

# Design & Technology

## A-Level

# Finishing techniques

## Multiple Choice

### Materials required for questions

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- Pencil
- Rubber
- Calculator

### Instructions

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- Use black ink or ball-point pen
- Try answer all questions
- Use the space provided to answer questions
- Calculators can be used if necessary
- Use a cross in the box to mark you answer



### Advice

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- Marks for each question are in brackets
- Read each question fully
- Try to answer every question
- Don't spend too much time on one question

# Good luck!

**Q1.** Which one of the following materials needs to have a surface finish applied if it is to be used outside?

**A**      Aluminium

☐

**B**      Copper

☐

**C**      Oak

☐

**Q2.** When applying a surface finish, what is key?

**A**      A smooth surface to paint on

☐

**B**      A rough surface to paint on

☐

**C**      A clean surface to paint on

☐

**Q3.** What is an alloy?

**A**      A mixture of 2 or more elements, where  
at least 1 is a metal

☐

**B**      A mixture of 3 or more elements, where  
at least 1 is a metal

☐

**C**      A compound of 2 or more elements  
Where at least 1 element is a metal

☐

**Q4.** Which one of the following finishes is best applied to the mild steel hanging basket shown below?



**A** Stain

☐

**B** Plastic dip coating

☐

**C** Varnish

☐

**Q5.** Which of the following finishes is used for woods?

**A** Shellac

☐

**B** Chemical lacking

☐

**C** Anodising

☐

**Q6.** Which of the following finishes is used on aluminium?

**A** Anodising

☐

**B** Galvanising

☐

**C** Electroplating

☐

**Q7.** Which of the following is the process called etching?

- A**      A prcoess whereby paint is sprayed onto the  
Surface of a material ☐
- B**      A process that creates a long-lasting protective  
Coating on a metal ☐
- C**      Acid is used to remove the unprotected surface  
Of a metal for a decorative finish ☐

**Q8.** Which one of the following processes involves dipping a metal into molten zinc?

- A**      Galvanising ☐
- B**      Cathodic protection ☐
- C**      Electroplating ☐

**Q9.** The image below shows playground equipment.



Specification for playground equipment:

- For use by children age 4-12.
- Designed for external use.
- Recessed/flush fitting construction fittings used.
- All fittings are tamper proof.
- Use of weatherproof materials.
- Suitable for installation on a flat surface.
- Use of non-slip surfaces.
- Tough, durable and wear resistant finish applied to all parts.
- Parts designed to be bolted together

Analyse and evaluate the playground equipment in terms of suitability for the user. **(4 marks)**

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**Q10a.** Explain why surface finishes are applied to materials and fabrics for aesthetic reasons.  
Give examples in your answer **(3 marks)**

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**10b.** Explain why surface finishes are applied to materials and fabrics for functional reasons.  
Give examples in your answer **(3 marks)**

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**Q11a.** Name 2 appropriate finishes that could be applied to mild steel **(2 marks)**

1. 

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2. 

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**11b.** Explain 2 reasons for applying a finish to the mild steel sheet **(4 marks)**

1.

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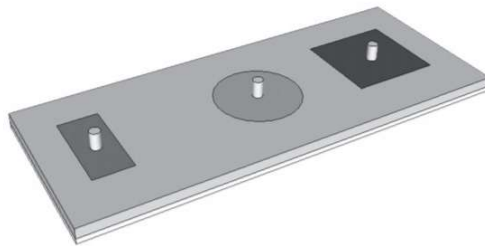
2.

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**Q12.** A child's wooden puzzle is shown below.



**12a.** Give 2 different types of finish that could be applied to wood **(2 marks)**

1.

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2.

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**12b.** The shapes could have been made out of acrylic rather than wood.

Describe two advantages of using acrylic rather than wood **(4 marks)**

1.

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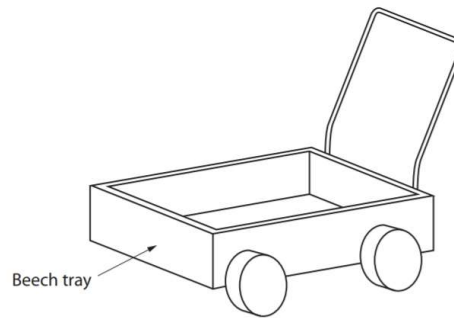
2.

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**Q13.** The picture below shows a baby-walking aid.



**13a.** Give 2 properties of beech that make it suitable for the tray **(2 marks)**

1.

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2.

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**13bi.** Name 2 finishes that could be applied to the beech tray **(2 marks)**

1.

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2.

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**bii.** Explain 1 reason for applying a finish to the beech tray **(2 marks)**

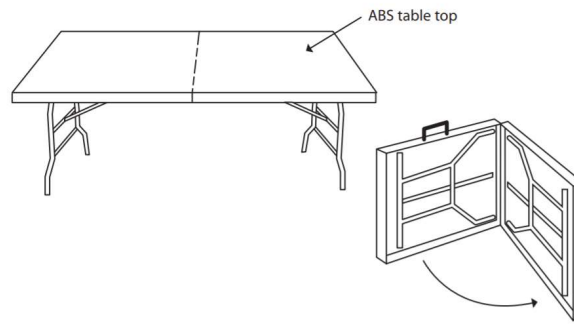
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**Q14.** The drawing below shows a garden table



**14a.** give 2 properties of ABS which make it suitable for the table top  
(2 marks)

1.

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2.

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**14bi.** The legs of the garden table are made from mild steel.  
Give 2 reasons for applying a surface finish to the mild steel table  
legs (2 marks)

1.

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2.

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**14bii.** Name 2 finishes that could be applied to the mild steel table  
legs (2 marks)

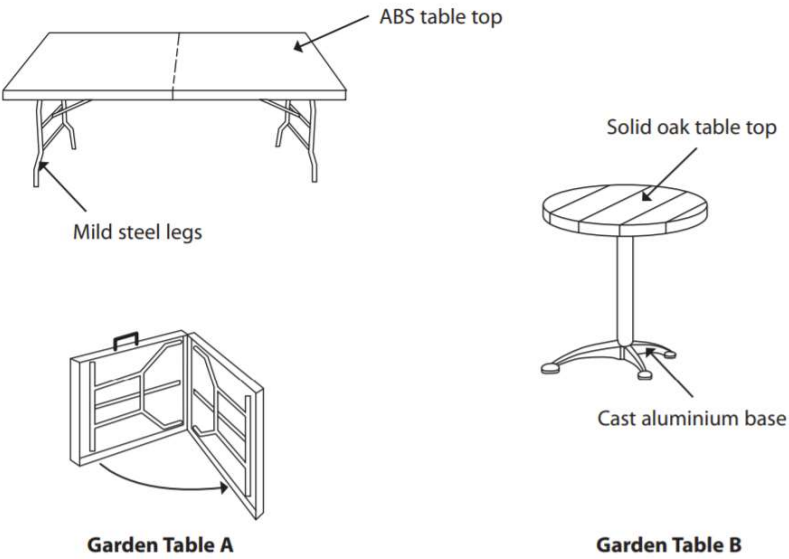
1.

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2.

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**14c.** The drawing below shows 2 different types of garden table



Evaluate garden table A compared with garden table B in terms of user requirements and sustainability **(6 marks)**

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## **Answers**

**Q1. A**

**Q2. B**

**Q3. C**

**Q4. B**

**Q5. A**

**Q6. A**

**Q7. C**

**Q8. A**

**Q9.**

Indicative content:

- Bright colours are engaging encouraging children to interact
- The house feature may promote child interaction
- Lots of different things to do and play developing coordination skills as well as physical activity
- Recessed fixings will ensure child does not catch or hurt themselves on the equipment
- Tough and durable finish will ensure the equipment stays looking good for longer and attract children
- Designed with specific age of children in mind so they can climb, use and fit on the equipment e.g. step distance, not too far to fall off the bottom of the slide
- Not suitable for over 12s or under 4s.
- Additional evaluative points worthy of credit:
- Only suited to day use as the equipment goes outside unless artificial light present

Accept all other valid responses

**Q10a.**

<b>3 marks</b>	Detailed functional reason(s) for applying finishes. At least one appropriate example provided
<b>2 marks</b>	One functional reason for applying a finish and one appropriate example given <b>or</b> two reasons and no example
<b>1 mark</b>	One basic reason for applying finishes for a functional reason. No example provided.
<b>0 marks</b>	Nothing worthy of credit

Indicative content:

Any named aesthetic reason:

- Change the colour of a product
- Improving appearance/make the product look more attractive
- Change the look and feel of a product
- Aesthetic finish examples:
  - Painting cars different colours to suit different customer tastes
  - Embossing in card to create a decorative 3D effect
  - Self-finished surface, eg the injection moulding process can 'build in' a textured surface in contrast to a smooth surface
  - Add to decoration and quality of finish, eg enamelling jewellery
  - Wood stains to enhance the colour of timber
  - Anodising to produce brightly coloured aluminium products, eg bike wheels, Maglites
  - Stonewashing jeans (distressing) gives a soft peach skin effect
  - Heat setting thermoplastic fibres to give crushed effect, creases and pleating

#### Q10b.

Indicative content:

- To make more suited to intended use/improve durability
- To inhibit combustion/reduce fire risk (textiles)
- Protect from moisture/water
- Stain resist finish
- To prevent insect/fungal attack (wood)
- To resist corrosion
- Build in a textured finish (polymers)
- Provide a non-slip finish
- Functional finish examples
  - Flame retardants to textiles
  - Waterproof finish on a jacket
  - Laminating a book cover to protect from moisture
  - Anodising aluminium to improve durability
  - Electro plating to provide a durable finish

- Wood preservative on a garden fence to protect from moisture and insect attack
- Dip/powder coating of metals to inhibit corrosion
- Galvanising (not aesthetic reason) mild steel to resist corrosion
- Self-finished surface, eg injection moulding process can 'build in' a textured surface to provide a non-slip surface/grip on a chair, child's toy etc.

**Q11a.**

Any two finishes given from:

- Plastic dip coating / dip coating / plastic coating (1)
- Powder coating (1)
- Electroplating (1)
- Galvanising (1)
- Lacquer (1)

Do not accept 'painting' of any form.

2 x 1

**11b.**

Any two reasons explained from:

- It will make it look nicer (1) which will potentially increase sales (1)
- Mild steel will rust / develop a surface oxide (1) so any finish will protect it / make it last longer / more durable (1)
- Colours can be applied (1) therefore making it more visually appealing to children / users / increase sales (1)

2 x 1

2 x 1

**Q12a.**

Two finishes given from:

- Paint (1)
- Varnish (1)
- Stain (1)
- Bees wax /wax (1)
- Shellac (1)
- Lacquer (1)
- Danish oil / linseed oil / oil (1)
- Sanding sealer (1)
- (Do not accept two different types / colours or types of paint / varnish – satin and gloss)

2 x 1

**12b.**

Two advantages described from:

- Acrylic will not burn (1) and discolour like wood (1)
- No edge finishing is required (1) which will speed up production time / reduce costs (1)
- Acrylic is available in many colours / shiney and therefore does not need a surface finish applying / more colourful / appealing / aesthetic (1)
- Easier to clean (1) therefore more hygienic (1)
- Acrylic has no grain (1) so no splinters to cause injury (1)
- Acrylic is lighter (1) therefore easier to move / carry / for toddlers to play with (1)
- Water resistant (1) therefore will repel water / not absorb water / saliva if a child puts the piece in their mouth / more durable (1)
- Less likely to be damaged by being put in the mouth (1) because it is more durable than wood (1)

2 x 1

2 x 1

**Q13a.**

Two properties given from:

- Hard/ withstand wear and abrasion (1)
- Tough/ withstand knocks/ impact resistance (1)
- Durable/ withstand weathering/ deterioration (1)

(Do not accept strong / cheap)

1 x 1

1 x 1

**13bi.**

Two finishes given from:

- Varnish (1)
- Sanding sealer (1)
- Polish (1)
- Lacquer (1)
- Paint (1)
- Stain (1)
- Shellac (1)
- Danish oil / oil (1)
- Wax (1)

1 x 1

1 x 1

**13bii.**

One reason described from:

- To make it look nicer / improve the aesthetics (1) so that more people will buy it/ marketability (1)
- To protect the surface (1) so that it lasts longer / more durable / will not soak up any water/ delays rotting (1)
- To provide a smooth surface (1) so that children do not get splinters / makes it easier to clean / dust (1)

2 x 1

**Q14a.**

Two properties given from:

- High impact strength (1)
- Tough (1)
- Scratch resistant/hard wearing (1)
- Lightweight (1)
- Durable (1)
- Good resistance to chemicals / weather (1)
- Plasticity (1)
- Waterproof/resistant (1)

Do not accept 'easy to clean/strong'.

2 x 1

**14bi.**

Two reasons given from:

- Improve the appearance of the product / make it look nicer/colour it (1)
- Protect/prevent rusting/oxidation/corrosion of the surface of the material/product/more durable (1)
- Make the product last longer/makes it easier to wipe clean (1)

2 x 1

**14bii.**

Two finishes given from:

- Paint (1)
- Electroplating/plating/chrome plated (1)
- Plastic dip coating (1)
- Hammerite (1)
- Powder finish (1)
- Laquer (1)
- Zinc plating/galvanising (1)

Only accept one form of paint.

2 x 1

**14c.**

**Evaluation to address the following issues:**

**User requirements**

What qualities make the product attractive to potential users?

Table A	Table B
<ul style="list-style-type: none"><li>• Large flat surface area</li><li>• Large stable base</li><li>• Can be folded and stored away</li><li>• Handle for easy carrying</li><li>• Lighter and easy for carrying</li><li>• More hygienic/wipe clean</li></ul>	<ul style="list-style-type: none"><li>• Smaller and more intimate</li><li>• Café style</li><li>• More use of natural materials for table top</li><li>• Will naturally age/weather</li><li>• Can enhance appearance with stain/varnish</li></ul>

**Sustainability**

How does the design allow for environmental considerations?

Table A	Table B
<ul style="list-style-type: none"><li>• Oil based products required to make plastics</li><li>• Extraction and energy consumption in the production of the steel for the legs</li></ul>	<ul style="list-style-type: none"><li>• Wooden top can be reused or recycled</li><li>• Top will blend in better with natural environment</li><li>• Aluminium can also be</li></ul>

Level	Mark	Descriptor
	0	No rewardable material
Level 1	1-2	Candidate identifies the area(s) of comparison with no development OR identifies and develops one area. Shows limited understanding of the comparison. Writing communicates ideas using everyday language but the response lacks clarity and organisation. The candidate spells, punctuates and uses the rules of grammar with limited accuracy.
Level 2	3-4	Candidate identifies some areas of comparison with associated developments showing some understanding of the comparison. Writing communicates ideas using D&T terms accurately and showing some direction and control in the organising of material. The candidate uses some of the rules of grammar appropriately and spells and punctuates with some accuracy, although some spelling errors may still be found.
Level 3	5-6	Candidate identifies a range of areas of comparison