
UNIT A: APPLICATION OF TECHNOLOGY IN MANUFACTURING (6269)



About This Unit

This unit introduces you to the organisation of manufacturing. It shows you how modern technology is used to make the products we use every day.

Through this unit you will:

- learn about the sectors of manufacturing;
- understand the materials and stages involved in making a product;
- learn about the use of modern technology, such as control technology, in making products;
- practise using a modern technology.

This unit links well with Foundation Unit B: *Working with a design brief* where you will be considering new design ideas, and with Foundation Unit C: *Manufacturing products* where you may use some of the new technology you have looked at here.

You will have the chance to develop your key skills while working towards this unit by using information technology and a variety of communication techniques.

This unit is assessed through your portfolio work and an external assessment.



What You Need To Learn

The Organisation of Manufacturing

The business of manufacturing covers the making of many different products, processes to make the products, and companies who make the products. But there are similarities among the activities and the materials used so we can group them into 'sectors'. Well-known sectors you will need to be aware of are:

- chemical;
- engineering;
- food;
- paper;
- printing;
- textiles.

When you look at a product, you must be able to identify which sector has made the product.

Making a product involves a number of important stages and activities. These can be generally grouped as:

- design;
- marketing;
- production planning;
- material supply and control;
- processing – production;
- assembly and finishing;
- packaging and dispatch.

When you look at a product, you must be able to identify the main stages and activities in making the product.

New Technologies

You will need to learn about the new technologies used in manufacturing. Examples of these technologies include:

- technology for obtaining information, such as databases and internet sites;
- new materials, such as plastics, alloys, adhesives and coatings;
- new food materials and methods of preparation;
- new computer technology, such as microprocessors and memory devices;
- CAD (computer-aided design) for drawing and modelling;
- CAM (computer-aided manufacturing);
- telecommunications technology, such as cellular phone links;
- control technology, such as automation and robotics.

When you look at a product and the company that makes it, you must be able to identify where new technology is used and how it helps in making the product.

Using Technology

You must be able to use some of the new technology that is used to manufacture products. The technology could be in the areas listed above.

When using the technology, you will need to be aware of what the technology is capable of doing when it is used for making products.

Assessment Evidence

You need to answer test questions to show how well you understand how new technology is used in manufacturing.

In addition, in your portfolio, you need to produce a case study about the making of a chosen product. In the study you must:

- identify the manufacturing sector
- identify the main materials used
- identify the new technology used in making the product
- show evidence of using **one** example of the modern technology used in manufacturing the product

To achieve a portfolio Pass you must show you can:

- P1 describe the key stages in making the product
- P2 identify the new technology used to make the product and describe how it helps in making the product
- P3 describe how to use one of the new technologies involved in making the product, such as a CAD system.

To achieve a portfolio Merit you must also show you can:

- M1 use appropriate technical terms to describe the stages involved in making the product and your own use of the new technology
- M2 seek and use additional relevant information about how the new technology is used in making the chosen product
- M3 describe the capabilities of the new technology when used to manufacture the product.

To achieve a portfolio Distinction you must also show you can:

- D1 plan how you will investigate your chosen product and find information on how the new technology works
- D2 consider the advantages and disadvantages of using the new technology in the manufacture of the product.



Teaching Strategies

This unit is concerned with the way technology affects products and companies. A good focus is interesting developments that have changed the ways items are produced. The positive aspects of technology should be stressed.

New technology has affected all stages of the manufacturing process from customer enquiries to final dispatch and eventual tracking of products. Many companies have websites on the Internet, these are a good starting point for obtaining information.

Students should be able to choose the technology they want to work with. The aims of the unit are to expose students to new technologies and then allow them to work with any acceptable form of technology used in manufacturing. This will offer the ability to contextualise the choice to pick up different manufacturing sectors and to integrate this unit with other units.

It is helpful if students have seen a modern production process. Students should appreciate that changing technologies affect many aspects of manufacturing including sales, production planning and operations.

When examining a product it is useful if it can be taken apart and examined. This helps introduce a practical activity into the unit and provides information about materials and components. Evidence could take the form of a sectioned display that is annotated by students.

Good simulations of automation and other new technologies can be achieved by using the equipment available from educational suppliers.

Assessment Strategies

All GNVQ students produce portfolio work as part of teaching and learning. The portfolio provides the evidence for internal assessment for most units. This unit is common to the six-unit and the Part One awards. Please note that the assessment requirements for these two qualifications are different.

Each unit in the Part One award combines portfolio evidence with a test to arrive at Pass, Merit and Distinction grades. All three compulsory units have this combination.

When grading student evidence you should consider the following general qualities that distinguish between the three grades:

- increasing depth and breadth of understanding;
- increasing coherence, comparison and drawing valid conclusions;
- increasing independence and originality.

For this unit you should also consider the following qualities that help distinguish between grades:

- increasing understanding of the manufacturing process;
- increasing skill and confidence in use of technology.

There is usually a variety of evidence equivalent to that stated in the assessment evidence that will show these qualities.

Pass

Students might present information using pre-prepared drawings and information sheets.

When students use the new technology they do not need to do more than achieve or carry out a basic task. They should receive close direction from a supervisor. If using information technology, a basic lead can be taken from the IT Key Skill at level 1.

Merit

Students might produce some original material such as their own diagrams and text. The Merit criteria build directly on the pass criteria. Students are expected to begin to show a slightly more independent approach to investigating the manufacturing process.

They are also expected to be more effective in their use of a technology. This could be done by using, or building on, the work done here in a larger project or work for other units.

Distinction

At Distinction, students could demonstrate understanding by using graphical or diagrammatic methods. For example, they could use vocationally relevant ways of depicting the role of timing, such as with a Gantt chart or bar chart.

Distinction students should have a secure grasp of a new technology (over and above the standard required of merit). They will make some links between their use of the technology and the manufacturing process.



Key Skills Guidance

This guidance is specific to this unit, but for planning and delivery purposes, it should be read in the context of the whole GNVQ. Please refer to the introduction to the whole qualification for further information.

The section on signposts indicates opportunities to achieve aspects of key skills that can be incorporated naturally into candidates' learning programmes. Candidates should be encouraged both to develop and to produce evidence for these aspects of the key skills, but they may need to develop additional evidence elsewhere to ensure that the requirements of the key skills units are fully met.

Signposts	
<i>When candidates are:</i>	<i>There may be opportunities for them to develop the following key skills evidence:</i>
<ul style="list-style-type: none">finding out how the new technology is used to make the product and helps in making the product by, for example, visiting an organisation and talking to professionals	C1.1 Take part in a one-to-one discussion and a group discussion about different, straightforward subjects
<ul style="list-style-type: none">finding out how the new technology is used to make the product and helps in making the product from, for example, textbooks, trade literature, CD-ROMs, the internet	C1.2 Read and obtain information from two different types of documents about straightforward subjects, including at least one image
<ul style="list-style-type: none">producing their case study and requesting information by fax or e-mail	C1.3 Write two different types of documents about straightforward subjects. Include at least one image in one of the documents
<ul style="list-style-type: none">finding out how the new technology is used to make the product and helps in making the product from, for example, textbooks, trade literature, CD-ROMs, the internet	IT1.1 Find, explore and develop information for two different purposes
<ul style="list-style-type: none">producing their case study	IT1.2 Present information for two different purposes. Include at least one example of text, one example of images and one example of numbers

<ul style="list-style-type: none">• using an example of modern technology. The type and amount of evidence they produce will depend on the technology used. For example:<ul style="list-style-type: none">- use CAD to produce circuit diagrams or patterns for weaving or knitting machines- use a database and a computer application to find and manipulate data.	IT1.1, IT1.2
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