

# GCSE

## Design and Technology Resistant Materials Technology

3545 (Full Course)

## Foundation

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**Design and Technology: Resistant Material Technology****Full Course Foundation Tier**Question 1

Any **three** correctly identified checks. No repetition.

Possible responses:

- And relevant check prior to going to shop (ergonomic features)
- Use the keyboard
- Use the mouse
- Access the printer
- Access the scanner
- Check the colour is suitable for the environment it will be used in.
- Check it is the correct size for the environment it will be used in. (Right size for equipment)
- Any quality related check (Quality of finish etc) (3 x 1 mark)

**Three** correct explanations

Explanation can be credited if check is wrong

Single words 1 mark (3 x 1 mark)

**Total 6 marks**

**Question 2**

Any **three** correct ways of using ICT to help design the workstation

Possible responses:

- i) Interrogating a CD Rom database
  - ii) By using a word processing package
  - iii) By using the internet
  - iv) By using a graphics software package (accept Corel Draw, Prodesktop, 2D Design, Power Point)
  - v) By using e-mail
  - vi) By using video conferencing
  - vii) By using a fax machine
  - viii) By using a mobile phone
  - ix) By using a digital camera
  - x) By using a scanner
- (3 x 1 mark)

**Three** correct explanations

Possible responses:

- i) To gain information about materials
- ii) To produce a letter requesting information from someone
- iii) To contact other relevant companies
- iv) To draft out ideas
- v) To communicate with a manufacturer
- vi) To communicate with a group of people
- vii) To send a letter quickly to someone
- viii) To telephone someone for information
- ix) To photograph the manufacture of a project
- x) To copy an image for use in a design folder (3 x 1 mark)

**Total 6 marks**

**Question 3**

Any **four** correctly identified requirements.

Possible responses:

- Must securely hold the computer and all the accessories
- Must be comfortable to sit at
- Must be soundly constructed
- Must be capable of being manufactured in quantity
- Must be safe to use
- Must fit into the home environment
- Must allow easy access to the computer and its accessories
- Must be capable of home assembly
- Must be an interesting design
- Must have a flat work area
- Environmental issues

(4 x 1 mark)

Four correct explanations

Single word answers not accepted

(4 x 1 mark)

**Total 8 marks**

Question 4

## Variety of ideas

Mark each idea separately against the following scheme

- A very good idea which differs in approach or principle, fulfils all the design brief and specification (6 marks)
  - A good idea which differs in approach or principle, fulfils most of design brief and specification (5 marks)
  - An idea which differs in approach or principle, fulfils some of the design brief and specification. (4 marks)
  - 
  - A good idea which fulfils the design brief and specification but is similar to the other ideas (3 marks)
  - An idea which fulfils some of the design brief and specification but is similar to the other ideas. (2 marks)
  - A simple idea (1 mark)
- (3 x 6 marks)

## Quality of sketches

Maximum of 3 marks for drawing showing no material thickness.

- Quality 3D rendered sketches in proportion with additional drawings (4 - 5 marks)
- Quality line sketches or an attempt at 3D sketches (2 - 3 marks)
- Simple line sketching (1 mark)

## Quality of notes

- Detailed explanations (5 - 6 marks)
- Simple notes (3 - 4 marks)
- Labelling (1- 2 mark)

**Total 29 marks**

Question 5

- (a) Good analytical thinking against  
2 or more points on the specification (2 marks)  
Simple analytical thinking against  
One point on the specification (1 mark)
- (b) Method of construction - flat pack or conventional
- A suitable method of construction,  
correct in detail and proportion. (4 marks)  
A suitable method of construction,  
with inaccuracies. (3 marks)  
Incorrect method of construction,  
but would function. (2 marks)  
Incorrect method of construction,  
little chance of success. (1 mark)
- Quality of drawing
- Quality line drawing (2 marks)
  - Simple line drawings (1 mark)
- Quality of notes
- Detailed notes (2 marks)
  - labelling (1 mark)
- Total 10 marks**

**Question 6**

(a) Any **three** correctly identified safety precautions.

Possible responses:

- Supervision / permission
- Dust extraction / mask / ventilation
- Ensure you are wearing goggles / glasses
- Ensure you are wearing an apron / overall
- Ensure you have the work securely clamped down
- Ensure you have the cord / flex away from the blade
- Do not place the jigsaw onto a workbench before it has come to a stop
- Ear protection
- Keep hands away from blade

(3 x 1 mark)

**Three** correct explanations

(3 x 1 mark)

(b) **Figure 3** This substance is flammable (1 mark)  
Do not expose to a naked light. (1 mark)

**Figure 4** This substance is harmful. (1 mark)  
Do not swallow  
Avoid contact with skin  
Do not inhale (1 mark)

**Total 10 marks**

Question 7

(a) Possible responses:

- Sustainable resource
- Converts CO<sup>2</sup> into O<sup>2</sup>
- Is a renewable resource
- Provides a habitat for flora and fauna
- Does not pollute the atmosphere
- Recyclable

(2 x 1 mark)

*Simple explanation 1 mark*

*Developed 2 marks*

(2 x 2 marks)

(b) Possible responses:

- Is made from a non renewable resource
- Is non biodegradable
- Pollutes the atmosphere during its manufacture / Disposal

(2 x 1 mark)

*Simple explanation 1 mark*

*Developed 2 marks*

(2 x 2 marks)

**Total 12 marks**



**Question 8****(a) Part A**

Specific material: Any suitable **light** coloured hard / softwood. (1 x 2 marks)

Generic term : wood / MDF / Plywood (1 x 1 mark)

Possible responses:

- Birch
- Beech
- Ash
- Oak
- Pine
- Sycamore
- Ramin

Reasons

Possible responses:

- Attractive
- Strong
- Capable of being cut to shape
- Capable of being joined
- Relatively lightweight
- Durable
- Cost (expensive / inexpensive)

(1 x 1 mark)

**Part B**

Specific material:

Possible responses:

- Toughened Glass
- Acrylic
- Polycarbonate

(1 x 2 marks)

Generic term : glass / plastic (1 x 1 mark)

Reasons

Possible responses:

- Appearance / style / aesthetic
- Clear
- Immaculate surface finish
- Rigid
- Low maintenance

(1 x 1 mark)

**Part C**

Specific material:

Possible responses:

- Steels
  - Aluminium
- (1 x 2 marks)

Generic term : metal (1 x 1 mark)

Reasons

Possible responses:

- Good strength to weight ratio
  - Capable of being cut to shape
  - Capable of being joined
  - Durable
  - Cost (inexpensive)
  - Suitable for quantity production
- (1 x 1 mark)

(b) **Part A** – Any suitable finish.

Possible responses:

- Wax – liming – graining if explained
  - Varnish / polyurethane
  - Stain
  - French polish / shellac
  - Lacquer
- (1 x 1 mark)

**Part B**

Possible responses

- No finish required
  - Polish / buff
  - Frosted
  - Flame finish (acrylic)
- (1 x 1 mark)

This should match A and B

No match C

**Part C** - Any suitable finish.:

Possible responses:

- (Gloss) paint
  - ‘Hammerite’
  - ‘Smoothrite’
  - Powder / plastic coating / dip coating
  - Anodised (aluminium only)
  - (Cellulose) spray
  - Stove enamel
  - Polish aluminium
- (1 x 1 mark)

(c) **Two** reasons required.

Possible responses:

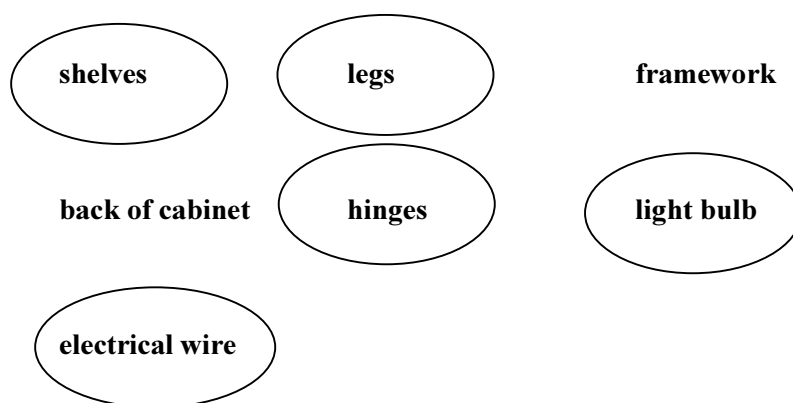
- For protection against rusting / corrosion
- To enhance the appearance of the leg
- Toughens surface (aluminium only)

(2 x 1 mark)

**Total 14 marks**

Question 9

- (a) Award **one** mark for each correctly circled part.  
If 5 correct parts ringed, maximum of 3 marks.  
If 6 ringed, maximum of 2 marks.  
If all 7 ringed, no marks.



(4 x 1 mark)

(b) Reason

It would be more cost effective to purchase components rather than manufacture them themselves

(1 x 1 mark)

Explanation

- They do not need to employ workers to manufacture the components
- They do not need to purchase expensive machinery
- They could purchase them from countries where labour charges are low
- They do not need to buy / rent additional workshop space
- They do not need to train a workforce to produce the components
- They do not need to purchase raw materials to manufacture the component

(1 x 1 mark)

(c) Possible responses:

Look for details such as;

- To speed up the manufacturing process
  - To reduce the unit cost of manufacturing the display cabinet
  - To produce a higher quality product
  - To improve the consistency of each product
  - To employ less skilled labour
  - A less skilled process
  - Program is easy to change
- Award **one** mark for each point

(4 x 1 mark)

**Total 10 marks**

### Question 10

Award **one** mark for correctly identified any of the tools indicated for each process.

Possible responses:

Process	Tools
<b>Marking out</b>	Ruler, scribe, pencil, centre punch, combination square, template, fine line marker, blue. (1 mark)
<b>Cutting</b>	Hack saw, junior hacksaw, jigsaw, guillotine, bandsaw, punch and die. (1 mark)
<b>Shaping</b>	Coarse file, smooth file, bastard file, second cut file. (1 mark)
<b>Drilling</b>	Pillar drill, hand drill, cordless drill, drill bit, clamp (cramp). (1 mark)
<b>Bending</b>	Bending jig / bars / former / press, hammer (1 mark)
<b>Cleaning and finishing</b>	Smooth file, emery cloth, brush, buffer, wet and dry, wire brush, wire/steel wool. (1 mark)

**Total 6 Marks**

