

Monday 30 January 2012 – Afternoon

GCSE DESIGN AND TECHNOLOGY Resistant Materials

A562/01 Sustainable Design

Candidates answer on the Question Paper.

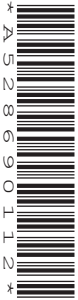
OCR supplied materials:

None

Other materials required:

None

Duration: 1 hour



Candidate forename		Candidate surname	
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Centre number							Candidate number				
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INSTRUCTIONS TO CANDIDATES

- Write your name, centre number and candidate number in the boxes above. Please write clearly and in capital letters.
- Use black ink. HB pencil may be used for graphs and diagrams only.
- Answer **all** the questions in Section A **and** B.
- Read each question carefully. Make sure you know what you have to do before starting your answer.
- Write your answer to each question in the space provided. Additional paper may be used if necessary but you must clearly show your candidate number, centre number and question number(s).
- Do **not** write in the bar codes.

INFORMATION FOR CANDIDATES

- The number of marks is given in brackets [] at the end of each question or part question.
- The total number of marks for this paper is **60**.
- Your Quality of Written Communication is assessed in questions marked with an asterisk (*).
- This document consists of **12** pages. Any blank pages are indicated.

Section A

Answer **all** questions.

You are advised to spend 15 minutes on this section.

On questions 1–5 **circle** your answer.

- 1** When sanding wood, wearing a dust mask helps you to
- (a) Look cool
 - (b) Concentrate
 - (c) Breathe safely
 - (d) Stop sneezing
- [1]**
- 2** Anthropometrics relates to
- (a) Measurement of human beings
 - (b) Study of other cultures
 - (c) History of past times
 - (d) Manufacture of steel rulers by hand
- [1]**
- 3** Biomass is grown to produce
- (a) Landfill
 - (b) Heat
 - (c) Light
 - (d) Roof insulation
- [1]**
- 4** Welded mild steel components
- (a) Cannot be recycled
 - (b) Will not rust in damp conditions
 - (c) Can be quickly dismantled for reuse
 - (d) Are strong and durable
- [1]**

- 5 A sustainable material can
- (a) Be washed and cleaned
 - (b) Be regrown or replenished for future generations
 - (c) Be used to make items that will last a long time
 - (d) Hold itself up without external support
- [1]

6 Give the meaning of the symbol shown.



..... [1]

7 What do the letters FSC stand for?

..... [1]

8 Name **one** renewable energy resource other than solar power.

..... [1]

9 Name the term that describes the look and feel of a product.

..... [1]

10 Which of the 6Rs refers to making a choice not to use a component or material?

..... [1]

4

Decide whether each of the following statements is **true** or **false**.

Tick [✓] the box to show your answer.

	True	False	
11 Hardwood is not biodegradable	<input type="checkbox"/>	<input type="checkbox"/>	[1]
12 Ferrous metals can be recycled	<input type="checkbox"/>	<input type="checkbox"/>	[1]
13 All Thermoplastics are made from sustainable sources	<input type="checkbox"/>	<input type="checkbox"/>	[1]
14 Polythene can be recycled many times	<input type="checkbox"/>	<input type="checkbox"/>	[1]
15 CFCs are no longer considered harmful to the ozone layer	<input type="checkbox"/>	<input type="checkbox"/>	[1]
			Total [15]

Section B

Answer all questions.

You are advised to spend 45 minutes on this section.

16 Fig. 1 shows two toothbrushes.



19th century toothbrush



21st century toothbrush

Fig. 1

(a) The 19th century brush was cheaply mass produced from animal bone and boar's-head bristle.

Explain **two** cultural issues associated today with these materials.

1
.....
.....

2
.....
.....

[4]

(b) Identify **two** design features of the modern toothbrush, and explain the purpose of each.

Feature 1
Purpose

Feature 2
Purpose

[4]

(c) Modern toothbrushes and other household items are often battery powered. Using sketches and notes produce a design for a small container that could be used in the home to collect dead batteries.

The container must

- allow batteries to be inserted/removed
- be easily carried
- be secure in use
- show an appropriate battery recycling symbol

(d) Toothbrushes are made and marketed throughout the world.

State the term that means manufactured and sold worldwide.

..... [1]

(e) Give **two** reasons why modern toothbrushes are difficult to recycle.

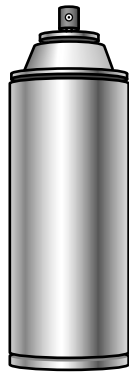
1

2

[2]

Total [15]

17 Fig. 2 shows a steel paint spray can and a plastic pump-action spray bottle.



steel spray can



plastic pump-action spray bottle

Fig. 2

(a) Give **two** reasons why the plastic pump-action spray bottle may be considered more environmentally friendly than the steel spray can.

1

.....

.....

.....

2

.....

.....

[4]

(b) Some modern paints change colour depending upon their temperature. State the name given to such paints.

..... [1]

(c) The plastic pump-action spray bottle has been ergonomically designed.

Describe **two** ergonomic features of this bottle.

1

.....

.....

.....

2

.....

.....

[4]

(d) The steel spray can contains a flammable gas.

Give the meaning of the word flammable.

..... [1]

Fig. 3 shows a symbol found on a steel spray can.

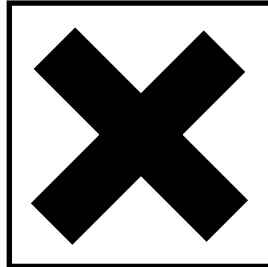


Fig. 3

(e) (i) State the meaning of the symbol shown in Fig. 3.

..... [1]

(ii) Explain why this symbol may be important to potential users of the steel spray can.

.....
.....
..... [2]

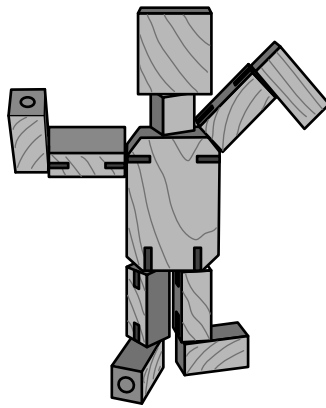
(f) Ferrous metals such as steel can be protected by a coating of paint to prevent them from rusting. Name **two** other ways to protect steel that will still allow the steel to be easily recycled.

1

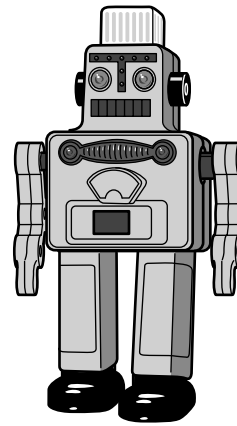
2 [2]

Total [15]

18 Fig. 4 shows two robot toys.



hardwood robot toy



metal robot toy

Fig. 4

(a) Give **two** reasons, other than cost, why a parent would choose the hardwood robot toy.

1

.....

2

..... [2]

(b) Explain the environmental advantages of hardwood and metal toys compared with plastic toys.

.....

.....

.....

.....

.....

..... [4]

(c) Metal toys can be powered by wind-up, clockwork motors.
Give **one** advantage of a wind-up mechanism over a battery-powered mechanism.

.....

..... [1]

(e) State **two** ways in which Health and Safety legislation protects employees in their place of work.

1

.....

2

.....

[2]

Total [15]



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