



Getting Ready for...

KS5 (A Level) DT

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The iterative design process is central to all courses in Design and Technology at KS5.

The following activities focus on all aspects of this design process and are designed to improve your depth of knowledge and skills in preparation for the demands of A Level.

Activities

1. Iconic Design

Considering the work of key historical design styles, design movements and designers can influence and inspire your own design thinking.

- Create a research mood board with examples of designs from the following list of designers and aesthetic design movements:

Historical Design Movements

Modernism – Bauhaus

Post modernism – Memphis

Art Deco

Arts and crafts movement – William Morris

Influential Designers

Philippe Starck

Dieter Rams

James Dyson

Charles and Ray Eames

Include notes on style, context and their influence on modern product design and manufacture.



2. Existing Product Analysis

Analysing an existing product in-depth is a useful way to determine the key design criteria used in the design of a product.

- Choose two similar products that contrast in their design style and discuss them in terms of the following design criteria:
 - Fitness for purpose
 - Target market group
 - Aesthetics
 - Materials
 - Ergonomics
 - Sustainability
 - Safety





3. Thumbnail Sketching

At the start of the design process you will need to sketch original design ideas. These first initial sketches, known as thumbnail sketches, can benefit from the use of inspirational starting points.

Natural forms are useful starting points and can help you create original design concepts.

Select a range of natural forms (e.g. shells, slices of fruit, plants, stones etc.) and try this design exercise:

- Using a pencil only, produce three quick sketches taking no more than one minute per sketch.
- Give yourself a further three minutes to add any additional detail to the sketches.
- Use the shapes and lines from your three sketches to influence and inspire a final design sketch for a product of your choice (e.g. a lamp, seating, furniture etc.)
- Add notes and details about materials, components and sizes.

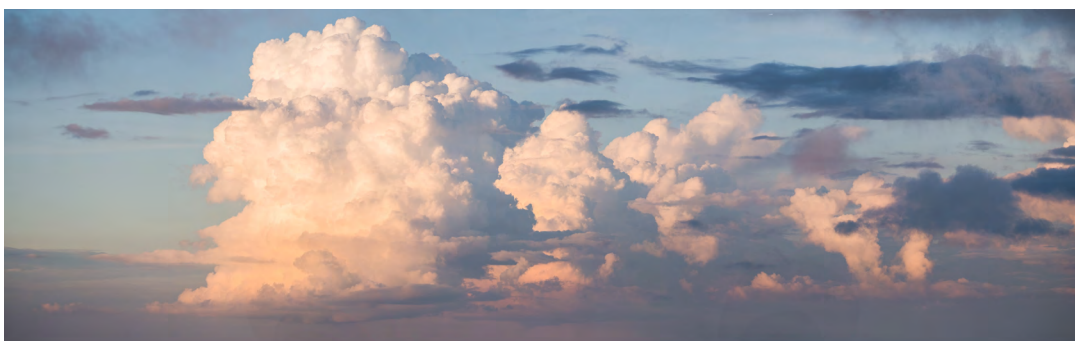


4. Design Influence

The Sydney Opera House was designed by Jørn Utzon. He was inspired by the forms, functions and colours of nature.

Utzon was influenced in his designs by bird wings, and the shape and form of clouds, shells, walnuts and palm trees.

- Find two other great pieces of design and see if you can work out their original design inspiration and influence.





5. Digital Design

Computer Aided Design is used to design, develop and present ideas for product design. For example, 2D CAD designs for working drawings or 3D presentation drawings to demonstrate a final design concept.

- List the advantages and disadvantages of using CAD compared to a manual alternative such as drawing or sketching by hand.

6. Materials Investigation

Investigating the properties of a wide range of materials in terms of function, aesthetics and mechanics is important in product design.

You will need this information to select suitable material choices in your design portfolio for both the initial and final stages of your design work.

For example, the properties of PET make it a suitable choice for a water bottle.

Do some research into the following products and in each case, choose suitable materials for manufacture.

Justify your choices by highlighting the specific properties of the materials.

- Cutlery
- An outdoor bench
- A cycle helmet
- A kayak



7. Life Cycle Analysis

A life cycle analysis assesses the environmental impacts associated with all the stages of the life-cycle of a product, process, or service.

In the case of a manufactured product, environmental impacts are assessed from raw material extraction and processing (cradle), through the product's manufacture, distribution and use, to the recycling or final disposal of the materials composing it (grave).

- Draw out your own life cycle analysis like the one here and make notes about the environmental impact at each stage of the life cycle. For example, the raw materials for paper contribute to large-scale tree felling and logging, and paper making and printing use large quantities of bleaching agents and chemicals.

Life cycle analysis of a newspaper





8. Accuracy and Efficiency

When designing for manufacture, the planning process needs to consider the importance of accuracy, repetition, waste reduction and quality assurance.

Define the following industrial key terms concerned with quality:

- Quality Control
- Tolerance
- Quality Assurance
- Total Quality Management
- Critical Path Analysis



9. National and International Standards

National and international standards organisations play an important role in product design and manufacture. These organisations set standards for the quality and safety of products to protect the consumer by ensuring their fitness for purpose. They provide detailed guidance on good practice and help businesses improve performance and productivity.

Research the role of the following standards, standards organisations or directives and describe how they protect the consumer and the environment:

- British Standards Institute (BSI)
- International Standards Organisation (ISO)
- WEEE directive
- Polymer codes for identification
- Energy ratings of products
- Forest Stewardship Council (FSC)

10. Rapid Prototyping Design Challenge

The ability to produce quick models to help develop design thinking and demonstrate design ideas is a key part of the iterative design process.

The Iterative Design Challenge

Design Task

You have a list of the following materials to work with:

- A sheet of 9 mm plywood size 2440 x 1220 mm
- A metre length of aluminium tube 10 mm in diameter
- A sheet of 3 mm acrylic (any colour) 500 x 500 mm



Sketch Original Ideas

Using only the materials listed above, design an original piece of product design of your own choice.

You can include additional fixings and components in your design work.

You could use your iconic designer mood board or sketches from natural forms from the previous tasks for inspiration.

Modelling a Prototype

Use card or paper to make a rapid model of an idea. Evaluate it, improve the idea and remake the model. Refine it at least three times over, modifying your sketches until you have a final solution to present.

