



**Eduqas**  
**A Level**  
**Product Design**  
**(Design Technology)**





## **A Level Design and Technology: Product Design – Edugas**

At this level emphasis is placed upon the design of products for the real world and you will learn about production methods, the application of modern materials and how modern technology is integrated into manufacturing systems. Throughout the course you will develop communication and practical skills through the completion of a number of open ended and focused design activities. Environmental issues are of high priority within this course, and you are encouraged to consider aspects of sustainability when designing and making.

A-level Design and Technology: Product Design requires you to engage in both practical and theoretical study. This specification requires you to cover design and technology skills and knowledge as set out below.

- Core technical principles
- Designing and making principles
- Additional specialist knowledge

You will demonstrate your knowledge of the above criteria through written exams and an extended design and make project. Within this, you will be able to work in a wide range of media and may include the opportunity to develop a rounded knowledge of Computer Aided Design and Computer Aided Manufacture. You must also demonstrate knowledge of Science and Mathematics with the context of design and technology.

Mrs G Davies

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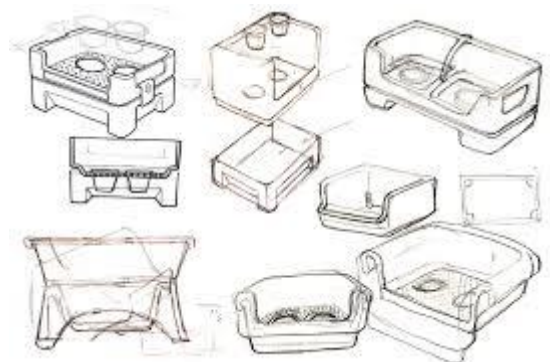
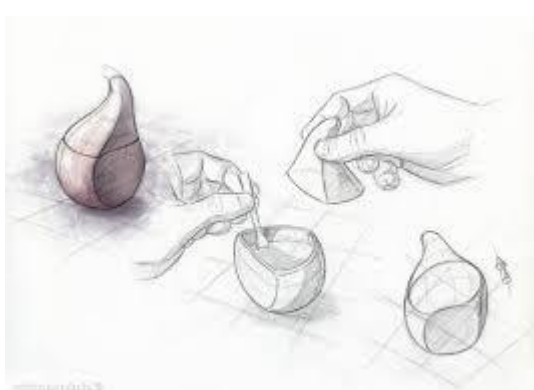
Examination (50%)	Non-Exam Assessment (NEA) (50%)
<p>Students will be expected to demonstrate their knowledge and understanding of:</p> <ul style="list-style-type: none"> <li>designing and innovation</li> <li>materials and components</li> <li>manufacturing processes</li> <li>industrial and commercial practice</li> <li>product analysis and systems</li> <li>human responsibility</li> <li>public interaction – marketing and research.</li> </ul>	<p>Practical application of technical principles, designing and making principles and specialist knowledge. Substantial design and make task undertaken in school over 45 hours (Submitted at the end of Year 2)</p>

## Department Expectations:

- ✓ You come equipped to lessons, with exercise books/folders, Pen, Pencil, ruler and Rubber.
- ✓ You abide by the Health and Safety rules within the department. Respect materials and equipment.
- ✓ If you cannot be trusted in a practical room, you will not be in the practical room.
- ✓ You are punctual to lessons and arrive on time, ready to learn o You respect your peers and teachers and allow others to learn and make progress in their studies.
- ✓ You present and keep your notes in an organised manner
- ✓ You engage with class discussion and ask thoughtful questions
- ✓ You make use of the department resources outside of lesson time.
- ✓ Please organise a time with your teacher where you can use the workshop in free/afterschool to focus on a specific task or develop a workshop-based skill.
- ✓ You do not stop thinking about your coursework (yr13). Gathering inspiration from everything you do and see.
- ✓ You produce ideas in and outside of lessons, sketches by hand, 3D models, computer generated ideas.
- ✓ You spend time understanding your strengths and weaknesses. Embrace them and work on accordingly.

The required skills include;

- ~ Strong writing skills to apply to lengthy essay writing
- ~ Mathematics skills & are able to apply them to show a level of technical precision
- ~ Creativity
- ~ Problem solving
- ~ Computer skills including; 2D design, fusion 360 & Tinker CAD (we will teach)
- ~ Modelling in a variety of materials
- ~ Time management
- ~ Reflective evaluation & annotation



## **Summer Bridging Work**

### **Task 1: Designer Research – on A4 or as a PowerPoint (3hours)**

Research and analyse a design movement. Remember detail is key. **Look at the movement** as a whole and then **pick a designer** within that movement to focus on. You should think about:

- ✓ key dates and facts
- ✓ what the movement looks like
- ✓ what the key features are
- ✓ how the designer was influenced
- ✓ your opinion on the design movement
- ✓ how could these key features be used as an inspiration point
- ✓ your own sketches of your favourite pieces from that movement

You should include a range of images and reference where you sourced your information from.

- ✓ Arts and Crafts – William Morris
- ✓ Art Nouveau – Charles Rennie Mackintosh
- ✓ Bauhaus Modernist – Marianne Brandt
- ✓ Art Deco – Eileen Gray
- ✓ Post Modernism – Philippe Starck
- ✓ Streamlining – Raymond Lowey
- ✓ Memphis – Ettore Sottsass.

<https://designkmg.weebly.com/design-movements.html>

### **Task 2: Drawing Practice/Sketching and Rendering – On A3/4 paper (2 hours)**

This will support you toward your first project in September.

Create an A3/4 page with 5-10 shapes of your choice from watching the tutorials from the You Tube channel below. [https://www.youtube.com/watch?v=S8RwyQovt-E&list=PLUmGlca4HGqZKHiBZtL\\_zHjh2HBoBNerA](https://www.youtube.com/watch?v=S8RwyQovt-E&list=PLUmGlca4HGqZKHiBZtL_zHjh2HBoBNerA)

You must have them rendered and showing shadow. Practice makes perfect!

[https://www.youtube.com/watch?v=jF0JPyxQ\\_3Y](https://www.youtube.com/watch?v=jF0JPyxQ_3Y)

### **Task 3: Analyse project – on A4 or PowerPoint (2 hours)**

- ✓ Analyse the Bic Pen product.



- ✓ Consider function, manufacture, ergonomics, size, safety, sustainability.
- ✓ Identify strengths & weakness of the design and try to think like the user.
- ✓ Research the history of the Bic pen and write 200-300 words on key developments.
- ✓ Suggest 3 ways to improve the design of the item through sketching and annotations.
- ✓ Be creative and experimental with your designs.
- ✓ Look at other handheld products to get ideas for shape, form or ergonomic grip.
- ✓ Add images from magazines or the internet to explain where your ideas came from.
- ✓ Annotate and explain your design ideas

#### **Task 4: (1 hour)**

Keywords dictionary Using the right terms within your NEA coursework and in your exams is really important. Make a dictionary of key terms with a detailed definition of each word. Make sure this is easy for you to read and access. Perhaps think about colour coding words to help you.

- CONDUCTIVITY
- STRENGTH
- ELASTICITY
- PLASTICITY
- MALLEABILITY
- HARDNESS
- TOUGHNESS
- DURABILITY
- BIODEGRADABILITY
- FLEXIBILI
- ERGONOMIC
- ANTHROPOMETRIC
- STABILITY
- STIFFNESS
- AESTHETICS
- BRITTLENESS
- CORROSION
- DENSITY

### **Wider reading for the course:**

- ✓ Scan read the product design section (pages 23-37)  
<https://www.educas.co.uk/media/kclpvixc/a-level-design-andtechnology-specification.pdf>
- ✓ E-Textbook - Digital resources for each unit of work: Have a look, you don't have to read them all.  
<https://resources.educas.co.uk/Pages/ResourceSingle.aspx?rId=1077>
- ✓ Making It: Manufacturing Techniques for Product Design - Chris Lefteri
- ✓ Design: The Definitive Visual History – Dorling Kindersley
- ✓ Inclusive Design Toolkit Issue 1-4  
[http://www.inclusivedesigntoolkit.com/VBA\\_bulletin\\_issue\\_1/](http://www.inclusivedesigntoolkit.com/VBA_bulletin_issue_1/)
- Inclusive Design Calculator  
[http://www.inclusivedesigntoolkit.com/VBA\\_bulletin\\_issue\\_3/#nogo](http://www.inclusivedesigntoolkit.com/VBA_bulletin_issue_3/#nogo)
- Exploded Drawing Technique <https://www.youtube.com/watch?v=qr4V8Nr9Fal>

### **Helpful Websites:**

- ✓ [www.technologystudent.com](http://www.technologystudent.com) -Timbers
- ✓ <https://www.youtube.com/watch?v=vVswXx2m3eI&t=166s> - Laminating plywood with a vacuum bag
- ✓ <https://www.youtube.com/watch?v=YHP0STc3Ghg> – routing
- ✓ <https://www.youtube.com/watch?v=S8cQz4rSit8> – laminating veneers
- ✓ <https://www.youtube.com/watch?v=ZD5JWP3qDdg> – steam bending
- ✓ <https://www.youtube.com/watch?v=TeOInBNEdjw> - turning Polymers
- ✓ <https://www.youtube.com/watch?v=AZyq3TgskAY> – plastic bad production (includes calendaring) • <https://www.youtube.com/watch?v=SqyrJUNhXwg> – extrusion
- ✓ <https://www.youtube.com/watch?v=xim1m2Bhvzc&feature=youtu.be> – injection moulding
- ✓ <https://www.youtube.com/watch?v=8W6P5KU5ONQ> – blow moulding
- ✓ <https://www.youtube.com/watch?v=xc9pKiV5wag> – rotational moulding
- ✓ [https://www.youtube.com/watch?v=wYb\\_UjgJ5E0](https://www.youtube.com/watch?v=wYb_UjgJ5E0) – laying up (GRP)
- ✓ <https://www.youtube.com/watch?v=p5M0YI2BUjE> - thermoforming
- ✓ • [https://www.youtube.com/watch?v=ik39\\_sv-wgQ](https://www.youtube.com/watch?v=ik39_sv-wgQ) – FDM Rapid Prototyping
- ✓ <https://www.youtube.com/watch?v=r6U6P0Y0bRw> – deep drawing
- ✓ <https://www.youtube.com/watch?v=LIRof0K0OQ> – die casting
- ✓ <https://www.youtube.com/watch?v=lZvP6Jj3HvY> – gravity die casting
- ✓ <https://www.youtube.com/watch?v=iSyBsdJkQu8> – high pressure die casting
- ✓ <https://www.youtube.com/watch?v=npHQPXGGkgl> – investment casting
- ✓ <https://www.youtube.com/watch?v=npHQPXGGkgl> – press forming type 1

- ✓ [https://www.youtube.com/watch?time\\_continue=1&v=5CuJjSk4U38](https://www.youtube.com/watch?time_continue=1&v=5CuJjSk4U38) – press forming type 2
- ✓ <https://www.youtube.com/watch?v=43N44lCyuEU> – metal spinning
- ✓ <https://www.youtube.com/watch?v=szOwGvYO> – sand casting
- ✓ [https://www.youtube.com/watch?v=6xnKmt\\_gsLs](https://www.youtube.com/watch?v=6xnKmt_gsLs) – rolling
- ✓ <https://www.youtube.com/watch?v=Sbs5BjM4wgk> – milling Papers & Boards
- ✓ <https://www.youtube.com/watch?v=kaokWmrxlsIc> - Die Cutting
- ✓ [https://www.youtube.com/watch?v=SljUVCho\\_xU](https://www.youtube.com/watch?v=SljUVCho_xU) – laser cutting