Unit A534

- *Technical aspects of designing and making*
- The paper will consist of five questions that focus on technical aspects of designing and making. Quality of written communication is assessed in this unit
- 20% of the total GCSE marks
- 1 hour 15 minutes Written Paper

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Assessment Objectives

- AO1 Recall, select and communicate their knowledge and understanding in Design and Technology including its wider effects.
- AO2 Apply knowledge, understanding and skills in a variety of contexts and in designing and making products.
- AO3 Analyse and evaluate

Written Paper

- Section A consists of three questions based on the technical aspects of working with materials, tools and equipment

- Section B consists of two questions on the design of products reflecting the wider aspects of sustainability and human use. One of these questions will require a design response

- This unit is externally assessed

The Design Process

- What are the main stages or steps in design?
- In groups match cards and definitions to form a linear or circular design process, review and produce a final design process
- Produce a flow diagram to show the design process

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Classification

- What is the difference between paper, card and board?
- Use paper, card, board, foam board, sheet plastics (up to 1mm thick), corriflute and/or styrofoam to design a logo for a paper company called ‘Omega’
- Give a brief outline of the source of these materials and the forms in which these materials are purchased

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Properties

- What is the difference between a physical property and an aesthetic property?

- In groups classify materials in terms of hardness, toughness, strength, flexibility, impact resistance, strength to weight ratio and aesthetic qualities

- Produce a chart showing the physical and aesthetic properties of a range of graphic materials

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Finish

- What is the purpose of an applied finish?
- Look at a range of products and say whether the finish is for protecting, preserving and/or enhancing
- Give an appropriate use for each of the following: laminating; spirit varnish; ultra violet (UV) lacquer; embossing; foil application

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Joining

- What are the common methods of joining materials?
- Strength test: Velcro, sticky pads, paper fasteners, eyelets, plastic ‘click’ fasteners or rivets, PVA adhesive, glue sticks, single and double-sided adhesive tape
- Explain why the following might be unsafe: a hot melt glue gun, spray adhesive, solvent cement and epoxy resin

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Smart and Modern Materials

- What is a smart material?
- Discuss possible uses for Polymorph, Thermochromic inks, pigments and film, Photochromic inks and pigments, Phosphorent pigments and Fluorescent pigments
- Give possible uses for NanoComposites, NanoCrystals, NanoClays, NanoStructured materials, NanoParticles and NanoTubes

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Sustainability

- What are the main environmental issues?
- Discuss the impact mobile phone packaging has on the environment (production, use and disposal) and how it could be made more sustainable
- Draw the following SPI symbols and pictograms Mobius loop with percentage, recycled cardboard, green dot and tidyman

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Design

- Is good design just following the stages in the design process or should designers take risks?
- Look at a range of designs and say where the designer has been innovative and creative or has considered sustainability, ergonomics or economics
- Collect a range of iconic designs and produce an image board highlighting the above

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Product Analysis

- What is meant by product analysis?
- Compare products designed to meet the same need and analyse in terms of function, market, materials, components and processes
- Carry out a Life Cycle Analysis (LCA) with reference to fitness for purpose, innovation, moral, cultural, environmental and sustainability issues

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Product Planning

- Why do we need to plan?
- Produce a plan to make a pop up card ensure there is sufficient **detail** to make the product and the stages are in the correct **order**
- Write guidelines for effective planning that will make the best use of resources in terms of cost, sustainability, moral and cultural issues

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Tools and Equipment

- What tools and equipment are available for you to use?
- Make a brief note on the equipment and tools available to you and keep for later reference
- Make a list of basic graphics materials equipment, how to select the appropriate tool and how to use it safely and effectively

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Geometric Shapes

- How would a designer make use of geometric construction?
- Construct a triangle, a quadrilateral, a pentagon, a hexagon, an octagon and an ellipse
- Sketch and name a solid that can be produced using each of the above shapes as a base

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Orthographic Projection

- Why do designers use orthographic projection?
- Make a card model of a house
- Using squared paper produce a third angle orthographic view of your card model house, add dimensions and the BSI symbol

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Isometric Projection

- When would designers use isometric instead of orthographic projection ?
- Use isometric paper to produce a range of different size cubes and ellipses
- Using isometric paper produce an isometric view of your card model house add portholes on the end gables and a circular pond in the garden

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Perspective Drawing

- What are the advantages/disadvantages of using perspective drawing?
- Draw a one point interior view of your card model house show the horizon line and vanishing points
- Draw a two point exterior view of your card model house show the horizon line and vanishing points

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Enhancement Techniques

- What is meant by an enhancement technique?
- Use thick and thin line technique to enhance your pictorial view of your card model house
- Use tone, texture, light, shade and shadow to add impact and realism to your pictorial view of your card model house

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Colour

- What do you associate with the following colours: red, orange, yellow, green, blue and purple?
- Draw a colour wheel to show primary, secondary and complementary colours
- Use images to produce a colour wheel showing colour associations

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Data Presentation

- What is meant by data presentation?
- Conduct a short survey and produce either a graph, a bar chart, a pie chart or a pictograph based on your class
- Produce a range of graphs, bar charts, pie charts and pictographs to show weather changes over the past few weeks

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Surface Developments

- What is meant by a surface development (net)?
- Using squared paper draw the development of a cube, a prism and a cylinder show fold lines, glue tabs, fold-in flaps and slot and tab fixing methods that do not require adhesive
- Using squared paper draw the development of a pyramid and a cone

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Manufacturing Processes

- Why do designers need to develop their manufacturing skills?
- Make an Easter egg box using a die cutter, scissors, craft knife, safety rule, circle cutter, perforation cutter, cutting mat
- Draw diagrams to show how a vacuum former and a strip heater form thin plastic sheet

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Printing Methods

- What are the four colours used in printing to produce full colour prints?
- Draw a sequence diagram to show how screen printing works
- Produce a table to show application and size of print run for screen, block printing, photocopying, letterpress, lithography and gravure

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Mechanical Systems

- What is meant by a mechanical system?
- Adapt a mechanical system (lever, linkage, V-fold mechanism, parallelogram, rotating disc) to produce a simple popup card
- Use diagrams to explain how mechanical systems used for pop-up cards and interactive books work

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Computer Applications

- What are the advantages and disadvantages of using CAD/CAM?
- Use Photoshop and Google Sketchup to design and model a free standing display for a travel agent
- Write a list of definitions for the following terms: layer, blur, mirror, vector, bitmap, file format, file size, data transfer and copyright

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Health and Safety

- Why is Health and Safety important in the work place?
- Identify hazards and say whether the risk is high, medium or low, say what measures have been taken to reduce the level of harm
- Give examples of: personal protective equipment, machine guards, dust and fume extraction, waste disposal and accident procedures?

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Quality

- How do consumers know that what they are buying is a quality product?
- Design a quality control check to ensure quality of design and quality of manufacture
- Draw and label the following symbols: ISO 9000, British Standard Kite Mark, the CE mark, copyright mark, Trade and Services Marks (Trademark) and the E mark

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Test

- Complete a test on the 6R's, use extended writing questions as used in section B of the A532 unit test
- Exchange papers, mark and discuss the answers with your teacher
- Identify areas of weakness to guide further preparation

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