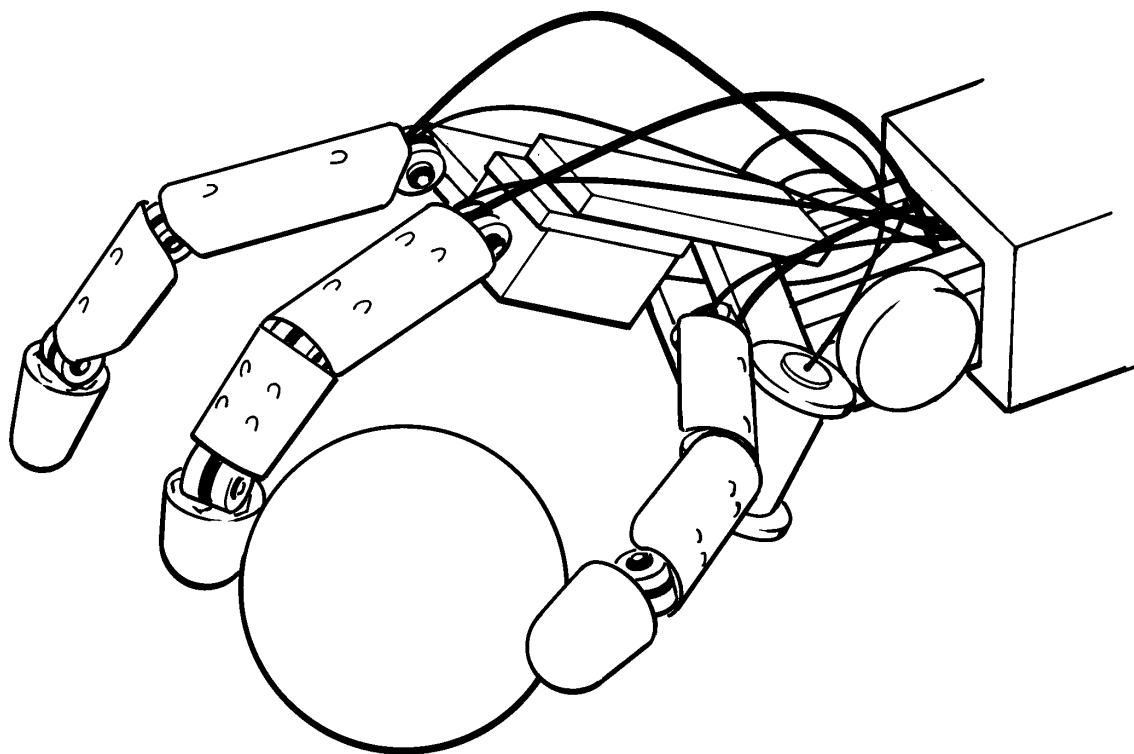


Edexcel GCSE



Candidate Kit

**Edexcel GCSE Engineering (Double Award)
Edexcel GCSE Manufacturing (Double Award)**

March 2004

Edexcel
Success through qualifications

Teachers Notes

Introduction

These materials have been put together by members of the Examining team overseen by the Principal Examiner. While the materials cover most of the requirements of the externally assessed unit students should not rely purely on these materials for their revision.

Before you start!

The examiners have written some notes to help the students understand how their exam paper will be structured and to introduce the materials in the pack.

Subject specific help

A variety of approaches and activities have been developed in order to help the students revise for their summer exams. There are a number of generic activities and some specific to the options.



Revision Checklist

Examiners have reviewed the unit being tested and devised a checklist for the students.



Command words used in your exam

This section explains for the student the meaning of the words used in the exam papers. Students should take note of this when answering the questions.

Model answers

These are examples to show how students could achieve maximum marks.

Key Words and phrases

Various activities have been written to reinforce the students understanding of key words and phrases.



Investigating products – Product Analysis

This is a series of activities to help the student summarise their research into their selected product.

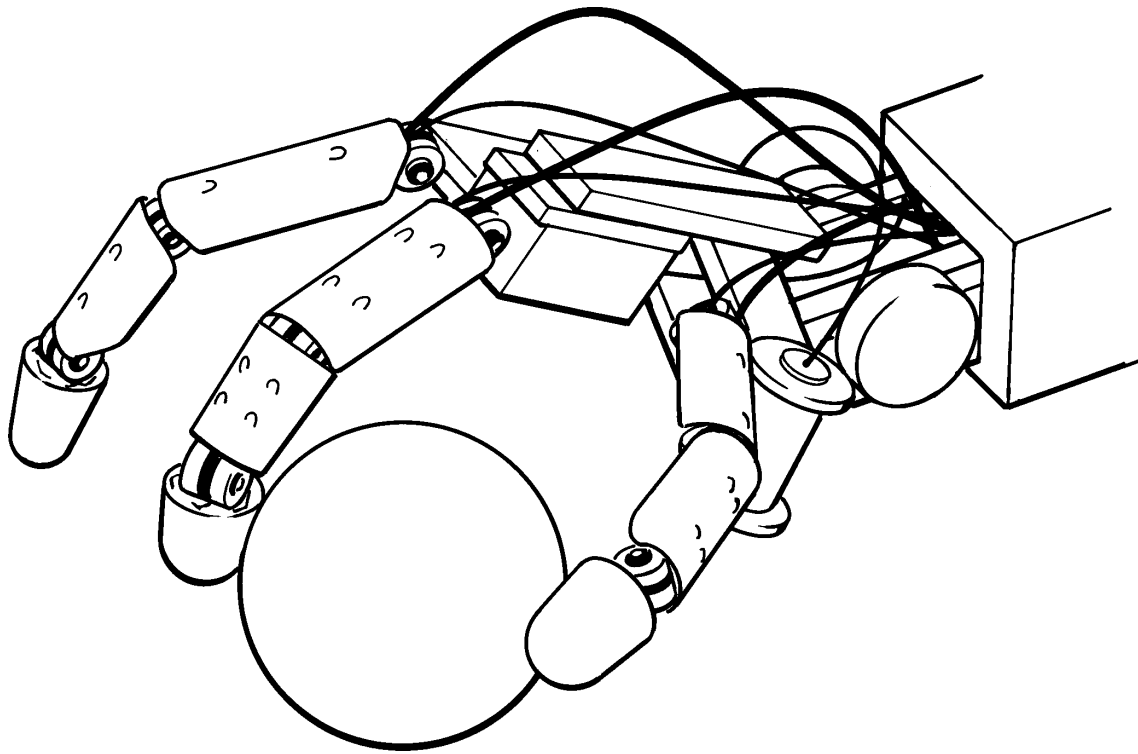
Revision tips

These pages could be looked at with the class group to reinforce good exam technique.

Teachers section

- Guidance for Moderation
- Answers

Edexcel centres may photocopy the materials in this pack.



Revision Pack

Edexcel GCSE Engineering (Double Award)
Edexcel GCSE Manufacturing (Double Award)

How to use this pack

You can use this pack to help you revise for Section A and Section B of the exam. Although the pack does not cover every topic in the unit it will help you organise your revision. Read and check out the Revision Checklist before you start, then dip into the Activities. Try and undertake your revision with a revision buddy so you help each other revise the different topics.

Check out how the exam is organised!

The exam is divided into two parts:

Section A has general questions based on the Unit 3 content. You should be able to:

- describe the stages of production involved in making mass produced products
- name the components and/or fastenings, and/or symbols, and/or the equipment and ingredients/packaging used in your product and explain their use
- understand the use of modern and smart materials used in products from your sector
- understand how and why process control and quality control are used in mass production
- understand how and why ICT is used in mass production.

Remember to check out the Revision Checklist in this pack!

Section B has questions that relate to the selected product. You should be able to understand how and why the following are used in the design and manufacture of your product:

- ICT
- modern and smart materials or modern materials and ingredients
- control technology.

Remember to check out the Product Analysis activity in this pack. It will help you to summarise all your research about your selected product.

How to prepare for the exam

Although you may take your research notes and sketches about your selected product into the exam, you will need to consider what will be **really useful**. If your notes are disorganised they will not help you in the exam!

You will therefore need to **analyse your research** before the exam – **use the Product Analysis activity** in this pack.

Exam skills

Exam skills are very important if you are going to show the examiner what you know.

The key points are:

- read each question carefully and pick out the key points that need answering
- match your answer to the marks available. For example, for two marks, you should answer with two good points that respond to the question
- always explain your answer giving an example or reason how, or why, it is true.



Name:

Revision Checklist

Topic	I know this	I need to revise this	Who can be my revision buddy?
The product investigated: <ul style="list-style-type: none">list the main stages and activities in making the productexplain the purpose of the productexplain the structure and form of the processlist the materials, ingredients and components used in the productlist any modern technology used in the manufacture of the productdescribe the technologies or processes these modern technologies have replacedexplain the benefits and implications of using these new technologies.			
Databases, spreadsheets and internet sites: <ul style="list-style-type: none">explain how these are used in design and manufacturingexplain how these affected the design and development of productsexplain how these have affected possible markets for products.			
Computer-aided manufacture – CAD: <ul style="list-style-type: none">explain how CAD is used in the design and development of productsexplain how CAD has affected the design and development process.			
Computer-aided manufacture – CAM: <ul style="list-style-type: none">explain how CAM is used in the manufacture of productsexplain the effects CAM has had on manufacturing methodsexplain how CAM has affected the type and size of the workforceexplain how the use of CAM has improved the quality of products.			



Name:

Revision Checklist

<p>Communications Technology:</p> <ul style="list-style-type: none">• name different forms of communication technology• explain how these forms of communication technology are used in the design and manufacture of products.			
<p>Control Technology:</p> <ul style="list-style-type: none">• name different control technologies used in the manufacture of products• explain how these control technologies affect the safety and efficiency of production methods• explain how the use of control technology has affected the qualities of the product• explain how the use of control technology has affected the type and size of the workforce• explain how control technology has affected the working environment.			
<p>Modern and smart materials and ingredients:</p> <ul style="list-style-type: none">• list any modern and smart materials used in products• explain how these materials have affected products• explain how these materials have affected the environment.			
<p>Modern components:</p> <ul style="list-style-type: none">• list any modern components used in the product• explain how these components have affected products.			
<p>Systems and Control technology:</p> <ul style="list-style-type: none">• list any systems and control technology used in the manufacture of products• explain how these technologies have affected the manufacturing methods or processes• explain any changes to the working environment due to the application of these technologies.			

Unit 3: Application of Technology



Main topics that you need to know about

Specification Content	Write briefly about each topic
Use of ICT in the design and manufacture of products	
Use of modern and smart materials in the design and manufacture of products	
Use of systems and control technology in the design and manufacture of products	
Impact of modern technologies on: <ul style="list-style-type: none">• products• methods of production• society	
Stages in engineering and manufacturing products	
Impact of modern technologies on stages of manufacture	
Investigating products: <ul style="list-style-type: none">• product analysis• identifying industrial and commercial processes• identifying product specifications	

Command words used in your exam



1. Give/State/Name

- normally a one or two word answer, at the very most a short sentence
- allocation of marks is normally **one** or at most **two** depending upon the complexity of the knowledge required

Example 1:

State **one** modern material used in the production of your product. (1)

Example 2:

Name the specific material most commonly used in the disc drive motor body of a CD player. (1)

2. Describe

- a higher level of response than **Give/State/Name**
- statement or account of something
- normally consists of one or two sentences making reference to a number of points
- allocation of marks is normally at least **two**

Example:

Describe **one** use of Information and Communication Technology (ICT) in the design stage of the CD player. (2)

3. Explain

- a higher level of response than **Describe**
- a clear or detailed account of something which normally includes justification, reasons or examples
- allocation of marks is normally at least **two** but if more points are required to be justified then mark allocation is increased accordingly

Example:

Explain how modern materials have helped CD players to become a more marketable product. (3)

4. Use notes and sketches/annotated sketches

- you should answer questions by using both notes and sketches. This will involve sketches with notes to support or clarify particular points in the answer
- allocation of marks is one mark for each point answered by either a sketch or supporting note
- sketch means a quick drawing
- it is more important that the drawing shows the information instead of beautiful presentation
- marks are awarded for the communication of the idea rather than the drawing skills shown
- the mark scheme will explain how marks may be awarded if you produce only notes or only sketches

Example:

Use notes and sketches to describe how control technology is used in the production of your product.

Your answer must include reference to:

- inputs
- processes
- outputs
- feedback.

(4)

5. Evaluate

- a higher level of response than **Explain**
- you should judge the quality or suitability or value of something. This can include both positive and negative points in the answer
- similar to **Explain** in that it normally requires a justification/reason or example
- allocation of marks is normally at least **two** (one mark for each point with justification/reason or example). If more points are required to be evaluated then mark allocation is increased accordingly

Example:

Systems and Control technologies are used in modern engineering manufacturing processes.

Evaluate, giving several reasons, the effect these technologies have had on the supply of, and demand for, CD players.

(5)

Model answers – Engineering Fabrication



5. In engineering manufacturing the use of modern control technology has replaced traditional methods.

(a) Give **two** examples of this by stating a traditional method used and the modern control technology now used.

Example 1

Traditional method **Oxyacetylene cutting of ferrous metal plate**

Control technology **Computer controlled laser cutting**
(2)

Example 2

Traditional method **Manual machining process eg lathe**

Control technology **Use of CNC lathe**
(2)

(b) Describe advantages for each control technology, when replacing the traditional methods.

Example 1

Advantage - **Laser cutting from computer data means that it is accurate and gives a high quality finish that does not require additional finishing.**

(2)

Example 2

Advantage - **Repeatability - all components will be manufactured to the same tolerance, quicker and therefore cheaper.**

(2)

(Total 8 Marks)

Model answers – Mechanical/Automotive



5. In engineering manufacturing the use of modern control technology has replaced traditional methods.

(a) Give **two** examples of this by stating a traditional method used and the modern control technology now used.

Example 1

Traditional method - ***Somebody designing and drawing an axle and somebody else making it on a lathe.***

Control technology - ***CAD/CAM - somebody designs the part on CAD and it is turned into a code to operate a computer controlled machine.***

(2)

Example 2

Traditional method ***Manually operated machinery***

Control technology ***PLC automatic control***

(2)

(b) Describe advantages for each control technology used, when replacing the traditional methods.

Example 1

Advantage - ***Quicker production times with reduced mistakes which means less waste.***

(2)

Example 2

Advantage - ***Reduces manpower needed which eventually lowers production costs and is more efficient as it eliminates 'human error'.***

(2)

(Total 8 Marks)



Electrical and electronic/computer/process control/telecommunications

5. In engineering manufacturing the use of modern control technology has replaced traditional methods.

(a) Give **two** examples of this by stating a traditional method used and the modern control technology now used.

Example 1

Traditional method **Quality control, manually sampling the components tolerance**

Control technology **Use of a CNC lathe**

(2)

Example 2

Traditional method **Manual machining process eg lathe**

Control technology **Use of a CNC lathe**

(2)

(b) Describe advantages for each control technology used, when replacing the traditional methods.

Example 1

Advantage - **Sampling could both miss a faulty component and is open to human error. Automated ensures 100% reliable testing.**

(2)

Example 2

Advantage - **Repeatability, all components will be manufactured to the same tolerance, quicker and therefore cheaper.**

(2)

(Total 8 Marks)



Model answers

Food and drink/biological and chemical

5. In food and drink manufacturing the use of modern control technology has replaced traditional methods.

(a) Give **two** examples of this by stating a traditional method used and the modern control technology now used.

Example 1

Traditional method *Measuring ingredients by hand*

Control technology *Measuring ingredients using automatic weighing scales*

(2)

Example 2

Traditional method *Visual examination of ingredients or use a magnet to check for metal contamination.*

Control technology *Using sensors to check food products for metal contamination*

(2)

(b) Describe advantages for each control technology, when replacing the traditional methods.

Example 1

Advantage - *Cleaner and more accurate to measure ingredients automatically on a large scale. It's also quicker to use automatic scales.*

(2)

Example 2

Advantage - *Using sensors to check for metal contamination is more reliable than using a magnet and therefore safer for the consumer.*

(2)

(Total 8 Marks)



Printing and publishing/paper and board

5. In engineering manufacturing the use of modern control technology has replaced traditional methods.

(a) Give **two** examples of this by stating a traditional method used and the modern control technology now used.

Example 1

Traditional method **Manual typesetting process of preparing printing plate letter by letter**

Control technology **Laser etching of printing plates**

(2)

Example 2

Traditional method **Manual printing presses.**

Control technology **Use of fully automated offset lithographic printing presses.**

(2)

(b) Describe advantages for each control technology, when replacing the traditional methods.

Example 1

Advantage - **Speed and quality – electronic data transfer of DTP files to computer controlled lasers means that printing plates can be accurately made to very small lead times.**

(2)

Example 2

Advantage - **More efficient and accurate printing using computer controlled quality checks such as ink density monitoring for detecting colour variation in a print run.**

(2)

(Total 8 Marks)

Model answers – Textiles and clothing



1. In textiles and clothing manufacturing the use of modern control technology has replaced traditional methods.

(a) Give **two** examples of this by stating a traditional method used and the modern control technology now used.

Example 1

Traditional method *Producing a flat pattern and lay plan by hand*

Control technology *Producing a flat pattern from a database and producing a lay plan using CAD*

(2)

Example 2

Traditional method *Cutting the fabric by hand*

Control technology *Sending fabric cutting instructions to an automatic cutting machine*

(2)

(b) Describe advantages for each control technology, when replacing the traditional methods.

Example 1

Advantage - *Can easily and quickly use and adapt a flat pattern from a company database. It is more accurate to use CAD to cost the fabric used in a range of garment sizes.*

(2)

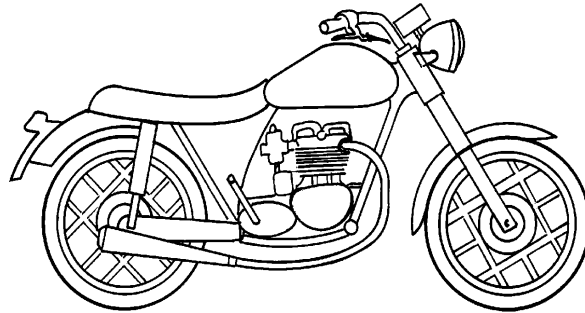
Example 2

Advantage - *Cutting the fabric automatically is faster, more accurate and safer than cutting by hand.*

(2)

(Total 8 Marks)

Model answers – Engineering Fabrication



10. The use of modern materials, components and technology has enabled the development of motorcycles.

Explain how they have helped motorcycles to become a more marketable product.

Example

(i) Modern materials - **Modern materials, such as carbon fibre for fairings and aluminium alloys for the frame are used in the manufacture of motorbikes. Carbon fibre is very strong, lightweight and durable. Aluminium alloys have a high strength to weight ratio and they can be easily fabricated so they can be incorporated into the aesthetics of the motorbike.**

(3)

Example

(ii) Components - **Now that components can be made smaller, more of them can be fitted onto a motorbike therefore increasing the reliability and versatility of the machine. This is due to more efficient manufacturing methods, use of materials and new technologies.**

(3)

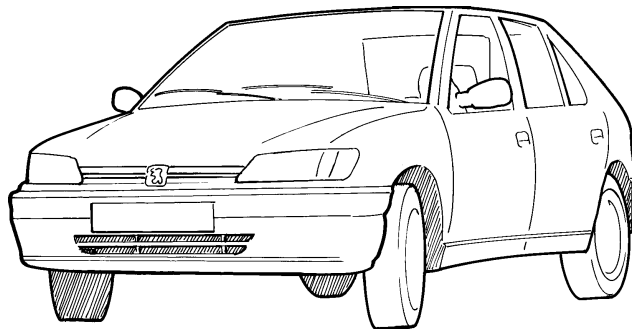
Example

(iii) Technology - **Modern manufacturing systems are more efficient and produce less waste therefore they produce cheaper motorbikes. Better quality control and use of modern electronic control technology enables motorbikes to be safer and more reliable.**

(3)

(Total 9 Marks)

Model answers – Mechanical/ automotive



10. The use of modern materials, components and technology has enabled the development of cars.

Explain how the following have helped cars become a more marketable product.

Example

(i) Modern materials - ***Increased corrosion resistance due to advanced formula paints and finishes. Interior components such as dashboards can be made from plastics which are cheaper to produce using injection moulding instead of bending and welding metal. They are also safer because they can be made softer on the outside.***

(3)

Example

(ii) Components - ***Electronic ignition does not need points so they do not need adjusting. LED's are smaller and cheaper than bulbs. Both are more reliable.***

(3)

Example

(iii) Technology - ***Newer cars are safer. Greater choice of models and different options are available. Less waste produced so manufacturers can keep costs down.***

(3)

(Total 9 Marks)



Electrical and electronic/computer/process control/telecommunications



10. The use of modern materials, components and technology has enabled the development of CD players.

Explain how the following have helped CD players to become a more marketable product.

Example

(i) Modern materials - ***CD players are extensively manufactured from plastics. Plastics have the advantage of being able to be moulded into complex shapes and different surface finishes to give an aesthetically pleasing product. Plastics are relatively robust, increasing durability and decreasing the amount of material used.***

(3)

Example

(ii) Components - ***Components have become smaller and more reliable. For example, CDs can be portable products because the motor, mechanical and electronic components are small enough to fit inside a product not much bigger than the CD itself. These products also have to be virtually maintenance free for the lifetime of the product.***

(3)

Example

(iii) Technology - ***Modern technologies enable CD players to be produced that are compact and reliable. The process of production minimises waste, making the product cheaper and the use of LCD and laser technology increases product performance for the customer.***

(3)

(Total 9 Marks)



Model answers

Food and drink/biological and chemical



10. The use of modern ingredients, components and technology has enabled the development of ready-made fruit pies.

Explain how the following have helped fruit pies to become a more marketable product.

Example

(i) Modern ingredients - ***The use of modern ingredients such as gelling agents and antioxidants make fruit pies taste and look better. Preservatives give the product a longer shelf life and make fruit pies safer to eat. The use of hydrogenated vegetable oil instead of animal fats makes the fruit pies healthier.***

(3)

Example

(ii) Components - ***In fruit pies the pastry case stops the fruit leaking and is made in a consistent shape so the consumer knows how many portions they will get. The use of a custard filling improves the nutritional value of the product. The lattice topping gives the pies a more attractive finish.***

(3)

Example

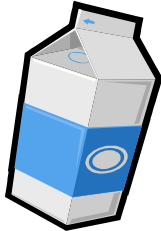
(iii) Technology - ***The use of modern technology such as CAD/CAM and automation means that fruit pies are now much more easily available in a wide range of shops making it easier for working people. The use of continuous production methods make the fruit pies cheaper. Tunnel ovens enable the fruit pies to be made more consistently so that consumers will always get attractive looking well cooked products.***

(3)

(Total 9 Marks)



Printing and publishing/paper and board



- 10.** The use of modern materials, components and technology has enabled the development of Tetra Pak juice cartons.

Explain how the following have helped the Tetra Pak juice carton to become a more marketable Product.

Example

- (i) Modern materials - ***The development of a packaging laminate consisting of paper, aluminium foil and polythene means that the materials have enhanced properties for use with liquids. The foil provides a moisture barrier, the polythene can be heat sealed and the paper can give an excellent print finish.***

(3)

Example

- (ii) Components - ***With the laminated packaging the move is away from the traditional glass packaging which could break quite easily. The whole package has strength and rigidity needed for its function of containing the juice. The Tetra Pak screw top lid closure is now more efficient for pouring whereas older versions, where you had to cut the packaging, tended to spill when pouring out the juice.***

(3)

Example

- (iii) Technology - ***Using new technologies, the customer now receives packaging fit for its purpose of containing, preserving, protecting and dispensing the juice effectively. The process of laminating is more cost effective as minimal waste is produced during processing. This has given rise to a greater range of liquid products being available in the shops.***

(3)

(Total 9 Marks)

Model answers – Textiles and clothing



10. The use of modern materials, components and technology has enabled the development of Trainers.

Explain how the following have helped trainers to become a more marketable product.

Example

(i) Modern materials - ***Trainers are now much more fashionable and attractive because modern materials can be made in more unusual shapes and in a wider range of colours. Modern materials used in trainers are also breathable and more comfortable to wear which is what consumers want. Modern materials like polyurethane are strong and lightweight which makes them suitable for trainers which could be used for lots of different types of activities.***

(3)

Example

(ii) Components - ***Polyurethane foam is used to provide cushioning which makes the trainers more comfortable to wear. The insole and moulded sole absorb the impact caused when someone runs, provide support for the feet and make the trainers more comfortable. Some trainers have Velcro fastenings which are an easy and quick way of fastening, especially for children.***

(3)

Example

(iii) Technology - ***The use of modern technology such as CAD/CAM means that there are a lot of different styles of trainers to choose from. Trainers are now much more modern looking and provide more functional types of shoes designed for specific activities such as running or basket ball. Manufacturers can use control technology and automation to make every day trainers at a more reasonable cost, although many branded trainers like Nike can be very expensive.***

(3)

(Total 9 Marks)



Use of Information and Communications Technology (ICT)

Use the following scenarios to explain how the use of ICT is involved in the design and manufacture of products.

Scenario 1

A UK based design company has its manufacturing facility based overseas in the Far East.

Explain how the use of communications technology can aid the flow of information between designer and manufacturer.

Keywords

- E-mail
- Computer Aided Design (CAD)

Scenario 2

A large manufacturing facility depends upon a large number of bought-in materials and components for the manufacture of its products. It needs to be able to effectively manage the supply and control of these materials and components.

Explain how the use of sourcing and handling information can benefit the manufacturer in this process.

Keywords

- Databases
- Spreadsheets

Scenario 3

A manufacturing company is considering a new manufacturing facility for the introduction of a new product range. In the past they have used traditional and labour intensive techniques that up until now have produced good quality and reliable products.

Explain how the use of modern technologies can benefit the manufacture of the new product range.

Keywords

- Computer Aided Manufacture (CAM)
- Control technology

Modern and smart materials



Modern and smart materials have been developed through the invention of new or improved technologies to produce materials with enhanced properties. Smart materials respond to differences in temperature or light and change in some way as a result.

In the table below name two specific materials or components that you have studied for each area. Outline their main properties and where they are used.

Area	Specific material/ component	Properties	Uses
Polymers			
Metal alloys			
Composites			
Modified ingredients			
Microprocessors			
Integrated circuits			
Thermochromic inks			

Systems and control



Use the words below to complete the following sentences:

- 1 _____ is an interlinked network of computers controlling machinery and the flow of information during the manufacturing process.
- 2 A modern manufacturing facility may use _____ to perform a number of high precision functions.
- 3 A tunnel oven used in the production of food products will use a _____ to regulate the temperature and humidity inside the oven.
- 4 Many modern cars use _____ to manage the engine system.
- 5 Using computers to create, develop and communicate design information is known as _____.
- 6 Numerical data can be sent from a computer to a _____ system for manufacture.

embedded computers

robotics

Computer Aided Design (CAD)

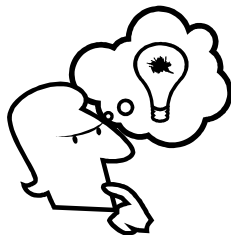
Computer Aided Manufacture (CAM)

Computer Integrated Manufacture

Programmable Logic Controllers (PLC's)

Missing keywords:

You must know how these are used to organize, monitor and control production.





Impact of modern technologies

Use the following headings to list the keywords/phrases that relate to a product of your choice

Range, types and availability of product

Design and development of product

Safety and efficiency of modern production methods used in the product

Sketch your product here

Materials, components and ingredients used in the product

Improved characteristics of the product

Markets for product



Impact of modern technologies

We have used a CD player as our example to show you how it's done

Range, types and availability of product

- Larger product range
- Mass production = lower unit costs
- Use of standard components

Design and development of product

- Shorter time to market
- Rapid prototyping
- Modifications to on-screen 3D solid modelling

Safety and efficiency of modern production methods used in the product

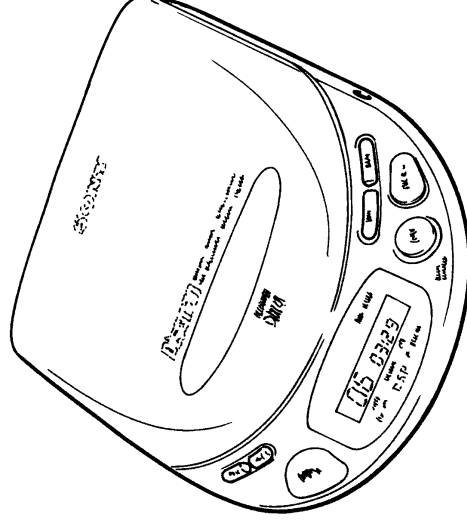
- Cleaner working environment
- Production of products of repeatable high quality
- Less wastage

Improved characteristics of the product

- Miniaturisation
- More functions
- Longer battery life

Materials, components and ingredients used in the product

- Polymers can be easily thermoformed
- Use of laser and digital technology
- LCD display for ease of communication



Markets for product

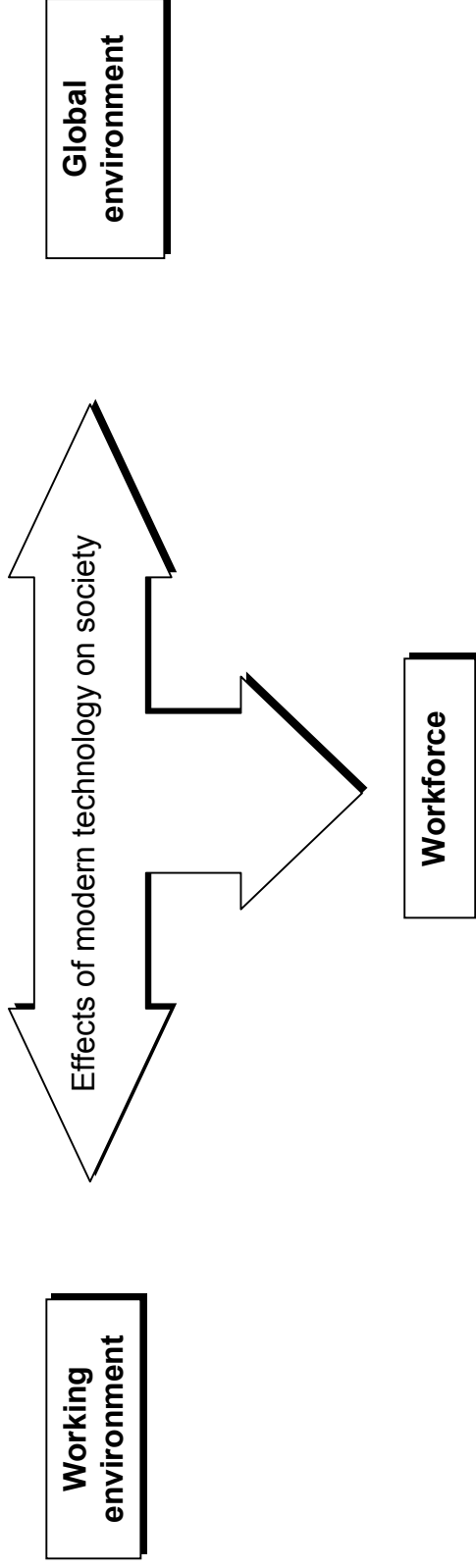
- Global marketplace
- Specific user group(s) targeted
- Effective market analysis



Effects of modern technology on society

Activity 1: Use the keywords to complete the mind map. Add your own keywords where possible.

Keywords:	CAD/CAM	Production cells	Waste management
Health and safety	Flexibility	Obsolescence	Training
Sustainability	Skills	Management	Multi-skilling
		Re-use	Pollution
		Recycleability	Just-in-time
		Manufacturing processes	Unemployment





Effects of modern technology on society

Activity 2: Cut out the following keywords and shuffle them up.

With your revision buddy, select a keyword and explain **one** advantage and **one** disadvantage for each word chosen. If in doubt – check with your teacher.

Health and safety

Flexibility

Sustainability

Obsolescence

Training

Re-use

Recycleability

**Manufacturing
processes**

Skills

Management

Waste management

Multi-skilling

Pollution

Just-in-time

Unemployment

Production cells

CAD/CAM

Make sure that your responses to these key words relate to their impact on society.

Stages of Manufacture



Activity 1: Cut out the 7 stages in engineering and manufacturing a product, then place them in the correct order.

Activity 2: Match the correct manufacturing stage with the correct description.

Activity 3: Explain **one** way in which modern technology has had an impact on each of the stages of manufacture.

Stage	Description of stage
Marketing	The building of a final product or component that meets the product specification.
Material supply and control	The details required in order to make the product.
Design	Targeting and promotion of the product towards user group(s).
Production planning	The protection, presentation and transportation of the finished product for sale.
Packaging and dispatch	The making of parts and components to the specified standards.
Assembly and finishing	The total management of resources throughout the production process.
Processing-production	Developing a design proposal based upon a client's design brief.

Investigating products – Product analysis



Use the following headings to analyse any product. It would be especially useful to analyse the product in the pre-release in this way as you can take your notes into the exam!

1. Sketch and label your product.

2. Describe your product using the following headings:

Purpose

Structure and form

Materials and components used



Investigating products - Product analysis

3. List and describe the industrial and commercial stages and activities used in making your product

Stage	Description of stage

Investigating products - Product analysis



4. Describe the properties and function of the materials and components used in your product.

Materials, properties and function

Components, properties and function

5. Describe the benefits that the use of these materials and components bring to:

The product

The manufacturer

The user

Investigating products - Product analysis



6. Explain how ICT is used in the design and manufacture of the product.

Design

Manufacture

7. Explain how control technology is used in the stages of manufacturing your product.

Use of control technology

Engineering fabrication quiz



Question	Your answer	Are you right or wrong?
1. Name the type of metals that are attracted by magnets.		
2. What is the name given to a mixture of two or more metals?		
3. Why is copper piping used in domestic plumbing?		
4. Name the two main groups of plastics.		
5. Name one thermo-forming process used for mass-production.		
6. Name one composite material that could be used in a mountain bike frame.		
7. Name one mechanical method of joining sheet metals together.		
8. Name one method of joining aluminium using heat.		

Mechanical/Automotive quiz

8

Question	Your answer	Are you right or wrong?
1. Name the component that reduces friction between a rotating shaft and its housing.		
2. Name a process that may be used to shape the body of a modern fire extinguisher.		
3. Name two different methods of permanently joining sheets of ferrous metal.		
4. Explain two possible reasons for the application of surface finishing to ferrous metals.		
5. Name an input device commonly found on an engine management system.		
6. What do the letters GRP mean in relation to materials used for manufacturing?		
7. Give two reasons for using aluminium alloys for the manufacture of components of engineering.		
8. Name one suitable process for forming the shape of sheet metal components such as car body parts.		

Electrical Engineering quiz

8

Question	Your answer	Are you right or wrong?
1. Name three output devices used in electronic products.		
2. Name the process component that latches a circuit on.		
3. Name the component used for the temporary storage of an electrical charge.		
4. Name the component used to control the amount of current flowing through a circuit.		
5. Name three different ways of storing information using computers.		
6. Modern telecommunications use signals that only have two states: on and off. Name this system.		
7. Name one component that can be used to send data over a telephone line.		
8. Name one component that can be used to separate two circuits.		

Food and drink/biological and chemical quiz



Question	Your answer	Are you right or wrong?
1. What can be used to provide the sweetness, but not the energy value of sugar?		
2. Name three different sensory characteristics of food.		
3. Name three different ways of storing information using computers.		
4. Name two examples of fibre (NSP).		
5. Name the system used to monitor food production.		
6. Name one heat treatment used to remove all micro-organisms.		
7. Name the fat found in nuts, grains, seeds and oily fish.		
8. Name a point in the production process where action must be taken to monitor, reduce or eliminate a hazard.		

Printing and publishing/paper and board quiz

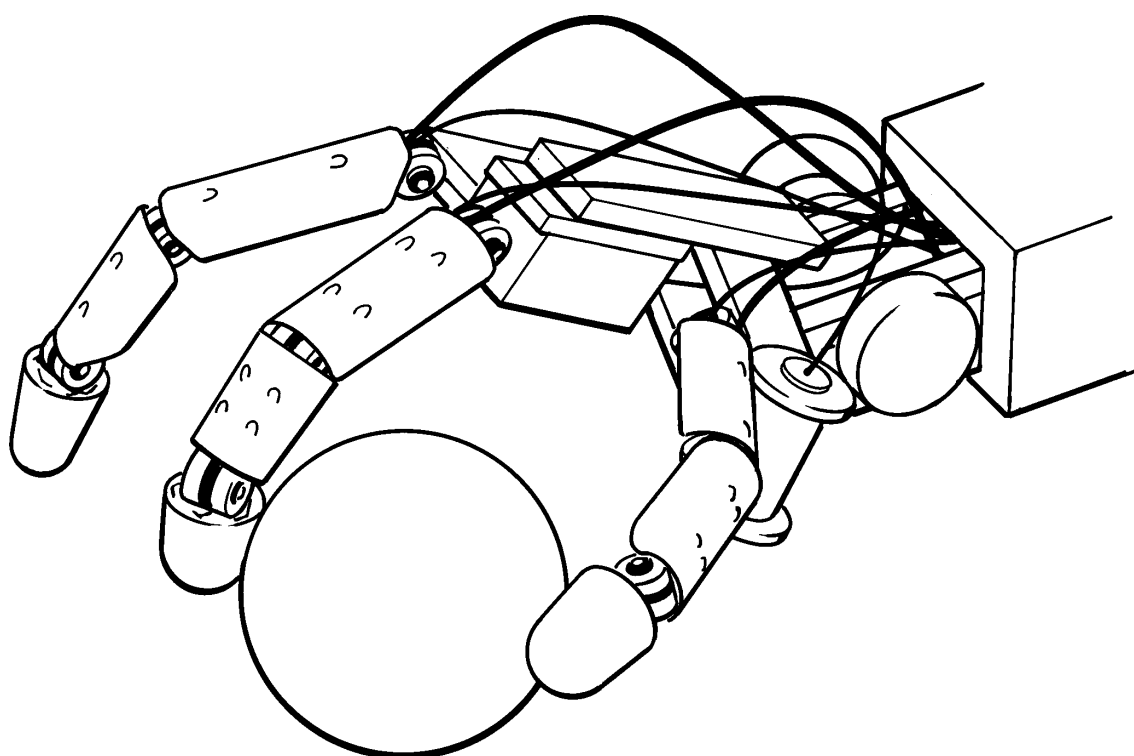


Question	Your answer	Are you right or wrong?
1. Name two widely used commercial printing processes.		
2. Name the machine process for punching out a specified area of paper or board.		
3. Name the process that transfers a foil coating to the paper using a heated die.		
4. Name one specific type of board used for packaging.		
5. Name the four colours in four-colour process printing.		
6. Name the printers mark that ensures that all printing plates line up.		
7. Name the tool used to measure the density of ink in a print run.		
8. Name the method of efficiently marking out multiple nets on a piece of board.		

Textiles and clothing quiz

8

Question	Your answer	Are you right or wrong?
1. Name one synthetic fibre used in all-weather wear.		
2. Name three different processes used to manufacture fabric.		
3. Name three different ways of storing information using computers.		
4. Name one type of fibre used in fire fighters uniforms.		
5. Name the system used to monitor garment production.		
6. Name one fastener suitable for use in children's trainers.		
7. Name two changes that the use of modern technology has brought to society.		
8. Name the method of efficiently marking out patterns on textiles.		



Revision tips

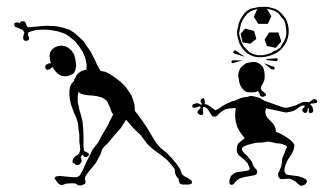
Exams coming up?

Get ready!

- 1 Find a revision buddy to work with
- 2 If you have missed any work for the examined unit:
 - copy up the notes
 - do any homework/class work that was set
- 3 Draw up a revision timetable:
 - put in all of your exam dates
 - block out time not available for revision
 - count down days/weeks
 - plan in your revision topics
 - set achievable targets for each revision session – work with about 20 minute slots

Get Set!

- 1 What do you know? - Use a checklist of all the topics in the unit and tick off the ones you feel confident with.
- 2 The ones you haven't ticked are then the ones that you don't know – plug the gaps by revising these topics.
- 3 Self help techniques:
 - work with your revision buddy
 - keep to your revision schedule
 - give yourself rewards when you keep to it – a reward might be to watch TV, meet your friends, have something nice to eat for example.



- 4 Devise a strategy for exam day, know where you have to go and get there on time.
- 5 If you have special requirements your schools can make special arrangements with the exam board.
- 6 If you are ill before an exam or have a family crisis – tell your teacher before the exam as this could affect your exam performance.
- 7 Have a good night's sleep the night before.
- 8 And don't forget to have breakfast on the day.

Go!

Getting there and getting settled:

- 1 Remember that you have done a lot of good revision!
- 2 Take a bottle of water with you.
- 3 Turn up at the exam room in plenty of time and make sure you have all the pens, erasers and so on you are allowed to take into the room.
- 4 Take your candidate number (you will need to write it on the paper).
- 5 Remember any preparatory work you are allowed to take into the exam.
- 6 Leave your bag and other 'non-allowed' items where instructed.
- 7 Find your seat.
- 8 Note the position of the clock.
- 9 Be calm – start and remain calm.
- 10 Keep to the rules of 'exam conditions' - eg no talking.

Starting the exam

- 1 When told to, read and fill in the front cover of the exam paper/answer book.
- 2 When told to, read the exam questions carefully. Plan your time per question – and stick to it.
- 3 Read the questions carefully – what is the question asking you to do, for example, explain, identify, give reasons.

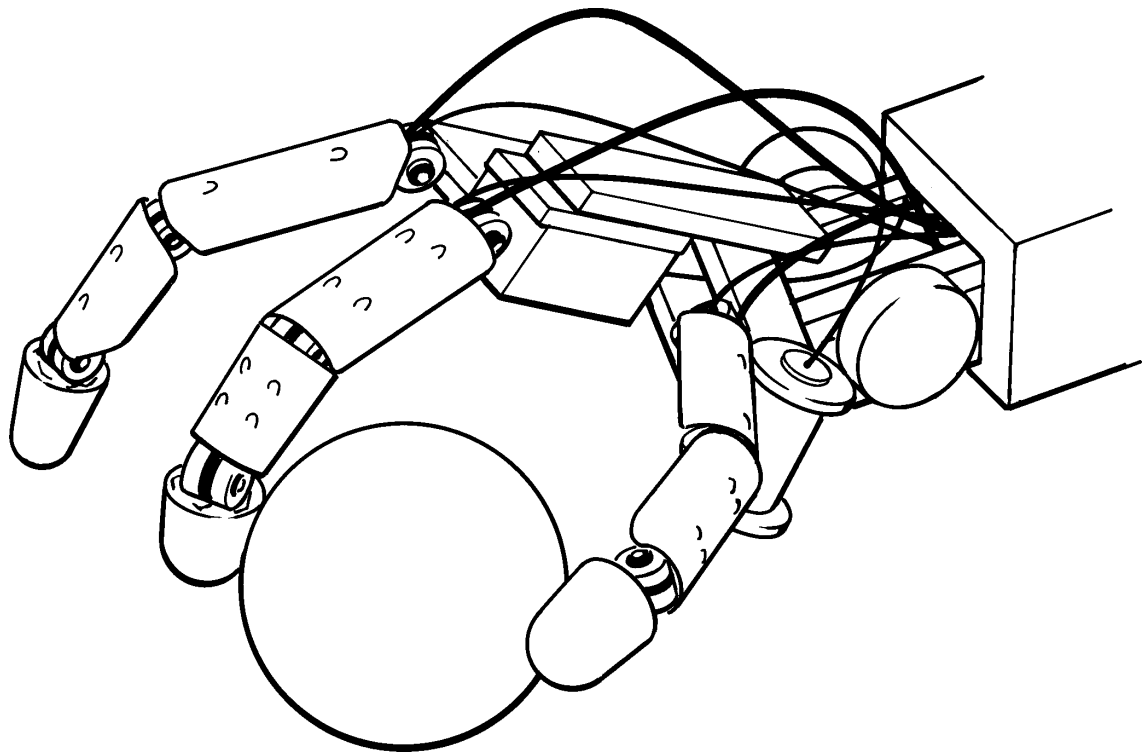


Don't panic

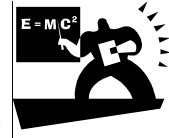
- 6 Use highlighters on the questions to pick out those things that you want to include in your answers.
- 7 Look at the marks allocated to the parts of each question (in brackets) - two reasons and two marks mean one mark per reason – no need to give three reasons!
- 8 Try each question and do as many parts of it as possible. If you get stuck move on to the next question.–
- 10 Structure your answers to match what the question is asking for - as you write your answer refer back to the question and make sure that you are keeping to it.
- 11 Keep an eye on the time throughout the exam.
- 9 **Dnt use txt in xams coz xmins nd 2 no what u r saing**
(don't use text in exams because examiners need to know what you are saying).
- 10 Watch your handwriting – the examiner cannot mark what they cannot read.

After the exam don't dwell on what you have done – have a break and relax, you may have another exam to get ready for!

Edexcel
Success through qualifications



Teachers Section



Teacher Notes for Moderation

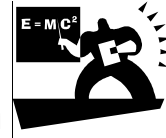
GCSE (Double Award) Engineering/ Manufacturing

- Students need to produce separate portfolios of evidence for each of units 1 and 2.

- A portfolio should contain the work for one assignment. It should not be a collection of all of the work undertaken throughout the unit. It should not contain course notes and non-relevant materials such as internet downloads, manufacturers catalogues etc.

- A portfolio should contain specific, explicit and auditable evidence to meet the criteria in the assessment grids. It must be recognised that progression across the mark bands is characterised by:
 - increasing breadth and depth of understanding
 - increasing coherence, evaluation and analysis
 - increasing independence and originality.

- The degree of independence demonstrated should be evidenced using a witness statement.



Unit 1: Design & Graphical communication

Each student portfolio should contain:

- a completed Mark Record Sheet
- a copy of the given client brief
- evidence to meet the requirements of the assessment grid for the development of a design solution to meet the given client brief
- graphical communication using manual and CAD techniques.

Unit 2 Engineered Products

Each student portfolio should contain:

- a completed Mark Record Sheet
- details of the given Product Specification and copies of the given drawings
- evidence to meet the requirements of the assessment grid for the manufacture of one engineered product.

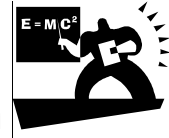
Photographic evidence

Edexcel does not accept artefacts. Annotated photographic evidence is valuable and the evidence produced should document the production activities and outcomes.

Witness statement

Witness testimony is compulsory to justify:

- student achievement in the practical activities
- the degree of independency demonstrated throughout the activities.



Unit 1: Designing a Product for Manufacture

The assessment of this unit focuses on the development of a design specification for a product from a given client design brief. The students must use this design specification to develop design and manufacturing proposals and draw up a final design and manufacturing solution.

Each student portfolio should contain:

- a completed Mark Record Sheet
- a copy of the given client brief
- evidence to meet the requirements of the assessment grid for the development of a design specification and design solution for a manufactured product to meet the given client brief.

Unit 2: Manufactured Products

Each student portfolio should contain:

- a completed Mark Record Sheet
- details of the given Product Specification, Production Plan and copies of any other information provided
- evidence to meet the requirements of the assessment grid for the manufacture a quantity of one manufactured product.

Photographic evidence

Edexcel does not accept artefacts. Annotated photographic evidence is valuable and the evidence produced should document the production activities and outcomes.

Witness statement

Witness testimony is compulsory to justify:

- student achievement in the practical activities
- the degree of independency demonstrated throughout the activities.

Sector	Answer
Engineering Fabrication	1 Ferrous metals 2 An alloy 3 Easy to join (solder)/corrosion resistant/ inert/ easy to bend 4 Thermoplastics and thermosetting plastics 5 Injection/ compression/ blow moulding/vacuum forming 6 Carbon fibre 7 Rivets/ nut and bolt/ crimping 8 TIG welding/ oxy-acetylene welding
Mechanical/automotive	1 Bearing 2 Extrusion, metal spinning, rolling 3 Welding, brazing, hot riveting 4 Prevent rusting/ corrosion, aesthetics, colour coding 5 Temperature sensor, rotational sensor, gas sensor, pressure sensor 6 Glass Reinforced Plastic 7 High weight to strength ratio, good heat transfer, easy to machine, high resistance to corrosion, self finishing 8 Pressing
Electrical Engineering	1 Motor, light bulb, buzzer, LED 2 Thyristor 3 Capacitor 4 Resistor 5 Floppy disk, CD, USB portable drive 6 Digital 7 Modem 8 Relay
Food and drink/biological and chemical	1 Artificial sweetener eg aspartame 2 Appearance, colour, texture, taste, aroma 3 Floppy disk, CD, USB portable drive 4 Bran, pectin 5 HACCP 6 Sterilisation 7 Polyunsaturated 8 A critical control point (CCP)
Printing and publishing/ paper and board	1 Offset lithography, gravure, letterpress, silk screen printing, flexography 2 Die cutting 3 Hot-foil blocking 4 Carton-board, folding boxboard, corrugated board 5 Cyan, magenta, yellow, black (CMYK) 6 Registration marks 7 Densitometer 8 Lay planning
Textiles and clothing	1 Polyester or nylon 2 Weaving, knitting or non-woven 3 Floppy disk, CD, USB portable drive 4 Nomex 5 Quality control 6 Velcro 7 Changes to the workforce/working environment/global Manufacturing 8 Lay planning

Answers - Systems and control

Use the words below to complete the following sentences:

- 1 **COMPUTER INTEGRATED MANUFACTURE** is an interlinked network of computers controlling machinery and the flow of information during the manufacturing process.
- 2 A modern manufacturing facility may use **ROBOTICS** to perform a number of high precision functions.
- 3 A tunnel oven used in the production of food products will use a **PROGRAMMABLE LOGIC CONTROLLER (PLC)** to regulate the temperature and humidity inside the oven.
- 4 Many modern cars use **EMBEDDED COMPUTERS** to manage the engine system.
- 5 Using computers to create, develop and communicate design information is known as **COMPUTER AIDED DESIGN (CAD)**.
- 6 Numerical data can be sent from a computer to a **COMPUTER AIDED MANUFACTURE (CAM)** system for manufacture.

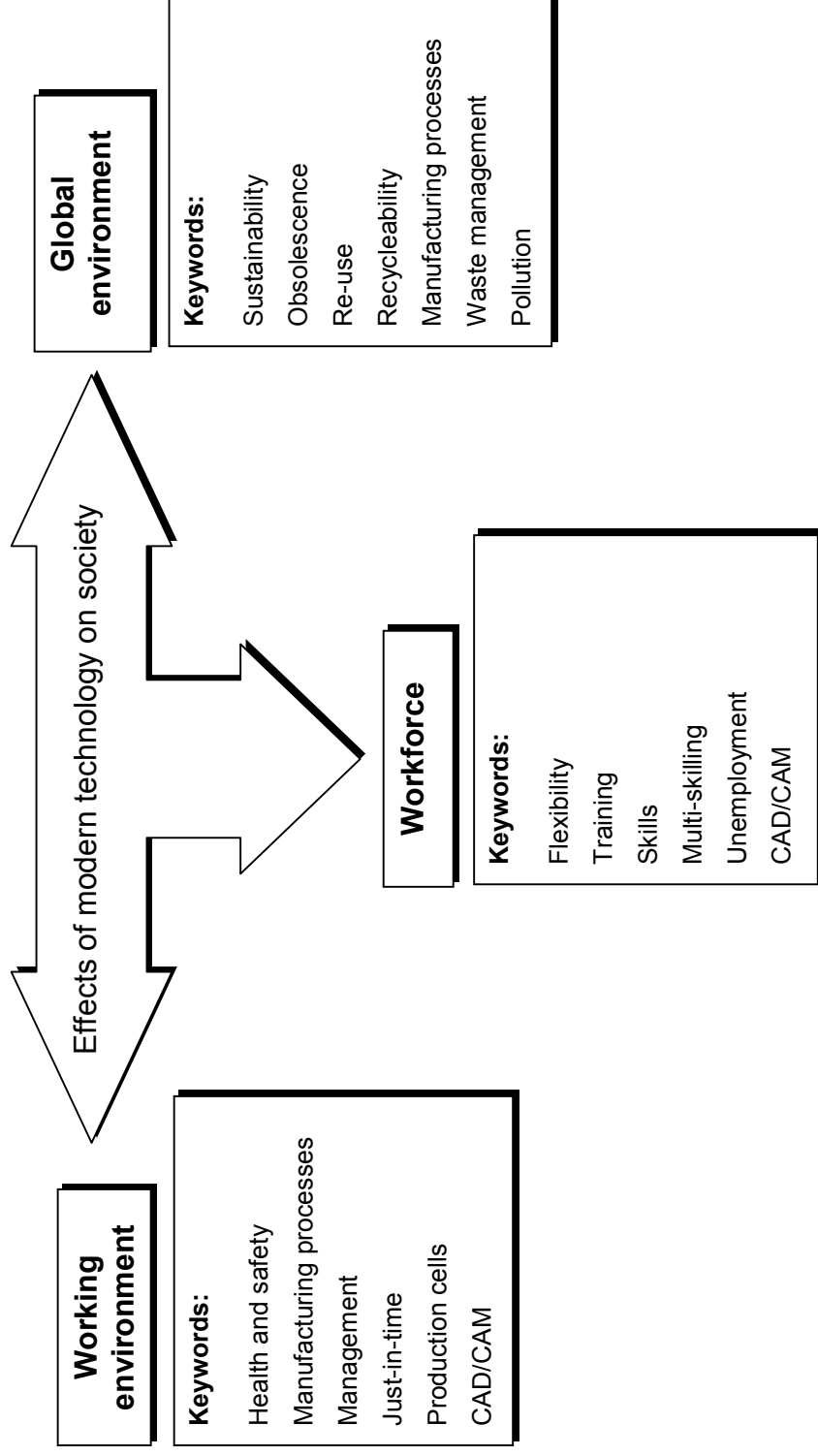
Answers - Stages of Manufacture

Stage	Description of stage
Design	Developing a design proposal based upon a client's design brief.
Marketing	Targeting and promotion of the product towards user group(s).
Production Planning	The details required in order to make the product.
Material supply and control	The total management of resources throughout the production process.
Processing-production	The making of parts and components to the specified standards.
Assembly and finishing	The building of a final product or component to meet the product specification.
Packaging and dispatch	The protection, presentation and transportation of the finished product for sale.



Effects of modern technology on society – Answers

Suggested answers to use as discussion points – some keywords can appear more than once



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