality control, maintenance, ergonomics

THIS LIST IS NOT THE LIMIT!