

**Advanced Subsidiary GCE  
 DESIGN AND TECHNOLOGY**

**F521 QP**

Unit F521: Advanced Innovation Challenge

**Specimen Paper  
 Session 1 and 2**

6 hours



Candidate  
 Name

Centre  
 Number

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Candidate  
 Number

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Instructions to Candidates

You will have a total of 6 hours to complete this part of the examination. There will normally be two 3 hour sessions.

At the end of the examination you must have:

- selected one of the challenges detailed with this paper;
- completed the answer booklet showing your creative thinking and how your idea works;
- produced a model/prototype to show the important features of your design;
- have at least three photographs fixed in your workbook showing your modelling activities;

**Your answer booklet will be collected at the end of the session 1 and 2 and reissued when you sit Session 3 (the Reflection question paper).**

Session	Marks	Total
1	30	
2	30	
3	20	

This document consists of **18** printed pages and **2** blank pages.

## Sporting Events

London often hosts large international sporting events. An Organising Committee of one of these has stated that they wish to stage “inspirational events that capture the imagination of young people around the world and leave a lasting sustainable legacy.”

A manufacturer has approached you as a designer to address **one** of the following challenges, and help to develop a range of **innovative** products to be used at a large event.

### Design Challenge One

The event will be used to raise awareness of Health and Fitness through Healthy Eating and Physical Activity. They wish to develop a new creative range of healthy snacks to be sold at various venues.

- The food products should be designed with the health of consumers in mind and should enliven the taste buds.
- The product should meet nutritional guidelines.
- The product should reflect the diversity of participating countries.

### Design Challenge Two

Many of the venues used for sporting events have no fixed seating or have limited seating areas e.g. for rowing and sailing events. Design a seat or seating system that can be erected quickly, that would still allow spectators to sit safely and individually or as groups to watch the games at such a venue.

- The events will be based on a strong sense of the concept of sustainability. Your design should reflect this.

### Design Challenge Three

The opening ceremony will include a parade; design a fixed display to be activated at the end of this parade.

- The display should provide interest and enjoyment throughout the games and beyond.
- Any energy used to power this display should be minimal as the event will be based on a strong sense of the concept of sustainability. Your design should reflect this.

### Design Challenge Four

Many of the venues used for such events have no fixed shelter areas. The UK weather is unpredictable. Design a product that can be used as a personal shelter/protection in the event of extreme weather, which would still allow spectators to watch the games.

- The events will be based on a strong sense of the concept of sustainability. Your design should reflect this.

### **Design Challenge Five**

The opening ceremony will include a parade; design a costume that best embodies the spirit of the host country, i.e. the UK.

- The costume may be designed for either a male or female.

### **Design Challenge Six**

The expected 300,000 daily spectators will be encouraged to travel by public transport. Design an interactive travel guide providing travel information to venues by public transport.

- This travel guide should seek to overcome language barriers.

# Session 1

**1 Explore your chosen Design Challenge.** What are your initial thoughts?

Use sketches and notes to communicate your thinking.

**2** Which of your initial thoughts offers greatest potential to be taken further? Why?

Additional space

**Sections 3, 4 and 5 are at the end of this booklet on the fold-out page**

**[Turn over**

- 6 Start designing.** Use annotated sketches and/or models to show your ideas. You may wish to use annotated photographs to communicate modelling.

Ideas continued.

7 What do you think of your ideas so far, how has your job bag helped to inspire/direct your ideas? Use annotated sketches and/or annotated photographs to explain.

8 Which is your best idea? Justify your decision.



**9 Reflect and Record**

You will be asked to present your ideas (no more than 5 minutes).

Use this space to plan what you will say. Think about your brief, specification and key factors of your design.

**10 Feedback**

Record any suggestions made by others. Identify further modifications that you could make in response to this feedback.

**11 Developing your idea, improvements and modifications.**

Use annotated sketches and/or annotated photographs to communicate your thoughts.

**12 Your Model'**

List the materials/ingredients you have chosen to make your prototype.

Component description	Material/Ingredient

Show how these components could be joined/combined together.

**13 Action Plan for Session 2**

# Session 2

## 14 Review

Record any new thoughts about your design. Use annotated sketches and/or notes.

## 15 Modelling - Test, develop and refine your design proposal.

### Progress Report 1

Problems you have come up against so far. What are the possible solutions?

**16 Continue Modelling.**

**Progress Report 2**

Did your solutions work? Why?

Which areas of modelling have been most successful so far?

**17 Planning.** Plan what you will be doing/making for during the final modelling activity

**Complete Modelling.**

**[Turn over**

**18 Evaluation of Developed Design Proposal.**

Describe the effectiveness of your developed design proposal and how it meets the needs of the original Design Challenge. Evaluate your final proposal against your specification, you can use annotated sketches and/or photographs.



**3. Decision Time**

Your Design Brief

I am going to design and model a ...

**4. Key Points:**

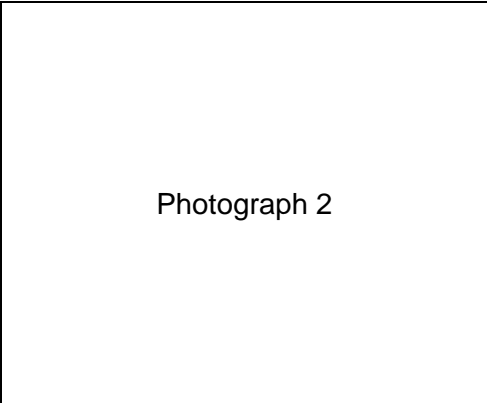
Examine the contents of your job bag remembering your design brief. Identify key points, which will help you write your specification.

**5. Your Design Specification**

To be successful my product must ...



Photograph 1



Photograph 2



Photograph 3

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**Advanced Subsidiary GCE  
Design and Technology**

Unit F521: Advanced Innovation Challenge

**Specimen Paper**

**Session 3**

**F521 QP**

Morning/Afternoon

Time: 1 hour



Candidate  
Name

Centre  
Number

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Candidate  
Number

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**INSTRUCTIONS TO CANDIDATES**

- Write your Name, centre Number and Candidate number in the boxes above.
- This paper contains two questions – you are to answer both questions.
- You are advised to spend 30 minutes on each question.
- Write answers in the spaces on the question paper.
- You may use annotated sketches to support your written answer.
- Use blue or black ink. Pencil may be used for diagrams only.
- **DO NOT WRITE IN THE AREA OUTSIDE THE BOX BORDERING EACH PAGE. ANY WRITING IN THIS AREA WILL NOT BE MARKED.**

**INFORMATION FOR CANDIDATES**

- The number of marks for each question is given in brackets [ ] at the end of each question or part of question.
- The total number of marks for this paper is **20**.
- You should have the Innovation Challenge booklet that you produced in sessions 1 and 2 to assist you during this paper.

This document consists of **8** printed pages.



A series of 30 horizontal dotted lines for writing.





2 Reflect on the product you have designed.

Inclusive design is an increasingly important issue that faces designers today.

Prepare a discussion that reflects your product and which addresses inclusion such as design of environments and products, consideration of different user groups and associated accessibility.

You should include:

- Any modifications you would make to your product to make it more inclusive to a broader range of users.
- Materials and manufacturing techniques that could be used.
- Cost implications.

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The maximum mark for this paper is **[80]**.

NB The Summary Sheet for F521 is for teacher/candidate use only.  
The Unit is externally assessed by OCR

**Session 1****Marks**

<b>1.1 Initial thoughts, design brief and specification</b>		<b>9</b>
Clearly outlines initial thoughts in detail, responding with an open mind showing unexpected and/or challenging ways of thinking. Analyses problems in depth, responds in a way that allows scope for innovation. Identifies a user/market resulting in a clear design brief. Develops a detailed specification that identifies the key features of the product.	7-9	
Outlines initial thoughts in some detail, some creative thinking. Analyses some aspects of the problem. Identifies a user/market, resulting in a design brief. Develops an adequate specification that gives some basic requirements of the product.	4-6	
Outlines initial thoughts, these are predictable/non creative. Analyses the problem at a superficial level that lacks depth. Some consideration of a user/market resulting in a design brief. Produces a basic or superficial specification that is vague/generic.	0-3	
<b>1.2 Designing</b>		<b>12</b>
Presents a wide range of innovative/creative initial ideas, using high quality annotated sketching showing full details of construction/materials. Presents a wide range of evidence to show the sources of inspiration and influences on the designing.. Presents a detailed and objective evaluation of ideas against the design specification and justifies all decisions. Reflects on their chosen design and responds to feedback from others, making further improvements if necessary.	9-12	
Presents a good range of innovative/creative ideas using reasonable quality annotated sketching showing some detail of construction/materials. Presents an adequate range of evidence to show the sources of inspiration and influences on the designing. Presents an adequate and objective evaluation of ideas against the design specification and justifies most decisions. Some reflection on their chosen design and response to feedback from others.	5-8	
Presents only a limited range of innovative/creative ideas using annotated sketching at a limited level with little detail of construction/materials. Little or no reference made to the design specification. Presents a limited range of evidence to show the sources of inspiration and influences on the designing. Presents only a limited and mainly subjective evaluation of ideas with little or no justification of decisions. Limited reflection on their design and little/if any response to feedback from others.	0-4	
<b>1.3 Development and planning</b>		<b>9</b>
Presents improvements, presents evidence of modelling, experiments, testing, making modifications their design to define and refine it, thorough consideration of materials, components or ingredients and methods of manufacture. Produce a detailed action plan for Making, to include a list of materials/ingredients/resources etc.	7-9	
Presents improvements, presents some evidence of modelling, experiments, testing, making modifications their design, some consideration of materials, components or ingredients and methods of manufacture. Some consideration sustainability issues. Produce a reasonable action plan for making, to include a list of materials/ingredients/resources etc.	4-6	
Presents limited improvements, and limited evidence of modelling, experiments, testing, and modifications their design, little if any consideration of materials, components or ingredients and methods of manufacture. Limited understanding of sustainability issues and how this affects their design. Produces a simplistic action plan for making, that shows limited awareness of materials/ingredients/resources etc.	0-3	

**Total**

<b>30</b>	
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**Session 2****Marks**

<b>2.1 Making</b>		<b>22</b>
Record and reflect on progress in detail at various stages. Selects and uses materials innovatively and creatively and further develops ideas to define and refine it. Completes a product/model to a high standard. Demonstrates a range of making skills/ and or complexity.	17-22	
Record and reflect on progress at various stages. Selects and use materials adeptly and makes further modifications to their design. Completes a product/model to a good standard, making skills demonstrate accuracy. Model/product accurately reflects design.	9-16	
Records progress at various stages but limited detail and thought. Use of materials and processes is limited as are any further modifications to their design. Product/model is finished to a poor standard/or is incomplete. Limited range of making skills apparent.	0-8	
<b>2.2 Evaluation</b>		<b>8</b>
Presents realistic and detailed modifications to their idea, using annotated sketches, improvements are creative. Produces a detailed evaluation of their product identifying strengths and weaknesses and shows good consideration of the users/market. Evaluates their design thoroughly against their product specification.	6-8	
Presents some realistic and detailed modifications to their idea, using annotated sketches. Produces a reasonable evaluation of their product identifying some strengths and weaknesses and shows good consideration of the users/market. Reasonable evaluation of their design against their product specification.	4-5	
Presents limited modifications to their idea, using basic annotated sketches. Produces a limited evaluation of their product identifying some strengths and weaknesses and shows limited consideration of the users/market. Some evidence of evaluation of their design against their product specification at a superficial level.	0-3	

**Total**

<b>30</b>	
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<b>SESSION 3</b>		
	<p><b>Reflection – Examination Paper</b></p> <p>This question paper consists of questions from a design, manufacturing or marketing perspective.</p> <p>Candidates are required to answer <b>both</b> questions each question will be worth 10 marks.</p> <p>The questions will require the candidate to reflect about the product they have designed.</p> <p>This will take the form of 2 outline presentations to an expert/ panel.</p> <p>The answers will be in the form of written material supported by annotated sketches.</p>	<b>[20]</b>

### Mark Scheme

Two outline presentations to an expert/ panel will be presented, answers will be in the form of written material supported by annotated sketches. (10 Marks each). QWC is assessed in P and Q

P	relevant points/issues raised	4 marks
S	supporting example and sketches	3 marks
QWC	quality of written communication	3 marks

#### QWC Level descriptors

- 3 Marks:                   Presents information and arguments in a clear and concise manner, using appropriate technical phrases and high quality written communication skills.
- 2 Marks:                   Presents information and arguments in a reasonably clear and concise manner, with limited use of technical phrases and reasonable written communication skills
- 0-1 marks:               Presents information and arguments in a manner that lacks a clear and concise approach, with little or no use of technical phrases and basic written communication skills.

1. Discussion may include:
  - information about market, how it would be targeted. The importance of visual impact to attract interest/sales
  - modifications to the design to make it more economically viable. Specific product use and the feasibility of the product. Scale of production and volume of sales.
  - details of chosen materials and manufacturing techniques
  - aesthetics, colour and fashion trends
  - product comparisons
  - marketing/advertising techniques
  
2. Discussion may include:
  - modifications you would make to your product to make it more inclusive to a broader range of users, e.g. the elderly, the disabled or children.
  - usability issues relating to product, age and ability, anthropometry and ergonomics.



- legislations that may affect product eg DDA
- user research and testing, empathetic approaches to design, understanding and imagining user, barrier free design.
- materials and manufacturing techniques that could be used. and cost implications of any modifications.

**Assessment Objectives Grid (includes QWC)**

	<b>AO1</b>	<b>AO2</b>	<b>Total</b>
<b>Built Environment and Construction</b>	40	40	<b>80</b>
<b>Engineering</b>	40	40	<b>80</b>
<b>Food</b>	40	40	<b>80</b>
<b>Graphic Products</b>	40	40	<b>80</b>
<b>Manufacturing</b>	40	40	<b>80</b>
<b>Resistant Materials</b>	40	40	<b>80</b>
<b>Textiles</b>	40	40	<b>80</b>
<b>Systems and Controls</b>	40	40	<b>80</b>
<b>Totals</b>	<b>40</b>	<b>40</b>	<b>80</b>



**OXFORD CAMBRIDGE AND RSA EXAMINATIONS**

**Advanced Subsidiary GCE**

**DESIGN AND TECHNOLOGY**

**F521**

Unit F521: Advanced Innovation Challenge

**Specimen Task Sheet**

**Released to centres in September**

**Teacher / Candidate Instructions**

**Pre-release materials for the examination to be taken on .....**

**[Turn over**

**The context for the examination is:**

### **Sporting Events**

London often hosts large international sporting Events. An organising committee of these events has stated that they wish to stage “inspirational events that capture the imagination of young people around the world and leave a lasting legacy.”

The Advanced Innovation Challenge will require you to address one challenge within this context from a list of alternatives that you will find on the examination paper.

Candidates should research the context ‘Sporting Events’ and collect inspirational resources relevant to this context in a ‘Job Bag’.

The Job Bag (collection of resources) will be used in Session 1 of the Advanced Innovation Challenge to provide inspiration when addressing the chosen challenge.

Candidates should bear in mind that a carefully selected and edited set of relevant materials will be easier to use during the challenge than masses of Material selected without sufficient thought being given to its possible value in the challenge.