Centre Number						Candidate Number				
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Other Names										
Candidate Signature										

For Examiner's Use	
Examiner's Initials	
Question	Mark
1	
2	
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10	
11	
TOTAL	

General Certificate of Secondary Education
June 2011

Design and Technology: Resistant Materials Technology 45601

Unit 1 Written Paper

Wednesday 25 May 2011 1.30 pm to 3.30 pm

For this paper you must have:
- a black pen, a pencil, a ruler, an eraser, a pencil sharpener and coloured pencils.

Time allowed
- 2 hours

Instructions
- Use black ink or black ball-point 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 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 questions in Section A relate to the context referred to in the Preliminary Material that was previously issued.
- All dimensions are given in millimetres unless otherwise stated.
- You are reminded of the need for good English and clear presentation in your answers. Quality of Written Communication will be assessed in Question 11.

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Section A

Answer **all** questions.

In this section you will be asked to

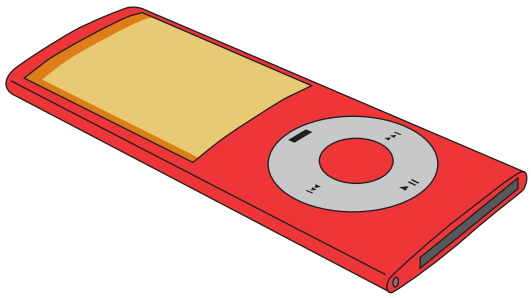
- produce a design specification
- produce a range of ideas
- develop **one** of your ideas
- evaluate your chosen idea.

Design Brief

You have been asked by a company that designs and manufactures personal hi-fi equipment to produce a range of casing designs for an mp3 player docking station with speakers.

The docking station should be suitable for the teenage market.

Below is an image of an mp3 player.



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1 Question 1 is about the Design Specification.

You are advised to spend about 5 minutes on this question.

Give **three** design requirements of a casing for an mp3 player docking station with speakers that is suitable for the teenage market.

Explain each of your answers.

An example has been completed for you.

Requirement: The docking station should securely hold the mp3 player.

Explanation: The mp3 player could get damaged by falling off the docking station.

1 (a) Requirement 1 .....

Explanation .....

.....

.....

(2 marks)

1 (b) Requirement 2 .....

Explanation .....

.....

.....

(2 marks)

1 (c) Requirement 3 .....

Explanation .....

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(2 marks)

6

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2 Question 2 is about creative design.

You are advised to spend about 15 minutes on this question.

Study the information given in the **Design Brief** (page 2) and your **Design Specification** (page 3).

Use this information to help you sketch **five** different design ideas for a casing for an mp3 player docking station with speakers that is suitable for the teenage market.

Marks will be awarded for creativity.

(5 x 3 marks)

15

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3 Question 3 is about developing the design.

You are advised to spend about 12 minutes on this question.

Choose your best idea from Question 2.

Use notes and sketches to show how you would develop the design features of your chosen mp3 player docking station with speakers.

Your developed design should include details of materials and finishes, method of construction and design features. You should include **three** important sizes.

Marks will be awarded for:

- details of materials and finishes *(3 marks)*
- method of construction *(3 marks)*
- design features and sizes. *(3 marks)*

9

Turn over ►

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4 Question 4 is about evaluation.

You are advised to spend about 3 minutes on this question.

Evaluate your developed design (Question 3).

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(3 marks)

3

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Section B

Answer **all** questions.

5 Question 5 is about tools and equipment.

You are advised to spend about 5 minutes on this question.

Name **each** of the following tools.

Give details of a specific process where you would use each tool.

© Thinkstock

Name .....
(1 mark)

Process .....

.....

.....
(1 mark)

© Thinkstock

Name .....
(1 mark)

Process .....

.....

.....
(1 mark)

Name .....
(1 mark)

Process .....

.....

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(1 mark)

6

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6 Question 6 is about health and safety.

You are advised to spend about 10 minutes on this question.

6 (a) Complete the sentence below by adding the correct words from the following list.

dust mask ear defenders apron gauntlets goggles

latex gloves safety boots

When using a jigsaw to cut wood you should ensure that you are wearing:

- ..... to protect your clothes
- ..... to protect your eyes
- ..... to protect your hearing
- ..... to protect your breathing.

(4 marks)

6 (b) Complete the table below by giving the meaning of each sign.

State a precaution you should take when using a product that displays each sign.

Sign	Meaning	Precaution
	.....	.....
	.....	.....
	.....	.....

(6 x 1 mark)

10

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7 Question 7 is about making.

You are advised to spend about 20 minutes on this question.

Two designs for a sports trophy are shown below.

Both of them could be made in a school workshop.

Choose **one** of the sports trophies and tick the appropriate box. You will be asked how you would make a batch of **ten** of your chosen sports trophies.

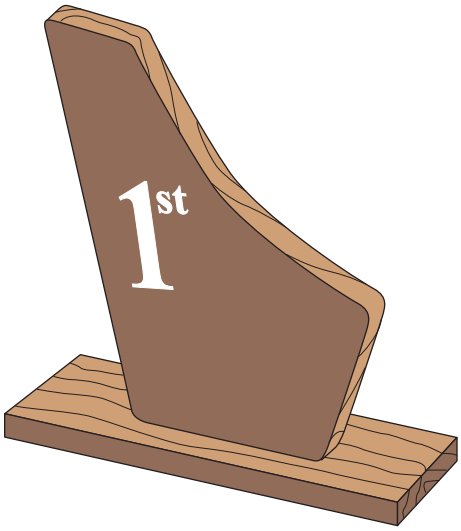
Plastic sports trophy with wooden base ☐

Metal sports trophy with wooden base ☐

Wooden sports trophy with wooden base ☐

A plastic or metal sports trophy with wooden base

A wooden sports trophy with wooden base



Question 7 continues on the next page

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Use clear notes and sketches to show how you would make a batch of **ten** of your chosen sports trophies in a school workshop.

At each stage, name **all** the tools, equipment or software you would use.

Stage 1: Marking out **or** CAD (Computer Aided Design)

(4 marks)

Stage 2: Cutting and shaping **or** CAM (Computer Aided Manufacture)

(4 marks)

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Stage 3: Bending **or** joining

(4 marks)

Stage 4: Applying the surface finish

(2 marks)

Stage 5: Producing the text that says '1st'

(2 marks)

16

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8 Question 8 is about materials.

You are advised to spend about 15 minutes on this question.

8 (a) Study the products shown below.

Name **one** suitable, *specific* material which has been used to make each product.

Give **one** reason for **each** choice.

Give the original source of the material.

Kitchen stool

© Thinkstock

Material .....
(2 marks)

Reason .....

.....

.....
(1 mark)

Original source of the material

.....
(1 mark)

Toy digger

© Thinkstock

Material .....
(2 marks)

Reason .....

.....

.....
(1 mark)

Original source of the material

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(1 mark)

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8 (b) Discuss the possible environmental impact of using metal to manufacture products.

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(7 marks)

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Turn over for the next question

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9 Question 9 is about sustainability and maintenance.

You are advised to spend about 15 minutes on this question.

Study the mountain bike shown below.

9 (a) Identify **three** components found on the mountain bike that require maintenance.

For **each** component, describe the maintenance operation that should be carried out.

Component	Maintenance operation
..... *(1 mark)*	.... *(2 marks)*
..... *(1 mark)*	.... *(2 marks)*
..... *(1 mark)*	.... *(2 marks)*

Do not write outside the box

9 (b) Explain why a designer should consider the importance of maintenance when designing products.

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(8 marks)

17

Turn over for the next question

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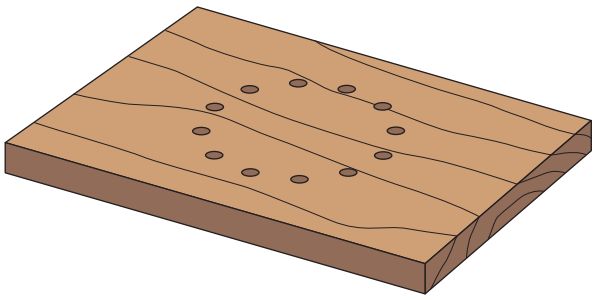
10 Question 10 is about quality control.

You are advised to spend about 10 minutes on this question.

Study the wooden block shown below. This wooden block is to be made in a school workshop.



10 (a) Produce a labelled drawing of a simple drilling jig that will allow 100 similar wooden blocks to be drilled.

(5 marks)

Do not write outside the box

10 (b) Explain how the use of jigs, moulds and templates affect the manufacture of products.

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(8 marks)

13

Turn over for the next question

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11 Question 11 is about sustainability.

You are advised to spend about 10 minutes on this question.

Quality of Written Communication will be assessed in your answer.

Explain what is meant by the term 'sustainability'. Give examples of products where sustainability has been considered during their design, manufacture or use.

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(10 marks)

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END OF QUESTIONS

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ANSWER IN THE SPACES PROVIDED

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