UNIT B: WORKING WITH A DESIGN BRIEF (6270)

About This Unit

In manufacturing a customer will often ask a company to provide ideas for the design of products. The customer will bring their manufacturing need to the company in the form of a design brief. The company will work with this design brief to produce a design specification and then a design solution.

In this unit you will learn how to work from a customer's design brief for a product. You will develop a design specification, draw up a final design solution and present the solution to the customer.

You will learn about:

- product requirements and constraints;
- production details and constraints;
- developing design ideas;
- presenting design ideas.

This unit links well with the other foundation units, which look at new technology and putting what you know about design into practice in manufacturing products. This unit will also prepare you for Intermediate Unit B: *Working with a design brief*.

You will have the chance to develop your Key Skills in communication and information technology.

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

What You Need To Learn

Design Briefs

The design brief tells you what the customer wants. It will present you with a series of design problems. Before you start to produce design solutions, you must understand your customer's needs.

The customer's needs usually include:

- purpose – where and how the product will be used;
- performance – what the product has to do;
- markets – who might use the product and competition with other similar products;
- aesthetics – how appealing the product should look to the user;

- basic ideas about cost, timescales and quality standards;
- scale and type of production – quantity of products.

Product Design Specifications

Before you can develop a design solution, you need to pick out the key features of a product from the design brief and find detailed information on each of the features. You can then use this information to develop a product design specification containing:

- product design details;
- production details;
- production constraints (constraints are things that limit the design in some way).

Designers use product design specifications to develop a proposal for how the product should be manufactured, how much it might cost and what it will be like.

Production Details and Constraints

You will need to consider the best way to manufacture a product. Factors to consider might include:

- labour – are there enough staff? Do they have the right skills or training?
- materials and components – what are the properties and features of materials and components that make them suitable for certain processes?
- available technology – what is the most appropriate technology for a particular process and material?
- health and safety – when and where is it important in the production process?
- quality standards required by the customer – is a special quality of materials or production required?

Producing a Design Solution

You must learn to use the product design specification to develop initial design ideas. You will need to find ideas and check them against what is needed for the product and against the constraints of making the product.

The following techniques will help you 'work up' your ideas:

- finding out about similar products or new materials and methods that might be used;
- discussing your ideas with others;
- freehand sketching of ideas.

From your initial design ideas, you will need to choose the one you think best meets the customer's brief in terms of:

- production – the most suitable processes, tools and equipment;
- materials – their size, properties and suitability for manufacturing processes;

- cost – of materials and production processes and estimated cost of each item;

- market – type and size;
- specific requirements – for finish, tolerances, performance and quality of material.

Presenting your Design Solution

You will need to be able to present your design solution clearly. The presentation is your chance to explain and 'sell' your solution to other people, for example the customer. In your presentation you will need to identify the key features of your design and explain how they match the customer's brief.

To present your design solution you will need to use suitable presentation techniques, such as:

- freehand and coloured drawings;
- photographs;
- samples and swatches;
- technical drawings;
- written material;
- spoken explanations;
- mock-ups, models and prototypes.

Assessment Evidence

You need to answer test questions to show how well you understand the design process.

In addition, in your portfolio, you need to produce a product design specification and design solution for a manufactured product from a given customer design brief.

Your work must include:

- details of the customer's design brief
- developmental work for early design ideas and final design solution
- a final design solution presented using suitable techniques

To achieve a portfolio Pass you must show you can:	To achieve a portfolio Merit you must also show you can:	To achieve a portfolio Distinction you must also show you can:
P1 identify key features from the customer's design brief such as purpose, performance and costs P2 communicate clearly your product design specification by giving information on the product design and production details and constraints P3 produce basic sketches to show your early design ideas P4 select and present a final design solution using suitable techniques, such as a prototype.	M1 use appropriate technical terms to explain why you modified your early ideas and how you arrived at your final design solution M2 present a final design solution in a way the customer can understand easily M3 show awareness of the design process by rejecting unrealistic design ideas and producing a realistic final design solution.	D1 include all key information in the product design specification and final design solution D2 explain how your final design solution best meets the customer's design brief and why you rejected other design ideas.

Guidance For Teachers

Teaching Strategies

The work for this unit may be undertaken in any of the sectors of manufacturing. Most students will be able to use a structure similar to that developed during their study of Design and Technology at Key Stage 3 of the National Curriculum.

To make the design development suitable for this level, students should normally be given a range of materials or components they can utilise in their work. This will allow you to plan for prototyping and experimentation if required. Components can include those already manufactured, such as electronic components from educational kitsets, or a pre-prepared food such as a biscuit base. The use of modelling and testing of ideas is to be encouraged in this unit.

The brief should not be open-ended and students should work to a set of parameters. This is representative of product design practice in industry, where briefs are seldom completely open-ended.

Encouraging students to work on a limited number of selected design briefs will give them the opportunity to develop skills in communication when brainstorming and discussing ideas. Individual design briefs would not allow this.

The presentation aspect of a design proposal is a good opportunity for students to use IT packages. It may be useful if an outsider, such as someone from industry, helps evaluate students' presentations.

This unit could be delivered alongside or after Foundation Unit C: *Manufacturing products.* This will give students experience of using a specification for production planning and of being involved in production processes. Students would then find it easier to judge their proposals realistically against production constraints.

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 this 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 design process;
- increasing skill and confidence in the design process.

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

Pass

Students' design solutions will typically show one approach and will be limited in depth and appropriateness. They will need close direction to understand and choose a final design.

Merit

At this level, students' design solutions will show an adequate approach with some indication of alternatives. They will need some direction when making their final design choices.

Distinction

Distinction students' design solutions will show a variety of ideas and principles. They will show limited interpretation at this level. They will make an appropriate design choice with some help.

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	
When candidates are:	*There may be opportunities for them to develop the following key skills evidence:*
• producing scaled 2D drawings and diagrams of design proposals	N1.1 Interpret straightforward information from two different sources. At least one source should be a table, chart, diagram or line graph N1.2 Carry out straightforward calculations to do with: a) amounts and sizes b) scales and proportion c) handling statistics N1.3 Interpret the results of calculations and present findings. Use one chart and one diagram
• presenting their design solution as mock-ups, models or prototypes	N1.2 Carry out straightforward calculations to do with: a) amounts and sizes b) scales and proportion c) handling statistics N1.3 Interpret the results of calculations and present findings. Use one chart and one diagram
• identifying product constraints using information from manuals, textbooks, manufacturers' literature and databases	C1.2 Read and obtain information from two different types of documents about straightforward subjects, including at least one image

• presenting their design solution orally with supporting notes and OHTs	C1.1	Take part in a one-to-one discussion and a group discussion about different, straightforward subjects
	C1.3	Write two different types of documents about straightforward subjects. Include at least one image in one of the documents
• identifying product constraints using information from manuals, textbooks, manufacturers' literature and databases	IT1.1	Find, explore and develop information for two different purposes
• presenting their design solution orally with supporting notes and OHTs	IT1.2	Present information for two different purposes. Include at least one example of text, one example of images and one example of numbers
• establishing the customer's needs and how the product is to be produced	WO1.1	Confirm what needs to be done to achieve given objectives, including your responsibilities and working arrangements
• selecting the key features of a product and producing a design solution	LP1.1	Confirm understanding of your short-term targets, and plan how these will be met, with the person setting them
	PS1.1	Confirm your understanding of the given problem with an appropriate person and identify two options for solving it
	PS1.2	Plan and try out at least one option for solving the problem, using advice and support given by others