

Design Briefs

A Design Brief is the statement of how you will solve the Design Problem
It will often include:

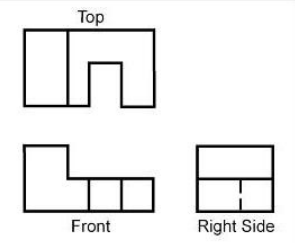
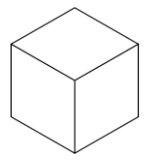
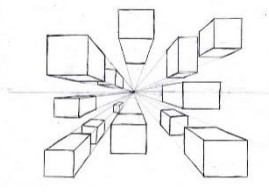
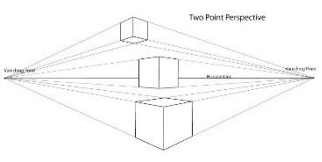

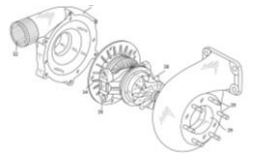
- Constraints/ limitations
- What the product is
- Materials/processes
- Any key information you know

Design Specifications

A Design Specification is a list of requirements your product has to meet in order to be successful

It is also useful for evaluation. If your product hasn't met the Spec then it gives you a starting point for improvements.

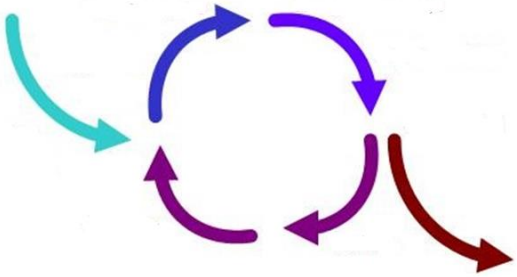
Aesthetics	What the product looks like? Style? Colour Scheme? Design Movement?
Customer	Who would buy it? (Age, gender, socio-economic, personality) How does the design appeal to them?
Cost	How much will it cost? (min-max) Why?
Environment	Where will it be used? Why? How will you make it suitable?
Safety	How is it safe? How will it be checked? Why must it be safe?
Size	What is the maximum or minimum size? Why?
Function	What does the product do? What features make it do that function well? How is it unique from similar products?
Materials	What is it made from? Why?
Manufacture	How might it be made? Why? What scale of production? Why?

Technique	Description/ notes	Diagram
Orthographic Projection/ Working Drawings	<ul style="list-style-type: none"> • Includes "Front", "Plan" and "End" 2D Views, and often an Isometric 3D View • Standardised method for scale, dimensions and line types • Great for manufacturing 	
Isometric	<ul style="list-style-type: none"> • Common 3D sketching method • Can be drawn free-hand or using isometric paper and ruler • Angles are at 30 degrees • Great for seeing most of the products 	
1-Point Perspective	<ul style="list-style-type: none"> • A 3D drawing method • Often used by interior designers and architects • Gives drawings depth • Only uses 1 vanishing point 	
2-Point Perspective	<ul style="list-style-type: none"> • Used for 3D designs • Exaggerates the 3D effect • Objects can be drawn above of below the horizon line but must go to the 2 vanishing points 	
Annotated Drawings/ Free and Sketches	<ul style="list-style-type: none"> • Quick and easy way of getting ideas down • Range of ideas can be seen • Annotation helps explain designs further 	
Exploded View	<ul style="list-style-type: none"> • Helps see a final design of a product and all it's parts • Can see where all the parts fit • Great for manufacturers 	

Modelling and Development

Modelling and development are key to testing and improving products
This can be done physically using materials like; card, foam, clay, man-made boards or virtually in **CAD**
Modelling helps the designer get feedback from the customer, check aesthetics, function, sizes and even materials and production methods and change them if needed

Design Strategies are used to solve **Design Fixation**, and help develop creative design ideas.



Iterative Design

- A Proposal is made
- It is then planned and developed to meet the brief
- It is analysed and refined
- It is then tested and modelled

- Then evaluated against the brief – many versions fail but that then informs development to make the idea better
- The cycle then repeats and if the product is successful it is then made and sold on the market

Iterative Design	
Advantages	Disadvantages
<ul style="list-style-type: none"> • Consistent testing helps solve problems earlier <ul style="list-style-type: none"> • Constant feedback • Easy evidence of progress 	<ul style="list-style-type: none"> • Designers can loose sight of "the big picture" • Time consuming

User-Centred Design

- This is when designs are based on fulfilling the needs and wants of the Users/ Clients at every stage of the design process
- Questioning and testing is ongoing and is often found through interviews, questionnaires, surveys, etc

User-Centred	
Advantages	Disadvantages
<ul style="list-style-type: none"> • User feels listened to • Makes sure the product meets their needs 	<ul style="list-style-type: none"> • Requires extra time to get customer feedback • If focused on just one person it can limit appeal to others

Systems Approach

- Usually used for electronic products
- Often uses diagrams to show systems in a visual way
- Planning the layout for the correct sequences e.g. inputs, outputs, timings, etc
- Electronics and mechanical systems need an ordered and logical approach

Systems Approach	
Advantages	Disadvantages
<ul style="list-style-type: none"> • Does not need specialist knowledge <ul style="list-style-type: none"> • Easy to communicate stages • Easy to find errors 	<ul style="list-style-type: none"> • Sometimes over-simplifies stages • Can lead to unnecessary stages

Collaborative Approach

- Working with others to share data and solving problems and coming up with design proposals can help with creativity
- Numerous companies work in teams, and has been shown to improve the range and quality of ideas produced

Collaborative Approach	
Advantages	Disadvantages
<ul style="list-style-type: none"> • Gets multiple opinions and a range of views • Working in groups can produce more ideas 	<ul style="list-style-type: none"> • Can be difficult to design ideas with opposing views • Can be difficult to find time to communicate with multiple people

Accuracy and Process Orders

Finishes

Finishes are used to improve the **aesthetics** and **durability** of products

Material Type	Finishes Used
Papers and Boards	<ul style="list-style-type: none"> • Paints • Varnishes • Laminating • Plastic coating • Wax coating
Timbers and Boards	<ul style="list-style-type: none"> • Paints • Varnishes • Wax and Polish • Staining • Oil
Metals and Alloys	<ul style="list-style-type: none"> • Painting • Lacquering • Electroplating • Galvanizing • Polishing • Plastic Coating • Powder Coating
Plastics	<ul style="list-style-type: none"> • Polishing • Painting • Decals (stickers)

Standard Components

Standard components are parts or components manufactured in the 1000s+ They are readily available, don't require specialist knowledge or tools to replace them and are universally recognised

Material Type	Components used
Papers and Boards	<ul style="list-style-type: none"> • Staples • Clips • Split pins
Timbers and Boards	<ul style="list-style-type: none"> • Nails • Screws • Panel Pins • Hinges
Metals and Alloys	<ul style="list-style-type: none"> • Nuts and bolts • Screw • Rivet • Washer
Plastics	<ul style="list-style-type: none"> • Plastic hinges

Tolerances

- The total amount a specific dimension or property is permitted to vary This can apply to hole depth, length, angle, thickness, weight and elasticity A gauge can be inserted into a gap or hole to check if the sizes fall within tolerance
- If parts do not fit within the specified tolerances they are discarded or recycled

Quality Control and Quality Assurance

- QC is **product** oriented
Quality control is where products are regularly tested (during and after manufacture) to ensure they meet the defined set of quality criteria
- QA is **process** oriented
Quality assurance is ensuring that the processes used to test the product have been done correctly and consistently
You can test a product all you like, but if the tests are wrong/ inconsistent with each other than the results are invalid
- Below are examples of Quality Assurance symbols:



Process Orders

