

Principal examiner reports for teachers

Principal examiner reports for teachers summarise what candidates did well and what candidates needed to improve for this examination series only.

This report is to be used in conjunction with the question paper and mark scheme.

For guidance on teaching and learning we provide resources for many of our syllabuses.

Resource	Where to find it
Grade descriptions – Grade descriptions describe the level of performance typically demonstrated by candidates achieving the different grades awarded for a qualification.	School support hub Select: Subject > Resource finder > Syllabus and specimen materials
Schemes of work – Schemes of work are designed to support you in your teaching and lesson planning.	School support hub Select: Subject > Resource finder > Teaching and learning
Lesson planning – Guidance on how to plan a lesson.	Lesson planning
Resource plus – There may be additional resources such as teaching packs containing lesson plans, resources and worksheets and videos for aspects of your syllabus.	School support hub Select: Subject > Resource finder > Teaching and learning
Teaching tools	Teaching Tools
Exemplar candidate responses	School support hub Select: Subject > Resource finder > Teaching and learning
Learner guide – A guide for students to help them understand what the course involves.	School support hub Select: Subject > Resource finder > Teaching and learning
Community forums – Do you have a question or something to share? Our online forums are great way to keep up to date with your subject and the global Cambridge community.	Community forum on the school support hub
Access to scripts for this series.	Access to scripts service
Results analysis is available for some syllabuses.	Results analysis
Test maker is available for some subjects.	Test maker

Other services from Cambridge International Education

- [Digital mocks service](#)
- [Insight assessments](#)
- [Professional development](#)
 - [Focus on assessment](#)
 - [Online marking workshops](#)

DESIGN AND TECHNOLOGY

Paper 9705/11 AS Level Written Paper

Key messages

What candidates did well

- Most candidates made good use of the time allocated to the examination paper, attempting all questions in the spaces provided.
- Many candidates demonstrated an excellent understanding of the design process, material properties and making processes.
- Most candidates produced high quality sketches and notes to describe making processes.
- Many candidates were able to draw upon their wider experiences in responses that required an understanding of sustainable design.

What candidates needed to improve

- Candidates should develop knowledge and understanding of all twelve topics in the syllabus content.
- Candidates should be encouraged to read the questions carefully and to take note of command words and instructions, such as a temporary joining method.
- In **Question 6**, candidates should clearly identify, through sketches or notes, the product that is to be modified.
- In **Question 7**, candidates must demonstrate an understanding of the topic, in this case the impact of the use of standardised components on the development of products, and knowledge of the wider issues in design and technology.

Comments on specific questions

Question 1

(a) (i) Comprehensive responses

- Many candidates named vacuum forming as a manufacturing process that could be used to make the polymer blister.

Limited responses

- Some candidates named inappropriate manufacturing processes that could be used to make the polymer blister, such as injection moulding.

(ii) Comprehensive responses

- Most candidates were able to name thermochromic ink or thermochromic pigment as a smart material that could be used to make part of the spoon change colour when in contact with warm food.

Limited responses

- Some candidates confused thermochromic ink with photochromic ink, as both are smart materials.

(iii) Comprehensive responses

- Most candidates demonstrated a good understanding of the term ergonomics by referring to the handle being shaped so that it could easily be gripped or the end of the spoon being curved so that it would not damage the baby's mouth.

Limited responses

- Some candidates did not refer to a specific part of the spoon in their answer.

(b)(i) Comprehensive responses

- Most candidates were able to explain that ultraviolet (UV) varnish would protect the design or enhance the appearance of the design.

Limited responses

- Some candidates did not demonstrate an understanding that spot varnishing is only applied to a specific area of a design.

(ii) Comprehensive responses

- Most candidates were able to explain that the designer of the packaging for the baby spoon had considered sustainability by making the materials easy to separate for recycling, by selecting card as it is biodegradable, or by selecting a thermoplastic as it can be recycled.

Limited responses

- Some candidates showed little understanding of the term sustainability, often referring to the physical properties of the materials.

Question 2

(a)(i) Comprehensive responses

- Most candidates were able to state that the task, making stage or the process was the missing column heading.
- Many candidates stated that the information that would be added to row 1 would be marking out the parts of the pop-up card or gathering the materials and equipment required to make the pop-up card.

Limited responses

- Some candidates described the information that would be added to row 1 as a stage in designing the pop-up card, rather than a stage in making the pop-up card.

(ii) Comprehensive responses

- Most candidates were able to explain that a flowchart shows more details of the making processes, a flowchart has decision boxes, or a Gantt chart only shows the total time for each stage in the process.

Limited responses

- Some candidates only partially showed how a flowchart could be used for planning.

(b) Comprehensive responses

- Almost all candidates were able to explain that an accurate materials list or cutting list saves costs as only the exact amounts of materials are purchased, it reduces waste as only the exact amounts of materials are purchased, it is more convenient as the materials can be ordered in advance, or it allows uninterrupted manufacture as all materials are available.

Limited responses

- Some candidates demonstrated only partial understanding of a materials or cutting list by using general terms, such as it is cost effective, better or more accurate.

Question 3

(a)(i) Comprehensive responses

- Some candidates demonstrated a good understanding of the material property dimensional stability by referring to it being the ability of the material to maintain its original size, shape, and form when exposed to environmental factors like temperature or humidity.

Limited responses

- Many candidates referred to the four legs of the coffee table as providing a stable structure that will not wobble or collapse.

(ii) Comprehensive responses

- Most candidates demonstrated a good understanding of the material property corrosion resistance by referring to the stainless steel supports that will not rust if exposed to moisture.

Limited responses

- Some candidates did not refer to a specific material in their response.

(b)(i) Comprehensive responses

- Almost all candidates were able to use sketches and notes to show how woodscrews, knock-down (KD) fittings or a variety of slot-together friction joints could be used to make a temporary joint.
- Almost all candidates produced high quality sketches and annotations with appropriate technical terms, such as a clearance hole or a countersunk hole.

Limited responses

- Some candidates used sketches and notes to show a permanent joining method, for example a glued lap joint, rather than a temporary joining method.

(ii) Comprehensive responses

- Most candidates were able to use sketches and notes to show how machine screws, nuts and bolts and a variety of slot-together friction joints could be used as a temporary method of joining the opaque acrylic shelf to the stainless steel tube support.
- Almost all candidates produced high quality sketches and annotations with appropriate technical terms, such as external thread or wingnut.

Limited responses

- Some candidates used sketches and notes to show a permanent joining method, for example the use of an adhesive, rather than a temporary joining method.

(c) Comprehensive responses

- Most candidates were able to identify a suitable finish for the beech frame, such as varnish, wax or stain.
- Many candidates justified their choice of finish by referring to how it protected the material or enhanced the appearance of the material.

Limited responses

- Some candidates gave simple reasons for choosing their finish, such as it is cheap, easy to apply or available in a range of colours.

(d) Comprehensive responses

- Almost all candidates were able to explain that the coffee table has been designed to have minimum impact on the environment because the different materials can easily be separated for recycling, the parts can be separated so that it is easier to repair, or the materials are durable so the coffee table will have a long lifespan.

Limited responses

- Some candidates referred to broader environmental strategies, such as build the factory closer to available resources, rather than referring specifically to the design of the coffee table.

Question 4

(a) Comprehensive responses

- Almost all candidates were able to sketch a three-dimensional (3D) view of the assembled package, with isometric, planometric and perspective drawing the most common methods used.
- Many candidates' responses were outstanding, with excellent proportions, high quality linework and details of the window opening and closing flap clearly shown.

Limited responses

- Some candidates only partially showed, usually using diagonal lines, that the window was made from a transparent polymer.

(b) Comprehensive responses

- Many candidates used hand tools, such as a pencil, rule and craft knife, or CAD/CAM solutions, involving the use of design software and a laser cutter, as a method of making and assembling the package.
- Most candidates showed the method of making through a series of steps that included details of the tools, equipment and processes to be used and safety precautions to be undertaken.

Limited responses

- Some candidates only partially showed the method of making and the annotations were technically inaccurate, for example using a saw to cut card.
- Some candidates did not include details of safety precautions to be undertaken during the making of the package or only included superficial details of the Personal Protective Equipment (PPE) that would be required, rather than linking the use of the PPE to a specific stage in the making process.

(c) (i) Comprehensive responses

- Many candidates referred to the sell by date, use by date, ingredients or allergies in their explanations of how the design of the surface graphics considered the safety of the user.

Limited responses

- Some candidates focused on the overall package, for example there should be no sharp corners that may injure someone, without referring to the surface graphics.

(ii) Comprehensive responses

- Most candidates referred to easy-to-read text or attractive images in their explanations of how the design of the surface graphics considered customer needs.

Limited responses

- Some candidates focused on the overall package, for example the package must be a convenient size to carry, without referring to the surface graphics.

Question 5

(a) (i) Comprehensive responses

- Most candidates were able to explain that the cover over the mechanism of the exercise bicycle protects the user from being caught in the moving parts, the cover prevents the mechanism from being exposed to dust or it is aesthetically more pleasing not to see the mechanism.

Limited responses

- Some candidates simply stated that a cover over the mechanism made it safer.

(ii) Comprehensive responses

- Most candidates were able to explain that the seat on the exercise bicycle was adjustable to allow a range of different height people to use the bicycle, or it broadens the potential market for the product as it can be used by people of all sizes.

Limited responses

- Some candidates simply stated that a height adjustable seat made it suitable for different users and offered no explanation.

(iii) Comprehensive responses

- Most candidates were able to explain that the exercise bicycle has a display panel to allow users to monitor their performance, allow users to set targets such as time or distance, or provide entertainment in the form of music or videos.

Limited responses

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(b) Comprehensive responses

- Most candidates were able to complete the table by adding the name for the battery, the symbol for the SPST switch and LED and the function for the SPST switch.

Limited responses

- Some candidates incorrectly added the symbol for the light emitting diode or added the symbol for another component, such as a lamp.

(c) Comprehensive responses

- Many candidates were able to explain that using solar photovoltaic panels to generate the electricity to power the machines in the factory would reduce reliance on fossil fuels.
- Some candidates referred to reducing the amount of electricity used by insulating the factory, lowering the level of light in certain areas or turning off machines when not in use.

Limited responses

- Some candidates referred to using an alternative fossil fuel, such as coal rather than oil, rather than reducing reliance on fossil fuels.

(d)(i) Comprehensive responses

- Many candidates showed pulleys and a belt or gear wheels and a chain as an example of a motion transmission mechanism.

Limited responses

- Some candidates used incorrect technical terms, such as reciprocating motion rather than linear motion in their response.

(ii) Comprehensive responses

- Many candidates showed a cam and follower or a rack and pinion as an example of a motion conversion mechanism.

Limited responses

- Some candidates used incorrect technical terms, such as confusing a rack and pinion with a worm gear in their response.

Question 6

Comprehensive responses

- Many candidates used sketches and notes to show modifications that included child-friendly surface graphics added to furniture, remote controls with larger buttons to make it easier for older people to use or kitchen appliances, such as kettles, redesigned so that they would be safer for a young person to use.
- Many candidates demonstrated a good understanding of the specific needs of the identified age group in their analysis.

Limited responses

- For many candidates, the strength of their response was in showing how they intended to modify a product for a specific age group, rather than analysing how their proposed modification would meet the needs of the age group.
- Some candidates did not show how the design of another product could be modified for use by a specific age group and simply used the given product in the question.

Question 7

Comprehensive responses

- Many responses demonstrated an excellent understanding of a wide range of standardised components by referring to knock-down (KD) fittings, electronic components or construction bricks in the use of exemplar products such as furniture, cars or building construction.
- Many responses were appropriately structured, based on accurate information, contained numerous relevant examples and included a concisely written conclusion.
- For many candidates, the strength of their response was in demonstrating their knowledge of the topic, rather than discussing the impact that the use of standardised components in the development of products has had on the wider issues in design and technology.

- Candidates who successfully discussed how standardised components have an impact on the wider issues in design and technology usually gave good examples of economic and environmental factors. Social and cultural factors were usually less well discussed.

Limited responses

- Some candidates only referred to the hinges and screws given in the question, through a collection of thoughts, rather than a balanced discussion.

DESIGN AND TECHNOLOGY

Paper 9705/12 AS Level Written Paper

Key messages

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Limited responses

- Some candidates did not refer to a specific part of the spoon in their answer.

(b)(i) Comprehensive responses

- Most candidates were able to explain that ultraviolet (UV) varnish would protect the design or enhance the appearance of the design.

Limited responses

- Some candidates did not demonstrate an understanding that spot varnishing is only applied to a specific area of a design.

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Question 2

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Question 3

(a)(i) Comprehensive responses

- Some candidates demonstrated a good understanding of the material property dimensional stability by referring to it being the ability of the material to maintain its original size, shape, and form when exposed to environmental factors like temperature or humidity.

Limited responses

- Many candidates referred to the four legs of the coffee table as providing a stable structure that will not wobble or collapse.

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DESIGN AND TECHNOLOGY

Paper 9705/13 AS Level Written Paper

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- Many candidates referred to the sell by date, use by date, ingredients or allergies in their explanations of how the design of the surface graphics considered the safety of the user.

Limited responses

- Some candidates focused on the overall package, for example there should be no sharp corners that may injure someone, without referring to the surface graphics.

(ii) Comprehensive responses

- Most candidates referred to easy-to-read text or attractive images in their explanations of how the design of the surface graphics considered customer needs.

Limited responses

- Some candidates focused on the overall package, for example the package must be a convenient size to carry, without referring to the surface graphics.

Question 5

(a) (i) Comprehensive responses

- Most candidates were able to explain that the cover over the mechanism of the exercise bicycle protects the user from being caught in the moving parts, the cover prevents the mechanism from being exposed to dust or it is aesthetically more pleasing not to see the mechanism.

Limited responses

- Some candidates simply stated that a cover over the mechanism made it safer.

(ii) Comprehensive responses

- Most candidates were able to explain that the seat on the exercise bicycle was adjustable to allow a range of different height people to use the bicycle, or it broadens the potential market for the product as it can be used by people of all sizes.

Limited responses

- Some candidates simply stated that a height adjustable seat made it suitable for different users and offered no explanation.

(iii) Comprehensive responses

- Most candidates were able to explain that the exercise bicycle has a display panel to allow users to monitor their performance, allow users to set targets such as time or distance, or provide entertainment in the form of music or videos.

Limited responses

- Some candidates simply stated that the display panel would provide information and offered no explanation.

(b) Comprehensive responses

- Most candidates were able to complete the table by adding the name for the battery, the symbol for the SPST switch and LED and the function for the SPST switch.

Limited responses

- Some candidates incorrectly added the symbol for the light emitting diode or added the symbol for another component, such as a lamp.

(c) Comprehensive responses

- Many candidates were able to explain that using solar photovoltaic panels to generate the electricity to power the machines in the factory would reduce reliance on fossil fuels.
- Some candidates referred to reducing the amount of electricity used by insulating the factory, lowering the level of light in certain areas or turning off machines when not in use.

Limited responses

- Some candidates referred to using an alternative fossil fuel, such as coal rather than oil, rather than reducing reliance on fossil fuels.

(d)(i) Comprehensive responses

- Many candidates showed pulleys and a belt or gear wheels and a chain as an example of a motion transmission mechanism.

Limited responses

- Some candidates used incorrect technical terms, such as reciprocating motion rather than linear motion in their response.

(ii) Comprehensive responses

- Many candidates showed a cam and follower or a rack and pinion as an example of a motion conversion mechanism.

Limited responses

- Some candidates used incorrect technical terms, such as confusing a rack and pinion with a worm gear in their response.

Question 6

Comprehensive responses

- Many candidates used sketches and notes to show modifications that included child-friendly surface graphics added to furniture, remote controls with larger buttons to make it easier for older people to use or kitchen appliances, such as kettles, redesigned so that they would be safer for a young person to use.
- Many candidates demonstrated a good understanding of the specific needs of the identified age group in their analysis.

Limited responses

- For many candidates, the strength of their response was in showing how they intended to modify a product for a specific age group, rather than analysing how their proposed modification would meet the needs of the age group.
- Some candidates did not show how the design of another product could be modified for use by a specific age group and simply used the given product in the question.

Question 7

Comprehensive responses

- Many responses demonstrated an excellent understanding of a wide range of standardised components by referring to knock-down (KD) fittings, electronic components or construction bricks in the use of exemplar products such as furniture, cars or building construction.
- Many responses were appropriately structured, based on accurate information, contained numerous relevant examples and included a concisely written conclusion.
- For many candidates, the strength of their response was in demonstrating their knowledge of the topic, rather than discussing the impact that the use of standardised components in the development of products has had on the wider issues in design and technology.

- Candidates who successfully discussed how standardised components have an impact on the wider issues in design and technology usually gave good examples of economic and environmental factors. Social and cultural factors were usually less well discussed.

Limited responses

- Some candidates only referred to the hinges and screws given in the question, through a collection of thoughts, rather than a balanced discussion.

DESIGN AND TECHNOLOGY

Paper 9705/02 Product Analysis and Improvement Project
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Key messages

What candidates did well

- Candidates showed a good ability to develop original solutions to the design problems identified in **Stage 1** of the assessment criteria.

What candidates needed to improve

- Candidates need only present research material that directly relates to the identified product and area for improvement.
- Candidates should be encouraged to organise their portfolios according to the six distinct project stage headings. This approach allows them to focus on the specific requirements of each section of the assessment criteria.
- Candidates should be encouraged to communicate their ideas through annotated freehand sketches and, where appropriate, screenshots from computer-aided design (CAD) software as evidence of the design process.
- Candidates need to include detailed photographic evidence of the final product.

Comments on individual assessment criteria

Stage 1: Identifying and analysing a product for improvement

Comprehensive responses

- Portfolios provided a thorough analysis of an existing product, which formed the basis for later design improvements.
- The evaluation at this stage also considered the key economic, environmental, social, and cultural factors linked to the product, resulting in a balanced and well-informed analysis.

Limited responses

- Presented analysis of multiple products instead of focusing on just one.
- This project is about analysing and improving a single aspect of an existing product, not creating an entirely new design.

Stage 2: Identifying one area for improvement

Comprehensive responses

- Evaluated and compared the selected product with a wide range of similar products on the market, narrowing the focus to one clear area for improvement.
- The specific area for improvement was clearly documented at the end of this stage of the project.

Limited responses

- Projects that did not do so well at this stage often used research to identify several areas for a complete product redesign, rather than to isolate and justify one specific improvement.

Stage 3: Clarifying the design situation or need and generating ideas

Comprehensive responses

- Referred consistently to the specification throughout design development, using it as a framework to evaluate the success of the final product.

- Communicated ideas clearly through hand sketches, annotation and, where appropriate, high-quality physical or computer modelling to develop product concepts.
- For each proposed design, materials and manufacturing processes were considered, with clear justification for the design chosen for further development in **Stage 4**.

Limited responses

- Candidates should begin this section with an accurate design brief that clearly defines the need being addressed, along with a detailed, justified, and measurable specification.

Stage 4: Developing the design and planning

Comprehensive responses

- The most successful projects at this stage provided comprehensive documentation outlining the progression and refinement of one of the initial concepts from **Stage 3** into a proposal appropriate for production.
- Further research, modelling and construction testing at this phase were included, offering clarity about the precise details and methodology for manufacturing the prototype.
- Detailed production planning was provided.

Limited responses

- Comprehensive construction and timing plans must be presented so that someone with experience could build the product. These should feature scale drawings, a detailed list of necessary materials with sizes, and a timeline for producing the prototype.

Stage 5: Producing a prototype to demonstrate the improvement

Comprehensive responses

- Most candidates produced high-quality products that demonstrated their skill in shaping and processing materials into a prototype for the intended use.
- Documenting each production stage was crucial. Most candidates effectively recorded the practical skills used and tracked project progress throughout manufacturing.

Limited responses

- Candidates should provide clear and detailed photographic evidence. This documentation should accurately record the step-by-step construction process, the range of techniques used at various stages of the prototype production, and close-ups of the main features of the final prototype. Where 3D printers are used, screenshots and photographs of the stages need to be provided as evidence.
- Candidates need to compare the product to the design brief and specification.

Stage 6: Testing and evaluating the improvement

Comprehensive responses

- Projects began this section with a testing and evaluation plan that provided a clear structure for assessing the completed prototype.
- Third-party evaluation and testing in use helped determine the overall viability of the improved prototype.
- Accurate and transparent comparisons with the **Stage 3** specification also provided useful evidence for identifying further improvements.

Limited responses

- Candidates need to suggest further improvements to their prototype. This ideally needs to be in the form of sketched and annotated designs.
- Commercial production methods and the wider design technology issues should be addressed during this stage.
- Candidates should provide a testing and evaluation plan at the start of this stage so that a structure for a comprehensive assessment of their completed prototype can be undertaken.

DESIGN AND TECHNOLOGY

Paper 9705/31 A Level Written Paper
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Key messages

What candidates did well

- Many candidates showed a broad understanding of the design process in both the school environment and industrial settings when completing describe and explain responses.
- Most candidates used effective communication methods to fully explain an idea or process in questions with 'using sketches and notes'.
- Many candidates used correct technical vocabulary when responding to describe, explain and discuss questions.
- Candidates showed a good ability to describe workshop manufacturing processes in detail.

What candidates needed to improve

- When candidates are responding to 'discuss'-based questions, a greater variety of relevant examples should be used to fully justify their point.
- Careful layout of a page when responding to a question which requires use of sketches and notes can allow candidates to fully explore ideas and improve communication more effectively.
- Clearer connections between industrial processes and real-world products can help to allow candidates to fully explain an answer.

Comments on specific questions

Question 1

(a) Comprehensive responses

- Candidates identified an appropriate material for the product by carefully analysing the image of the product to see how it had been shaped and formed.
- Candidates gave realistic reasons for the choice of material based on how the product would be made and how it would function.

Limited responses

- Some responses selected a material that would not be ideally suited to the photograph holder based on how it would be shaped or formed, for example, solid oak.
- Some responses needed to ensure that their reasoning for choice of material is based on realistic scenarios for the use of the photograph holder.

(b) Comprehensive responses

- Many candidates showed detailed logical stages of how to make the product, clearly based on their own experiences in a practical environment.
- Responses used carefully drawn diagrams to show the details of each stage, which were further explained with well laid out notes and annotations.
- A wide range of appropriate tools, equipment and processes were explained in a response showing detailed understanding of the manufacturing of the product.

Limited responses

- Some responses focused too much on health and safety aspects which do not show how the product would be made.

(c) Comprehensive responses

- Candidates described both changes to the material, or justified choice of the same material, and changes to the design in detail.

Limited responses

- Some candidates selected an inappropriate manufacturing method by not focusing on the quantity of products to be made. A commonly occurring example was injection moulding.

Question 2

(a) Comprehensive responses

- Candidates described and sketched the correct process and used good detail in their sketches including details of the interior mould shape.

Limited responses

- Some candidates confused the process with injection moulding.

(b) Comprehensive responses

- Candidates gave a detailed explanation, often using a real-life example to justify their explanation.

Limited responses

- Some candidates gave limited detail, often focusing solely on the price of the product.

(c) Comprehensive responses

- Candidates clearly understood the difference between a design specification and a manufacturing specification.
- Responses showed an understanding of industrial practices and how the manufacturing specification can be used in those real-world situations.

Limited responses

- Some candidates gave a simple reason with limited explanation.
- Some responses focused on the design and development stage of the product's life, rather than manufacturing.

Question 3

(a) Comprehensive responses

- Candidates understood the correct position of the growth stage in the product's life.
- Correct occurrences of the growth stage were explained in detail. Examples seen were increasing sales and profit, with some candidates explaining increase in competition from other companies at this stage.

Limited responses

- Some responses had limited explanation of the stage.
- Some responses had the incorrect position of the stage in the life cycle.

(b) Comprehensive responses

- Candidates observed that customers would not recognise the product if its packaging were updated.
- Candidates explained in detail the further impacts to the company if the extension strategy did not work.

Limited responses

- Some responses had limited explanation of the disadvantage.
- Some responses explained unrealistic disadvantages.

(c) Comprehensive responses

- Candidates gave accurate explanations of factors that would directly impact the unit cost.

Limited responses

- Candidates focused on profit that the company would make rather than the specific cost of each unit made.
- Some candidates explained about retail cost rather than unit cost.

Question 4

(a) Comprehensive responses

- Candidates described an accurate function of the design and development service sector, giving accurate examples of what it does to give detail to their description.

Limited responses

- Some responses were missing the depth needed in the description.

(b) Comprehensive responses

- Candidates focused on the employees and carefully considered real life situations and how they would benefit from mass production.

Limited responses

- Some responses did not show enough understanding of industrial processes.
- Some responses confused mass production systems with batch or one-off systems.

(c) Comprehensive responses

- Candidates were able to structure a logical discussion which gave a balanced argument about the importance of digital technology.
- Some responses included positive and negative benefits to the design and manufacturing industries.
- A wide range of points were considered including economic, social, cultural and environmental, to give a balanced discussion.

Limited responses

- Some candidates only focused on the economic issues, discussing costs, which limited discussion.

Question 5

(a) Comprehensive responses

- Candidates gave specific examples of technical drawing software to fully describe the benefit.

Limited responses

- Some responses were missing the depth needed in the description.

(b) Comprehensive responses

- Candidates explained how the template would be used and linked it to a specific production process, showing a good understanding of batch production methods in real-world situations.

Limited responses

- Candidates described the benefit of templates, rather than how templates are used when designing and making products.

(c) Comprehensive responses

- Candidates were able to structure a logical discussion which showed a clear understanding of the benefits of Kaizen.
- Candidates used Kaizen specifically as the main focus for their response, rather than just generic continuous improvement processes. This allowed them to focus their discussion and link it to real-world examples.
- Specific examples were given of companies or products to further justify points discussed.
- A wide range of points were considered, including economic, social, cultural and environmental, to give a balanced discussion.
- Some candidates clearly understood and discussed one of the main benefits which is waste reduction.

- Some responses gave good examples of how socially and culturally people can benefit in all areas of the manufacturing industry.

Limited responses

- Some candidates discussed how products would be improved, rather than the improvement of actual manufacturing processes, which is the main focus of Kaizen.
- Some responses only discussed cost benefits, rather than widening the discussion to include social and environmental issues.

Question 6

(a) (i) Comprehensive responses

- Candidates produced an innovative idea which had unique features.
- Responses included all of the requirements laid out in the question.
- Multiple sketches and notes were used to fully communicate the idea in detail.
- Some candidates made full use of the space to clearly lay out their idea with additional notes and drawings.

Limited responses

- Some responses were a very basic or obvious idea to solve the problem.
- Some candidates went into great detail to explain how it would be manufactured which is not relevant in this question.

(ii) Comprehensive responses

- Candidates produced a very different style of design to **(a)(i)**, whilst still including all requirements laid out in the question.
- Some responses included innovative features not used in **(a)(i)**.
- Multiple sketches and notes were used to fully communicate the idea in detail.
- Some candidates made full use of the space to clearly lay out their idea with additional notes and drawings.

Limited responses

- Some candidates produced an idea that was too similar to the idea presented in **(a)(i)**.
- Some responses were a very basic or obvious idea to solve the problem.
- Some candidates went into great detail to explain how it would be manufactured which is not relevant in this question.

(b) Comprehensive responses

- Candidates were able to use evaluative language to find the strengths and weaknesses of the two ideas.
- The ideas were compared to each other, allowing the candidate to see which was potentially better.
- Candidates clearly explained their choice of idea to take onto the next stage, with full justification.

Limited responses

- Some responses pointed out a good or bad feature of each idea with no justification or comparison.
- Some responses stated which idea they would take forward with no justification.

(c) Comprehensive responses

- Candidates used a range of different drawings to fully show how all parts of their chosen idea could be developed.
- Development included actual changes to the idea which would improve the function or aesthetics.
- Details of materials and manufacture were given and fully justified.
- Candidates used the full page effectively to lay out all the developments to the design.

Limited responses

- Some candidates simply re-drew their first idea with no further developments or changes made to the idea.

- Some responses focused too heavily on how each part of the product would be made rather than showing developmental changes.
- Some candidates did not justify choices of material or finish used.

(d) Comprehensive responses

- Candidates used an appropriate method to draw their final design solution in detail. Effective methods seen included isometric or detailed orthographic drawings.
- Sizes of the final product were included as part of the detail.
- Candidates described all functions and details of the product, including time and cost constraints.
- If a candidate felt that not enough detail had been shown on one drawing, smaller additional views were used to show all aspects of the design.
- Some candidates used drawing instruments to ensure line quality and accuracy, for example using a ruler to create straight lines.

Limited responses

- Candidates did not add annotation or explain some details.
- Some responses had drawings which contained inaccuracies or were missing some detail.

(e) Comprehensive responses

- Candidates produced at least four detailed and fully justified manufacturing specification points.
- Some candidates showed clear understanding of a manufacturing specification by including specific details like sizes or exact types of finishes required.

Limited responses

- Many candidates confused a manufacturing specification with a design specification.
- Some candidates did not fully justify their specification point.

(f) Comprehensive responses

- Candidates fully explained an advantage by using a specific situation or example product.
- Most candidates demonstrated a clear understanding of the need for modelling when designing a product by explaining advantages linked to testing of the product.

Limited responses

- Some candidates did not fully explain the advantage, only giving partial explanations.

DESIGN AND TECHNOLOGY

Paper 9705/32 A Level Written Paper
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Key messages

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Limited responses

- Candidates described the benefit of templates, rather than how templates are used when designing and making products.

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Limited responses

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- The ideas were compared to each other, allowing the candidate to see which was potentially better.
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Limited responses

- Some responses pointed out a good or bad feature of each idea with no justification or comparison.
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(c) Comprehensive responses

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- Candidates used the full page effectively to lay out all the developments to the design.

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- Some candidates simply re-drew their first idea with no further developments or changes made to the idea.

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- Some candidates used drawing instruments to ensure line quality and accuracy, for example using a ruler to create straight lines.

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- Candidates did not add annotation or explain some details.
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- Some candidates showed clear understanding of a manufacturing specification by including specific details like sizes or exact types of finishes required.

Limited responses

- Many candidates confused a manufacturing specification with a design specification.
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(f) Comprehensive responses

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- Most candidates demonstrated a clear understanding of the need for modelling when designing a product by explaining advantages linked to testing of the product.

Limited responses

- Some candidates did not fully explain the advantage, only giving partial explanations.

DESIGN AND TECHNOLOGY

Paper 9705/33
A Level Written Paper

There were too few candidates for a meaningful report to be produced.

DESIGN AND TECHNOLOGY

Paper 9705/04 Design, Realisation and Manufacturing Project
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Key messages

What candidates did well

- Candidates identified a wide range of real-world contexts of their own choice, which was positive. The approach of choosing an area to explore that candidates have an interest in is at the very core of this project, and similarly, the choice of materials is purposely open.

What candidates needed to improve

- Candidates should not choose design proposals that are too large or complex, and which therefore cannot be completed in the time recommended for **Stage 4: Realising the product**.

Comments on specific assessment criteria

Stage 1 Identifying a situation or need to produce a design brief and design specification

What candidates did well

- Candidates were able to identify an area to focus their design project on and generally researched it well.
- Candidates chose one design situation or need to take forward, providing a justification for their choice.
- In some projects, each point of the design specification was fully justified, with references to the candidate's research.

What candidates needed to improve

- Some candidates completed many pages of research in **Stage 1** of their project which did not ultimately benefit their learning journey. Primary research is particularly valuable, with real-time photographs in this stage but an over-reliance on secondary research can be counterproductive.

Candidates are recommended to spend around **6 guided learning hours** on Stage 1.

Stage 2 Generating and appraising design ideas leading to a design proposal

What candidates did well

- Generally, this stage was well attempted by all candidates with some outstanding examples of innovative idea generation and proposals for new products.
- Candidates had the confidence to explore new ideas that did not simply replicate products that already exist and then iterate them several times as they worked toward an imaginative outcome.

What candidates needed to improve

- None was seen.

Candidates are recommended to spend around **9 guided learning hours** on Stage 2.

Stage 3 Developing the product and planning for making

What candidates did well

- Candidates generally documented their development journey clearly with a wide range of different approaches from sketch models and physical models to some very impressive CAD and, on occasion, CAM modelling. All of these should be documented with good quality photographs/screenshots and annotations.

- Working drawings often communicated all individual parts, as well as assembly details, materials and chosen finishes.

What candidates needed to improve

- Plans to make the final solution were not always included and candidates should be encouraged to produce these.

Candidates are recommended to spend around **9 guided learning hours** on Stage 3.

Stage 4 Realising the product

What candidates did well

- Candidates often demonstrated proficiency in a wide range of practical skills.

What candidates needed to improve

- 3D printed parts are best employed when they are used in conjunction with other materials and processes.
- Some candidates did not communicate their making journey with either clearly annotated or high-resolution photographs. Candidates needed to include evidence within a portfolio of this aspect.
- Safe working practices should also be evident.
- It is expected that candidates produce a full-sized product/prototype, not a scale model.

Candidates are recommended to spend around **14 guided learning hours** on Stage 4.

Stage 5 Testing and evaluating the product

What candidates did well

- Candidates carried out appropriate tests on the full-sized prototype showing it in use in its intended environment and by the user. This allowed the candidate to draw meaningful conclusions leading to proposals for further development.

What candidates needed to improve

- Testing the full-sized prototype and drawing meaningful conclusions.

Candidates are recommended to spend around **9 guided learning hours** on Stage 5.

Stage 6 Planning for manufacturing a product in quantity

What candidates did well

- Candidates presented Stage 6 as a clearly distinct section following the testing and evaluation of the product.
- Responses included analysis of at least three wider issues, such as cultural, economic, environmental and social factors, demonstrating an understanding of the product's broader impact.
- A plan for manufacturing the final product in quantity was provided.

What candidates needed to improve

- A small number of candidates did not include this stage in their portfolio.

Candidates are recommended to spend around **8 guided learning hours** on Stage 6.