Year 11 - 12 Bridging the Gap

GCSE → A Level

A Level Product Design

Summer 2023

Course Breakdown

AQA Design and Technology: Product Design (7552)

Paper 1: Technical Principles • Materials, uses, applications, finishes, techniques and processes. • CAD / CAM • Product development • Environmental issues **Paper 2:** Designing and Making Principles • Iterative designing • Designers and design movements • Evaluation and analysis • Design and manufacture	30% 20%	• 2 hour 30 minute written paper • 120 marks • A mixture of short answer and extended responses including maths and science based questions. • 1 hour 30 minute written paper • 20 marks • A mixture of short answer and extended response questions • Section A: Product Analysis (30 marks) Section B: Commercial Manufacture (50 marks)
NEA Practical application of technical principles, designing and making principles.	50%	• Substantial design and make project • 100 marks • 50% of A Level • Evidenced as a written or digital design portfolio and photographic evidence of final prototype

Year 1

Technical Principles

Skills based practical projects

Development and modelling

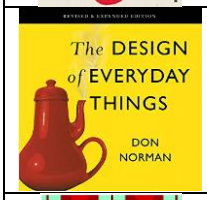
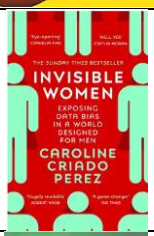
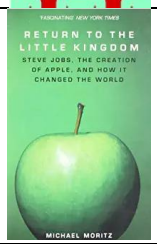
Begin NEA in Spring term

Year 2

Designing and Making Principles

NEA (completion in April)

Recommended Reading

	AQA Design and Technology: Product Design Revision Notes Julia Morrison and Dave Sumpner 2018
	Cradle to Cradle: Remaking the way we make things Michael Braungart and William McDonough 2009
	The Design of Everyday Things Don Norman and Neil Helligers et al.
	Invisible Women: Exposing data bias in a world designed for men Caroline Criado Perez 2020
	Return to the Little Kingdom: Steve Jobs, the creation of Apple and how it changed the world Michael Moritz 2009

Scholarly Articles

10 Principles of good design: What is "Good" Design? A quick look at Dieter Rams' Ten Principles. - Design Museum

6 pillars of Steve Jobs design philosophy: The 6 Pillars Of Steve Jobs's Design Philosophy (fastcompany.com)

Youtube Clips

How product design can change the world | Christiaan Maats | TEDxUniversityofGroningen - YouTube

How To Come Up With Good Ideas | Mark Rober | TEDxYouth@ColumbiaSC - YouTube

The three ways that good design makes you happy | Don Norman - YouTube

The first secret of great design | Tony Fadell - YouTube

Channels

Product Designer Maker: product designer maker - YouTube

The Design Museum: Design Museum - YouTube

Jimmy Design: Jimmy Design - YouTube

TASK 1 – Technical Principles

Investigate different types of materials and fill in the table below:

Material	Categories	Types	Uses	Properties
Wood	Hardwood Softwood	Hardwood: Ash, beech, birch, mahogany, cherry Softwood: pine, larch, fir	Furniture, construction, joinery, DIY	Strong in tension and compression, attractive, tough, durable, weather resistant / resistant to rot (when coated)
Manmade board				
Plastics				
Metals				
Textiles				
Paper and Board				

TASK 2 – Designing and Making Principles

Above are three picture of lamps. Analyse these lamps using the following headings:

Functionality:

Lamp 1:
Lamp 2:
Lamp 3:

Aesthetics:

Lamp 1:
Lamp 2:
Lamp 3:

Customer:

Lamp 1:
Lamp 2:
Lamp 3:

Task 3 – Designers and design movements

Part 1: Design movements

Choose one of the design movements listed below

- Arts and Crafts
- Art Deco
- Modernism eg. Bauhaus, De Stijl
- Post Modernism eg Memphis

Create a study of your chosen movement. The study should include:

- ☐ A title (name of the design movement) in a relevant style
- ☐ Images of products / artwork from the time
- ☐ Images and explanations of current events from the time (wars, revolutions, developments in technology, celebrities, fashion, books, films, TV programmes)
- ☐ A biography of one key designer from your chosen design movement
- ☐ Two sketches of products from your chosen design movement
- ☐ One detailed product analysis of a product from your chosen design movement

This can be completed digitally or by hand.

Part 2: Designers

Choose one of the designers listed below and create a study of them. The study should include:

- Philippe Starck
- James Dyson
- Margaret Calvert
- Dieter Rams
- Charles and Ray Eames
- Marianne Brandt

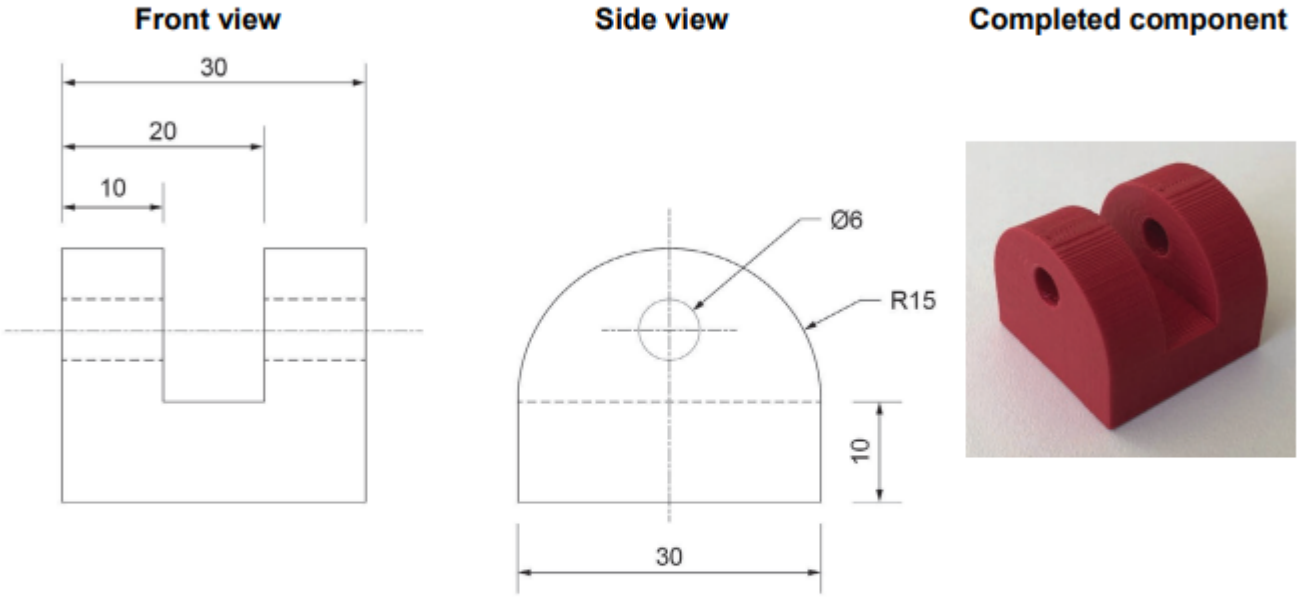
Create a study of your chosen designer. The study should include:

- ☐ A title (name of the designer) in a relevant style
- ☐ Images of products / artwork by the designer
- ☐ Images and explanations of current events from the time (wars, revolutions, developments in technology, celebrities, fashion, books, films, TV programmes) that may have influenced the designer
- ☐ A biography of the designer you have chosen
- ☐ Two sketches of products from your chosen designer
- ☐ One detailed product analysis of a product from your chosen designer

This can be completed digitally or by hand.

TASK 4 – The application of maths and science in Technology

Figure 4
All dimensions in mm
Not drawn to scale



	Material costs	
Material	**Printed density (grams per mm^3)**	**Cost per 500 g**
ABS	0.000 448 g	£18

Calculate the material cost of manufacturing 50 units.

Show your working out.

Calculate the volume of hardener needed.

Show all of your working.

Size of GRP mat needed for moulding	2 metres × 5 metres
Ratio of resin to hardener	3 : 2
Total volume of liquid (resin and hardener) needed per m^2 of GRP matting	3 litres per m^2

TASK 5 – Design and Make

Part 1: Analyse and Research

a) Analyse the design context, exploring design possibilities and opportunities
b) Research the design context by conducting a detailed product analysis, and some market research
c) Write a design brief a specification for your design idea

Part 2: Design and Develop

Visit the "product designer maker" youtube channel and watch videos on how to create design pages. Create 2 design pages with at least 6 design ideas on for your brief.

Develop and model your idea until you have a final design.

Sign up online for an "onshape" account and practise using the tools to develop your idea.

Onshape | Product Development Platform

Part 3: Make

Create a model of your final design using materials that you have available to you.

Part 4: Test and Evaluate

Conduct relevant tests on your model, including client feedback and physical / functional testing.

This can be presented digitally or by hand, and should be approximately 10 A4 pages.