edexcel

GCSE
Design and Technology
2017

Launch Event

Pearson

Agenda

- GCSE reforms
- Our approach
  - Design and development
- Our specification:
  - Overview
  - Content
  - Assessment
- Support and next steps

The GCSE reforms

- Updated content and assessment requirements from DfE and Ofqual
- Fully linear structure
- New 9-1 grading scale, with 9 the top level
- Tiering only in certain subjects such as Maths (no tiering in Design & Technology)
- External examinations only, unless coursework or controlled assessment is the only valid option
- No change to guided learning hours

edexcel

GCSE Timeline

	2016	2017	2018	2019
Current specification	Summer series as normal	Summer series as normal	Final assessment	
New 2017 specification		First teaching of 2 year course		First assessment

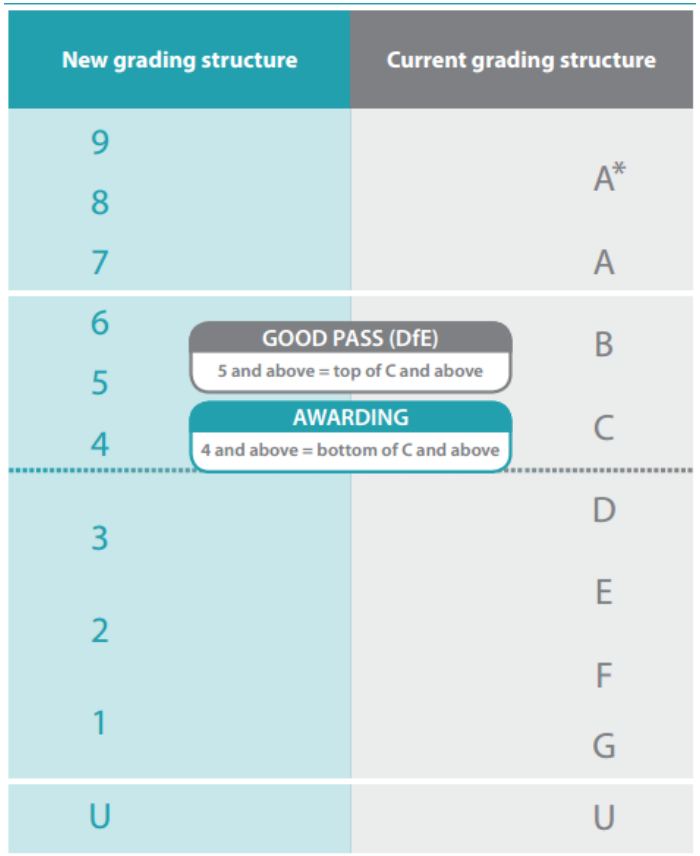
- The last available assessment for the current GCSEs will be June 2018
- The reformed GCSEs will be reported in the 2019 performance tables

Pearson

GCSE reforms

The new 9-1 grading scale

- Broadly the same proportion of students will achieve a grade 4 and above as currently achieve a grade C and above
- Broadly the same proportion of students will achieve a grade 7 and above as currently achieve a grade A and above
- The bottom of grade 1 will be aligned with the bottom of grade G
- The new ‘good pass’ is grade 5



Source:
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/465873/your_qualification_our_regulation.pdf

Subject Content

The Subject Content for Design and Technology has been put together by the DfE, which worked with major stakeholders including Dyson, the Design and Technology Association (DATA) and the Royal Academy of Engineering.

The content is split into 2 sections:

- Technical principles
- Designing and making
- **All** specifications have to include **all** content to be accredited

Design & Technology qualifications

- Awarding organisations can no longer offer a choice of several different titles in different, specialised material areas.

- The is only one qualification title: Design and Technology. The titles of Resistant Materials, Textiles, etc. are no longer present

Mathematics and science content

The GCSE subject content has a new requirement to include maths and science knowledge, skills and understanding.

- At least 15% of the qualification must assess mathematical skills. This will be assessed in the written examination
- The level of demand is higher KS3 Maths
- Science skills are embedded within the Design and Technology content and do not have a prescribed percentage attached to them

Maths and Science content is in Appendix 1 in the DfE Subject Content (next slide)

edexcel

Mathematical skills

The requirements:

a) Recognise and use expressions in decimal and standard form

b) Use ratios, fractions and percentages

c) Calculate surface area and volume

d) Presentation of data, diagrams, bar charts and histograms.

e) Plot, draw and interpret appropriate graphs

f) Translate information between graphical and numeric form

Pearson

edexcel

Mathematical skills

The requirements:

g) Use angular measures in degrees

h) Visualise and represent 2D and 3D forms including two dimensional representations of 3D objects

i) Calculate areas of triangles and rectangles, surface areas and volumes of cubes

Pearson

Science skills

The requirements:

a) quantities, units and symbols

b) SI units, prefixes and powers of ten for orders of magnitude

c) metals and non-metals and the differences between them

d) the basic principles in carrying out a life-cycle assessment

e) corrosion and oxidisation

f) the composition of alloys

g) the physical properties of materials

h) the main energy sources available for use on Earth, the ways in which they are used and the distinction between renewable and non-renewable sources

i) the action of forces; levers and gears

Non-examined assessment (NEA)

Coursework is now know as **Non-Examined Assessment**

There has been a reduction in weighting:

- from 60% to 50% of the qualification

All students need to produce a design and make project

edexcel

Current Assessment Objectives

Students must:		%
A01	Recall, select and communicate their knowledge and understanding in design and technology including its wider effects.	30
A02	Apply knowledge, understanding and skills in a variety of contexts and in designing and making products.	53
A03	Analyse and evaluate products, including their design and production.	17
	To total	100

This has now changed to -

Pearson

edexcel

Assessment Objectives 2015

Students must:		%
A01	Identify, investigate and outline design possibilities to address needs and wants	10
A02	Design and make prototypes that are fit for purpose	30
A03	Analyse and evaluate: • design decisions and outcomes, including for prototypes made by themselves and others • wider issues in design and technology	20
A04	Demonstrate and apply knowledge and understanding of: • technical principles • designing and making principles	40
	To total	100

For first teaching 2017

Pearson

edexcel

GCSE
Design and Technology
2017

Our approach to Design and Development

Pearson

Our approach

Our approach to design and development of specifications is to:

- Review our existing qualifications
  - What works well?
  - What need improving?
- Review other offerings
  - UK and international
- Liaise regularly with stakeholders
- Use subject specialists during development

edexcel

Our research

Several telephone surveys with teachers were conducted as we developed the qualifications

- This included testing assessment models

We held meetings with the External Subject Advisory Group (ESAG)

Teachers, Higher Education

We worked with subject associates, e.g. DATA

Pearson

Our findings

Students who take D&T like making things

- Retain this focus, despite the reduction in NEA weighting

Our teachers like specialist material areas

- Retain specialisms within the assessments

Concern about maths content

- Questions in context

Extended writing questions should be used only when appropriate

edexcel

Our design principles

- Emphasise creativity in design
- Support material specialisms
- Embed mathematical and science content in context
- Include clear progression
  - GCSE to AS and A level
- Remember that students like ‘making’

Pearson

edexcel

Inspiring innovative design

- Equipping students with design skills for the future
- Encourages creativity and innovation
- Clear routes through the specification
- Progression from GCSE and beyond to HE/Careers
- Support with new content

Pearson

edexcel

GCSE
Design and Technology
2017

Edexcel Specification

Pearson

Specification overview

In this section we will cover:

- Assessment models and objectives
- Subject content
- Sample question paper examples
- NEA

edexcel

Subject to DRAFT

Assessment overview

Component 1	Component 2
• Written exam, externally assessed • 1 hour and 45 minutes • 50% of qualification • 100 marks	• Non-examined assessment, internally assessed and externally moderated • 50% of qualification • 100 marks

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 in section A (40 marks).
• Students must choose one specialism in section B – either Metals, Papers and Boards, Polymers, Systems, Textiles or Timbers (60 marks).
• Students must have calculators and rulers in the examination
	Three contextual challenges will be provided by the board on 1st June each year, from which students must choose one to respond to.
	Projects will be internally assessed and externally moderated.
	• Students will produce a project which consists of a portfolio and a prototype
	• The portfolio will contain approximately 20 to 30 sides of A3 paper (or electronic equivalent)
	There are four parts to the assessment:
	Part 1: Investigate
	Part 2: Design
	Part 3: Make
	Part 4: Evaluate

Component 1 – Core content

Key idea
1. The impact of new and emerging technologies
2. How the critical evaluation of new and emerging technologies informs design decisions
3. How energy is generated and stored in order to choose and use appropriate sources
4. Developments in modern and smart materials, composite materials and technical textiles
5. The functions of mechanical devices used to produce different sorts of movements
6. How electronic systems provide functionality to products and processes
7. The use of programmable components to embed functionality into products
8. The categorisation of the types, properties and structure of ferrous and non-ferrous metals
9. The categorisation of the types, properties and structure of paper and boards

Component 1 – Core content continued

Key idea
10. The categorisation of the types, properties and structure of thermoforming and thermosetting polymers
11. The categorisation of the types, properties and structure of natural, synthetic, blended and mixed fibres, and woven, non-woven and knitted textiles
12. The categorisation of the types, properties and structure of natural and manufactured timbers
13. All design and technological practice takes place within contexts which inform outcomes
14. Investigate environmental, social and economic challenges
15. Investigate and analyse the work of past and present professionals and companies to inform design

Component 1 – Material categories

Key idea – for Metals; Papers and Boards; Polymers; Systems; Textiles; and Timbers
1. Design contexts
2. Sources, origins, physical and working properties
3. The way in which selection of materials is influenced
4. This impact of forces and stresses on materials and how they can be reinforced and stiffened
5. Stock forms, types and sizes in order to calculate and determine the quantity of material required
6. Alternative processes that can be used to manufacture products to different scales of production
7. Specialist techniques and processes that can be used to shape, fabricate, construct and assemble a high-quality prototype
8. Appropriate surface treatments and finishes that can be applied to ferrous and non-ferrous metals for functional and aesthetic purposes

Component 1 – assessment

The written paper has a range of short and extended response questions plus maths calculations

- 1 hours and 45 minutes
- 100 marks

The following questions illustrate some examples:

- 1(c) - ‘use annotated sketches to show…’
- 2(b) - maths
- 2(c) – ‘explain’
- 3(a) – ‘name’
- 4(c) – ‘identify’
- 4(d) – ‘discuss’
- 8(c) – ‘evaluate’ - extended writing

Command words

A list of the command word definitions can be found in Appendix 3 page 74 of the specification.

edexcel

Subject to Ofqual accreditation DRAFT

Any more questions on Component 1?

Pearson

Component 2 – assessment

Investigate, Design, Make and Evaluate Project, non-examined assessment

- An investigate, design, make and evaluate project which will test students' skills in designing and making a prototype
- The portfolio will contain approximately 20-30 sides of A3 paper (or electronic equivalent)
- 50% of the qualification
- May be in any material specialism or combination of materials
- No suggested learning hours

What is meant by ‘prototype’?

The term ‘prototype’ means an appropriate working solution to a need or want that is sufficiently developed to be tested and evaluated (for example, full-sized products, scaled working models or functioning systems).

NEA overview

- Students are given a choice of three contextual challenges, from which they choose one
- From the contextual challenge, students identify a problem and a design context then develop a range of potential solutions and realise one
- Encourages creativity and imagination
- Apply iterative processes
- Real world problems, with associated needs, wants and values of the end user
- Students should take ownership
- Apply maths and science principles

Conditions

There are certain conditions which have to be followed during the NEA

- Task taking
  - What teachers can do, must do and must not do whilst students are undertaking the NEA
  - More detail on page 53
- Task writing
  - Authentication, portfolio guidance and evidence required whilst writing the task
  - More detail on page 54
- Marking, standardisation and moderation
  - Requirements to be followed when marking, and the moderation process. JCQ instructions
  - More detail on page 55

Investigate, Design, Make and Evaluate Project

Content - in 4 parts:

1. Investigate
    - Investigation of needs and research
    - Product specification
2. Design
    - Design ideas
    - Review of initial ideas
    - Development of design ideas into a chosen design
    - Communication of design ideas
    - Review of chosen design

Independent Design and Make Project (continued)

3. Make
    - Manufacture
    - Quality and accuracy
4. Evaluate
    - Testing and evaluating

NEA assessment

A Candidate Assessment Booklet (CAB) will be provided for you to add your marks

Marking is levels-based throughout

Take a holistic approach to marking

See page 55 in the specification

Contextual challenges

Here are the example contextual challenges provided in our Sample Assessment Materials. How might you approach these with your students?

1. **Improving living and working spaces (environments and objects)**
- How can living spaces also be used for a work environment?
- How can living spaces be shared for different purposes?
- How can housing be made smarter?

2. **Developing communities**
- How can we share our community spaces better?
- How can shipping containers be reused for temporary living accommodation?
- How can we encourage communities to be more sustainable?

3. **Expanding human capacity**
- How can an aid for people with disabilities improve their capacity to perform a given task?
- How can technology be used to improve human capacity in a sporting situation?
- How can we provide more protection from the environment?

edexcel

Subject to DRAFT Ofqual accreditation

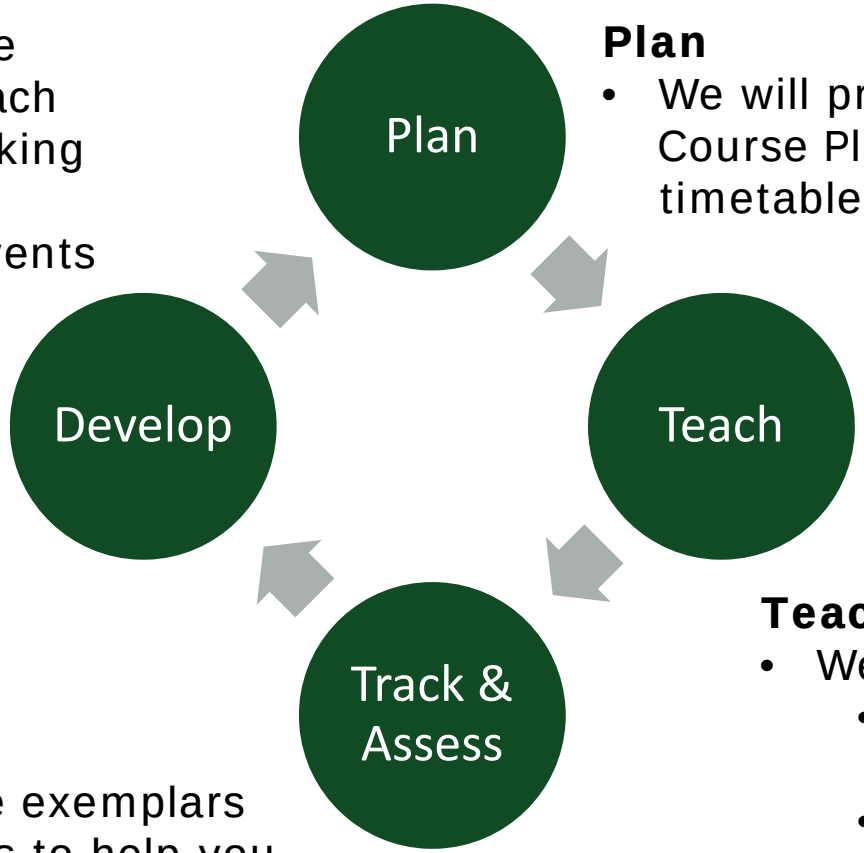
Any more questions on Component 2?

Pearson

Supporting great Design and Technology teaching

Develop

- We will offer you free Getting Ready to Teach events and NEA Marking Training
- Paid for Feedback events will also be available



Plan

- We will provide you with a free Course Planner to help you timetable your lessons

Teach

- We will give you free
  - Editable Schemes of Work
  - Hints on how to teach Maths skills
  - Guidance materials in the core content

Track & Assess

- We will give you free exemplars and specimen papers to help you track your students' progress

ResultsPlus

- **ResultsPlus** provides the most detailed analysis available of your students' exam performance. This free online service helps you identify topics and skills where students could benefit from further learning, helping them gain a deeper understanding of Design and Technology.

Published resources

- We are committed to helping teachers deliver our Edexcel qualifications and students to achieve their full potential. To do this, we aim for our qualifications to be supported by a wide range of high-quality resources, produced by a range of publishers.

- However, it is not necessary to purchase published resources to deliver our qualifications.

Published resources

- Pearson will be publishing a Student Book to support the new GCSE Design and Technology qualification*.

- These resources have not yet been endorsed.
- *You do not have to purchase any resources to deliver our qualification.

Other published resources

- We are working with a range of publishers who are looking towards getting their resources endorsed.
- **ZigZag Education**: photocopiable resources for learning, revision and exam practice.

- *These resources have not yet been endorsed. This information is correct as of 11 January 2016, but may be subject to change.

No paid-for products or services are required to deliver Pearson Edexcel qualifications.

Edexcel GCSE and A level in Design and Technology

- Our GCSE and A level qualifications have been designed together to ensure progression so that students will have a coherent experience of moving from the breadth of the GCSE to the depth of A level and beyond.
- AS and A level Design and Technology: Product Design is also being redeveloped for first teaching in 2017. We have designed the 3 levels of Design and Technology to allow progression through each qualification.

Pearson is recruiting for Design and Technology

- We have exciting opportunities to become an examiner for Design and Technology and:
  - get closer to the qualification you are teaching
  - gain insight on National Standards
  - grow your career.

- To find out more please visit: www.edexcel.com/aa-recruitment

Information email: aaresourcing@pearson.com

Contact details

The Design and Technology team

- email: teachingdesignandtechnology@pearson.com
- telephone: 020 7010 2166
- Twitter: @PearsonTeachDT

Next steps

- Please complete your evaluation form for today's event.
- Visit the website for support materials and sign up for updates: **http://qualifications.pearson.com/en/qualifications/edexcel-gcses/design-and-technology-2017.html**

edexcel

Questions?

Pearson