PiXL Gateway: Progression

Design and Technology

As a prospective student of Design and Technology you should already be taking a real and active interest in this subject. This progression booklet will help build your knowledge and skills in Design and Technology and get you off to the best possible start this September. The tasks set for you will give you a taste of the wide variety of tasks/issues of what is involved and get you thinking like a designer.

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This booklet will develop your skills, knowledge and understanding in the following areas:

- Technical principles
- Designing and making principles

NOTE: It is NOT compulsory to do **ALL** of these tasks – you need and deserve some relaxing times over summer too! But these topics are useful, and far more interesting than watching Eastenders! I've checked/edited them, and they are genuinely relevant to our course requirements. In Design, the more you know or are aware of the better, allowing you more scope to refer to things in your coursework and exam answers, as well as practical skills such as Maths and sketching. Get stuck in (but have a great summer too!). KL

Technical principles

Materials

Understanding materials and their characteristics and working properties is crucial in design.

Task: Research the following materials and create a mind map based on your research and understanding of their characteristics and working properties:

- Woods
- Metals
- Polymers
- Textiles
- Composites
- Smart and modern materials

Production processes

Task: Research the following manufacturing processes and create a presentation explaining the process. Include diagrams/sketches to aid your understanding.

- Injection Moulding
- Extrusion
- Laminating
- Milling
- Turning
- Casting
- Stamping

Sketching

Communicating your thoughts and ideas through sketching will be key to your success next year. Practise your sketching techniques. Get in a habit of carrying a sketchbook around with you. Sketch the many interesting things you see over the summer.

Task: A sketch a day. In September, I'd like you to present a sketch book full of sketches. There are no rules on what to include, it just needs to show progression in your sketching skills over time. Have fun with it, make it your own.

Things you might include:

- Stick in photographs, magazine, internet clippings to aid inspiration and contexts for your sketches.
- Mixed media – use pencils, pens, marker pens, charcoal, pastels etc.
- Doodle – quick sketching. Learn to get ideas down quickly.
- Perspective drawing – 3D drawing.
- Draw everyday items that you see.
- Interesting idea? Problem you have encountered? Get your design problem solution sketched and developed.
- Annotate – not all sketches need annotation but get in the habit of including it where you can. Write down your thoughts.

YouTube has great online tutorials to follow.

CAD/CAM

Task: Read the article at the link below.

https://www.inc.com/encyclopedia/computer-aided-design-cad-and-computer-aided-cam.html

Mathematics and Science

Design and Technology requires you to demonstrate your knowledge of mathematics and science in both theoretical and practical ways. You will be required to use mathematics and science to support decisions made in the processes of designing and making.

Task: You are required to understand and apply the following mathematical skills next year. Research the mathematical skills listed below and for each one, generate an exam style question with an answer. Next year we can collate them and create a revision booklet of mathematical problems to solve to aid the entire group.

Mathematical skill	Potential question
Confident use of number and percentages	Calculation of quantities of materials, costs and sizes
Use of ratio	Scaling drawings
Calculation of surface areas and/or volumes	Determining quantities of materials
Use of trigonometry	Calculation of sides and angles as part of product design
Construction, use and/or analysis of graphs and charts	Representation of data used to inform design decisions and evaluation of outcomes. Presentation of market data, user preferences, outcomes of market research.
Use of coordinates and geometry	Use of datum points and geometry when setting out patterns
Use of statistics and probability as a measure of likelihood	Interpret statistical analysis to determine user needs and preferences. Use data related to human scale and proportion to determine product scale and dimensions

Designing and Making Principles

Iterative Design

Task: Research and explain the iterative design process. Include a case study of a designer and product. You should evidence how the iterative process was used in the development of the product.

Click on the link for an example of its use to develop a successful product:

http://fortune.com/2016/10/03/billionaire-inventor-james-dyson-on-his-tedious-creative-process/

https://www.theguardian.com/culture/2016/may/24/interview-james-dyson-vacuum-cleaner

Design Theory

Task: Research a design movement and redesign an everyday object using the influence of the movement. Evidence the sketches in your sketchbook. Include a photograph of the product and then begin rapid sketching your initial ideas. Evaluate and analyse your ideas and develop them further. Annotate your development, explaining your design ideas. Draw a final design and explain how the design has been influenced.

http://www.vam.ac.uk/page/0-9/20th-century-design-styles/

Further Research

This list gives suggestions for further research you may wish to do… it's more interesting than watching Eastenders, and the more you know or are aware of the better….

www.designmuseum.org/design

www.vam.ac.uk

www.sciencemuseum.org.uk

https://www.designcouncil.org.uk/
