

GCSE Design Technology

AQA Content

Specification link:

[GCSE Design and Technology Specification Specification for first teaching in 2017 \(aqa.org.uk\)](https://www.aqa.org.uk/qualifications/gcse/design-technology/specification)

The GCSE is made up of two parts:

- Non-Examination Assessment (NEA) – 50%
- Examination – 50%

The examination is a single 2-hour long paper and covers the following content:

Section A – Core Principles

Content

- Industry and Enterprise
- Sustainability – finite and non-finite resources, waste disposal.
- Technology push
- Market pull
- Fashion and trends
- Designing for different disabilities, ages, cultures, and religious groups.
- Pollution and global warming.
- Continuous improvement and efficient working.
- Automation and CAD/CAM.
- Production systems (JIT, lean manufacturing, and warehouse).
- Scales of production – mass, continuous, batch and one off.
- Fossil fuels and renewable energy.
- Energy storage including batteries.
- Modern and smart materials.
- Composite materials and technical textiles.
- Systems (Input – Process – Output) and mechanical devices (levers, pullies, rotary systems etc.)
- Papers and Boards (names and functions).
- Timbers (names and functions).
- Textiles (names and functions).
- Metals (names and functions).
- Polymers (names and functions).
- Material properties.

Question Types

This content will be questioned in either multiple choice questions or one- or two-mark questions.

When the question is multiple choice, only ONE answer must be given, the questions never require more than one answer.

For the two-mark questions, these are typically 'explain' questions. This means that to obtain the marks, PE or PEE sentences must be used:

PE Sentence	PEE Sentence
P – Point E – Explain	P – Point E – Explain E – Example

PE sentences are typically worth one mark in Section A, while PEE sentences are worth two marks in Section A.

An example of this would be [“Explain why the use of modern materials improves the function of products.”](#)

This question doesn't specify if an example needs to be given so we can either answer with two PE sentences or one PEE sentence. To answer with PE it would be:

Point – Modern materials can offer greater strength.

Explain – Some modern materials have been designed to be much stronger so the product can last longer.

Point – Modern materials are specifically designed for a purpose.

Explain – If current materials don't have the properties needed, a modern material can be designed/used.

Putting this together into two PE sentences would give:

[“Modern materials can offer greater strength. Some modern materials have been designed to be much stronger so the product can last longer.](#)

[Modern materials are also specifically designed for a purpose. If current materials don't have the properties needed, a modern material can be designed/used.”](#)

If a PEE sentence was used instead of a PE sentence, then only one would be needed because the extra example is worth another mark:

Point – Materials are specifically designed for a purpose.

Explain – A product needs to be strong, lightweight, and non-reactive.

Example – Titanium used for joint replacement in the human body.

Putting this together into a PEE sentence would give:

[“Modern materials can be specifically designed to fit a purpose. For example, Titanium is used for joint replacement in the human body because it was designed to be strong and non-reactive as well as lightweight”.](#)

If the question asks for reasons or suggests multiple answers are needed, then a PE (Point, Explain) sentence is needed but two of them rather than one.

Section B – Specialist Technical Principles

Content

In this section, you need to have an in-depth knowledge of at least one of the material areas, however we recommend that you specialise in TWO.

The material areas are the same ones from Section A:

- Systems (electronic)
- Papers and Boards
- Timbers
- Textiles
- Metals
- Polymers

On top of the names, types and properties you will need to have the specialist knowledge of the following for your chosen TWO materials:

- Selection of materials or components (aesthetic properties, functional properties, environmental factors, social factors, cultural factors, availability)
- Forces and stresses including how materials can be reinforced or strengthened.
- Ecological and social footprint
- Sources and origins
- Using and working with materials
- Stock forms, types and sizes
- Specialist techniques and processes including tools and equipment, jigs, quality control etc.
- Surface treatments and finishes.

We recommend specialising in Timbers and Polymers. These materials are contrasting in terms of sustainability and processes such as injection moulding are easy to draw and write about in order to obtain marks.

Question Types

This content will be questioned using anything from one- or two-mark questions to longer 8-mark questions.

For the two-mark questions, these are again typically 'explain' questions and just as with Section A, this means that to obtain the marks, PE or PEE sentences must be used:

PE Sentence	PEE Sentence
P – Point E – Explain	P – Point E – Explain E – Example

In Section B, PE sentences are worth 2 marks! One mark for the point and one mark for the explanation. A PEE sentence is worth 3 marks, with the extra mark for the example.

For the four-mark questions, often you would need two PE sentences and for five-mark questions, a PE and PEE sentence would be needed.

For longer mark questions such as 8-mark questions, often an example is needed. This would mean a PEE sentence and then two or three PE sentences.

Some questions in Section B will also require the drawing of a diagram. This doesn't mean the diagram will get the marks alone and detailed annotations are needed to explain what is happening in the diagram. Typically, this will be a process such as injection moulding.

For the process you might be given a table of options such as:

Die Cutting	Injection moulding	Cutting by shearing	Turning
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You would then need to think about what you have studied in class and the two materials you have specialised in. If it was Timbers or Polymers then Injection moulding OR Turning would need to be selected as options.

The question might ask:

Name **one** specific commercial manufacturing process and describe what it is used for.

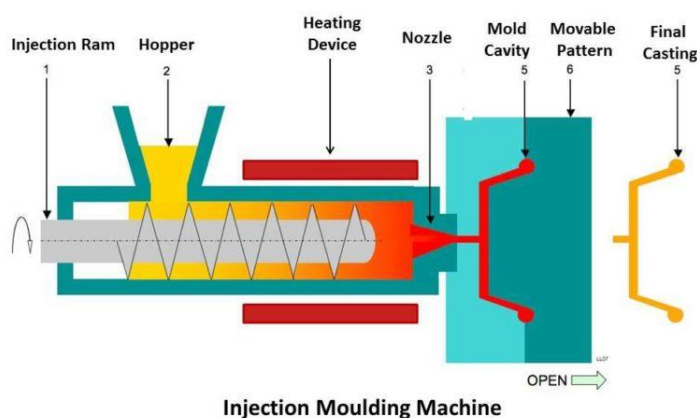
Name of process _____

Using notes and/or sketches describe the process you have named above.

[4 marks]

For this question you would simply select a manufacturing process you feel confident about labelling and describing.

Answering this question would involve:



“Plastic pellets are loaded into the hopper. Plastic pellets are used because of their small surface area so requiring less heat energy to melt them.

As the screw turns the pellets are sent down the machine where heating devices melt the pellets into a liquid ready to be injected into the 2-part mould.

A 2-part mould when closed has a cavity inside that forms the shape of the product to be made. When the liquid plastic is injected into the mould it fills the cavity, forming the shape of the product.

The plastic is either allowed to cool in the metal mould or a cooling system is used to rapidly cool the plastic before it is then ejected from the mould and the machine is reset ready to be used again.”

Notice this question hasn't used PE or PEE sentences, but instead describes the process in as much detail as possible using a diagram for help.

Maths Questions

Your mathematical knowledge will also be tested in Section B.

The mathematical knowledge needed includes:

- Simple arithmetic questions such as addition, subtraction, multiplication and division.
- Ratios, fractions, and percentages.
- Area and volume.
- Charts and graphs.
- Trigonometry.

As in GCSE mathematics, all working must be shown, and marks are available for correct working.

Section C – Designing and Making Principles

Content

In this section, you will be tested on the knowledge gained from your NEA work. This won't be about your product specifically, more the tasks and processes you went through to do it, such as:

- Research – primary and secondary as well as different methods.
- Design brief and specification – what they are and how to use them.
- Sustainability such as Fair Trade and other factors on a design (similar to Section A and B content for this)
- Design strategies such as user centred design, iterative design etc.
- The work of others – knowledge of a famous designer and design company is needed.
- Drawing methods such as sketching, perspective drawing, exploded drawing etc.
- Modelling and testing.
- Selection of materials (similar to Section A and B content for this)
- Tolerances.
- Material management such as nesting, waste management etc.

Section B material content can come into Section C in terms of selection of materials so be prepared to again pick a product made from one of your TWO specialist materials to comment on the material's suitability, production etc.

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Drawing Questions

Section C will usually contain a question that will require you to complete or undertake a drawing in one of the drawing methods studied:

- Oblique
- Isometric
- Exploded
- Perspective

Space will be provided for this in the question and proportion as well as effective use of the technique will be assessed.