

Getting Started Guide



AS and A Level Design and Technology

Pearson Edexcel Level 3 Advanced Subsidiary GCE in Design and Technology (Product Design) (8DT0)

Pearson Edexcel Level 3 Advanced GCE in Design and Technology (Product Design) (9DT0)

GCE Design & Technology 2017 Getting Started Guide

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Introduction

The subject content sets out the knowledge, understanding and skills relevant to AS and A level Design & Technology.

The key aim of this new qualification is to enable students to:

- Use creativity and imagination when applying iterative design processes to develop and modify designs, and to design and make prototypes that solve real world problems, considering their own and others' needs, wants, aspirations and values.

Students will be able to integrate and apply their understanding and knowledge from Key Stage 4, with a focus on mathematics and science for analysis and informing decisions in design, whilst being open to taking design risks which show innovation and enterprise.

Within the Independent Design and Make Project, students will undertake a substantial design, make and evaluate project. At A level, this will be of their choice. At AS they will respond to one of the contextual challenges. They will create a prototype, by which is meant an appropriate working solution to a need or want that is sufficiently developed to be tested and evaluated; this could be a full-sized product or a scaled working model or functioning system.

This project will require students to follow the iterative design processes of exploring, creating and evaluating.

This Getting Started guide provides an overview of the new GCE specification, to help you understand the changes to content and assessment, and what these mean for you and your students.

We will be providing a full package of support to help you plan and implement the new specification.

- **Plan:** In addition to the section in this guide, there is a Course Planner and Schemes of Work for a co-teachable AS and A level course, as well as a full linear two-year course. These are not meant to be prescriptive, therefore they are available as a Word document so that you can adapt to suit your department, specialisms and resources.
- **Teach:** There will be exemplar materials that you will be able to use with your students.
- **Track and Assess:** In addition to the Sample Assessment Materials, there will be an additional set of exemplar papers created that you will be able to use for a Mock examination.
- **Develop:** There will be Getting Ready to Teach events, both face to face and online training. In addition, there will be specific events targeting the NEA in terms of delivery and assessment, as well as Feedback events after the first assessment in 2019.

These support documents will be available on the GCE 2017 Design and Technology pages.

What's changed?

What are the changes to the GCE qualification?

There is no longer such a range of pathways that awarding organisations can offer. There are now only three possible endorsements that can be offered:

- Product Design
- Fashion and Textiles
- Design Engineering.

Pearson has made the decision to offer one title: Product Design.

The new course is made up of two components; a single paper and a single non-examined assessment (NEA) task.

The weighting of the NEA has been reduced from the current 60% to 50% at both AS and A level, which gives an equal split between the examined component and the NEA.

Maths skills now contribute to the overall qualification and, since Maths cannot be assessed in the NEA, it will be sited in the examination paper, representing 15% of the total paper marks.

There are now four Assessment Objectives, rather than the current two. This is to provide an increased focus on analysis and evaluation.

The AS is now a stand-alone qualification, the results of which will no longer contribute to the overall A level grade.

Changes to Design and Technology content requirements

The content requirements for GCE Design and Technology have been revised. To gain accreditation, all awarding organisations' specifications must meet these criteria.

The new subject content has been split into three sections: Core technical principles, Core Design and Making principles and Specialist knowledge. Students must study a range of material areas; develop an understanding of contemporary industrial and commercial practices; have a good working knowledge of health and safety procedures, as well a sound working knowledge in the use of ICT.

Changes to Assessment Objectives

The GCE Design & Technology assessment objectives have been revised as shown below.

A01	Identify, investigate and outline design possibilities to address needs and wants.	15%
A02	Design and make prototypes that are fit for purpose.	25%
A03	Analyse and evaluate: <ul style="list-style-type: none"> • design decisions and outcomes, including for prototypes made by themselves and others • wider issues in design and technology. 	25%
A04	Demonstrate and apply knowledge and understanding of: <ul style="list-style-type: none"> • technical principles • designing and making principles. 	35%

Changes to specification content

Changes have been made as a result of feedback from all parts of the design and technology subject community, including teachers, subject associations, professional bodies and higher education. We have used this opportunity to redesign a qualification that equips students with design skills for the future and encourages creativity and innovation.

There is some overlap between the new specification and the legacy specifications. Details of the overlap can be found in the mapping documents available on the GCE 2017 Design and Technology pages.

Qualification at a glance

AS Level

Content and assessment overview

The Pearson Edexcel Level 3 Advanced Subsidiary GCE in Design and Technology (Product Design) consists of one externally-examined paper and one non-examined assessment component.

Students must complete all assessment in May/June in any single year.

Component 1: Principles of Design and Technology (Paper code: 8DT0/01)
<p>Written examination: 2 hours 50% of the qualification 100 marks</p>
<p>Content overview</p> <ul style="list-style-type: none"> • Topic 1: Materials • Topic 2: Performance characteristics of materials • Topic 3: Processes and techniques • Topic 4: Digital technologies • Topic 5: Factors influencing the development of products • Topic 6: Effects of technological developments • Topic 7: Potential hazards and risk assessment
<p>Assessment overview</p> <ul style="list-style-type: none"> • The paper includes calculations, short-open and open-response questions, as well as extended-writing questions focused on: <ul style="list-style-type: none"> • analysis and evaluation of design decisions and outcomes, against a technical principle, for prototypes made by others • analysis and evaluation of wider issues in design technology, including social, moral, ethical and environmental impacts. • Students must answer all questions.

- Students must have calculators and rulers in the examination.

Calculators may be used in the examination. Information on the use of calculators during the examinations for this qualification can be found in *Appendix 2: Calculators*.

Component 2: Independent Design and Make Project (Paper code: 8DT0/02)

Non-examined assessment

50% of the qualification

100 marks

Content overview

- Students are required to analyse a given contextual challenge on an individual basis. Selecting a problem to focus on, they develop a range of potential ideas and then realise one through practical making activities.
- Students will develop a range of potential solutions which include the use of computer aided design and evidence of modelling.
- Students will realise one potential solution through practical making activities.
- Students will incorporate issues related to sustainability and the impact their prototype may have on the environment.
- Students are expected to analyse and evaluate design decisions and outcomes for prototypes/products made by themselves and others.
- Students are expected to analyse and evaluate of wider issues in design technology, including social, moral, ethical and environmental impacts.

Assessment overview

- The investigation report is internally assessed and externally moderated.
- Students to undertake a small-scale design, make and evaluate project in response to a realistic contextual challenge set by Pearson, taking the needs and wants of the user into account.
- Contextual challenge is set no earlier than 1 June in the calendar year preceding the year in which the qualification is to be awarded. This will be made available on our website.
- The project will consist of a portfolio and a prototype.
- There are four parts to the assessment:

Part 1: Identifying opportunities for design

Identification and investigation of a design possibility, investigation of client/end user needs, wants and values, research and production of a specification.

Part 2: Designing a prototype

Producing different design ideas, review of initial ideas, development of design ideas into a final design, review of development and final idea and communication of design ideas.

Part 3: Making a final prototype

Design, manufacture and realisation of a final prototype, including tools and equipment and quality and accuracy.

Part 4: Evaluating own design and prototype

Testing and evaluation.

A Level

Content and assessment overview

The Pearson Edexcel Level 3 Advanced GCE in Design and Technology (Product Design) consists of one externally-examined paper and one non-examined assessment component.

Students must complete all assessment in May/June in any single year.

Component 1: Principles of Design and Technology (Paper code: 9DT0/01)

Written examination: 2 hours 30 minutes

50% of the qualification

120 marks

Content overview

Topic 1: Materials

- Topic 2: Performance characteristics of materials
- Topic 3: Processes and techniques
- Topic 4: Digital technologies
- Topic 5: Factors influencing the development of products
- Topic 6: Effects of technological developments
- Topic 7: Potential hazards and risk assessment
- Topic 8: Features of manufacturing industries
- Topic 9: Designing for maintenance and the cleaner environment
- Topic 10: Current legislation
- Topic 11: Information handling, Modelling and forward planning
- Topic 12: Further processes and techniques

Assessment overview

- The paper includes calculations, short-open and open-response questions, as well as extended-writing questions focused on:
 - analysis and evaluation of design decisions and outcomes, against a technical principle, for prototypes made by others
 - analysis and evaluation of wider issues in design technology, including social, moral, ethical and environmental impacts.
- Students must answer all questions.
- Students must have calculators and rulers in the examination.

Calculators may be used in the examination. Information on the use of calculators during the examinations for this qualification can be found in *Appendix 2: Calculators*.

Component 2: Independent Design and Make Project (Paper code: DT0/02)

Non-examined assessment
50% of the qualification
120 marks

Content overview

- Students individually and/or in consultation with a client/end user identify a problem and design context.
- Students will develop a range of potential solutions which include the use of computer aided design and evidence of modelling.
- Students will be expected to make decisions about the designing and development of the prototype in conjunction with the opinions of the client/end user.
- Students will realise one potential solution through practical making activities with evidence of project management and plan for production.
- Students will incorporate issues related to sustainability and the impact their prototype may have on the environment.

- Students are expected to analyse and evaluate design decisions and outcomes for prototypes/products made by themselves and others.
- Students are expected to analyse and evaluate of wider issues in design technology, including social, moral, ethical and environmental impacts.

Assessment overview

- The investigation report is internally assessed and externally moderated.
- Students will produce a substantial design, make and evaluate project which consists of a portfolio and a prototype.
- The portfolio will contain approximately 40 sides of A3 paper (or electronic equivalent).
- There are four parts to the assessment:

Part 1: Identifying and outlining possibilities for design

Identification and investigation of a design possibility, investigation of client/end user needs, wants and values, research and production of a specification.

Part 2: Designing a prototype

Design ideas, development of design idea, final design solution, review of development and final design and communication of design ideas.

Part 3: Making a final prototype

Design, manufacture and realisation of a final prototype, including tools and equipment and quality and accuracy.

Part 4: Evaluating own design and prototype

Testing and evaluation.

Planning

Constructing a coherent course

Time in Year 12 can be spent teaching much of the content, especially topics 1–7 if both AS and A level classes are being taught together.

It is quite likely that, if centres are offering a one year AS course, it could be taught concurrently with the A level course. If this is the case, time will need to be given over to the AS group for them to complete the NEA task in response to the Contextual Challenge.

Alongside the teaching of the content in Year 12, a start can be made on the NEA: The Independent Design and Make Project.

The remaining context, topics 8–12, can be taught in Year 13 as the NEA task progresses.

It is essential that pupils are exposed to Mathematical skills in a variety of contexts at every opportunity over the two- year course.

Delivery models

As the AS qualification will no longer contribute towards the A level, centres will need to decide whether they wish to continue to offer the AS qualification. It should

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be noted that the subject content at AS is identical to work that has to be covered at A level.

There is a course planner and detailed schemes of work available on the GCE Design & Technology 2017 webpage which take account of a delivery approach for both AS and A level. These are word documents and are not prescriptive. Centres may amend and adapt these to suit their students and resources.

Co-teachability example

Year 12		
Autumn	Spring	Summer
Teach everyone Topics 1–7	AS – NEA Contextual Challenge A level – complete NEA as practice making task	AS – revise topics 1–7. Submit NEA, sit AS examination
Year 13		
Autumn	Spring	Summer
A level topics 8–12 Start NEA	Finalise NEA	Revision and examination

Assessment guidance

Implications of linear assessment

All assessment is to take place in the final year as a terminal examination. Therefore, it is essential, if AS is being sat, that the correct Contextual Challenge is used for students. The Contextual Challenges are issued annually, therefore students should use the Contextual Challenge valid for the series in which they are entered for the examination.

Contextual challenges

Our contextual challenges at AS will give students the freedom to take design risks and innovate in a situation where it is safe to test and refine ideas, giving them the confidence at A level to further develop these skills in their own design brief with a client/end user.

It is important to note that candidates will be able choose the route they want to work within, so that they can explore design problems in a field of their own interest or in an area they want to develop skills.

AOs and skills targeted at AS level

AO1	Identify, investigate and outline design possibilities to address needs and wants.	10%
AO2	Design and make prototypes that are fit for purpose.	25%
AO3	Analyse and evaluate: <ul style="list-style-type: none">design decisions and outcomes, including for prototypes made by themselves and otherswider issues in design and technology.	25%

A04	Demonstrate and apply knowledge and understanding of: <ul style="list-style-type: none"> • technical principles • designing and making principles. 	40%
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Breakdown of assessment objectives

Component	Assessment Objectives				Total for all Assessment Objectives
	A01%	A02%	A03%	A04%	
Component 1	0	0	10	40	50%
Component 2	10	25	15	0	50%
Total for GCE	10%	25%	25%	40%	100%

AOs and skills targeted at A level

A01	Identify, investigate and outline design possibilities to address needs and wants.	15%
A02	Design and make prototypes that are fit for purpose.	25%
A03	Analyse and evaluate: <ul style="list-style-type: none"> • design decisions and outcomes, including for prototypes made by themselves and others • wider issues in design and technology. 	25%
A04	Demonstrate and apply knowledge and understanding of: <ul style="list-style-type: none"> • technical principles • designing and making principles. 	35%

Breakdown of assessment objectives

Component	Assessment Objectives				Total for all Assessment Objectives
	A01%	A02%	A03%	A04%	
Component 1	0	0	15	35	50%
Component 2	15	25	10	0	50%
Total for GCE	15%	25%	25%	35%	100%

NEA Administration

Coursework submissions

All paper submission should be made on A3 paper; the work should be well bound and easy to access. The work needs to be clearly labelled with name and centre/candidate number.

Electronic submissions are permitted but should be as PowerPoints or PDF. It is important that the work on electronic submissions can be read easily in full screen format without the need to zoom in on parts of the page.

Guidance in applying the assessment criteria

The following points may help when establishing a final mark for the student's work:

- read through the student's work to form an overall impression of the level of response achieved
- study the evidence presented by the student for each assessment criterion
- read the level of response descriptors for each assessment criterion and identify the group of statements that offer the 'best fit' for a student's work
- match the evidence presented and the individual statements available to further refine the range of marks, e.g. 10-14, to establish a final score within that range.

Where 'best fit' bridges two levels of response, e.g. medium and high, and where perhaps two level statements from the high level are met and the rest firmly within the medium level, it would be acceptable to place the overall level of response within the bottom one or two marks of the high level of response category. More statements met from the high level category would earn further credit in that section. Similarly, if most of the statements in the medium level of response category were met, but one or two were in the low level of response category, the likely overall mark would be at the low end of the medium level category. More statements judged to be in the low level of response category would lower the overall mark accordingly. This type of refinement is more likely to be necessary where a more substantial range of marks is available at each level of response. The maximum mark range in any group of level descriptors is five.

Internal standardisation

Internally assessed work must be marked in accordance with the assessment criteria stated in the specification and any guidance in subject-specific instructions for the conduct of examinations. Where more than one teacher has been involved in the assessment of the candidate's work, then the work should be internally standardised. This involves a comparison of marking between the submitting teachers and an agreement to adjust marking where it is agreed to be lenient or severe. The final marks should then be sent Edexcel after adjustments have been made. It is important that conversations between colleagues are honest and open, allowing colleagues to air concerns if they have them. Where significant discrepancies are found between teachers in a sample during moderation, it can cause serious consequences for candidates during the moderation process.

Coursework assessment booklets (CAB)

The CAB is completed for every candidate in the centre. The candidates and teacher need to sign the relevant section in the CAB to confirm the work is the candidate's own. The teacher records the marks in the CAB and annotates the booklet to confirm how the marks awarded relate to the marking criteria.

The indication as to how marks have been awarded should:

- be clear and unambiguous
- be appropriate to the nature and form of the coursework

- facilitate the standardisation of marking within your centre
- enable the moderator to check that the assessment criteria have been applied in the marking.

Photographic evidence is also included in the CAB of the practical outcome. The photographs should:

- be limited to a maximum of three (any extras can be added to the portfolio itself)
- be clear and easily to read
- not be enhanced or adjusted in any way prior to processing.

It is the responsibility of the centre to make sure that the photographs evidence the detail needed to justify the marks asked. A failure to submit photographic evidence will result in marks not being upheld if it is not clear to the moderator.

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