

Coursework guide

**Edexcel GCSE in
Design & Technology 3970 - 3974 (Short Course)**
First examination 2003
February 2001

Edexcel is one of the leading examining and awarding bodies in the UK and throughout the world. We provide a wide range of qualifications including academic, vocational, occupational and specific programmes for employers.

Through a network of UK and overseas offices, Edexcel's centres receive the support they need to help them deliver their education and training programmes to learners.

For further information please call our Customer Response Centre on 0870 240 9800, or visit our website at www.edexcel.org.uk

Acknowledgements

This document has been produced by Edexcel on the basis of consultation with teachers, examiners, consultants and other interested parties. Edexcel recognises and values all those who contributed their time and expertise to the development of the qualification.

Authorised by Peter Goff

Publications Code UG009836

All the material in this publication is copyright

© Edexcel Foundation 2001

Contents

Introduction	1
Coursework guide – key features of the Short Course	1
Assessment requirements	2
The nature of the coursework	3
Key issues for delivery	8
Time management	8
Project selection	8
Targeting marks	8
Feedback to students	9
Some do's and don'ts in project work	9
Incorporating the wider curriculum	10
Key skills	10
Citizenship	11
Moral, ethical, social and cultural issues	11
Health and safety issues	11
Assessing students' work	12
Marking coursework projects	12
Candidate Mark Record Sheet	13
Annotation	14
Standardisation within the centre	14
Coursework project folders	14
Procedures for moderation of internal assessment	15
Submission checklist	18
Support and training	19
Support materials	19
Examiners' and moderators' comments and mark schemes	19
Edexcel Publications	19
Training	20
Website	20
Regional offices and Customer Response Centre	20

Appendices	21
Appendix A – Candidate Mark Record Sheet	23
Appendix B – Use of ICT	25
Use of ICT in Resistant Materials Technology	26
Use of ICT in Graphic Products	28
Use of ICT in Textiles Technology	30
Use of ICT in Food Technology	31
Use of ICT in Systems and Control Technology	32
Appendix C – Edexcel set tasks	35
Resistant Materials Technology	35
Graphic Products	41
Textiles Technology	49
Food Technology	52
Systems and Control Technology – Electro/Mechanical	58
Systems and Control Technology – Electronics	61
Systems and Control Technology – Mechanisms	64
Appendix D – A3 proforma sheets	67

Introduction

This coursework guide should be read in conjunction with the Edexcel Short Course specifications for Design & Technology. It is written to help teachers and students when choosing appropriate coursework projects, developing coursework projects and when assessing and reporting.

The Short Course specification titles are:

- ÷ Food Technology
- ÷ Textiles Technology
- ÷ Graphic Products
- ÷ Resistant Materials Technology
- ÷ Systems & Control Technology.

The above titles are referred to using the following specification codes.

Full course specification code	Material route
3970	Design & Technology: Food Technology
3971	Design & Technology: Textiles Technology
3972	Design & Technology: Graphic Products
3973	Design & Technology: Resistant Materials Technology
3974	Design & Technology: Systems & Control Technology

Coursework guide – key features of the Short Course

- ÷ Maximum coursework project weighting (60%).
- ÷ Single coursework project consisting of a design and make task and design portfolio (20 hours).
- ÷ Choice of coursework project from a range of Edexcel-set tasks.
- ÷ Clear and easy to use, coursework assessment criteria, which differ from the Full Course.
- ÷ Coursework is internally assessed and standardised and externally moderated (postal moderation of portfolio, including photographic evidence of practical outcome).
- ÷ Full programme of INSET delivered by senior examiners and specialist technologists in each material area.
- ÷ Specialist ICT INSET for each specialist area.
- ÷ Exemplar material developed to support each material area.
- ÷ Signposting of key skills and the wider curriculum in coursework.
- ÷ Each material area gives direct progression to Edexcel AS/Advanced GCE.

Assessment requirements

Students are required to submit a single coursework design and make project that consists of a design folder of approximately 10-page, A3 proforma, produced by Edexcel – see *Appendix D*, and a practical outcome.

Students are guided to choose one Edexcel-set task from a list of 20 provided and spend up to 20 hours working on this project.

The scheme of assessment is designed to be flexible enough to allow students who wish to do so, to focus their main efforts on designing and also to provide an opportunity for those who prefer to concentrate on making to achieve similar credit for their efforts.

Ideally, project work will promote a good balance between designing and making and should produce quality outcomes that integrate both aspects of coursework.

Coursework projects should be selected by students under teacher supervision to ensure that they are appropriate to the abilities of individual students.

The level of demand of a coursework project should influence the interpretation of the assessment criteria. A successful project that makes greater demands on thinking and making skills and involves high levels of knowledge and understanding, should be more highly rewarded than a successful project with fewer demanding aspects.

Teacher intervention at the design stage is crucial to a successful outcome and should ensure that students are in control of their project and are working at a level that will result in the best grade possible for that student.

Any group work embarked upon by students must be carefully monitored to ensure that selected projects are appropriate and provide individual and separate evidence of a student's ability to design and make holistically, reflecting all assessment criteria.

It is essential that design folios are very focused and succinct and students must ensure that they treat each of the 10-page proforma, as design exercises in themselves in order to include as much relevant information as possible in the space available. Students must be selective when deciding on the content of design folders and padding should be avoided. Students will be allowed to include **one** supplementary sheet of folio work if necessary.

An increased emphasis on industrial practices, particularly in the use of CAD/CAM and on the wider effects of technological activity on society and the environment is a feature of GCSE Design & Technology and should be evident in the project design folder.

The nature of the coursework

Successful design and technology coursework demands the application of a wide range of skills that focus on a particular problem in order to meet detailed points of specification and a good understanding of the assessment criteria is necessary to give students control of their work and to enable them to target marks effectively.

Use information sources to develop detailed specifications and criteria for a given task

Information

Information researched from a wide range of sources will give the best balance of useful data, but it must be relevant and well targeted to be of use. Useless padding will gain no credit. Students may consider some of the following sources as useful in their collection of information:

- ÷ market research
- ÷ consumer surveys
- ÷ visits to manufacturers
- ÷ product test reports
- ÷ textbooks
- ÷ e-mail
- ÷ CD ROMs
- ÷ databases
- ÷ the Internet
- ÷ data sheets
- ÷ magazines
- ÷ people in manufacturing industry.

Specification

A clear and detailed specification is essential to the success of any design project and students should refer to their specification when designing and developing ideas and when evaluating solutions both formatively and summatively. The specification should be written with precision and should contain important points of consideration for the proposed design.

Whereas statements of analysis are general questions related to design decisions such as ‘what materials are available’ or ‘what scale of production is the design aimed at’, points of specification will use statements that are specific, ‘the material used will be acrylic’ or ‘the design must be suitable for batch production’.

The specification should contain quantitative information that can be measured against the performance of the final solution when it is evaluated.

Considerations in a specification may include:

- ÷ purpose
- ÷ user and performance requirements
- ÷ materials to be used
- ÷ size and cost limitations
- ÷ scale of production appearance
- ÷ safety factors
- ÷ product maintenance
- ÷ environmental issues.

Develop ideas from the specification, check, review and modify as necessary to develop a product

Ideas

This is a very important point in the design process, and up to now students will probably have followed well defined routes in their analysis and research of the problem in hand, but now they have the opportunity to use their creativity to present alternative solution to the problem and to display their design ability.

Several alternative design ideas (at least three) should be presented in this part of the design folder and each design should consider and meet the points of specification. Each idea should be realistic and workable and should be evaluated formatively to assess its potential.

Students should present a range of design proposals that explore distinctly different materials, processes and working techniques and allow the opportunity to use and display knowledge and understanding gained throughout the design and technology course of study.

Develop

Idea development brings together the best features of initial design ideas into a final solution to the problem that best fits the specification. Compromises may have to be made at this stage to allow for cost or material constraints, limitations in available processing equipment or other unforeseen problems and students should be encouraged to see this as a valid part of the design process.

Modelling and testing of ideas and sub-systems at this point will enable students to establish the feasibility of their proposed solution. Modelling techniques can be used to ‘mock up’ designs and may include the use of materials and processes that replicate the selected ones in a cheaper or more convenient way. Card could be used to create and test a mechanism for a toy, or to establish dimensions for food packaging. Rigid foam could be used to test the form and ergonomics of a torch design and a cheap fabric could be used to test the pattern design for a garment. Electronic circuits can be tested using a circuit modelling software package and Printed Circuit Board (PCB) drawing packages can be used to develop a final circuit diagram.

When using modelling, students should ensure that they record evidence of this aspect of their work.

The final developed idea should be presented with detailed information on all points given in the specification and should be justified through evaluation of each point.

Use written and graphical techniques including ICT and Computer Aided Design (CAD), where appropriate to generate, develop, model and communicate

Written communication

Design and technology uses a technical language that is both precise and unique and students should endeavour to use accurate and appropriate terms when writing about their coursework project. High quality work will reflect a level of knowledge and understanding that is expressed through competent use of specialist terminology, presented in a well thought out and logical way.

Other media and ICT

Students should be encouraged to use a range of graphical media and techniques in their design work. Good quality communication skills are essential to the design process in order to relate ideas and concepts to others.

Students could choose to use some of the following in their work:

- ÷ effective and clear hand sketching
- ÷ formal technical drawing
- ÷ pictorial drawing
- ÷ exploded views
- ÷ perspective drawing
- ÷ rendering
- ÷ model making
- ÷ photography and other appropriate graphical techniques.

There are many opportunities throughout the coursework project for the use of ICT and students should be encouraged to use the resources at their disposal in a relevant way. ICT should be seen as another communication tool to be used appropriately within the context of the project and should not be used simply for effect, or in a contrived manner.

(Refer to *Appendix B* for *Use of ICT*.)

Produce and use a detailed working schedules, which include a range of industrial applications as well as the concepts of systems and control

Simulate production and assembly lines using appropriate ICT

Systems and control

Manufacturing/making processes can be broken down into the sub-systems of inputs, processes and outputs. The purpose of such systems is to change inputs into outputs through the processes involved.

Students should be able to identify in their work a range of possible inputs and ones which should be investigated and considered for use. They should become familiar with any processes that will be used to shape and transform the inputs. They should also evaluate the outputs to determine whether the system is an effective and successful means of manufacturing.

Feedback in systems design is important and students should identify potential problems and difficulties within the system and suggest changes and modifications to improve its performance.

Careful planning for manufacture is essential and students should be able to produce a detailed working schedule that would enable another person to construct the final outcome. The basis of a schedule could be a flow chart that includes the main stages in production, including collecting components and materials, the preparation of materials when measuring and marking out, processing, assembly and finishing.

Industrial applications

Students should demonstrate an understanding of industrial processes and use them in their work where appropriate. Having produced a one-off product, students might consider the demands on equipment and processes of using batch production to produce a few hundred of the same product.

Select and use tools, equipment and processes effectively and safely to make single products and products in quantity, Use Computer Aided Manufacture (CAM) appropriately

Select and use

Students should demonstrate their competence in selecting appropriate tools, equipment and processes with reference to their planning for manufacture schedule. They should use tools and equipment as expertly as possible and should show an ability to modify techniques and processes when necessary through their understanding of the limitations and flexibility of tools and equipment.

Make product(s)

Students should aim to produce a high quality product that is complete and fully functional and meets the requirements of the specification.

Making, presents an opportunity for students to demonstrate skills in manipulating tools and equipment and in applying processes creatively and safely. High quality outcomes demand high level skills and students should be encouraged to explore unfamiliar construction techniques if appropriate. Challenging work of good quality should be rewarded more highly than good quality work that is more straightforward.

The use of CAM in manufacturing should be encouraged if it is available and relevant, but should not be contrived in order to include it for its own sake.

All students should demonstrate a regard for safety awareness for themselves and others when working with materials, tools and equipment. Safety awareness should be recorded in the planning for manufacture schedule.

Devise and apply tests to check the quality of their work at critical control points, Ensure that their products are of suitable quality for the intended use, Suggest modifications that would improve their performance

Tests and checks

Testing a product against its specification, measures its fitness for purpose and gives guidance for further improvements and modifications.

Testing can be carried out during manufacture to inform students of their progress towards a successful outcome and after manufacture, to assess the product under realistic conditions.

Field testing under working conditions, testing over extended periods, third party user testing, testing against external standards and general sensory tests are all methods that students might employ in their checks.

Evaluate

Students should objectively evaluate their work summatively against the specification in order to justify and confirm the success of their product. Evaluation should include mention of problems encountered, how they were overcome and any modifications made during manufacture.

Third party evaluation is a valuable addition to a student's own assessment of their work.

Testing and evaluation provide feedback on performance and fitness for purpose of a product and allow students to suggest design improvements and modifications for future development of the product.

Suggestions for improvement should relate to product performance, quality of manufacture and design, fitness for purpose, target market and larger-scale production.

Key issues for delivery

The successful outcome of coursework depends on the consideration of a number of factors and the control that teachers and students have over those factors.

Time management

Most GCSE Design & Technology courses are taught in years 10 and 11, but should be seen as five terms long and not six terms, as coursework projects must be submitted to Edexcel by 1 May in the year of the examination.

Terms 1 and 2 of the course should be spent on skills and knowledge building through short-focused tasks that present students with differing experiences and demands from task to task.

The recommended time of 20 hours for a coursework project implies a commitment from students of approximately two terms' work based on 1 hour of practical work per week. Accompanying knowledge and understanding of the subject must also be covered during the course, so an early start to the coursework project is important if students are to have an opportunity to complete their work and test and evaluate it appropriately.

Students should be encouraged to choose their final project during term 3 of the course and should begin work in earnest no later than half term. Such an early start ensures that students are well prepared to continue their work in September of year 11 and are not coming to their projects 'cold'.

Students should aim to complete their coursework project by half term in term 5 of the course, so that final additions and refinements can be made with time to spare.

Project selection

It is essential that projects chosen by students can be supported by the resources of a department and by the expertise of teachers within those departments. It is a valid strategy to limit the range of projects that students can pursue, so that control can be maintained and resources can be standardised.

Projects must allow students to achieve their potential, but they should not be too daunting and students must always bear in mind the time constraints attached to their work.

Wherever possible, knowledge and understanding of the subject should be taught through project work as this adds relevance and coherence to the course. Limiting the choice of project topics ensures that taught knowledge is directed at all students.

Targeting marks

Coursework assessment criteria statements are progressive in their demands from low, to medium, to high and it is clear from the content of each statement what students must do to achieve the next level of credit.

In order to enable students to achieve the best possible outcome from their work, they need to be familiar with the assessment criteria so that they understand what is required of their efforts and can resist for example, collecting inordinate amounts of research material where little credit is available for that activity.

From the coursework assessment criteria it can be seen that criteria 2 ‘developing ideas’ and criteria 5 ‘making’ carry a much heavier weighting than the other statements and students must ensure that they make an effort to produce high quality work in these areas as they are the most influential in achieving marks.

Targeting marks is an important skill that should be developed in all students so that they can use their time and effort as effectively as possible with the maximum gain.

Feedback to students

It is essential to their success that students understand how their work is assessed and what they have achieved as they progress through different stages in their project.

During a two-term project, it would be good practice to assess a student’s work three times and to give feedback on their progress each time.

Using the coursework assessment criteria sheets gives teachers a convenient tool with which to report back to students on their progress. By highlighting the levels of achievement at the time of the first review of their work, students have a reference or baseline from which to make progress. Each subsequent review will plot progress and illustrate where efforts need to be focused. This exercise not only feeds back to students on their progress, but also makes final assessment very straightforward.

Some do’s and don’ts in project work

- ÷ Do make sure students manage time properly – testing and evaluation cannot be carried out effectively on incomplete work.
- ÷ Do make sure projects are appropriate to the abilities of students and the time available.
- ÷ Don’t be too ambitious in choice of project.
- ÷ Don’t embark upon joint or group projects unless students can justify individual marks in **all** areas of assessment.
- ÷ Do target marks on the assessment grid – consider the weightings of each criteria.
- ÷ Don’t award marks that cannot be justified.
- ÷ Do give regular feedback to students on their progress.
- ÷ Do take clear and effective photographs of practical outcomes.
- ÷ Do send completed coursework to Edexcel by 1 May.

Incorporating the wider curriculum

Key skills

The qualification in key skills requires students to demonstrate achievement levels in application of number, communication and information technology. Also available are units for the wider key skills of improving own learning and performance, working with others and problem solving.

Students following a course of study in design and technology have the opportunity to develop and generate evidence of attainment in all key skills areas through their coursework project.

The GCSE Design & Technology specifications signpost development and assessment opportunities that are based on the level 2 key skills units which identify the evidence that students must produce for their portfolio.

Application of number skills are required throughout the design process and activities such as calculating and measuring quantities of materials in research, the use of formulae in design development and production of accurate working drawings in planning for manufacture are examples of where key skills evidence could be found.

Communication skills underpin all design and technology work and activities such as brainstorming ideas and group discussion at the outset of a project, provide appropriate evidence in this area. When researching design problems, students will read extensively around a topic in order to collect relevant information that they will summarise for use. They may also use product analysis in their work and this will involve the use of images, providing further portfolio evidence.

Information technology is very widely used in design and technology work and many opportunities in all areas of design and making will occur for the collection of evidence for this key skill. Use of databases, the Internet and CD ROMs for research purposes are common applications of ICT in project coursework. Charts and graphs generated from spreadsheets as well as word processing and desk top publishing are used to present work and specialist software is used to present design and technology work that is focused on particular areas of the subject.

Refer to *Appendix B* on *Use of ICT*.

Working with others is an important part of design and technology and will involve cooperative efforts in collecting information, working in pairs and small groups, dividing tasks and exchanging information in order to improve a design or process. Evidence for this key skills area would be better collected in year 10, when students are more likely to be working in groups or pairs on short skills building tasks. All GCSE project work submitted for assessment must be the student's own, so year 11 work is unlikely to generate appropriate evidence.

Improving own learning and performance evidence could be assembled through planning the final coursework project to set short-term targets such as dates for completion of each section of the design folder, times for review by the teacher, planning using time constraints, available materials and equipment and a production plan.

Problem solving is the holistic activity that is at the heart of all design and technology courses and is in evidence at every stage of the design process. Students who identify a need, analyse the problem, collect research, develop a specification, generate a range of alternative solutions, develop a chosen solution, produce a production plan and evaluate the outcome of their designing will generate appropriate evidence for this key skill.

Citizenship

In the Key Stage 4 (KS4) citizenship programme of study, the activities of developing skills of enquiry and communication and developing skills of participation and responsible action are directly reflected in the work of students involved in coursework projects.

The impact made on society by certain products, materials and processes is of interest to a designer and students need to consider this before making design decisions. The designer must also take into consideration the needs of the customer or client through market research and negotiate and compromise to achieve a mutually desirable outcome. Students approaching their work through a designer/client relationship would need to make such compromises.

Moral, ethical, social and cultural issues

Design and technology as a subject allows students to develop an understanding of moral, ethical, social and cultural issues as they underpin all design and make work.

Some products may have the potential to cause harm or injury, while others may have an impact on the way large groups of people live their lives. Automation has reduced the need for a large manufacturing workforce, but ICT has allowed people to work more flexibly.

When designing, students need to consider an increasing range of users of products in different societies who will have differing needs and these diverse and wider needs should be considered where appropriate.

Health and safety issues

Health and safety issues are implicit in all design and manufacturing and it is important that students ensure that their work is safe to use and safe to make and that it conforms to relevant safety standards.

Assessing students' work

The work of each student must be assessed using the coursework assessment criteria sheets, which contains criteria statements and levels of response, and the Candidate Mark Record Sheet, which is used to convert achievement levels to marks.

Edexcel recommends using formative assessment during the development of projects, to provide students with feedback on their progress. Summative assessment should be made at the end of the coursework project.

Marking coursework projects

The six main assessment criteria for designing and making are further divided into two key features that have low, medium and high levels of response descriptors attached to them.

For each key feature, teachers should select the statement that is the best fit for a student's level of performance, transfer the selected level to the Candidate Mark Record Sheet and circle the mark relating to it. Marks for the six criteria should be added together and entered in the Final Total box.

In assessment criteria 2, 'Ideas' and 'Develop', mid-marks of 6 and 10 are available **to award to students whose performance easily meets one criteria, but does not fully fulfil the next higher statement**. In assessment criteria 5, 'Select and use' and 'Make product(s)' mid marks of 9 and 15 are available for similar use.

An example of a filled-in Candidate Mark Record Sheet can be found on page 13.

Candidate Mark Record Sheet

Centre no: 43781	Specification no: 3970	Year of Entry: 2003
Candidate no: 9825	Candidate name: RUSSEL HOBBS	

Task title: COOK CHILL MEAL

Assessment criteria	Key feature	Annotation page number	LEVEL			Edexcel use only		
			L	M	H			
1 Use information sources to develop detailed specifications and criteria for a given task	Information	Pg 2	①	2	3			
	Specification	Pg 2	1	2	③			
2 Develop ideas from the specification, check, review and modify as necessary to develop a product	Ideas	Pg 3	4	6	8	⑩	12	
	Develop	Pg 4, 5	4	⑥	8	10	12	
3 Use written and graphical techniques including ICT and computer aided design (CAD where appropriate) to generate, develop, model and communicate	Written communication	Pg 2, 5, 9, 10	1	②	3			
	Other media and ICT	Pg 6	①	2	3			
4 Produce and use detailed working schedules, which includes a range of industrial applications as well as the concepts of systems and control	Systems and control	Pg 6	①	2	3			
	Industrial applications	Pg 6	1	②	3			
5 Select and use tools, equipment and processes effectively and safely to make single products and products in quantity, Use CAM appropriately	Select and use	Pg 7	6	9	⑫	15	18	
	Make product(s)	Pg 1 see back of sheet	6	9	12	15	⑮	
6 Devise and apply tests to check the quality of their work at critical control points. Ensure that their products are of suitable quality for the intended use. Suggest modifications that would improve their performance	Tests and checks	Pg 8	1	②	3			
	Evaluate product	Pg 9	①	2	3			
FINAL TOTAL			59					

Annotation

Annotation is a compulsory requirement for coursework projects and is used to:

- ÷ help the moderator to understand how and where marks for each assessment criteria have been awarded
- ÷ describe where students have received help beyond normal learning support or where students have been rewarded for initiatives that are not immediately apparent from the evidence presented
- ÷ explain any other features of a student's work that will assist the moderator in understanding how a particular assessment was arrived at.

The minimum requirement for annotation is to complete the annotation column on the Candidate Mark Record Sheet by listing the portfolio page numbers where evidence can be found for each of the assessment criteria.

Further comments can be made on the back of the Candidate Mark Record Sheet. Detailed annotation will help a moderator to agree a centre's marks.

Annotation should not be written directly on students' work.

Standardisation within the centre

It is the centre's responsibility to ensure that where more than one teacher has marked the work, internal standardisation has been carried out. This procedure ensures that the work of all students at the centre is marked to the same standards and that an accurate rank order is established.

Coursework project folders

Following assessment, all coursework folders must be available for inspection by Edexcel. Each student's folder should contain only the work used for awarding marks for the assessment.

Coursework project folders must be appropriately presented with information boxes on each proforma page properly completed.

The work **must** be sent to Edexcel to arrive no later than 1 May in the year of the examination. No practical work is to be submitted to Edexcel unless specifically requested.

The moderated coursework will be returned to centres after 30 September in the year of the examination. Edexcel reserves the right to retain examples of folders for archive, grading or training purposes. Centres will receive feedback about the appropriateness of coursework projects and assessments made.

Procedures for moderation of internal assessment

This section can be lifted directly from the specification.

All centres will receive Optically-read Teacher Examiner Mark Sheets (OPTEMS) for each coursework component.

Centres will have the option of either recording marks on OPTEMS or recording marks on computer for transfer to Edexcel by means of Electronic Data Interchange (EDI).

OPTEMS will be pre-printed on three-part stationery with unit and paper number, centre details and student names in candidate number order.

The top copy is designed so that marks can be read directly by an optical mark reader, so it is important to complete the OPTEMS carefully, in accordance with the full instructions listed in the specification.

OPTEMS should be completed using an HB pencil, on a flat surface so that they are easily read by the computer and to ensure that figures written in the marks box go through to the second and third copies.

For each student, the total mark from the Candidate Mark Record Sheet should be transferred to the box labelled 'Marks' on the OPTEMS. Care should be taken to check arithmetic and to make sure that the correct student is credited with the correct mark.

The component mark should be encoded on the right hand side of the OPTEMS by drawing a line to the two dots inside the ellipse on the appropriate marks. Clear, dark HB pencil lines must be made but they must not extend outside the ellipses on either side of the two dots.

Every candidate listed on the OPTEMS must have either a mark or one of the following codes in the marks box.

- ÷ 0 (zero marks) should be entered only if work submitted has been found to be worthless. It should not be used where candidates have failed to submit work.
- ÷ ABS in the marks box and an A in the encoded section for any candidate who has been absent or has failed to submit any work.
- ÷ W should be entered in the marks box and the encoded section where the candidate has been withdrawn.

An example of a completed OPTEMS can be found on page 16.

Encoded section

Candidate name	Number	Marks												
NEW ALAN* SP	3200	0	(+0+) (+0+)	(+10+) (+1+)	(+20+) (+2+)	(+30+) (+3+)	(+40+) (+4+)	(+50+) (+5+)	(+60+) (+6+)	(+70+) (+7+)	(+80+) (+8+)	(+90+) (+9+)	(+100+) (+A+)	(+200+) (+W+)
OTHER AMY* SP	3201	5	(+0+) (+0+)	(+10+) (+1+)	(+20+) (+2+)	(+30+) (+3+)	(+40+) (+4+)	(+50+) (+5+)	(+60+) (+6+)	(+70+) (+7+)	(+80+) (+8+)	(+90+) (+9+)	(+100+) (+A+)	(+200+) (+W+)
SMITH JOHN AW	3202	47	(+0+) (+0+)	(+10+) (+1+)	(+20+) (+2+)	(+30+) (+3+)	(+40+) (+4+)	(+50+) (+5+)	(+60+) (+6+)	(+70+) (+7+)	(+80+) (+8+)	(+90+) (+9+)	(+100+) (+A+)	(+200+) (+W+)
WATTS MARK* SP	3203	ABS	(+0+) (+0+)	(+10+) (+1+)	(+20+) (+2+)	(+30+) (+3+)	(+40+) (+4+)	(+50+) (+5+)	(+60+) (+6+)	(+70+) (+7+)	(+80+) (+8+)	(+90+) (+9+)	(+100+) (+A+)	(+200+) (+W+)
STEVEN JANE AW	3204	84	(+0+) (+0+)	(+10+) (+1+)	(+20+) (+2+)	(+30+) (+3+)	(+40+) (+4+)	(+50+) (+5+)	(+60+) (+6+)	(+70+) (+7+)	(+80+) (+8+)	(+90+) (+9+)	(+100+) (+A+)	(+200+) (+W+)
JONES ANN* AW	3205	40	(+0+) (+0+)	(+10+) (+1+)	(+20+) (+2+)	(+30+) (+3+)	(+40+) (+4+)	(+50+) (+5+)	(+60+) (+6+)	(+70+) (+7+)	(+80+) (+8+)	(+90+) (+9+)	(+100+) (+A+)	(+200+) (+W+)
PATEL RAJ* AW	3206	55	(+0+) (+0+)	(+10+) (+1+)	(+20+) (+2+)	(+30+) (+3+)	(+40+) (+4+)	(+50+) (+5+)	(+60+) (+6+)	(+70+) (+7+)	(+80+) (+8+)	(+90+) (+9+)	(+100+) (+A+)	(+200+) (+W+)
WEST SARA SP	3207	W	(+0+) (+0+)	(+10+) (+1+)	(+20+) (+2+)	(+30+) (+3+)	(+40+) (+4+)	(+50+) (+5+)	(+60+) (+6+)	(+70+) (+7+)	(+80+) (+8+)	(+90+) (+9+)	(+100+) (+A+)	(+200+) (+W+)

Where more than one teacher has assessed the work, the teacher's initials should be shown to the right of each candidate's name as shown.

Once the authentication and internal standardisation statement on the OPTEMS has been signed, the three-part sets should be divided and dispatched, or retained as follows:

- ÷ the top copy must be sent direct to Edexcel in the envelope provided, to be received no later than 1 May. This form must not be folded or creased
- ÷ the second copy must be sent with the sampled coursework to the moderator. The name and address of the moderator will either be printed on the OPTEMS or sent separately
- ÷ the third copy must be retained by the centre.

Centres using EDI should follow the procedures laid out in the specification,

A blank copy of the Candidate Mark Record Sheet is provided in the appendices for centres to photocopy. The Candidate Mark Record Sheet, to be completed for each candidate, provides details for the moderator of how each candidate's total mark is reached. It is the centre's responsibility to ensure that:

- ÷ all marks are recorded accurately and that arithmetic is correct
- ÷ the total mark is transferred correctly onto the OPTEMS or via EDI.

Where the pre-printed OPTEMS is asterisked indicating the candidates whose work is to be sampled, this work, together with the second copy of the OPTEMS, must be posted to reach the moderator no later than 1 May. In addition, the centre must send the work of the candidate awarded the highest mark and the work of the candidate awarded the lowest mark, if these are not already included in the selected sample.

Candidate Mark Record Sheets must be attached to each candidates work in the requested sample.

If the pre-selected sample does not represent all parts of the mark range for the centre, additional samples should be sent to the moderator and indicated with a tick.

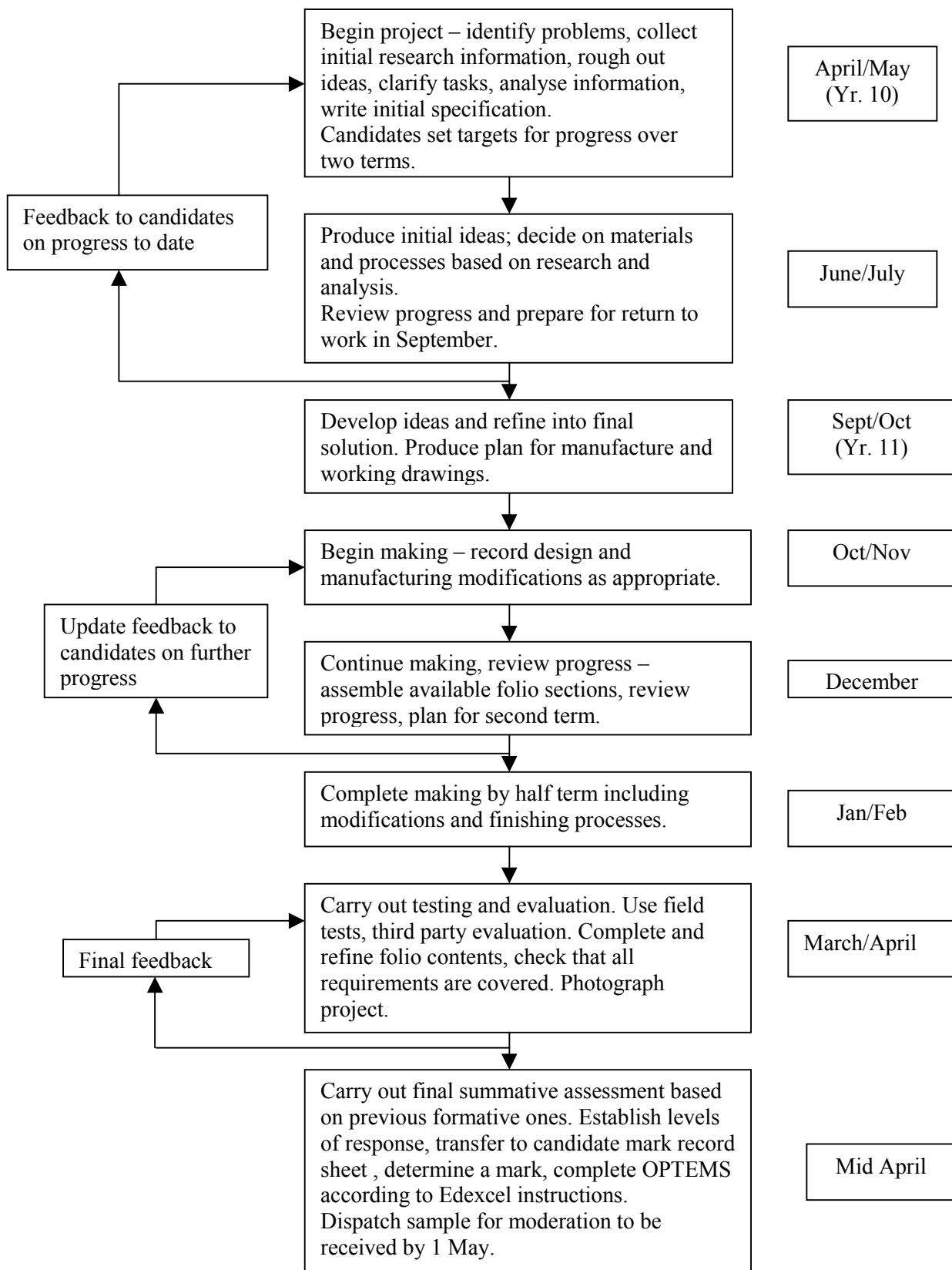
The moderator may request further samples of coursework, as required and the work of all candidates should be available for such a request.

If an absent or withdrawn candidate is pre-selected, a substitute candidate's work should be sent for moderation and the word 'substitute' should be written against their name.

Photographic evidence of the practical outcome of the design and make task must be securely attached to the sampled candidates folios.

The centre should ensure that coursework is presented in an orderly fashion and that the work of all candidates is clearly identifiable. The use of bulky, heavy folders is not recommended.

Submission checklist



Support and training

Support materials

The following support materials will be available from spring 2001 onwards:

- ÷ specimen papers
- ÷ teacher's guide
- ÷ exemplar materials
- ÷ student guide
- ÷ internal assessment guide.

Other materials will be available to centres during the lifetime of the specification in response to centres' needs.

Copies of these support materials may be obtained from Edexcel Publications at the address below.

Examiners' and moderators' comments and mark schemes

These will be issued to centres for Design & Technology after each examination series. Additional copies may be obtained from Edexcel Publications at the address below.

Edexcel Publications

Support materials and further copies of this publication can be obtained from:

Edexcel Publications
Adamsway
Mansfield
NG18 4FN

Tel: 01623 467467

Fax: 01623 450481

E-mail: publications@linneydirect.com

Training

Each year Edexcel provides a programme of training courses covering aspects of the specifications and assessment.

These courses take place throughout the country. For further information on what is planned, please consult the annual Training and Professional Development guide, which is sent to all centres, or contact:

INSET
Edexcel Foundation
Stewart House
32 Russell Square
London WC1B 5DN

Tel: 020 7758 5620
Fax: 020 7758 5950
Fax: 020 7758 5951 (second fax number)
E-mail: inset@edexcel.org.uk

Website

www.edexcel.org.uk

Please visit the Edexcel website, where further information about training and support for all qualifications, including this GCSE, can be found.

The website is regularly updated, and an increasing amount of support material and information will become available through it.

Regional offices and Customer Response Centre

Further advice and guidance is available through a national network of regional offices. For general enquiries and for details of your regional office please contact the Edexcel Customer Response Centre on:

Tel: 0870 240 9800

E-mail: enquiries@edexcel.org.uk

Regional subject advisers

For the South

Susan Medway
Tel/Fax: 01235 862307
E-mail: susan.medway@edexcel.org.uk

For the East

Una Jones
Tel/fax: 01206 366 398
E-mail: una.jones@edexcel.org.uk

For the West

Carol Griffiths
Tel/Fax: 0151 648 8695
E-mail: carol.griffiths@edexcel.org.uk

For Wales

Dorothy Powell
Tel: 01873 890 382
E-mail: dorothy.powell@edexcel.org.uk

Appendices

Appendix A – Candidate Mark Record Sheet	23
Appendix B – Use of ICT	25
Use of ICT in Resistant Materials Technology	26
Use of ICT in Graphic Products	28
Use of ICT in Textiles Technology	30
Use of ICT in Food Technology	31
Use of ICT in Systems and Control Technology	32
Appendix C – Edexcel set tasks	35
Resistant Materials Technology	35
Graphic Products	41
Textiles Technology	49
Food Technology	52
Systems and Control Technology – Electro/Mechanical	58
Systems and Control Technology – Electronics	61
Systems and Control Technology – Mechanisms	64
Appendix D – A3 proforma sheets	67

Appendix A – Candidate Mark Record Sheet

Centre no:	Specification no:	Year of Entry:
Candidate no:	Candidate name:	

Task title:

Assessment criteria	Key feature	Annotation page number	LEVEL			Edexcel use only
			L	M	H	

1 Use information sources to develop detailed specifications and criteria for a given task	Information		1	2	3	
	Specification		1	2	3	

2 Develop ideas from the specification, check, review and modify as necessary to develop a product	Ideas		4	6	8	10	12	
	Develop		4	6	8	10	12	

3 Use written and graphical techniques including ICT and computer aided design (CAD where appropriate) to generate, develop, model and communicate	Written communication		1	2	3	
	Other media and ICT		1	2	3	

4 Produce and use detailed working schedules, which includes a range of industrial applications as well as the concepts of systems and control	Systems and control		1	2	3	
	Industrial applications		1	2	3	

5 Select and use tools, equipment and processes effectively and safely to make single products and products in quantity, Use CAM appropriately	Select and use		6	9	12	15	18	
	Make product(s)		6	9	12	15	18	

6 Devise and apply tests to check the quality of their work at critical control points. Ensure that their products are of suitable quality for the intended use. Suggest modifications that would improve their performance	Tests and checks		1	2	3	
	Evaluate product		1	2	3	

FINAL TOTAL						
--------------------	--	--	--	--	--	--

Appendix B – Use of ICT

Information and communication technology in design and technology

Within design and technology coursework, ICT should be used to support the process and activity of designing and making and it should enable students to enhance their design and technology skills and capabilities.

ICT in design and technology should be used to assist in researching and gathering information, generating, developing, modelling and communicating ideas, planning for and making what is designed, and to control products and systems.

The use of the term CAD/CAM should be interpreted in its broadest sense and should be appropriate to the material being used, the experience gained by students and the resources available.

Students should be selective in their choice and approach to the use of ICT and should always use it appropriately where it is available.

ICT is formally assessed in coursework projects in assessment criteria 3 but there are opportunities in most other assessment criteria to use a variety of ICT tools.

Use of ICT in Resistant Materials Technology

Students are encouraged to use ICT where it enhances the content and presentation of coursework in resistant materials technology. It is expected that generic software packages such as word processing and desktop publishing will be widely used, but also that students will consider using more specialist applications where they are available.

Students will not be penalised for non-use of ICT in areas where it is not assessed.

Students may choose to use some of the following when:

- ÷ researching information
 - use a database ie Internet or CD ROM to seek information on materials available, technical information, existing products, lifestyles and environments
 - use survey software to generate questionnaires and to present information gathered
 - use grammar and spell checks to correct written coursework
 - use e-mail to communicate with outside agencies when seeking information
 - present and analyse information using charts generated in a database or spreadsheet
- ÷ generating ideas
 - use a digital camera and scanned images to produce source material as a starting point for creative design ideas
 - use 2D draw and paint packages and CAD software to generate, edit and communicate design ideas
- ÷ developing ideas
 - use a CAD package to select and refine final designs and to produce dimensioned working drawings
 - use a 3D modelling program to produce a visual image of the proposed completed product
 - use a spreadsheet to cost a product and to determine the implications of quantity production
 - use toolpath simulation to test for safe cutting when using a Computer Numerical Control (CNC) machine
- ÷ considering industrial application
 - use a digital camera to record the sequence of making activities and to show processes used in producing a coursework project
 - use computer-generated flowcharts to plan the sequence of activities in manufacturing the designed product
 - use CNC software to simulate graphically the machining process for a design

÷ making

- use a 2D draw program to produce a template or jig design to be printed out for use in accurate repeat drilling
- use a 2D draw program to produce images to apply to the surface of a flat wooden puzzle
- use a cutter/plotter to produce shapes in thin materials for attaching to nursery furniture as decoration
- use a CNC machine to produce products of repeatable quality ie use a milling machine to cut patterns in small acrylic puzzles
- use a CNC router to make a wooden former for use in vacuum forming.

Use of ICT in Graphic Products

Students are encouraged to use ICT where it enhances the content and presentation of coursework in graphic products. It is expected that generic software packages such as word processing and desktop publishing will be widely used, but also that students will consider using more specialist applications where they are available.

Students will not be penalised for non-use of ICT in areas where it is not assessed.

Where design work is aided by the use of a computer then details of the software, used or devised, should be included.

Where initial ideas are explored using a computer it may not be practical or realistic to present all computer variations of the ideas, however it is important to describe the variations and the thinking behind the ideas.

Where ideas are developed using a computer it may not be practical or realistic to present all of the stages of the process, however it is important to include a description, diary or log of the stages together with details of the thinking that produced the development.

Where part of the final solution is a computer programme it is important to include details of how to operate the programme, the nature of the programme and, as a result of testing, how well it works.

While the subject of graphic products is seen as an ideal medium for the exploitation of all forms of ICT, it is not intended that any candidates should be advantaged, or disadvantaged, by the availability of particular resources.

CAD and CAM resources are considered to be part of the range of techniques available for the completion of the Design and Make task.

As with all available techniques, candidates will gain credit for the appropriate and successful application of the technique.

Candidates should be warned of the dangers of locking all of their work into a single technique approach.

Where the final graphic product solution is presented as a prototype model it is also important to provide a high quality 'concept' representation of the solution in its intended setting. Where appropriate this presentation can be in the form of a CAD generated visual.

There should be encouragement to exploit the use of CAM machines currently available in schools, however, where these facilities are not available candidates must be able to show an understanding of the appropriate application, in both coursework and terminal test of computer prototyping, computer aided manufacture, computer numerical control, and computer integrated manufacture.

Students may choose to use some of the following when:

- ÷ researching information
 - use a database, ie Internet or CD ROM, to seek information on materials available, technical information, existing products, lifestyles and environments
 - use survey software to generate questionnaires and to present information gathered
 - use grammar and spell checks to correct written coursework
 - use e-mail to communicate with outside agencies when seeking information
 - present and analyse information using charts generated in a database or spreadsheet
 - use a digital camera to record disassembly and analysis of existing products

- ÷ generating ideas
 - use a digital camera and scanned images to produce source material as a starting point for creative design ideas
 - use 2D draw and paint packages and DTP, CAD and web design software to generate, edit and communicate design ideas
- ÷ developing ideas
 - use a CAD package to select and refine final designs and to produce dimensioned working drawings
 - use a 3D modelling program to produce a visual image of the proposed completed product
 - use a spreadsheet to cost a product and to determine the implications of quantity production
- ÷ considering industrial application
 - use a digital camera to record the sequence of making activities and to show processes used in producing a coursework project and/or an industrial visit
 - use computer generated flow charts to plan the sequence of activities in manufacturing the designed product
- ÷ making
 - use a cutter/plotter to produce shapes in thin materials for structural packaging designs and vinyl stickers
 - use 3D fax machines for rapid prototyping
 - use DTP software to produce printed materials ie leaflets, menus, business stationary etc
 - output designs to colour bubble-jet or laser printers to produce products of repeatable quality.

Use of ICT in Textiles Technology

Students are encouraged to use ICT to enhance the content and presentation of coursework in textiles technology. It is expected that generic software packages such as drawing, desk-top publishing and word-processing will be appropriately used and also that students will consider using specialist CAD and CAM applications where they are available.

Students will not be penalised for non-use of ICT in areas where it is not assessed.

Students may choose to use some of the following when:

- ÷ researching information
 - use the Internet or CD ROMs to find information on available materials and their properties, existing products, lifestyles and environments
 - use databases to find information on fibres, fabrics, properties and safety data
 - use software to generate questionnaires and to present gathered information in graphs and pie-charts
 - use grammar and spell checks to correct written coursework
 - use e-mail to link candidates with professional designers and outside experts
 - use e-mail for individual study by sharing ideas with other students
- ÷ generate ideas
 - use a camcorder, digital camera and scanned pictures to generate, develop model and communicate design proposals
 - use 2D and 3D drawing packages to present and edit design ideas
 - use specialist programs to design stitch patterns, such as cross stitches
 - use specialist programs to view knitting patterns
- ÷ considering industrial application
 - use a camcorder or digital camera to record the one-off process of making a fabric item or to record an industrial production system
 - use software to grade patterns into different sizes or to produce pattern lays
 - use computer-generated flowcharts to plan the sequence of manufacture
 - use spreadsheets for costing the process of making fabric items
- ÷ making
 - use CAM equipment such as computerised sewing machines, embroidery machines and knitting machines
 - use a 2D drawing program to produce an image which can be printed and transferred on to fabric
 - scan images for printing on to fabric or for the manufacture of stencils.

Use of ICT in Food Technology

Students are encouraged to use ICT where it enhances the content and presentation of coursework in food technology. It is expected that generic software packages such as word processing and desktop publishing will be widely used, but also that students will consider using more specialist applications where they are available.

Students will not be penalised for non-use of ICT in areas where it is not assessed.

Students may choose to use some of the following when:

- ÷ researching information
 - use a database ie Internet or CD ROM to seek information on food materials, technical information, existing products, lifestyles and environments
 - use survey software to generate questionnaires and to present information gathered
 - use grammar and spell checks to correct written coursework
 - use e-mail to communicate with outside agencies when seeking information
 - present and analyse information using charts generated in a database or spreadsheet
- ÷ generating ideas
 - use a digital camera and scanned images to produce source material as a starting point for creative design ideas
 - use 2D draw and paint packages and CAD software to generate, edit and communicate design ideas
- ÷ developing ideas
 - use a CAD package to select and refine final designs and to produce dimensioned working drawings
 - use a 3D food modelling program to produce a visual image of the proposed completed product
 - use a spreadsheet to cost a product and to determine the implications of quantity production
- ÷ considering industrial application
 - use a digital camera to record the sequence of making activities and to show processes used in producing a coursework project
 - use computer-generated flowcharts to plan the sequence of activities in manufacturing the designed product
 - use HACCP and HASAP software simulation to test proposed manufacturing processes for 'safe' food production
- ÷ making
 - use a 2D draw program to produce a template or food cutting design (eg biscuits, burgers) to be printed out for use in accurate repeat drilling
 - use a 2D draw program to produce images to apply to the surface of food packaging
 - use a cutter/plotter to produce shapes in thin materials for attaching to nursery furniture as decoration
 - use of CAM in food production to produce items of repeatable quality ie use of a bread machine to produce identical loaves and microwave ovens to ensure uniform cooking times.

Use of ICT in Systems and Control Technology

Students are encouraged to use ICT where it enhances the content and presentation of coursework in systems and control technology. It is expected that generic software packages such as word processing and desktop publishing will be widely used, but also that students will consider using more specialist applications where they are available.

Students will not be penalised for non-use of ICT in areas where it is not assessed.

Students may choose to use some of the following when:

- ÷ researching information
 - use a database ie Internet or CD ROM to seek information on electronic circuitry, mechanisms and materials available, technical information, existing products, lifestyles and environments
 - use survey software to generate questionnaires and to present information gathered
 - use grammar and spell checks to correct written coursework
 - use e-mail to communicate with outside agencies when seeking information
 - present and analyse information using charts generated in a database or spreadsheet
- ÷ generating ideas
 - use a digital camera and scanned images to produce source material as a starting point for creative design ideas
 - use circuit-modelling software to test and simulate ideas. Use CAD software to generate, edit and communicate design ideas
- ÷ developing ideas
 - use an electronic circuit-modelling program to develop component values and theoretically test the performance of the final circuit design
 - use a Printed Circuit Board (PCB) design package to develop and refine final electronic circuit board designs
 - use ‘autorouting’ facilities to simulate industrial applications in electronic circuit board design
 - use a 3D modelling program to produce a visual image of the proposed completed mechanical or electronic product
 - use a spreadsheet to cost a product and to determine the implications of quantity production
 - use toolpath simulation to test for safe cutting when using Computer Numerical Control (CNC) machinery
- ÷ considering industrial application
 - use a digital camera to record the sequence of making activities and to show processes used in producing a coursework project
 - use electronic auto-routing to highlight advantages and drawbacks of this facility
 - use computer generated flowcharts to plan the sequence of activities in manufacturing the designed product
 - use CNC software to simulate graphically the machining process for design details of a product

÷ making

- use a 2D draw program to produce a template or jig design for use in mechanical construction
- use a PCB design program to produce printed images of circuit board designs to apply to acetate sheets for photo-etching
- use a cutter/plotter to produce logos and shapes in thin materials for attaching to cases for electronic or mechanical products
- use a CNC machine to produce products of repeatable quality ie use a milling machine to produce cut-outs for speakers and switches, or a lathe to manufacture identical sets of wheels
- use a CNC router to make a wooden former for use in vacuum forming.

Appendix C – Edexcel set tasks

Resistant Materials Technology

- 1 The local branch of the local wildlife conservation society requires a bird-feeding table to sell in its town centre shop. In particular it needs small, attractive, weather resistant bird-feeding units to cater for a variety of situations, foods and bird types.

Your task

Research bird-feeding habits and food types.

Design and make bird-feeding unit in resistant materials, no larger than 400mm x 400mm x 400mm excluding hanging or mounting system for sale as a flat pack in the wildlife conservation shop.

The product must be designed for quality and quantity.

Production by volunteer home out-workers.

- 2 A local photographic club requires a folding table-mounted camera stand. The stand should fold to a compact size for storage and transport. It must have a standard screw fitting to attach to the base of cameras. It will possibly have the ability to be angled and will be made of metal or other durable and attractive materials.

Your task

Research methods of supporting photographic equipment.

Design and make a table-mounted camera stand in resistant materials, to be made of metal or other materials to give a quality appearance for sale to camera club members.

The product must be designed for quality and quantity.

Production by a local engineering firm.

- 3 A local charity needs a new range of hand-made products to sell in its town centre shop. In particular it needs small, attractive and decorative table decorations for a range of candles that it sells. The candle decoration will be made of metal and metal casting and will be both attractive, safe and stable so that it presents no fire risk.

Your task

Research candle decorations in the home.

Design and make a table display in resistant materials, to be made in beaten, drawn or cast metal for sale in the charity shop.

The product must be designed for quality and quantity.

Production by a local occupational therapy workshop.

- 4 A local music shop requires a compact disc holder to promote their company.

The holder should accommodate a number of discs, be of high quality finish and suitable for standing on a surface or wall mounted.

Your task

Research storage of compact discs.

Design and make a disc storage unit in resistant materials, to hold a specified number of disc storage boxes for sale in a chain of music stores.

The product must be designed for quality and quantity.

Production using renewable resources in a third world country.

- 5 A local playschool needs a range of furniture to be used by the toddlers in its classes. In particular it needs a small attractive novelty stool which the toddlers will enjoy using. It will have an amusing novelty theme, be strong, robust and stable. The finish must be bright, easily cleaned and safe.

Your task

Research children's furniture.

Design and make a child's stool in resistant materials, to fit a child between three and five years old for use in the playschool.

The product must be designed for quality and quantity.

Production by the local occupational therapy workshops.

- 6 A local cycle shop needs a cycle stand, which will support one cycle. It will either be free standing in the garden or used to store the cycle in the garage. The stand will only hold one cycle. It will be made of strong durable materials with protective finish.

Your task

Research storage of cycles in the home.

Design and make a cycle in resistant materials, to support the cycle by either the wheel or frame for sale in the local cycle shop.

The product must be designed for quality and quantity.

Production by a local engineering company.

- 7 A local computer firm require a 3.5-inch floppy disc holder to promote their company.

The holder should accommodate a maximum of 10 discs, be of high quality finish and suitable for standing on a desk. It should have a design quality that makes it and the company logo noticable.

Your task

Research storage of computer discs.

Design and make a disc storage unit in resistant materials, to hold a specified number of 3.5 discs for distribution as a promotional gift.

The product must be designed for quality and quantity.

Production by computer assisted manufacture.

- 8 A local technical college needs a range of drawing equipment that can be made by the students. In particular they would like a simple drawing board with a parallel motion straightedge that can be used by students at home.

Your task

Research drawing devices.

Design and make a drawing board in resistant materials, to accommodate either A3 or A4 paper for sale to the students.

The product must be designed for quality and quantity.

Production to be provided as a kit for student completion.

- 9 A local course-fishing club require a small, good quality, tackle box that can be sold to its members to raise funds for the club. It is to hold floats and other small items of tackle so that they are separated, easily found and kept safe and ready for use.

Your task

Research storage of fishing tackle.

Design and make a prototype tackle storage container in resistant materials, no larger than 450mm x 450mm x 50mm for sale in the club.

The product must be designed for quality and quantity,

Production by a local craftsman, who will make it using machinery.

- 10 A local craft society needs a new range of hand-made products to sell in its town centre shop. In particular it needs small, attractive and high-quality storage for jewellery. Quality of design and excellent finish are important factors.

Your task

Research storage systems for jewellery.

Design and make a storage product in resistant materials, no larger than 300mm x 150mm x 100mm for sale in the craft shop.

The product must be designed for quality and quantity.

Production by enthusiastic amateur crafts persons.

- 11 A local craft society needs a new range of hand-made products to sell in its town centre shop. In particular it needs a small, attractive and high-quality storage tree for jewellery. Quality of design and excellent finish are important factors. The design is to sit on the surface of a dressing table and needs a stable base, probably of cast metal or similar.

Your task

Research storage systems for jewellery.

Design and make a jewellery storage tree in resistant materials, no larger than 400mm high x 180mm x 180mm for sale in the craft shop.

The product must be designed for quality and quantity.

Production by enthusiastic amateur crafts persons.

- 12 A local craft society requires a new range of hand-made jewellery to sell at fairs. The jewellery is to be designed to appeal to teenagers and should be modern, good quality and attractive. The range of pieces should follow a design theme.

Your task

Research modern costume jewellery.

Design and make jewellery in resistant materials, to be worn on the body or clothes for sale at the craft fairs.

The product must be designed for quality and quantity.

Production by amateur jewellers.

- 13 A local ironmonger needs a new range of hand-made products to sell in a town centre shop. In particular there is a need for small, attractive and amusing key storage devices for the safe and logical storage of a number of keys in either homes or commercial premises.

Your task

Research secure storage of keys.

Design and make a storage product in resistant materials, no larger than 300mm x 300mm x 50mm for sale at the key cutting counter of the ironmongers.

The product must be designed for quality and quantity.

Production by volunteer home out-workers.

- 14 A local charity runs a occupational therapy workshop. They require a range of toys that are powered by hand and use mechanisms to add movement to a theme. The mechanical novelty toy will be amusing, well made, safe and have a number of moving parts. It should be designed to be made by hand but the use of jigs for accuracy is to be encouraged. The finish is to be high quality, bright and non-toxic.

Your task

Research mechanisms and novelty mechanical toys.

Design and make a mechanical toy in resistant materials, no larger than 400mm x 300mm x 100mm for sale in the charity shop.

The product must be designed for quality and quantity.

Production by volunteer in the occupational therapy workshop.

- 15 A local horticultural society requires a flower or plant display stand to be used at their summer show. The stand should hold a number of pots in an attractive display. The design will be free standing and of a durable construction. Each exhibitor at the show will have the same stand.

Your task

Research methods of holding and displaying flowers and plants.

Design and make a plant display system in resistant materials, no larger than 1 metre high and free standing.

The prototype is to be assessed by the club for use in their summer show.

The product must be designed for quality and quantity.

Production by a local craft consortium.

- 16 You have a problem in your house with the remote controllers for a variety of electrical equipment. It has been suggested that you could tidy up these devices with a stand or holder. The stand should be free standing, of attractive appearance and hold a specific number of controllers in a neat and safe manner.

Your task

Research sizes and shapes of remote controllers.

Design and make a remote controller storage unit in resistant materials, to hold a specified number of remote control senders for use in your home.

In addition to the prototype that you will make you should consider the product being made in quantity production for sale in a large retail outlet.

- 17 A local angling club requires a stand for fishing rods. The design will be for either a riverbank stand or a beach fishing stand. The stand should accommodate one or two rods so that they are secured and out of the water, dirt and sand. It will be made from non-corroding and durable materials and have a high quality and attractive finish.

Your task

Research stands for fishing equipment.

Design and make a rod stand in resistant materials, to hold more than one rod for use by fishing club members.

The product must be designed for quality and quantity.

Production by a local engineering company.

- 18 A local hospice needs a new range of hand-made products to sell in its town centre shop. In particular it needs a small, attractive side table to stand by the side of a chair. The table will hold a cup and plate at a good height when you are sitting down. It is to be made in an attractive wood with a durable, high-class finish.

Your task

Research table heights and designs in the home.

Design and make a small side table for a specified position in resistant materials, no larger than 300mm x 300mm x 1000mm high for sale in the charity shop.

The product must be designed for quality and quantity.

Production by the local occupational therapy workshops.

- 19 A local sports club requires a set of badges or brooches for their officers and members. The badges will denote the club name and activity and possibly the rank of the wearer. The badges will be of metal, or similar high quality material that will be both attractive and durable. There must be a method of attaching the badge to clothing, or to the front of a vehicle.

Your task

Research badge design and sports logos.

Design and make a badge system in resistant materials, of a size suitable to be worn on a lapel or fixed to a motor vehicle for sale to sports club members by post.

The product must be designed for quality and quantity.

Production by a local craft consortium.

- 20 A local allotment society would like a hand-made novelty bird scarer that can be sold to their members and used to scare pests from their gardens. It needs to be wind powered, durable, weather resistant and attractive. It will be mounted on the top of a pole driven into the ground, it should have a novelty appeal and be completed with a durable finish.

Your task

Research wind-driven mechanisms.

Design and make a wind driven novelty in resistant materials, no larger than 400mm x 300mm x 300mm to be mounted on a pole, maximum diameter 30 mm.

The product must be designed for quality and quantity.

Production by volunteer home out-workers.

Graphic Products

Definition

The making in a graphic product should always result in **both** two dimensional (2D) and three dimensional (3D) outcomes.

The 3D outcome must be supported by and linked to the 2D outcome. Together both of these outcomes will be assessed in a holistic way as the graphic product.

The two parts of the graphic product (2D and 3D outcomes) must be produced in addition to the work produced for the coursework design folder. The design brief, specification and subsequent design activities must relate directly to the proposed outcomes.

2D outcomes can be made from traditional or modern graphical media.

3D outcomes can be made from a range of appropriate materials.

One part (either 2D or 3D) or all of the graphic product must be commercial ie is capable of being produced in quantity either batch or volume production. However the graphic product (2D and 3D parts) can be produced by the candidate as a one-off prototype.

-
- 1 A local primary school needs packs of birthday invitations to sell at the Autumn Fete. In particular it needs pop-up invitations suitable for the under-five age group.

Your task

Research three existing pop-up cards and the mechanisms used.

Research three birthday invitations for the under-five age group.

Design and make:

- ÷ a pop-up invitation card that will fit into a normal 160mm x 115mm envelope and be suitable for a four-year-old
- ÷ a poster to be used at the Fete to promote the sale of the cards.

The final designs for the cards should be suitable for a production run of 200, using school resource facilities. Only one copy of the poster will be needed.

- 2 A local film company is developing a new video cartoon about a friendly scarecrow.
The story-line features the scarecrow, three girls and one boy, their little dog and many of the animals of the countryside.

The scarecrow helps the young children when they get lost in the country.

Your task

Research the design and construction of three cardboard video-tape covers.

Design and make:

- ÷ a card cover for the video tape called The Scarecrow
- ÷ a poster to promote the sale of the new video.

The final design for the video-tape cover should be suitable for a production run of 5000. 200 copies of the poster will be required.

- 3 A major manufacturer has decided to promote a new breakfast cereal with a range of cut-out, self assembly, jointed, puppets printed on the back of the boxes.

The puppets are to be based on nursery rhyme characters.

Your task

Research a small range of nursery rhyme characters.

Research the construction and assembly of jointed puppets.

Select one nursery rhyme character.

Design and make:

- ÷ one cut-out, jointed puppet to be printed onto the back of a cereal box measuring 296 mm x 210 mm
- ÷ diagrammatic instructions for the cutting out and assembly of the puppet.

The final designs must be suitable for a high-volume production run.

- 4 A local primary school needs a range of educational jigsaw puzzles to occupy children during wet lunchtimes.

The jigsaw puzzles must involve an educational element and be appropriate for the target age group.

Your task

Research three appropriate jigsaw puzzles and their packaging.

Research suitable educational themes for the jigsaw puzzle.

Identify the target age group for the jigsaw puzzle.

Design and make a jigsaw puzzle and its packaging to occupy children of a specified age during wet lunchtimes.

Five copies of the final design will be required using school facilities for colour printing or colour photocopying.

- 5 A local shop is about to promote a new mobile phone aimed particularly at the teenage market.

The window display in the shop is to show a large-scale model of the phone presented on a three-dimensional promotional stand.

Your task

Research both the construction and applied graphics of three different mobile phone window displays.

Choose a suitable existing mobile phone to model.

Design and make a 2:1 scale model of a mobile phone together with a flat-pack display stand to promote the phone.

Five sets of the final designs will have to be produced for the window display.

- 6 A major stationery company needs to promote the sale of coloured pencils.

It has been decided to give away a 'free' rack with all packs of 12 pencils.

The rack must be made of card, of a flat-pack design for ease of storage and transport, yet easily assembled.

Your task

Research three existing flat-pack storage racks.

Research three pencil racks.

Design and make:

- ÷ a flat-pack rack to hold and display 12 pencil crayons. The rack should be assembled from a single piece of card no larger than 296mm x 210mm
- ÷ a high quality 'concept' presentation drawing of the assembled rack holding the 12 pencil crayons.

The final design for the rack must be suitable for a high-volume production run.

- 7 A local primary school needs a teaching aid to explain the working of a torch. The teaching aid must be made of card and allow the parts to be removed and replaced during the teaching explanation.

Your task

Research three teaching aids used with primary children.

Research the components and workings of a torch.

Design and make:

- ÷ a card teaching aid of a torch for primary children
- ÷ a high quality 'concept' presentation drawing of the teaching aid.

The final design for the teaching aid should be suitable for small-batch production.

- 8 A local charity needs a new range of hand-made products to sell in the charity shop. In particular, novelty covers are needed to fit over tissue boxes. The covers should appeal to a specific target market. The tissue boxes measure 240mm x 120mm x 75mm. When the cover is in place it should be possible to remove tissues from the box.

Your task

Research suitable themes for the novelty box cover.

Design and make:

- ÷ a novelty tissue box cover for sale in the charity shop
- ÷ a high quality 'concept' presentation drawing of the tissue box cover.

The final design for the tissue box cover should be suitable for batch production.

- 9 A manufacturer of cosmetics wants to promote a new spray perfume, called **STYLES**, by sending out free samples through the post. The sample bottle and cap is in the form of a cylinder, 40mm diameter x 80mm high. To protect the free sample and promote the new perfume, a card package is needed for sending in the post.

Your task

Research three existing packages for cosmetic products.

Research lettering styles, use of colour, graphics and statutory package information.

Design and make:

- ÷ a promotional package for the free sample of Styles
- ÷ a high quality 'concept' presentation drawing of the package.

The final design must be suitable for a high-volume production run.

10 A successful company needs a new shop sign for all of its high-street outlets.

The company is called **DAVID TECHNOLOGY INTERNATIONAL**.

The new shop sign should include the name of the company and a logo based on the initial letters D, T, and I.

The sign will need to be 3000mm x 1000mm.

Your task

Research three existing shop signs.

Research three existing commercial logos.

Design and make:

÷ a 1:10 scale model of a new shop sign for the company based on a suitable shop frontage

÷ a high quality 'concept' presentation drawing of the shop sign.

Five sets of the signs will have to be produced for the new shops.

11 A new popgroup is about to commence a world tour. To promote the tour, T-shirts are needed with the words: **WHITEHOUSE – see them live**.

Your task

Research three existing T-shirt designs.

Research three existing pop-group promotions.

Design and make:

÷ a T-shirt for the pop-group: Whitehouse

÷ a high quality 'concept' presentation drawing showing a person wearing the T-shirt.

The final design for the T-shirt must be suitable for a high-volume production run.

12 A local drama group need to promote their next pantomime called Cinderella to be performed in your school.

It has been decided to promote the pantomime using a large mobile hanging in the entrance hall of the school.

For the purposes of this project you have to decide all necessary details of performance times, ticket prices, etc.

Your task

Research three existing promotions for drama productions.

Research the construction of at least one mobile.

Decide all of the details needed to be included on the mobile in order to effectively promote the pantomime.

Design and make a 1:10 scale model of a mobile, to be hung in the school entrance hall, to promote the pantomime, Cinderella.

The final solution should be presented in the form of a model, together with a high quality 'concept' presentation drawing of the mobile.

- 13 A major stationery company called **PARUL PENS** is to market blister packs of three ball-point pens at special three-for-two prices. The packs will contain one of each of blue, black and red pens.

Your task

Research the design of three blister packs: materials, manufacture, package information, lettering styles, colour, display methods, etc.

Design and make:

- ÷ a blister pack display for three ball-point pens on a three-for-two promotion
- ÷ a high quality 'concept' presentation drawing of the blister pack displayed in a shop.

The final design for the blister pack must be suitable for a high-volume production run.

- 14 Imagine that you have, with a budget of £1,000, decided to re-design the layout, furnishings and decoration of your bedroom.

Your task

Research your own needs for the bedroom.

Research a small range of bedroom furniture and decoration.

Research the materials and construction of at least one architectural model.

Design and make a model to show your proposals for the re-design of your bedroom.

The final design should be presented in the form of a model, together with a high-quality 'concept' presentation drawing.

- 15 A major manufacturer has decided to develop a new board game based on a currently popular television drama series. The game should involve the rolling of dice and the movement of pieces around the board.

Your task

Research three existing board games and their packaging.

Investigate and then select one television programme suitable for development as a board game.

Decide and produce the list of rules for the new game.

Design and make a board game and its packaging based on a current television drama series.

The final design should be suitable for high-volume production.

- 16 A major manufacturer has decided to develop a new brand of toothpaste called **GLEAM**, aimed particularly at the teenage market.

Your task

Research the graphic designs on both the tubes and the packaging for three existing brands of toothpaste.

Research the popularity with the teenage market of different brands of toothpaste.

Design and make:

- ÷ both the graphics for the paste tube and the packaging for the new brand of toothpaste called Gleam
- ÷ a high quality 'concept' presentation drawing of the toothpaste pack displayed in a shop.

The final design for the package should be suitable for high-volume production.

- 17 A local amateur drama group is to stage a production of Sir Lancelot.

All of the action of the play takes place in a large baronial hall containing the famous Round Table.

The drama group need a design for the stage set for the play.

Your task

Research the construction of stage sets.

Research the architectural detail of castle interiors of the time of the play.

Research the shape, size and facilities of one suitable stage.

Design and make a scale model of a stage set for a production of Sir Lancelot.

The final design should be presented in the form of a model, together with a high-quality 'concept' presentation drawing.

- 18 A major manufacturer of sports equipment is to promote the sale of golf balls by using a re-packaging exercise.

The new package must be both interesting and unique, and hold three golf balls, 12 golf tees and one ball marker.

Your task

Research the design and construction of three current packages for golf balls.

Design and make:

- ÷ a package to hold and promote the golf balls, tees and marker
- ÷ a high quality 'concept' presentation drawing of the golf pack displayed in a shop.

The final design of the package should be suitable for high-volume production.

- 19 A local council has decided to develop part of a local park as a garden for the disabled, mainly those who are blind or in a wheelchair.

Your task

Research existing garden facilities for the disabled.

Research the problems experienced by disabled people when visiting conventional gardens.

Design and make a scale model for a garden for the disabled. Include details of facilities and layout.

The final solution should consist of a model, together with a high-quality 'concept' presentation drawing.

- 20 A local animal sanctuary needs small charity collection boxes which can be placed in libraries and museums.

Your task

Research the design and construction of three existing charity collection boxes.

Design and make:

- ÷ a one-piece development charity collection box for the animal sanctuary
- ÷ a high quality 'concept' presentation drawing of the collection box displayed in a library.

The final design for the collection boxes should be suitable for low-volume production.

Textiles Technology

- 1 A local school is producing a musical.

Your task

Research promotional banners.

Design and make a fabric banner to advertise a musical production.

The banner must be designed for production in a small-batch.

- 2 Young people take great pride in their appearance.

Your task

Design and make a range of fabric hair accessories to be sold at a craft fair.

- 3 Designs of ties have changed throughout the centuries.

Your task

Research the history of ties.

Design and make a range of customised ties to be sold at a craft fair.

- 4 A zoo needs soft fabric toys for sale in its souvenir shop.

Your task

Design and make a toy or toys for sale in the zoo shop.

- 5 Parents of young babies often have a number of things such as feeding bottles and nappies which they need to carry with them when going out.

Your task

Design and make a fabric container to carry these items safely.

The product should be designed to be manufactured as a small-batch for sale in a children's wear shop.

- 6 In summer children need to be protected against strong sunlight.

Your task

Design and make a protective item of clothing for a child to be sold in a children's boutique.

- 7 A local band needs an item of clothing to identify and promote them.

Your task

Design and make an item of clothing such as a waistcoat which would enhance the group's identity.

The product should be designed to be made as a small-batch production.

- 8 A local school has an open evening at which there are going to be cookery demonstrations.

Your task

Design and make an item of protective clothing for a young cook to meet the public food hygiene requirements.

The item is to be produced in a small batch.

- 9 A company specialising in soft furnishings is designing a new range of products to enhance the comfort of a block of seaside holiday apartments.

Your task

Design and make an item of soft furnishings to be manufactured in quantity.

- 10 School students often have to carry sports equipment such as cricket bats or hockey sticks.

Your task

Design and make a fabric container to carry lightweight sports equipment.

The container must be made as a small-batch production.

- 11 Babies learn about the world around them by touching.

Your task

Design and make a fabric toy to teach a baby about different textures.

- 12 A company specialising in children's toys, wants to make a fabric toy which will help promote children's physical development indoors.

Your task

Design and make a fabric item which will help a young child exercise safely indoors.

- 13 A company specialising in producing bedroom furnishings plans to produce a new range of minimalist bedroom items for young people setting up their first home.

Your task

Design and make an item or items of coordinated bedroom furnishings to be produced in quantity.

- 14 A national car company has showrooms with public seating areas where they display fabric wall hangings to promote the company's image.

Your task

Design and make a fabric wall hanging to promote a car company.

The item should be produced as a small-batch.

15 Theme parks are visited by children of all ages.

Your task

Design and make a range of themed fabric products to be produced in quantity and sold to visitors of all ages as souvenirs.

16 A local riding school needs fabric covers for ponies to keep them warm and dry during the night.

Your task

Design and make a protective fabric cover for ponies to be manufactured as a small-batch.

17 A local riding school sometimes has to take horses out in the dark.

Your task

Design and make reflective fabric items which can be attached to horses to make them more visible in traffic.

The items must be produced in quantity.

18 People of all ages own small items such as tools, hair accessories, socks etc which they need to store and have easy access to.

Your task

Design and make a wall hanging with pockets to store small items.

The wall hanging should be designed to be sold by a small mail-order company.

19 You have been commissioned by a garden centre to design and make a fabric item with an appropriate theme to be sold in their shop.

Your task

Design and make a fabric item to be sold in a garden centre.

The item must be manufactured in quantity.

20 Young children need to learn to do and undo fastenings in order to be able to dress and undress themselves.

Your task

Design and make a fabric toy which will develop a child's manipulative skills.

The toy must be designed to be sold by a mail-order company.

Food Technology

- 1 Large supermarket chains are always looking to increase their range of ready-prepared meals. Research has shown that there is a gap in the market for vegetarian ready-prepared products for one.

Your task

Research products available at present and consider the needs of vegetarians.

Design and make a suitable vegetarian dish for one.

Your design should be suitable for small-scale trial production by the supermarket food technologists.

- 2 Soup is a quick and convenient food. There has been a large increase in the range of ready-prepared soups available.

Your task

Research the range of soups available.

Design and make a soup suitable for quality batch production in a local café. Cost is an important factor as profit margins are tight in such a small concern.

Leftover products must be suitable to be kept safely overnight for sale the next day.

- 3 A local company specialising in the manufacture and delivery of meals for the elderly is looking to extend its range.

Your task

Research the needs of the elderly.

Design and make a food product that would be suitable for a midday meal for an elderly person.

The product must be designed for daily, quality batch production in the small company kitchen. Consider the storage and transportation of the food.

- 4 Pasta is a cheap, filling and nutritious food.

Your task

Design and make a pasta dish that can be made in advance, chilled and then reheated by the catering manager at the local rugby club to serve to the home and opposing teams.

Your product should be suitable for quality batch production.

- 5 The proportion of people who are overweight in the UK is increasing. A large number of these people wish to lose weight in an attempt to prevent associated health disorders and simply to feel happier with their own appearance.

Your task

There are already a range of reduced-fat cakes and biscuits on the market.

Research those available.

Design and market a cake or biscuit with a reduced-fat content that is still appetising and appealing to people.

Your design should be suitable for one-off manufacture so that it can be demonstrated and tasted at the next slimming club meeting in your area. Consider the possibility of batch production of this product.

- 6 The government has identified the need to increase the quantity of fresh fruit and vegetables eaten by school children today, to ensure that their diets meet the latest government dietary guidelines.

Your school canteen is looking for ways to improve their weekly menu to address this new directive from the government.

Your task

Research the needs and requirements of school children and consider the needs of the school canteen manager.

Design and make a food product that could be introduced to the existing menu to increase and enhance the quality and quantity of fresh fruit available to school children from the school canteen.

Your product must be designed for quality batch production.

- 7 There is a hugely popular and profitable range of take-away ready-prepared filled sandwiches in food outlets nowadays. They meet the needs of people's lifestyles of having to 'eat on the go'.

Your task

Research the range of take-away sandwiches available and alternative foods offered by food outlets.

Design and make an alternative food product to the basic sandwich.

Your design should be suitable for daily quality food production by a local sandwich van operator.

- 8 A new charter airline flying to European destinations has decided to include a meal for longer-distance flights. The meal should reflect the airline's low-cost ticket price but still maintain a quality profile for the company.

Your task

Research current airline meals and consider the various personal preferences of customers using the airline.

Design and make a suitable main course for inclusion in the meal. Fruit juice will be served as a starter and a simple mousse served as dessert.

The product must be designed for daily batch production in the airline's own kitchen unit and must be suitable for overnight storage for eating next day.

- 9 A local hospital is to open a fresh food bar for older people who attend their day centre. They need a new range of snack foods to meet the needs of the older people attending.

Your task

Research fresh food bars, healthy food products and the possible needs of older people attending the centre.

Design and make a food product that meets the needs of both the hospital and the older people in the day centre.

The product must be designed for daily, quality batch production by volunteer workers. Left-over products must be able to be kept safely overnight for sale next day.

- 10 Many cultures celebrate festivals and special occasions with sweet foods.

A major biscuit manufacturer is looking to develop a range of novelty biscuits to celebrate special occasions. The manufacturer has devised a schools-based competition to provide them with ideas for future ventures.

Your task

Research a range of cultures and festivals.

Design and make a special occasion biscuit that could be entered in the manufacturer's competition.

Your design must be appropriate for quality and quantity batch production in a school's food technology kitchen by school children.

- 11 In the food industry, manufacturers frequently buy standard components to save preparation time. They also help guarantee a uniform look and taste.

Your task

The local Women's Institute (WI) want to increase the range of savoury flans available for sale at their weekly market stall. Ready-made pastry cases are readily available in supermarkets.

Design and make a range of savoury fillings that could be placed in a standard component pastry case.

Your design should be appropriate for weekly quality production by WI members in their homes.

- 12 The incidence of dietary intolerance is on the increase in the UK. It is especially prevalent in children. Many parents are then faced with the problem of providing nutritional and appealing packed lunches for these children to take to school.

Your task

Coeliac disease is one such food intolerance complaint.

Research the needs of coeliacs, together with the needs of school children.

Design and make a baked savoury product that could be included in the lunch box of a child suffering from coeliac disease.

Your design should be appropriate for quality small-scale batch production in the home and consideration should be given to the freezing and storage of product items made, for use in future lunch boxes.

- 13 The health authority in your area, in conjunction with local schools, wants to promote healthy eating. It wants to make people aware of the government's latest dietary guidelines.

To do this it is running a series of food technology competitions in schools, encouraging people to modify traditional recipes to improve the nutritional content of dishes.

Your task

Research up-to-date government dietary guidelines.

Design and make a 'healthier' version of a traditional cake or biscuit that could be sold in a volunteer-staffed hospital tea-room. The design should retain the appetising qualities of the original recipe.

The product must be designed for quality and quantity batch production.

- 14 A local delicatessen sells fresh pasta and is looking to increase the volume it sells.

One way it intends to do this is to introduce a range of fresh sauces to accompany the pasta.

Your task

Research the sauces that could be served with pasta and consider the needs of the delicatessen owner.

Design and make a fresh sauce that could be sold in the delicatessen.

Your design should be suitable for daily quality batch production in a small industrial kitchen. Left-over products must be able to be kept safely overnight for sale the next day.

- 15 There has been an increase in the range of healthy cereal snack bars available in supermarkets in recent years. These help 'fill the gap' between meals and even sometimes replace a meal when time is short. The tuck shop at your local school wishes to introduce a healthy cereal snack bar to encourage pupils to reduce the amount of chocolate bars they buy.

Your task

Research cereal snack bars and consider the needs of school children buying a snack food to fill the gap between breakfast and lunch.

Design and make a cereal snack bar that meets the needs of school children at break time.

Your design must be suitable for daily quality batch production by volunteer 6th form tuck shop committee members.

- 16 The range of frozen fast foods specifically produced for children is vast, but in these days of health awareness parents often wish to provide a less processed diet for their children.

The local nursery provides lunch for the children that stay all day. Once a week they serve a beef burger, bread bun and salad for lunch.

The catering manager would like to serve an alternative to a processed beef burger.

Your task

Research the range of burgers available and suitable alternative food materials. Consider the needs of the children and also those of the catering manager.

Design and make a fresh nutritious alternative to a frozen beef burger to go with the bun.

Your design should be appropriate for small quantity batch production in the nursery kitchen.

- 17 Meat alternatives are becoming ever more popular.

Quorn has proved to be a versatile and successful alternative to meat.

Your task

Research the availability and uses of Quorn.

Design and make a main course dish using Quorn as an alternative to meat, which could be used in a local restaurant as vegetarian option on the menu.

Your design should be suitable for small-scale batch production.

- 18 People living in bedsits may have a low income and limited cooking facilities. They may also have few culinary skills.

Your task

Consider the needs of such people.

Design and make a meal that can be prepared on a single-ring cooker with limited utensils.

Your design must be suitable for one-off production. Consider the storage of leftovers for use at a later date.

- 19 As lifestyles are getting increasingly busier, food manufacturers have taken the opportunity to produce quality ready-made dishes suitable for use at social gatherings. This saves the host from having to find time to prepare food.

Your task

Research the range of ready-prepared desserts on the market suitable for serving at a dinner party.

Design and make your own dessert that could be a batch produced by a leading food manufacturer.

- 20 A family member was recently told by a doctor that she should cut down on her fat intake as she has a high cholesterol level which could affect her health. Unfortunately she is particularly fond of cheesecakes.

Your task

Design and make a reduced-fat, reduced-cholesterol cheesecake.

Your design will be a one-off production, but consider the possibility of batch production if the cheesecake was successful.

Systems and Control Technology – Electro/Mechanical

- 1 Model railway enthusiasts use accessories to enhance the realism of their systems. Automatic triggering of devices is a particularly effective way of adding realism.

Your task

Research how automatic level crossings operate.

Design and make a system that will sense electronically the approach of a slow-moving model train and will raise the mechanical arm of a level crossing gate.

The electronics of the system should be protected and the gate must return to the closed position.

The design should be suitable for small-scale specialist production.

- 2 Children sustain interest for longer in toys that are dynamic in their use. Visual features and movement are key features of interest.

Your task

Investigate mechanisms that produce interesting output movement and electronic circuitry that produces lighting effects.

Design and make a pull-along toy that uses both types of output to good effect.

The product must be safe to use and be robust enough to withstand day-to-day use.

Design should be suitable for medium-batch production.

- 3 When families with pets are on holiday, it is often a problem to arrange for regular feeding of their animals.

Your task

Research automatic feeding methods for pets.

Design and make a device that will deliver a pre-measured amount of fish food into the fish tank once a day.

The design should use electronic timing and mechanical movement to deliver the food.

The design should be suitable for medium-batch production.

- 4 School parents' evenings are busy times and it is often useful to know how many parents have attended.

Your task

Research electro-mechanical methods of counting.

Design and make a device that will record automatically the number of people passing through a simple turnstile on their way to a meeting.

The turnstile mechanism should trigger the electronic sub-system only when people are passing through in a forward direction.

The design should be suitable for one-off specialist production.

- 5 Novelty money boxes encourage saving by offering a visual or audible reward when money is deposited.

Your task

Research electronic timing methods and linkage movements.

Design and make a novelty money box that will produce a short, motor-driven movement of a linkage mechanism when operated.

The timer must switch on when a coin is inserted and output for about 20 seconds. The motor should be geared to run slowly.

The design should be suitable for medium-batch production.

- 6 Games of skill are popular with people young and old and can prevent boredom on long car or rail journeys.

Your task

Research pocket games.

Design and make a game that involves a mechanism at the input and an electronic display at the output.

The game must be small enough to fit into a handbag or large pocket and should be completely enclosed so that no parts can be lost.

The design should be suitable for large-batch production.

- 7 Confectionery and food are commonly available from dispensing machines. This is a convenient way of distributing goods at a low cost.

Your task

Research into how vending machines operate.

Design and make a working model of a machine that will dispense small rolls of sweets when a 20p coin is inserted into the device.

You should use both electronics and mechanisms in your design, which should be suitable for small-scale production.

- 8 When motorists break down at night, they are in potentially dangerous situations, especially if there is a loss of electrical power that affects their lights.

Your task

Research road safety with regard to breakdowns at night.

Design a folding warning triangle that uses flashing superbright LEDs as its output and has a mechanism to lock it into its stable position once it is operated.

The device must be clearly seen at a distance of 40 metres and the electronics must be housed in a weatherproof case.

The design should be suitable for medium-batch production.

- 9 Quick-setting adhesives and solvent cements can quicken manufacturing times if they are used correctly and are clamped for the optimum length of time.

Your task

Research the characteristics of quick-setting adhesives and clamping devices.

Design and make a mechanical clamp that has a built-in electronic device that will give out an audible warning when a pre-set time limit is reached.

The device should be easy to use and have accurate and adjustable time delays.

The design should be suitable for small-batch production.

- 10 Babies enjoy playing or looking at toys before they fall asleep in their cots at night. Mobiles are popular and effective in this task, but need to be switched off after a time.

Your task

Research toys for babies that can be attached to cots and timing devices.

Design and make a rotating attractive toy that can be operated for a pre-determined time before switching off automatically.

The device must be very safe to use and should need no maintenance beyond battery changing.

The design should be suitable for medium-batch production.

Systems and Control Technology – Electronics

- 1 Electronic timing devices are widely used in products as they can be simple in design and accurate in use. Consider a range of board games that give players a limited amount of time in which to take a turn.

Your task

Design and make an electronic timer that can be used when playing a board game.

The timed period must be easily adjustable and the end of the timed period must be clearly indicated.

The design should be suitable for high-volume production.

- 2 Safety at night is an important consideration for cyclists. Oscillating LEDs are more noticeable than those that are on continuously.

Your task

Research some safety lighting devices used on bicycles.

Design and make a flashing LED display suitable for use as a rear warning light on a bicycle.

The frequency of the flashes should be adjustable for maximum effect and the display should be clearly visible at night from a distance of 30 metres. The design must be weatherproof and give easy access to the battery.

The design should be suitable for high-volume production.

- 3 Monitoring conditions in a greenhouse is essential to the good health of plants. Too much cold will damage and destroy delicate plants.

Your task

Design and make an electronic device that will warn a gardener when temperatures are dangerously low.

The device should be adjustable so that it can be set to trigger at a range of temperatures. It should give an audible output warning when triggered.

The design should be suitable for medium-batch production.

- 4 Electronics is used extensively in music to produce sophisticated instruments and sounds. Simple electronic ‘music makers’ are available very cheaply that can be used for entertainment purposes by the unskilled.

Your task

Design and make a child’s electronic organ that can be played by using either a stylus or push buttons.

The design should have a single octave range and should fit easily into a school bag or large pocket.

- 5 Scoring on a board game is usually done by rolling a die or dice. Electronic scoring is quicker and more efficient.

Your task

Design and make an electronic die that can be used to score a board game.

The design should be operated by a push button and should indicate the 'throw' value clearly.

The designed product should be as compact as possible in order to maintain as much space on the board as possible.

- 6 Electronic circuits often do not work first time and need to be de-bugged using a range of test equipment.

Your task

Design and make at least one piece of test equipment that would be useful in troubleshooting a student's electronic project work in schools.

The design should be reliable, safe and easy to use. It should have either an audible or visual output and should be suitable for medium-volume production.

- 7 Security of personal possessions is important and electronic sensing circuitry has enabled reliable alarm systems to be cheaply available. Identify some areas where a personal security device may be useful.

Your task

Design and make a device that will give a warning when personal possessions are being removed without permission.

The device must give an audible output that is latched on and be easily re-set by a 'special tool' that only the owner has access to.

- 8 Amateur sports enthusiasts often train alone to improve their performance or levels of skill. Electronics is often used to help in these situations. Research some methods of training used by sportspeople.

Your task

Design and make an electronic device that will aid a sportsperson in developing their performance.

The device should focus on one aspect of training. It should be easy to use and should be weatherproof for outside use.

- 9 Many young children are afraid of the dark, especially if they wake up during the night and this can lead to disturbed nights for the rest of the family.

Your task

Design and make an electronic device that will automatically switch on and off a low voltage lamp according to the level of daylight.

The device should be adjustable for triggering at different light levels and it should have a manual override switch.

The design should appeal to young children and should be suitable for low-batch production.

- 10 Cheap electronic novelty jewellery is often made for a limited lifespan and is 'throwaway', as there is no access to battery or circuitry. Such jewellery is produced with a theme such as Christmas or Halloween.

Your task

Research some areas of cheap jewellery production to determine materials and sources of ideas.

Design and make some electronic jewellery that could be worn for a party with a theme of your choice.

The designs should be no-maintenance throwaway pieces, they must be cheap to produce and should be noticeable in the dark.

The designs should be suitable for low-volume, hand-assembly production.

Systems and Control Technology – Mechanisms

- 1 Mechanical toys are a source of interest to children. The mechanisms involved and their ingenious use provide differing levels of interest.

Your task

Research some methods of converting types of input movement to other types of output movement.

Design and make a pull-along toy that uses mechanisms to create interest.

The design should be aimed at a particular target market and should be suitable for large-batch production.

Safety will be of great importance in your design.

- 2 Levers and linkages are used to amplify or reduce output movement in comparison with input movement. These principles can be employed in devices that are helpful in everyday life.

Your task

Research the use of levers and linkages in tools and equipment.

Design and make a mechanical device that will enable the user to retrieve small objects from the floor and inaccessible places without having to bend down.

The device should be easy to use and should not damage items being retrieved.

The design should be suitable for medium-batch production.

- 3 People who suffer from arthritis, or who have a weak grip, experience difficulty in holding and removing screw tops from bottles and jars.

Your task

Research problems associated with arthritis sufferers related to holding and manipulating objects.

Design and make a device that will assist in the easy removal of screw tops from bottles and jars.

The device must be adjustable for use with a range of screw top diameters and adjustment must be easy to achieve. Consideration must be given to materials used, as the device should be washed frequently.

- 4 Collecting materials for recycling is a feature of modern-day, environmentally-aware living and many schools are given financial rewards for collecting particular kinds of recyclable materials.

Your task

Research recycling methods for aluminium drinks cans.

Design and make a mechanical device that will crush a can to a minimum height so that many cans can be packed into a small space ready for recycling.

The device must be capable of being loaded and unloaded quickly and it should be easily operated by the youngest students in a secondary school.

The design should be suitable for small-batch production.

- 5 Many special devices are available for holding materials and components in position while they are worked on or fixed together.

Your task

Identify processes in a school workshop that require clamping apparatus to assist in holding materials in a fixed position.

Design and make a mechanical device that will hold the two parts of a mitred joint securely at 90° during gluing.

The device must be adjustable for different sizes of material and should be suitable for large-batch production.

- 6 Birds that feed on seeds sown by gardeners when growing flowers or a new lawn can be a destructive nuisance, causing extra work for the gardener. Bird-scaring devices are available in many forms to combat this problem.

Your task

Research bird-scaring techniques.

Design and make a device that uses mechanisms to convert wind energy to an effective output that will scare birds away from a small patch of garden.

The device should have a novelty theme, be maintenance free and should be robust enough to withstand spring weather.

The design should be suitable for self-assembly by the user.

- 7 Word processing is used extensively by students when presenting assignments and project work and often requires the transfer of information from loose pieces of paper that are awkward to organise.

Your task

Research methods of holding several loose sheets of paper securely so that they can be read easily.

Design and make a mechanical device that can be fixed to a computer monitor to enable a user to hold and organise sheets or documents while typing.

The device should be adjustable for height and be capable of being swung out of position when not in use.

The design should be suitable for high-volume production.

- 8 Many technicians experience difficulties in holding equipment while working in awkward situations to repair or install products where they could use an 'extra hand' to help them.

Your task

Research adjustable holding apparatus.

Design and make a device that will hold a torch securely at a convenient angle.

The design should clip to or stand on convenient surfaces, grip torches of different sizes securely and allow adjustment of angle for shining.

- 9 When teaching courses on mechanisms, it is essential to have a range of good visual aids to illustrate how mechanisms operate, particularly ones that convert one sort of motion to another.

Your task

Identify mechanisms that convert rotary motion to reciprocating linear motion.

Design and make two 3-dimensional visual aids that illustrate clearly how each mechanism works.

The designs should be large enough to be seen clearly by a class of 20 students and should be suitable for small-batch production.

- 10 Mouse infestation is sometimes a problem in old properties and traditional mousetraps can be a cruel method of catching the creatures.

Your task

Research methods of trapping small animals.

Design and make a humane mousetrap that will not harm a captured animal when operated.

The device must sense the presence of a mouse mechanically and use a triggering mechanism that will cause no harm to the trapped animal.

The design should be suitable for small-batch production.

Appendix D – A3 proforma sheets

		Edexcel Design & Technology Coursework Folio Short Course Set Task				
<p style="text-align: center;">Attach the Candidate Mark Record Sheet here (The moderator will need to detach the CMRS)</p>		<p style="text-align: center;">Attach photographic evidence of the completed product here</p>				
						Brief No:
Centre No:	Candidate No:	Candidate Name:		Specification Code:	Year:	Page 1

<p>Sources of information</p> <p><i>List the sources used to gather useful information on your chosen task.</i></p>	<p>A summary of information gathered</p> <p><i>Select only the essential detail from the information you have gathered that will be useful when designing your product.</i></p>	<p>Product specification</p> <p><i>Present a specification that describes the form, function, user requirements and budgetary constraints for your design.</i></p>			
Centre No:	Candidate No:	Candidate Name:	Specification Code:	Year:	Page 2

Outline ideas

Present a range of realistic and imaginative design ideas that address the specification.

Centre No:

Candidate No:

Candidate Name:

Specification Code:

Year:

Page 3

Development of ideas

Develop, model and test a design to produce a realistic design proposal.

Centre No:

Candidate No:

Candidate Name:

Specification Code:

Year:

Page 4

The chosen design

Details of form, size, construction, materials, finish and user information as appropriate to the product.

Centre No:

Candidate No:

Candidate Name:

Specification Code:

Year:

Page 5

Systems and control

Outline system diagrams for the manufacture of the product, showing inputs, process, outputs and feedback.

Work schedule

Detail a work schedule for manufacture and show where performance checks are made. Show where the use of industrial methods of manufacture are used to advantage.

Centre No:

Candidate No:

Candidate Name:

Specification Code:

Year:

Page 6

Manufacture: A summary of activity

Select a range of appropriate tools, equipment and processes and use them with a high degree of skill and accuracy, to safely make a product.

Records of making, modifications to the design and of performance testing during manufacture.

Centre No:	Candidate No:	Candidate Name:	Specification Code:	Year:	Page 7
-------------------	----------------------	------------------------	----------------------------	--------------	---------------

Testing

Develop and use appropriate testing techniques to check the product against all aspects of the specification and users' needs.

Record the results of testing using a range of appropriate communication techniques.

Centre No:

Candidate No:

Candidate Name:

Specification Code:

Year:

Page 8

Evaluation and modifications

*Evaluate the product using the evidence from the test results and considering users' views to suggest and justify modifications.
to the design, materials, manufacturing and use, that may improve the performance of the product.*

Centre No:

Candidate No:

Candidate Name:

Specification Code:

Year:

Page 9

The supplementary sheet <i>One copy of this sheet only may be used to supplement other sheets where extra space is required.</i>		Title			
Centre No:	Candidate No:	Candidate Name:	Specification Code:	Year:	Page 10

Further copies of this publication are available from
Edexcel Publications, Adamsway, Mansfield, Notts, NG18 4FN

Telephone 01623 467467
Fax 01623 450481
E-mail: publications@linneydirect.com

Order Code UG009836 February 2001

For more information on Edexcel qualifications please contact our
Customer Response Centre on 0870 240 9800
or E-mail: enquiries@edexcel.org.uk
or visit our website: www.edexcel.org.uk

Edexcel Foundation is a registered charity and a Company Limited
By Guarantee Registered in England No. 1686164

Edexcel
Success through qualifications