DESIGN TECHNOLOGY: PRODUCT DESIGN | GCSE | AQA | 4555

AQA Product Design Practice Papers 2015

Pre-release context for Section A:
'Patterns and structures inspired by nature'

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POD 5850

Contents

Teacher's Introduction

In the run-up to the summer examinations the importance of preparing for the examination becomes greater. With this in mind, this pack contains two examination papers, with Section A based on the summer 2015 pre-release design context (Patterns and structures inspired by nature).

Each paper follows the structure of a typical AQA examination paper, and as such they can be used as either mock examinations using the full paper, or as revision materials by considering each question individually.

Alongside each paper there is a mark scheme which has indicative answers for each question. Combining these together can provide students with an invaluable insight into what is required of them when they sit the examination during the summer.

This resource is intended to supplement your teaching only.

As with all pre-release material it is the teacher's responsibility to decide in what way to assist their students, and how this resource in particular can be used to fit into that assistance.

The resources here are provided as an interpretation of the preliminary material.
The author does not have any special knowledge of what to expect on any particular exam.

Name	

ZigZag Education supporting
AQA GCSE Design Technology
Product Design – Unit 1 [45551]

Practice Paper 1

Pre-release Context: Patterns and structures inspired

Time: 2

Instructions

- Use black ink or black ballpoint pen. Use pencil and coloured pencils only for drawing.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- Do all rough work in this answer book. Cross through any work you do not want to be marked.

Information

- The marks for questions are shown in brackets.
- The maximum mark for this paper is 120.
- The question in Section A relates to the pre-release context.
- You are reminded of the need for good English and clear presentation in your answers.
- Quality of written communication will be assessed in Question 6(c).

Section A

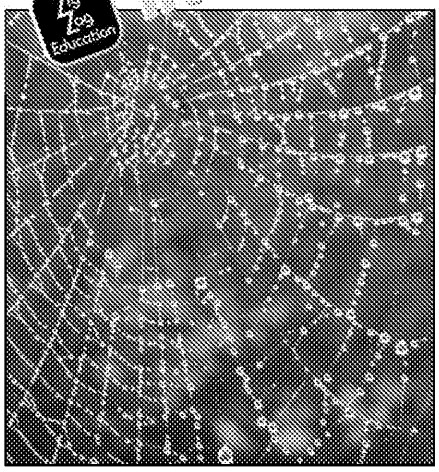
Answer **all** questions in the spaces provided

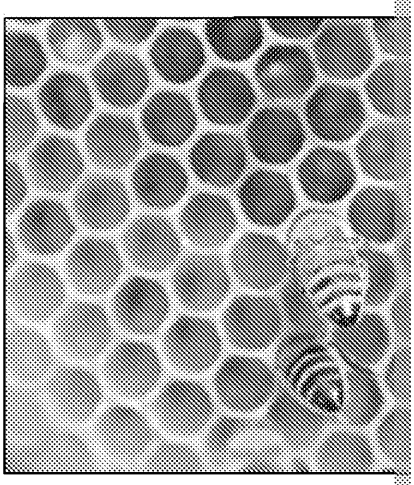
Question 1 is about the use of natural structures to inspire design.
You are advised to spend about 34 minutes on this question.

1 There are many structures in nature that can be used as a starting p

Choose one of the following types of product, drawing a circle aroun
asked to design a product of the type you choose later in the questio

Storage *Chair* *Lighting* *Ca*





a) In the space on the following page, sketch a design for the prod
You must use one of the pictures shown above to inspire the ap

Marks will be given for:

- originality of idea, including use of the images above
- materials and construction techniques
- surface decoration, including the use of colour

b) Describe three methods that could be used to gather information they think of your design.

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c) What is the difference between quality control and quality assura

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Question 1 continues on the following pag

d) A manufacturer has decided to produce your design. Describe th
carry out to check that the product is of suitable quality.

Test 1

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Test 2

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Test 3

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Section B

Answer **all** questions

Question 2 is about materials.
You are advised to spend about 14 minutes on this question.

2 a) In the table below, give three different examples of paper or card
For each material, state an application for which it is often used.

Type of paper or card	Ap
.....	.....
.....	.....
.....	.....
.....	.....
.....	.....
.....	.....

b) Give three examples of stock sizes for paper and card.

1 .....

2 .....

3 .....

Question 2 continues on the following pag

c) i. Explain what is meant by the term 'smart material'.

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ii. Name one specific smart material.
Describe its properties and identify an application in which it is used.

Material: .....

Properties: .....

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Application: .....

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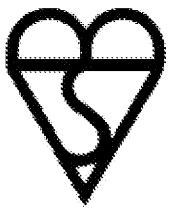
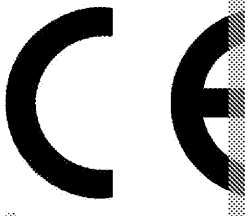
Question 3 is about consumer issues.
You are advised to spend about 14 minutes on this question.

3 a) Explain the meaning of the following symbols:





b) What is the purpose of national standards?

Question 4 is about brand identity and advertising.
You are advised to spend about 19 minutes on this question.

4 a) Explain what is meant by brand identity. You should use example

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b) A company have developed a new range of products for teenage
their products through advertising.

Name three different types of advertising.

1 .....

2 .....

3 .....

4 .....

c) Choose one of the methods you named in part b) above.

Using examples, explain how this method of advertising would p
the product.

Selected method: .....

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Question 5 is about manufacturing products.
You are advised to spend about 25 minutes on this question.

5 A Design and Technology class are learning about production lines. S
together in teams, which will each make 80 identical products.

a) Choose one of the following products. Draw a circle around you

wooden toy *metal pendant* *badge*

biscuits *'get well soon' card*

In the box below, show a simple s e ch e product to be made

You will be asked t esc e how the product will be manufactur
Marks will be a d for feasibility, surface decoration and quali

b) i. Name a suitable main material for your product.

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ii. Explain why the ma al u have chosen in i) is suitable fo

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Question 5 continues on the following pag

5 c) In the box below, use a flow chart to show how your product will
You should include quality control checks at each stage.

Question 5 continues on the following pag

5 d) Students will work in teams, with each team making 80 identical

In the space below, draw a layout to show how the production o
organised.

Marks will be awarded for:

- layout and order of the processes
- identification of tools and equipment
- quality of communication

Question 6 is about manufacturing systems.
You are advised to spend about 28 minutes on this question.

6 a) Explain what is meant by the following types of production. For e
product made using that method.

i. One-off production

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ii. Batch production

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iii. Mass production

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Question 6 continues on the following pag

iv. Just-in-time (JIT) production

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b) C[illegible]s widely used to manufacture products. Explain the advan[illegible] using CAM to produce products.

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Question 6 continues on the following pag[illegible]

c) Commercial manufacturing consists of a system, a group of systems
Explain in detail what this means, giving examples of the types of sy

You will be assessed on your quality of written communication in this

Name	

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Practice Paper 2

Pre-release Context: Bridges and structures inspired

Time: 2 h

Instructions

- Use black ink or black ballpoint pen. Use pencil and coloured pencils only for drawing.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- Do all rough work in this answer book. Cross through any work you do not want to be marked.

Information

- The marks for questions are shown in brackets.
- The maximum mark for this paper is 120.
- The question in Section A relates to the pre-release context.
- You are reminded of the need for good English and clear presentation in your answers.

Section A

Answer **all** questions in the spaces provided

Question 1 is about the use of patterns in nature to inspire design.
You are advised to spend about 30 minutes on this question.

A new shop selling a wide range of sustainable natural products has ask
the carrier bag that they will use for their packaging.

1 a) State four of the basic functions carried out by packaging.

1 .....

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2 .....

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3 .....

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4 .....

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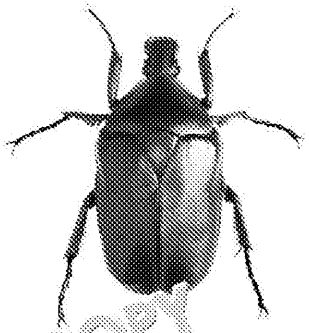
b) The shop want a repeat design to appear on their carrier bags. Th
not copy, one of the following images:



On the follo[illegible] sketch a suitable design for the carrier ba
[illegible] above to inspire the appearance of your design.

Marks will be given for:

- originality of the design
- use of the images above
- presentation, including the use of colour

Question 1 continues on the following pag

c) The shop have asked you to advise them on appropriate design

Give three different design criteria which will make your product
Give one reason for each design criterion.

An example is given for you.

Design Criteria	
Should be sustainable	*To avoid damage with the image of*
.....	.....
.....	.....
.....	.....
.....	.....
.....	.....
.....	.....

d) Suggest a suitable material that the carrier bag could be made f material is appropriate.

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Question 1 continues on the following pag

e) Describe a suitable process to apply your repeat design to the c

Section B

Answer **all** questions

Question 2 is about materials.
You are advised to spend about 18 minutes on this question.

2 a) Choose a type of material from the list below and circle your cho

aluminium *pasta* *acrylic* *porcelain*

i. Describe the processes involved in ... ing the material y... from its source to a workab... material.

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ii. Describe two forms in which the material you have selected ... available.

1 .....

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2 .....

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Question 2 continues on the next page

b) i. State what is meant by a pre-manufactured component.

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ii. Explain why a manufacturer might buy pre-manufactured co
manufacturing process, rather than making the components

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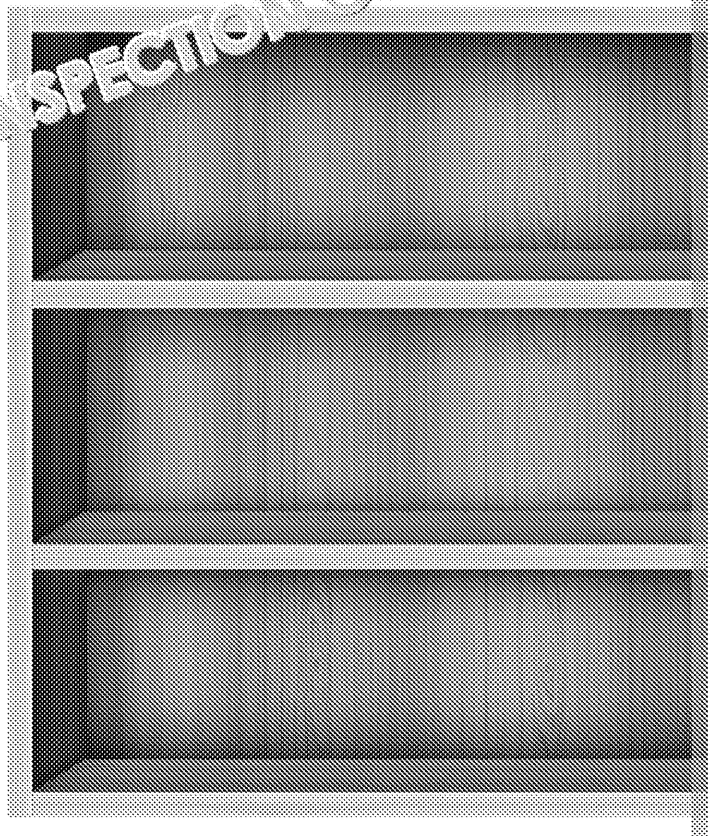
Question 3 is about design movements and environmental issues.
You are advised to spend about 18 minutes on this question.

3 a) Design movements have had a significant influence on product d
movements.

Movement 1 .....

Movement 2 .....

b) The following bookcase is to be redesigned i he style of one o
you have identified in a).



Circle the movement selected.

Movement 1 *Movemen*

In the space on the following p e, using notes and sketches, sh
design for the bookca ing the typical features of this des

M w given for:

- design features typical for this design movement *(3 mark*
- quality of drawing *(4 marks)*
- describing how it would be different if instead it had the t
other movement named in a) *(3 marks)*

Question 3 continues on the following pag

c) Designers can use the 6 Rs to reduce the impact of their design

Choose three words from the list below:

Rethink *Reduce* *Refuse* *Repair* *Reu*

Explain how using your chosen words would change the design produced in b).

Word selected: .....

Effect: .....

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.....

Word selected: .....

Effect: .....

.....

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Word selected: .....

Effect: .....

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Question 4 is about health and safety.
You are advised to spend about 12 minutes on this question.

4 a) Explain why it is important to consider health and safety issues w
products.

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b) Select o[illegible]at you are familiar with from the following list. C

sewing machine *vacuum forming machine* *electric*

soldering iron *CNC sticker cutter* *kiln f*

List two potential hazards of using the tool. For each, give a way

For example, if the tool was a pillar drill, a hazard might be flying
reduce the risk might be to wear goggles.

Potential hazard	Action to
1.	
2.	

c) Explain the difference between immediate and cumulative risk.

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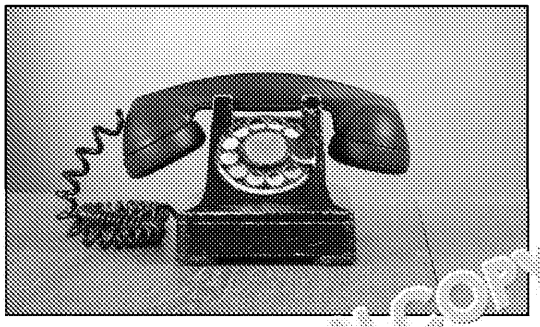
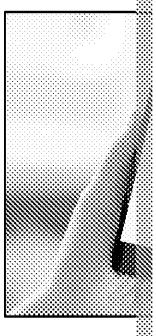
Question 5 is about the evolution of product design.
You are advised to spend about 25 minutes on this question.

5 Telephones have changed over the years.





a) Identify a design feature from the pictures shown above and use it to explain how it has changed over time.

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b) Identify two different features of a telephone where the designer would have used data. Explain how using this data would help to make sure that the product is successful.

Feature 1: .....

Data used: .....

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Feature 2: .....

Data used: .....

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Question 5 continues on the following page

c) When designing using anthropometric data, explain why the range
percentile is important.

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d) Di[illegible]s the advantages and disadvantages of recycling. Explain h
easier to recycle.

Quality of written communication will be assessed in your answer.

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e) D[illegible] what is meant by market pull and technological push. Gi[illegible] de[illegible]ned in response to each.

Question 6 is about manufacturing products.
You are advised to spend about 25 minutes on this question.

6 A local charity are planning to hold a fair to raise funds. Your class ha
simple product to sell, using a batch manufacturing approach.

a) You have been asked to design the product that your class will m
- be suitable to be manufactured in batches of 25
- include a decorative feature

Use notes and/or sketches to show your product in the box below.
You will be asked to describe how the product will be manufacture

b) i. Name a suitable main material for your product.

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ii. Explain why the material you have chosen in i) is suitable for
25.

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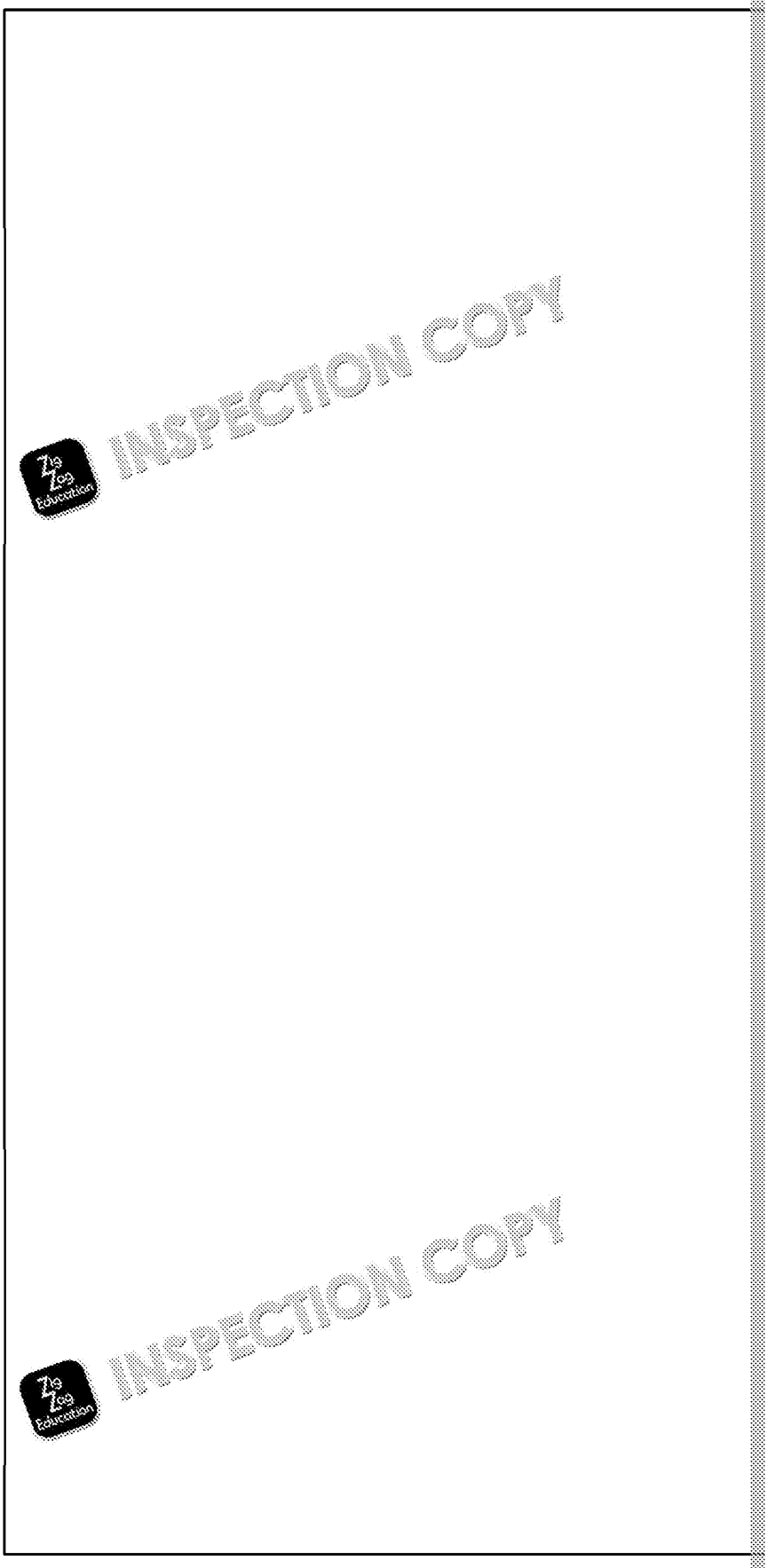
Question 6 continues on the following pa

c) In the box below, use notes and/or sketches to show how your pr
You should include quality control checks at each stage.



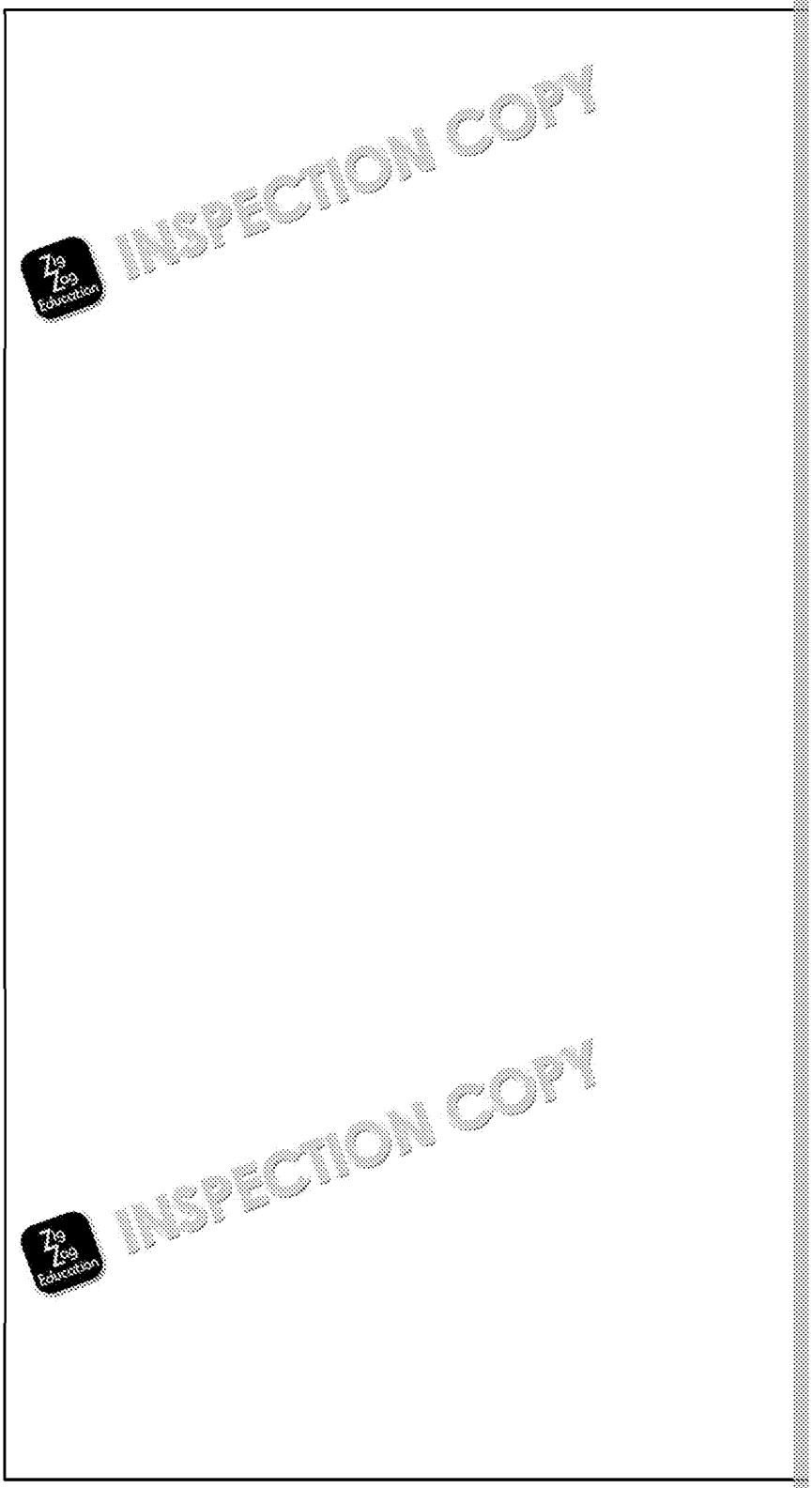
Question 6 continues on the following pag

d) Students will work in teams. Each team will make 100 identical pr

In the space below, draw a layout to show how the production of y
organised.

Marks will be awarded for:

- feasible layout and order of processes
- identification of tools and equipment
- showing how you ensure that each product is made to a high



Practice Paper 1 Mark Scheme

Section A

1 a

Originality:

- Award 5–6 marks if the response is fully compatible with the se drawn in proportion and would be fully effective. Solution has i commercially recognised features which enhance the product's
- Award 3–4 marks if part of response may be effective, but may has missing components which result in solution not being app be a simple solution with limited detail of innovative or commer which therefore may not enhance the product.
- Award 1–2 marks for a limited respons[illegible]ch lacks significan or creative solution.

Link to images:

- Award 4 [illegible] for design containing multiple features or exten cl[illegible]ed to the images and annotated with well-reasoned
- A[illegible]rd 3 marks for a design annotated with three or more featu by the images.
- Award 2 marks for simple annotation pointing out obvious feat images.
- Award 1 mark if the annotation is brief and superficial only, or t transposed onto the design.

Manufacturing:

- Award 4–5 marks for an accurate and detailed explanation of h manufactured, naming appropriate processes and relating thes specific features of the product.
- Award 3 marks for a sound explanation of how it could be man most of the processes used. The processes are appropriate. S product may be related to the processes used.
- Award 2 marks for a simple explanation of how it could be mar naming a few of the processes used. The processes are mostl
- Award 1 mark for naming a few processes that could be used t Some of the processes may not be appropriate.

Surface decoration:

- Award 4–5 marks for application of colour used to provide deta decoration appropriate to the user and show any design featur
- Award 2–3 marks for reasonable application of colour to give s surface decoration. It may not be appropriate for the user or m lack detail.
- Award 1 mark for basic application of colour to give simplistic d decoration. It may not have given detail or features.

b

Award 1 mark each for three s[illegible]m[illegible]ous (e.g. survey, interview, focus group) and a seco[illegible]rk[illegible]ch if details of how the method wou given.

c

[illegible] mark for stating that quality control is checking products after m[illegible] stating that quality assurance is putting systems in place to en correct before it is made.

d

Award 1 mark each for identifying three appropriate tests and a second how the test is carried out. Accept any suitable example.

Section B

2 a Award 1 mark each for up to three valid materials – accept any named
cartridge paper, tracing paper, layout paper, sugar paper, tissue paper
newsprint; corrugated card, mounting board, solid white board, foil-line

Award a second mark for each if there is a valid application or example

Do not accept wallpaper, paper sizes (e.g. A4), card/cardboard, or lam

b Award 1 mark each for up to three suitable sizes given, e.g. A2, A3, A

c i Award 1 mark for a simple statement such as 'a material that has a pro
award 2 marks if this is qualified as being in response to changes in its
stated that the change is reversible.

ii Award 1 mark for a specified named material, such as: quantum tunnelli
thermochromic pigment, photochromic pigment, shape-memory alloy (

Award 1 mark for naming the 'smart' property and a further mark for st
environmental factor that the material reacts to. Award 1 mark for iden
product. Some suggestions are listed in the following table.

Material	Property	Exa
Quantum tunnelling composite	Material changes from an insulator to a conductor when compressed	Pressure s
Photochromic pigment	Becomes darker as light increases	Colour-ch
Thermochromic pigment	Colour changes with temperature	Kettles, co food pack
Shape-memory alloy	When heated, metal returns to a 'remembered' shape; e.g. wire (Nitinol) shrinks by 5% in length when electrical current is passed through it	Spectacle fire alarm

3 a Award 1 mark each for correctly identifying the two symbols (BSI Kiten
European symbol).

Award 1 mark for stating that the products have been tested to a stand
meet safety requirements. Award a second mark for additional detail, s
independent nature of testing or comparison with the different markings

E.g.
- A product with the BSI Kitemark is independently tested (1) to ensure
of a high quality and safety standard (1).
- The CE (Conformité European symbol means that the product meets a m
sold within the EU (1).
- Typically the BSI Kitemark is a guarantee of higher quality standard t

b Award 1 mark each for up to three of the following points:
- They give the consumer confidence in the quality of the products.
- They provide independent verification (or testing) of a product's per
- They set safety standards, to protect the user.
- Any other suitable answer.

4 a Award 1 mark each for up to four of the following points:
- Brand identity is typically the attributes associated with a bran owner wants the consumer to perceive the brand (1) and by e company, organisation, product or service (1).
- A 'brand' involves using a name, term, colour, symbol, design these to identify the goods or services to make them appealin
- Brands often speak to our self-image and aspirations.
- Brands can give a product a personality or inferred characteris 'swoosh', energy, movement.
- Appropriate examples of brand identity.

b Award 1 mark each for any four of the following:
leaflets or flyers; point-of-sale displays; viral mark ing – Internet socia buzzwords; school newspapers and maga T , radio and cinema placement in TV programmes; billb ar / b stop / bus poster campa sponsorship; celebrity endors consumer advertising (large logo

c Award 1 mark for a simplistic statement which mentions one point only

2 marks for a sound response showing a basic understanding o of advertising increases sales.

Award 3 marks for a concise, detailed response showing a good unde specific method of advertising increases sales.

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5 a Solution is fully feasible and suitable for manufacture in this quantity. S appropriate and complements the design. (4 marks)

Solution might not be completely feasible/suitable for manufacture in t decoration may not have been added or be appropriate or complemen (2–3 marks)

Solution is insufficiently detailed, not feasible or suitable for manufactu surface decoration. (1 mark)

b i Award 1 mark for any suitable material that is specifically named, e.g. aluminium, polystyrene, acrylic, felt, card, biscuit mix, pastry.

ii Award 2 marks if the reason shows good understanding of the working material. Award 1 mark if the reason is vague and lacking in understan of the material.

c All main stages of manufacture listed correctly and in correct order. Ap control measures identified and in the correct place. (7–8 marks)

Most main stages of manufacture listed and correct, but may not be in Appropriate quality control measures identified may not be in corre

Some main stages of manufactu de tified, but information may be i and in wrong order. Appr fe quality control measures may not hav may be incorrect f e m nufacturing process. (3–4 marks)

n main stages of manufacture identified, or information is vag Appropriate quality control measures have not been identified o t manufacturing process. (0–2 marks)

d A well-planned layout and feasible order of processes; sequence is cle
omissions. Correctly named tools and equipment for major stages of m
Comprehensive and appropriate quality control measures and feedbac
Appropriate division of labour. Suitable for the scale of production. (8–

A generally correct layout and sequence of manufacturing detailed, bu
omissions. Correctly named tools and equipment for major stages of m
appropriate quality control measures and feedback included. Division
may be disproportionate for some tasks. Suitable for the scale of prod

Only part of the layout or process superficially detailed or unsuitable fo
produced. Some tools and equipment are correctly named. Quality co
feedback may not be included or may not be appropriate to process. D
not be feasible or may have not been considered. (3–4 marks)

Limited or no response. (0–1 mark)

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6 a For each method of production, award 1 mark each for two of the follo
appropriate example of a product made using that approach.

i
- Just one product made at a time
- Every product made this way is different
- Often uses flexible, manual machines
- Labour-intensive

ii
- Small number of identical products manufactured
- Jigs, fixtures and templates often used to aid production
- May use manual processes or CAM machines
- Machines changed over to produce batches of different products

iii
- Very large number of products produced
- Often uses a production line
- Often involves high use of CAM equipment
- Workers may have fewer skills than for smaller-volume productio
- Sub-assemblies may be used

iv
- Only enough stock, materials or components purchased to cover
needs
- Reduces cost of storage and overstocking
- Allows production runs to be changed quickly
- Production can be disrupted when supply fails

b Award 1 mark for describing each of the following points, up to a maxi

Advantages
- Products made to a consistent/high qu
- Less chance of human error a
oduct quality
- More efficient, accura
ster production
- Not as many
eed to be employed as machines r
mone

ar
ges:
- CAM equipment can be expensive to purchase
- Users have to spend time learning how to use the equipment;
spend time/money training staff
- Less job availability for jobseekers
- Other suitable comments should also gain credit

c 6 marks to be awarded in answer to question and 4 marks for QWC.

Award 1 mark for describing each of the following points, up to a maxi

- Risk assessment and compliance with health and safety rules
- The organisation and storage of materials/components/ingredi
- The design and production of products in a systematic way
- Special buildings or places of work, building requirements
- The organisation of people, job roles, etc.
- The organisation of tools and equipment
- Outputs of manufacturing, such as disposing or recycling of w associated environmental issues
- Use of ICT to help people communicate with each other effect
- Ways of changing the shape and form of materials to increase
- Ways of using tools and equipment to transform the materials
- Quality assurance and quality control
- Efficient working and cost efficiency savings during productio
- Safe disposal of unwanted materials
- Other relevant comments should also gain credit

4 marks – excellent QWC with no obvious errors
3 marks – good coverage with very few grammatical errors
2 marks – coverage but with some obvious errors
1 mark – poor coverage and significant errors present

Practice Paper 2 Mark Scheme

Section A

1 a Award 1 mark each for up to four of the following: protect, inform, conta
preserve and display.

b Originality:
- Award 5–6 marks if the response is fully compatible with packa
image and is drawn in proportion.
- Award 3–4 marks if part of response may be effective, but may
not be repeated, or might not be appropriate. Design may be a
limited detail.
- Award 1–2 marks for a limited response which lacks significan
or creative solution.

Link to images:
- Award 5–6 for design containing multiple features or exten
clearly linked to the images and annotated with well-reasoned
- Award 3 marks for a design annotated with three or more featu
by the images.
- Award 2 marks for simple annotation pointing out obvious feat
images.
- Award 1 mark if the annotation is brief and superficial only, or t
transposed onto the design.

Presentation:
- Award 4–5 marks for a clear and good-quality drawing with app
of colour used to provide detail.
- Award 2–3 marks for a reasonable drawing with some applicat
be simplistic and lack detail.
- Award 1 mark for a simple sketch with no use of colour. It may
features.

c Award 1 mark each for up to three sensible design criterion identified a
chosen target user, and a second mark each for up to three appropriat
durable / must not break in use; weather resistant / used outside; mant
reduce cost; material; weight; dimensions; ergonomics.

Give credit for the reason where appropriate even if the design criterio
versa.

Do not award a mark for a reason that is not relevant or incorrect or ina
user, or repeats the requirement for a repeat image.

d Award 1 mark for a suitable sustainable material such as paper or hess
for up to two suitable reasons, e.g. sustainability, cost, strength, ease o

Do not award a mark for plastic bag

e Award 1 mark for naming a suitable method. Award 1 mark each for an
details in the description:
- The sustainable materials required
- The equipment used
- The steps in the process to produce the design (e.g. creating a te
the design, printing)

Section B

2 a i Award marks as follows, where the candidate describes an appropriat conversion for the stated material.

Award 1 mark for a limited or simplistic statement which mentions only process.

Award 2 marks for a response showing a basic understanding of the c identifying up to two steps in the process.

Award 3 marks for a sound response showing a good understanding o process.

Award 4 marks for a concise, detailed response showing a good unde conversion process.

ii Award 1 mark for each up to a maximum of 4 marks for two appropria (e.g. sheet, bar, tube) and a second mark for each explanation of

b i Award mark for suitable point: pre-prepared component or ingredient, component, standard component, component that is 'bought in'.

ii Answers may include the following points:

- It is more cost-effective to buy these parts than to invest in the them.
- Suppliers can get economies of scale by making the same pro
- The parts are of more consistent quality than if they were mad quantities.
- It is cheaper to buy them than the cost of labour to make them

Award 1 mark for a limited or simplistic statement which mentions only

Award 2 marks for a sound response mentioning two points briefly or

Award 3 marks for a concise, detailed response that includes three ba point with additional explanation and a basic point.

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3 a Award 1 mark each for two appropriate design movements, e.g. Arts a Art Nouveau, Art Deco, Bauhaus, Modernism, De Stijl, Memphis, Post

b Award 1 mark each for typical features of the selected design moveme maximum of 3 marks in total.

Award 1 mark each for stating typical features of the other design mov maximum of 3 marks in total or comparing the stated characteristics, e inspiration, differences in appearance or function, drawing differences usi

Drawing – select an appropriate mark as follows:
Award 1 mark for a limited response which lacks significant detail.
Award 2 marks if a recognisable drawing technique is used for at leas is to a reasonable standard.
Award 3 marks if a recognisable drawing technique is used for the dra good standard with some detail.
Award 4 marks if a recognisable drawing technique is used to a good appropriate rendering and detail.

Examples of some of the characteristics are shown below:

- Arts and Crafts – Inspired by organic shapes and patterns fou traditional craft techniques and expensive materials.
- Art Deco – Bright and bold style. Much use of geometric shap window design. Also influenced by Egyptian art, such as Tuta
- Art Nouveau – Based on the organic lines of climbing plants a

often used by designers of glass, furniture, fabrics and wrough
- Bauhaus – Modern materials and mass production methods. F
- De Stijl – Geometric designs, using basic shapes and primary essential colour and form used in the design.
- Memphis – Used industrial materials and unconventional mate laminates). Inspired by historic forms, kitsch motifs and gaudy
- Modernism – Ergonomic designs using appropriate materials Often used geometric shapes that were easy to mass produce
- Post-modernism – Anti-design. Products look unintentional or weren't really designed.

c Award 1 mark each for a simple or limited statement. Award 2 marks e explanation that relates to the design or use of the product.

Examples of definitions:
- Rethink – reviewing t[illegible]ion or functions of the product an actually need
- Redu[illegible]signing the product so that less material or ene [illegible]nufacture and use
- Refuse – not using a product, material or process if it is not th environment
- Repair – extending the life of the product, by designing it to all maintenance
- Reuse – redesigning the product so that its parts or componer other products without modification
- Recycle – ensuring that the materials used to make the produ and used to make other products

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4 a Award 1 mark for each of the following points, up to a maximum of 2 m To ensure that people can use equipment/machines confidently (1) an themselves (1) and/or others (1).

b Award 1 mark each for stating two hazards and a second mark each f action.

c Award up to a maximum of 2 marks, as follows:
Immediate risk is something that poses a potential safety risk straight mark); cumulative risk is a combination of seemingly benign incidents/ added together can cause a safety issue/risk (1 mark).
Accept similar wording.

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5 a Award 1 mark each for identifying a different design feature. Award a f for providing a rationale for the change.

E.g. change from dial to screen dialling, reducing size or due to improv technology; reductions in size due to the development of microelectro shape due to increased consideration of ergo[illegible] factors in design.

b Award 1 mark each for identifyi[illegible] appropriate features, such as but weight, separation betw[illegible]er and microphone, etc.

For each feature, award 1 mark for describing an appropriate type of d [illegible]ue, and a further mark for the explanation (e.g. so that indivic [illegible]d without pressing another, to make it comfortable to hold witho

c Award 1 mark for a limited or simplistic statement, e.g. referring in gen

Award 2 marks for a sound description of the 5th to 95th percentile.

Award 3 marks for a detailed description of the 5th to 95th percentile ex by designers to ensure that products are ergonomic and comfortable f

d 6 marks to be awarded in answer to question and 4 marks for QWC.

Award 1 mark for up to a maximum of six of the following points:

Advantages

- Less energy is needed to recycle materials than to make new ma
- Reduces the need for new materials
- Can reduce the cost of a product (where the recycled material is
- Reduces waste
- Moves from a linear economy to a circular economy

Disadvantages

- Materials need to be separated for recycling
- Design needs to allow for disassembly
- Materials need to be clearly identified
- Quality of materials may be reduced during recycling

Also:

- Some products are not suitable for recycling, such as electronic
  compos
- An [illegible] appropriate point

4 marks – excellent QWC with no obvious errors
3 marks – good coverage with very few grammatical errors
2 marks – coverage but with some obvious errors
1 mark – poor coverage and significant errors present

e Award 1 mark each for defining the two terms. Award a further mark to
an appropriate example.

E.g. Market pull is where products are developed in response to a kno
(1). Fridges were developed to meet the need to keep food fresh for a
time (1). Technology push is where products are developed due to imp
materials or processes (1), before consumers know that they have a n
Developments in microelectronics mean that mobile phones can now i
cameras.

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6 a Solution is fully feasible and suitable for manufacture in this quantity. S
appropriate and complements the design. (4 marks)

Solution might not be completely feasible /suitable for manufacture in this
decoration may not have been added or be appropriate or complement th

Solution is insufficiently detailed, not feasible or suitable for manufactu
surface decoration. (1 mark)

b i Award 1 mark for any suitable material that is specifically named, e.g.
aluminium, polystyrene, acrylic, felt, card, biscuit, mdx, pastry.

ii Award 2 marks if the reason shows good understanding of the working
material. Award 1 mark if the reason is vague and lacking in understan
of the material.

c [illegible] of manufacture listed correctly and in correct order. Ap
[illegible] measures identified and in the correct place. (7–8 marks)

Most main stages of manufacture listed and correct, but may not be in
Appropriate quality control measures identified but may not be in corre
Some main stages of manufacture identified, but information may be i
and in wrong order. Appropriate quality control measures may not hav
may be incorrect for the manufacturing process. (3–4 marks)

Little or no main stages of manufacture identified, or information is vag
order. Appropriate quality control measures have not been identified o
the manufacturing process. (0–2 marks)

d A well-planned layout and feasible order of processes; sequence is cle
omissions. Correctly named tools and equipment for major stages of m
Comprehensive and appropriate quality control measures and feedbac
Appropriate division of labour. Suitable for the scale of production. (8–

A generally correct layout and sequence of manufacturing detailed, bu
omissions. Correctly named tools and equipment for major stages of m
appropriate quality control measures and feedback included. Division o
but may be disproportionate for some tasks. Suitable for the scale of p
marks)

Only part of the layout or process superficially detailed or unsuitable fo
produced. Some tools and equipment are correctly named. Quality con
feedback may not be included or may not be a[illegible]riate to process. D
not be feasible or may have not been c[illegible]de[illegible]. (2–4 marks)

Limited or no response (0 marks)