

Paper Reference(s)

5318

Edexcel GCSE

Manufacturing (Double Award) (2351)

Engineering (Double Award) (2316)

Unit 3: Application of Technology

Sectors:

- **Printing and Publishing, Paper and Board (5318/01)**
- **Food and Drink, Biological and Chemical (5318/02)**
- **Textiles and Clothing (5318/03)**
- **Engineering Fabrication (5318/04)**
- **Electrical and Electronics, Process Control, Computers, Telecommunications (5318/05)**
- **Mechanical, Automotive (5318/06)**

June 2010 Pre-release material

To be opened on receipt

Instructions to Candidates

This pre-release material contains instructions for all **six** sectors.

Candidates should be entered for, study and select the research product from only **one** of these sectors.

Advice to Candidates

You may take your researched notes and sketches into the examination room and use these as reference materials. **None** of this material should be sent to Edexcel and pre-release work will **not** be marked.

ALL the questions in Section B of the question paper will relate to your selected product.

Printer's Log. No.

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Turn over

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Use of Pre-release for the External Examination Unit 5318 Support Paper for Teachers of GCSE Engineering/Manufacturing

Introduction

The examination for Unit 3 is offered as **six** different sector pathways. Centres are free to select the sector paper they wish to enter their candidates. The deadline for entries to be received by Edexcel is 19 March 2010. The pre-release material is posted on the website by the end of September 2009 for the examination in June 2010. This pre-release will be in the form of a booklet and will cover all six sectors. Teachers at new centres should ensure that their Examinations Officer has informed the ECC (Entries Department) at Edexcel of their intention to enter candidates.

The pre-release consists of guidance for the candidates and notes to the centre. Staff at the centre should therefore open this material as soon as it arrives in the centre and read the information for all six sectors before deciding which sector is most suitable for them to support the needs of their candidates.

Generally speaking Engineering is split into three sectors: Engineering Fabrication; Mechanical, Automotive; and Electrical and Electronics, Process Control, Computers, Telecommunications. Manufacturing is split into three sectors: Food and Drink, Biological and Chemical; Printing and Publishing, Paper and Board; and Textiles and Clothing.

Regardless of the route the centre is planning for the other two units in the qualification, the sector for this unit can be chosen to suit the best support a centre can offer rather than being defined by any preconceived ideas.

Introduction to use the pre-release

The product selected by Edexcel for each of the sectors is a product that is in general use, easy to recognise and easy to obtain. Most of these products would be of a reasonable price to purchase, such as the side lever grease guns, or are already available or owned by centres or candidates, such as the paperback books.

Whilst the internet is a very valuable source of information researching for this product, centres should not rely totally on this and may need to be diligent in their own research before deciding which sector is best for their candidates. For some sector products there may be a wealth of materials on the internet, such as food industry information. However, searching for manufacturers of traditional engineering type products may prove more difficult. Often adding the word 'manufacturer' when carrying out searches using 'advanced search tools' on search engines supplies better results than not entering, or using this word alongside the product name.

Supporting the candidates

After defining the sector specific paper, centres need to develop a support strategy for their candidates. They need to consider the local support that can be gained from either industry, colleges or even universities, together with the information known to be available from the teachers' initial search and investigation to decide which sector paper to use.

In an area where manufacturer support for the exact product may be difficult to come by, such as the trolley jack in the 2005 pre-release, the centre needs to source local engineering support that uses similar process and techniques to that found in almost any engineering manufacture. A typical way to support the candidates, in this case, would be to visit the local company before the planned visit, establish what the company can show/offer, and then match or simulate this to the manufacturing process in, e.g., the

trolley jack. Different groups of candidates could be asked to collect information on a particular aspect on application of technology from the company visit and briefed to give feedback to the rest of the group on return to the centre. The teacher's role would be to draw out the similarities between the technology seen and that of the trolley jack. Back at the centre the product, in this case, the trolley jack, should be made available and dismantled. Again the teacher should be able to relate what is required for the manufacture and application of technology from that seen on any visits to local companies.

Further support

The delivery of the vocational curriculum requires that centres support candidates in the context of their course by applying work related learning techniques to their area of study. Engineering and Manufacturing has the support of SEMTA and local STEMNET, as well as all other local support mechanisms, such as the Education Business Links Organisations (EBLO) and Work Related Learning Officers, either in schools or Local Authorities. Food manufacturing, for example, has the support of appropriate trade associations and professional bodies, such as for the mass produced sliced and wrapped loaves of bread in the 2004 pre-release, the Federation of Bakers or similar baking industry associations may be useful sources. Often Vocational Learning Support Networks 14–19 are available and supported by the Learning and Skills Network (LSN).

Once centres have facilitated the research required by the pre-release material and instructions, the teachers should encourage the candidates to consider the usefulness of any materials gained. Often materials will be found on websites, centres need to ensure that the candidates print/copy only pages that are relevant to that required and defined by the pre-release. They should not print masses of web pages.

If studied closely the pre-release highlights the areas of knowledge required for the examination and can become the focus for collecting information. Just like an internally assessed unit, the candidates should be encouraged to produce a portfolio of their research. This can then be taken into the examination and used by the candidates when answering the questions in the paper. The research notes and sketches therefore need to be well organised, or they may be more of a hindrance than help. After studying the application of technology associated with the manufacture of the trolley jack candidates in 2005 were asked, for instance, to answer questions about coatings used. Therefore this was listed in the pre-release instructions as an important aspect to research for Section B of that paper.

What not to do

The experience of reviewing responses in previous examinations indicates that centres may be allowing candidates to take into the examination more than their own research notes and sketches, such as practice or previous examination papers, or materials from the Candidate Kit supplied by Edexcel as support materials. This often damages candidates' opportunities when they give a very detailed answer, obviously taken from the practice papers or Candidate Kit, but fail to put their answer into the context of the question being asked. Centres should think about their responsibility in this matter as candidates may be disadvantaged and not be awarded marks to match their potential.

In short, staff in centres should prepare the candidates to achieve to the best of their ability without employing strategies that will disadvantage them.

1. Printing and Publishing, Paper and Board

The written examination paper is split into two sections.
Section A is worth 45 marks and Section B is worth 55 marks.

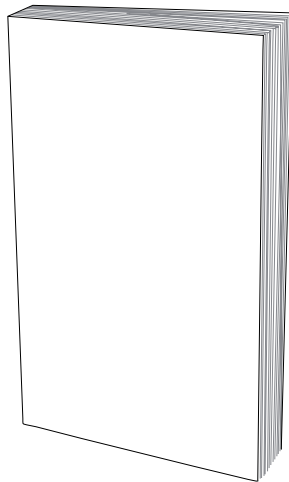
In **Section A** you will need to answer a range of general questions.

To prepare for Section A, you should study and understand the design and manufacture of a range of mass produced products belonging to and used in the *Printing and Publishing, Paper and Board* sector.

You should be able to:

- Name and identify products from this sector including their appropriate uses and applications
- Identify a range of items and equipment, and understand how they are used, in the manufacture of printing and publishing, paper and board products
- Identify the stages in manufacturing products from this sector
- Name and understand the functions of modern materials used in products in this sector
- Identify, apply and explain new technologies including CAD, CAM, ICT and smart materials
- Know and understand how new technology can affect marketing and control technology within a company.

For **Section B** you should carry out research into the stages in manufacturing **mass produced mass market paperback books**.



You should be able to:

- Identify the component parts of mass market paperback books and know about their functions
- Name and explain the use of modern materials and their impact for mass market paperback books
- Explain high volume printing processes used in production and know about a range of other processes
- Name and describe the stages in manufacture
- Explain the effects, benefits and impact of modern technology on quality, retail, the use of human resources, the environment, costs and energy consumption.

You should also familiarise yourself with the 'What you need to learn' section of the GCSE specification – Unit 3: Application of Technology.

2. Food and Drink, Biological and Chemical

The written examination paper is split into two sections.
Section A is worth 45 marks and Section B is worth 55 marks.

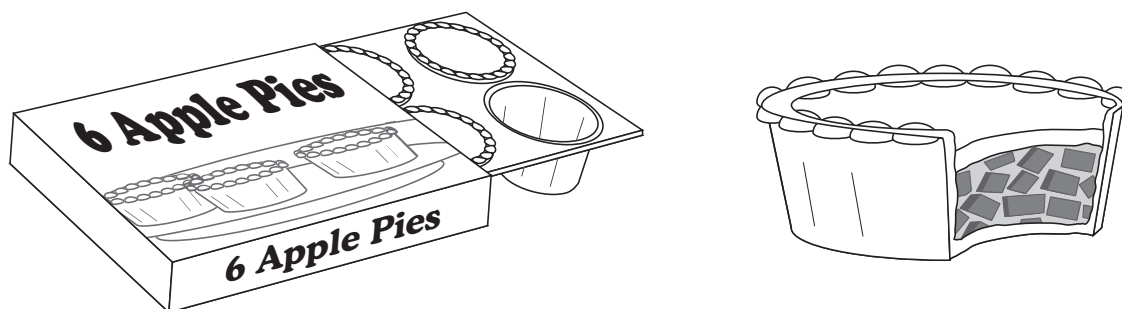
In **Section A** you will need to answer a range of general questions.

To prepare for Section A, you should study and understand the design and manufacture of a range of mass produced products belonging to and used in the *Food and Drink, Biological and Chemical* sectors.

You should be able to:

- Name and identify products from this sector including their appropriate uses and applications
- Identify a range of equipment and understand how it is used, in the manufacture of food and drink, biological and chemical products
- Identify the stages in manufacturing products from this sector
- Name and understand the functions of modern materials used in products in this sector
- Identify, apply and explain new technologies including CAD, CAM, ICT and smart materials
- Know and understand how new technology can affect marketing and control technology within a company.

For **Section B** you should carry out research into the stages in manufacturing **mass produced boxes of small apple pies**.



You should be able to:

- Identify the ingredients, composition and parts of mass produced boxes of small apple pies and know about their functions
- Name and explain the use of modern materials and their impact for mass produced boxes of small apple pies
- Explain high volume manufacturing processes associated with the preparation of ingredients and know about a range of other processes
- Name and describe the stages in manufacture
- Explain the effects, benefits and impact of modern technology on quality, retail, the use of human resources, the environment, costs and energy consumption.

You should also familiarise yourself with the 'What you need to learn' section of the GCSE specification – Unit 3: Application of Technology.

3. Textiles and Clothing

The written examination paper is split into two sections.
Section A is worth 45 marks and Section B is worth 55 marks.

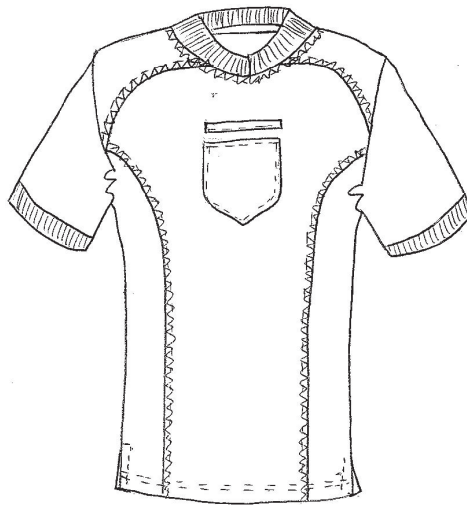
In **Section A** you will need to answer a range of general questions.

To prepare for Section A, you should study and understand the design and manufacture of a range of mass produced products belonging to and used in the *Textiles and Clothing* sector.

You should be able to:

- Name and identify products from this sector including their appropriate uses and applications
- Identify a range of equipment, and understand how they are used, in the manufacture of textiles and clothing products
- Identify the stages in manufacturing products from this sector
- Name and understand the functions of modern materials used in products in this sector
- Identify, apply and explain new technologies including CAD, CAM, ICT and smart materials
- Know and understand how new technology can affect marketing and control technology within a company.

For **Section B** you should carry out research into the stages in manufacturing **mass produced replica football shirts**.



You should be able to:

- Identify the component parts of mass produced replica football shirts and know about their functions
- Name and explain the use of modern materials and their impact for mass produced replica football shirts
- Explain high volume embellishment processes used in production and know about a range of other processes
- Name and describe the stages in manufacture
- Explain the effects, benefits and impact of modern technology on quality, retail, the use of human resources, the environment, costs and energy consumption.

You should also familiarise yourself with the 'What you need to learn' section of the GCSE specification – Unit 3: Application of Technology.

4. Engineering Fabrication

The written examination paper is split into two sections.
Section A is worth 45 marks and Section B is worth 55 marks.

In **Section A** you will need to answer a range of general questions.

To prepare for Section A, you should study and understand the design and manufacture of a range of mass produced products belonging to and used in the *Engineering Fabrication* sector.

You should be able to:

- Name and identify products from this sector including their appropriate uses and applications
- Identify a range of components, and understand how they are used, in the manufacture of engineering fabrication products
- Identify the stages in manufacturing products from this sector
- Name and understand the functions of modern materials used in products in this sector
- Identify, apply and explain new technologies including CAD, CAM, ICT and smart materials
- Know and understand how new technology can affect marketing and control technology within a company.

For **Section B** you should carry out research into the stages in manufacturing **mass produced golf trolleys**.



You should be able to:

- Identify the component parts of mass produced golf trolleys and know about their functions
- Name and explain the use of modern materials and their impact for mass produced golf trolleys
- Explain high volume moulding processes used in production and know about a range of other processes
- Name and describe the stages in manufacture
- Explain the effects, benefits and impact of modern technology on quality, distribution, the use of human resources, the environment, costs and energy consumption.

You should also familiarise yourself with the ‘What you need to learn’ section of the GCSE specification – Unit 3: Application of Technology.

5. Electrical and Electronics, Process Control, Computers, Telecommunications

The written examination paper is split into two sections.
Section A is worth 45 marks and Section B is worth 55 marks.

In **Section A** you will need to answer a range of general questions.

To prepare for Section A, you should study and understand the design and manufacture of a range of mass produced products belonging to and used in the *Electrical and Electronics, Process Control, Computers, Telecommunications* sector.

You should be able to:

- Name and identify products from this sector including their appropriate uses and applications
- Identify a range of components, and understand how they are used, in the manufacture of electrical and electronics, process control, computers, telecommunications products
- Identify the stages in manufacturing products from this sector
- Name and understand the functions of modern materials used in products in this sector
- Identify, apply and explain new technologies including CAD, CAM, ICT and smart materials
- Know and understand how new technology can affect marketing and control technology within a company.

For **Section B** you should carry out research into the stages in manufacturing **mass produced USB flash drives**.



You should be able to:

- Identify the component parts of mass produced USB flash drives and know about their functions
- Name and explain the use of modern materials and their impact for mass produced USB flash drives
- Explain high volume processes used in the construction of electronic circuits and know about a range of other processes
- Name and describe the stages in manufacture
- Explain the effects, benefits and impact of modern technology on quality, distribution, the use of human resources, the environment, costs and energy consumption.

You should also familiarise yourself with the 'What you need to learn' section of the GCSE specification – Unit 3: Application of Technology.

6. Mechanical, Automotive

The written examination paper is split into two sections.
Section A is worth 45 marks and Section B is worth 55 marks.

In **Section A** you will need to answer a range of general questions.

To prepare for Section A, you should study and understand the design and manufacture of a range of mass produced products belonging to and used in the *Mechanical, Automotive* sector.

You should be able to:

- Name and identify products from this sector including their appropriate uses and applications
- Identify a range of components, and understand how they are used, in the manufacture of mechanical, automotive products
- Identify the stages in manufacturing products from this sector
- Name and understand the functions of modern materials used in products in this sector
- Identify, apply and explain new technologies including CAD, CAM, ICT and smart materials
- Know and understand how new technology can affect marketing and control technology within a company.

For **Section B** you should carry out research into the stages in manufacturing **mass produced side lever grease guns**.



You should be able to:

- Identify the component parts of mass produced side lever grease guns and know about their functions
- Name and explain the use of modern materials and their impact for mass produced side lever grease guns
- Explain why high volume moulding processes are used in production and know about treatment processes
- Name and describe the stages in manufacture
- Explain the effects, benefits and impact of modern technology on quality, distribution, the use of human resources, the environment, costs and energy consumption.

You should also familiarise yourself with the ‘What you need to learn’ section of the GCSE specification – Unit 3: Application of Technology.

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