

The generation and development of ideas

- To have ideas, designers must have a clear **understanding of the problem** they are trying to solve!
- The **user's needs and wants** are critical – without them the product will fail to succeed.
- Investigating the problem is key.
- Discussion with users is also key – this is what **USER CENTRED DESIGN** is!
- **Initial ideas** are starting points – they can be sketches, thoughts, models, mock ups, CAD simulations, or even just analysis of an existing product that needs improving!
- Initial ideas need **testing** to see if they work.
- The **target market** should also be used during this 'testing'.

Performance criteria to inform designing

During design and development, ideas should be tested with clear reference to the design specification. From this, analysis can:

- identify where specification criteria are met
- identify where ideas need to develop further to meet the needs, wants and values of the target market
- help structure the next iteration of ideas
- confirm features to be retained and those that need to be replaced
- specification content can be evaluated fully.

Communicating ideas

There is no set pathway or order to designing – that's why there's so much freedom. Below, however, are some design strategies that designers employ when designing.

- **Quick developmental sketching** – these are quickly recorded thoughts to be explored later. Messy, untidy, not the best quality, no labelling, just outlines!
- **Card modelling** – working out whether an idea will function or not is difficult on paper, so some **low fidelity modelling** allows designers to 'see' if ideas work fully, partially, or not at all.
- **2D and 3D modelling** – allows designers to introduce CAD to simulate, test and present ideas in more detail. These can be communicated to others, including the target market, for feedback.
- **CAM and rapid prototyping** – CAD files can be converted into CAM data and models produced for testing.
- **Formal drawings** – once ideas reach a final stage, formal drawings are critical to present details of the final proposal.

Effective design specifications

The design specification is a critical tool for the designer. It should lay out all of the different details required to achieve success.

Measurable criteria should be included so the specification point is clear, achievable, and easy to check. For example – when considering the size of a product, there should be minimum and maximum dimensions established so designers can work with clear reference.

Structuring design specifications can help the design process. Bullet points can condense information. Prioritising criteria is also useful, perhaps in **ESSENTIAL** and **DESIRABLE** so that it is clear what is 'critical' and what is a 'maybe'.

User centred design

The user, or target market, should be consulted regularly throughout the design process – they are an important part of it!

For example, it would be a failure to only use the target market during the investigating and final evaluation stage.

The user or target market should be an integral part of design, testing, development, refinement and finalising of ideas. This 'closeness' will ensure the final product 'fits' and will be successful.

Fitness for purpose

For a product to be fit for purpose, it must meet the design specification and solve the original design problem fully. The product must function in a reliable and expected manner and prevent the design problem from continuing.