

Mark Scheme (Results)

Summer 2010

GCSE

GCSE Design & Technology Resistant Materials (5RM02/01) Knowledge and Understanding of Resistant Material Technology

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Publications Code.

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General Marking Guidance

- All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.
- Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.
- Examiners should mark according to the mark scheme not according to their perception of where the grade boundaries may lie.
- There is no ceiling on achievement. All marks on the mark scheme should be used appropriately.
- All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e. if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.
- Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.
- When examiners are in doubt regarding the application of the mark scheme to a candidate's response, the team leader must be consulted.
- Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.

Question Number	Answer	Mark
1	C	(1)

Question Number	Answer	Mark
2	B	(1)

Question Number	Answer	Mark
3	C	(1)

Question Number	Answer	Mark
4	C	(1)

Question Number	Answer	Mark
5	A	(1)

Question Number	Answer	Mark
6	D	(1)

Question Number	Answer	Mark
7	C	(1)

Question Number	Answer	Mark
8	A	(1)

Question Number	Answer	Mark
9	A	(1)

Question Number	Answer	Mark
10	D	(1)

Question Number	Answer	Mark
11(a)	Safety goggles	(ai) Protecting / stop bits getting into your eyes (1)
	Try square	(aii) Checking / marking out right angles / 90° / perpendicular to an edge (1) <i>(Do not accept marking out lines on its own)</i>
	(aiii) Chuck key (1) (Only answer)	Tightening up a drill bit into a pillar drilling machine
	(aiv) Tap (1) (Only answer)	Cutting an internal crew thread
		1x1 1x1 1x1 1x1
		(4)

Question Number	Answer	Mark
11(b)	Two properties given from: <ul style="list-style-type: none"> • Hard (1) • Durable (1) • Tough (1) • Dense (1) <i>(Do not accept hardwood)</i>	1x1 1x1 (2)

Question Number	Answer	Mark
11(c)	Dowel joint / dowel (1) <i>(Only answer)</i>	1x1 (1)

Question Number	Answer	Mark
11(d)	<p>Two finishes named from:</p> <ul style="list-style-type: none"> • Varnish (1) • Wax (1) • Paint (1) • Stain (1) • Polish (1) • Shellac (1) • Sanding sealer (1) • Liming (1) <p><i>(Only answers)</i></p>	1x1 1x1 (2)

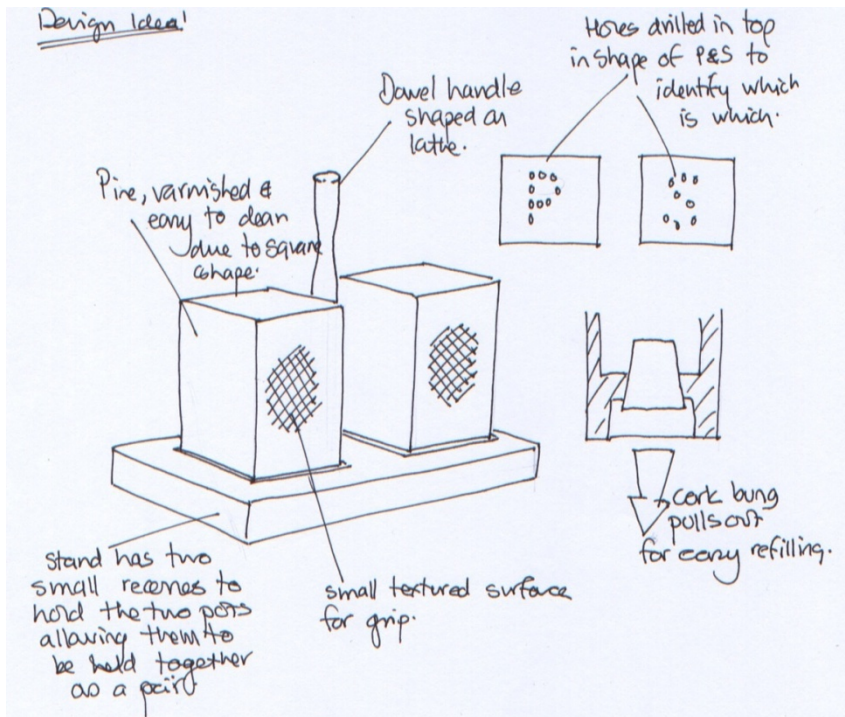
Question Number	Answer	Mark
11(e)	<p>Two advantages explained from:</p> <ul style="list-style-type: none"> • Available in large sheets (1) which means planks do not have to be glued together (1) • Cheaper than solid oak (1) which means the drawer will cost less (1) • Plywood is less likely to warp / move than oak / good dimensional stability / uniform strength (1) which means the drawer will run smooth / will not change shape (1) • Plywood is more sustainable than oak (1) which means we can preserve our natural timber supplies (1) • It is lighter than oak / it has a good strength to weight ratio (1) which means it is easier to pull in / move (1) 	2x1 2x1 (4)

Question Number	Answer	Mark
11(f)	<p>Two pieces of information given from:</p> <ul style="list-style-type: none"> • Price / cost of item (1) • Know what the item is (1) • How many they have in stock (1) • How many they have sold (1) • Country of origin (1) • When they were made (1) • Material stock / information (1) • Manufacturers details (1) <p style="text-align: right;">1x1 1x1</p>	(2)

Question Number	Answer	Mark
11(g)	<p>Two advantages described from:</p> <ul style="list-style-type: none"> • Reaches wide audience (1) quickly / cheaply (1) • Can take orders online (1) and process immediately (1) • Regular e-mail contact with customers / suppliers (1) to tell them about special offers / new products (1) • You can advertise (1) to increase sales/market awareness (1) • Search engines (1) can help direct customers to their site / products (1) • Cheaper than billboards / magazines (1) which means they save money on advertising costs (1) <p style="text-align: right;">2x1 2x1</p>	(4)

Question Number	Answer	Mark
12	<p>Design idea 1</p> <p>Candidates may answer any specification point in either graphical form or by annotation.</p> <p>No marks are awarded for the quality of graphical communication.</p> <ul style="list-style-type: none"> <li>• identify which pot holds salt and which holds pepper (1): use of print / engraving / drilled holes / colours (Black / white) <li>• be easy to clean: shape / materials / ability to be wiped clean <li>• be easy to refill (1): plug / screw cap <li>• be held together as a pair (1): shapes which fit together / held on a rack / joined <li>• must not slip out of the hand (1): textured grip / indents / ribbing <li>• allow for the salt and pepper to come out (1): shake / twist / grinding mechanism <li>• be made from materials available in a school workshop (1): specifically named material (not wood / metal / plastic) <li>• be manufactured using processes available in a school workshop (1): named process 	

Example of candidate response:



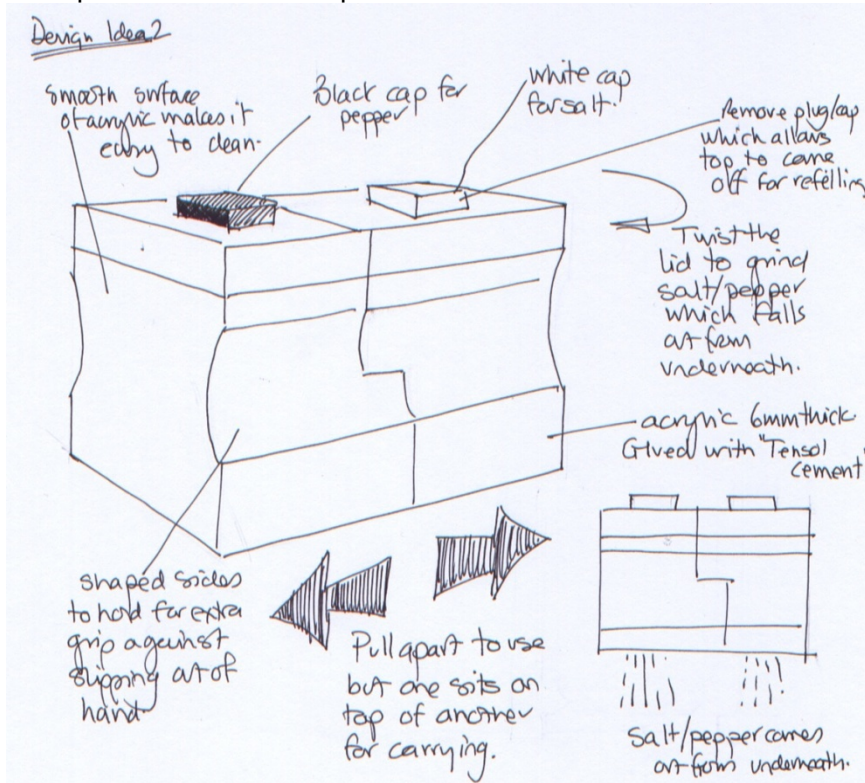
8x1

(8)

Design idea 2

Marks for design idea 2 can only be awarded where specification points are resolved differently than in design idea 1.

Example of candidate response:



8x1

(8)

Question Number	Answer	Mark
13(a)	<p>Two properties given from:</p> <ul style="list-style-type: none"> • stiffness (1) • plasticity (1) • durability (1) • water resistant / water proof (1) • clear / transparent / see through (1) • lightweight (1) <p><i>(Do not accept tough / cuts shapes easily)</i></p> <p style="text-align: right;">1x1 1x1</p>	(2)

Question Number	Answer	Mark
13(b)	<p>Two reasons described from:</p> <ul style="list-style-type: none"> • automated / repeatable process (1) makes it suitable for high volume / mass production (1) • hollow shape / uniform cross section (1) which allows it to be formed over a simple mould (1) • tapered shape (1) which means it can be easily released from the mould (1) <p style="text-align: right;">2x1 2x1</p>	(4)

Question Number	Answer	Mark
13(c)(i)	<p>One reason explained from:</p> <ul style="list-style-type: none"> • The large switch is in a position (1) which allows the user to turn it on and off with their thumb / easy to find in the dark (1) • The switch is textured / shaped (1) which means your thumb will not slip (1) • The torch can be held and operated (1) with the same hand (1) <p style="text-align: right;">2x1</p>	(2)

Question Number	Answer	Mark
13(c)(ii)	<p>One reason explained from:</p> <ul style="list-style-type: none"> • A large handle is well positioned (1) therefore making it balanced (1) • The shaped handle (1) fits the shape of the users hand (1) • The textured / shaped handle (1) means it will not slip / move in the hand (1) <p style="text-align: right;">2x1</p>	(2)

Question Number	Answer	Mark																
13(d) QWC(iii)	Evaluation to address the following issues:	(6)																
	<table border="1"> <thead> <tr> <th>Torch A</th> <th>Torch B</th> </tr> </thead> <tbody> <tr> <td>Once turned on it will stay on without having to power it</td> <td>Continually needs powering / squeezing therefore you might get tired</td> </tr> <tr> <td>Many component parts make it expensive to make</td> <td>Does not use batteries therefore cheaper to run</td> </tr> <tr> <td>Simple and easy to carry but it might be heavy due to the battery</td> <td>Lightweight because it has no batteries</td> </tr> <tr> <td>More expensive to run due to cost of batteries</td> <td>Complicated dynamo mechanism which could go wrong / snap / break easily</td> </tr> <tr> <td>Batteries need to be disposed of so damage to environment</td> <td>No batteries to dispose of therefore better for the environment</td> </tr> <tr> <td>Easier to hold the handle</td> <td>Squeezing the trigger constantly might cause it to slip in the hand</td> </tr> <tr> <td>Easier for children to use with small hands</td> <td>Difficult for children to use / grip / squeeze</td> </tr> </tbody> </table>		Torch A	Torch B	Once turned on it will stay on without having to power it	Continually needs powering / squeezing therefore you might get tired	Many component parts make it expensive to make	Does not use batteries therefore cheaper to run	Simple and easy to carry but it might be heavy due to the battery	Lightweight because it has no batteries	More expensive to run due to cost of batteries	Complicated dynamo mechanism which could go wrong / snap / break easily	Batteries need to be disposed of so damage to environment	No batteries to dispose of therefore better for the environment	Easier to hold the handle	Squeezing the trigger constantly might cause it to slip in the hand	Easier for children to use with small hands	Difficult for children to use / grip / squeeze
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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 student spells, punctuates and uses the rules of grammar with limited accuracy.																
Level 2	3 - 4	Candidate identifies some areas of comparison with associated development 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 student 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 with associated developments showing a detailed understanding of the comparison. Writing communicates ideas effectively, using a range of appropriately selected D&T terms and organising information clearly and coherently. The student spells, punctuates and uses the rules of grammar with considerable accuracy.																

Question Number	Answer	Mark
14(a)	<p>Two properties and linked justification from:</p> <ul style="list-style-type: none"> • Property: Tough (1) • Justification: which means it can take knocks and bumps / can be dropped without any damage (1) • Property: Malleable (1) • Justification which means it can be pressed into shape without ripping / breaking • Property: Good tensile / shear / compressive strength (1) • Justification which means it will withstand forces being applied to it (1) • Property: Hardness / can be hardened (1) • Justification which means that it will not get scratched easily / maintain a cutting edge / resist indentation /wear (1) <p><i>(Do not accept strong / cheap / easy to work)</i></p> <p style="text-align: right;">2x1 2x1</p>	(4)

Question Number	Answer	Mark
14(b)	<p>Three reasons given from:</p> <ul style="list-style-type: none"> • Will result in a smooth surface finish (1) • Will form a protective layer over the surface of the steel / stop it from rusting (1) • Will be more comfortable for the user (1) • Will cover any sharp / rough edges / make it safer to use (1) • Improves aesthetics (1) • Easier to clean (1) • Improves the grip (1) • Makes it safer to use (1) • More durable surface (1) <p style="text-align: right;">3x1</p>	(3)

Question Number	Answer	Mark
14(c)	<p>Two reasons described from:</p> <ul style="list-style-type: none"> • The protective layer (1) will stop the mild steel from rusting / corroding / increase durability (1) • The shiny surface finish is more attractive (1) which means it looks better / will increase sales (1) • The quality of the finish (1) gives the impression of use of quality materials (1) • Speed of the finishing process (1) makes product less expensive to make (1) • Cheaper to apply a quality surface finish (1) rather than using a high grade stainless steel (1) <p style="text-align: right;">2x1 2x1</p>	(4)

Question Number	Answer	Mark
14(d)	<p>One description from:</p> <ul style="list-style-type: none"> • A hole is drilled and a rivet is put through the hole (1) before it is closed flat (1) • A rivet is placed through both parts (1) and one end is shaped (1) • A rivet snap / tool is placed over one end (1) before being hit with a hammer(1) <p><i>(Do not accept anything related to pop riveting)</i></p> <p style="text-align: right;">2x1</p>	(2)

Question Number	Answer	Mark
14(e) QWC	<p>Indicative content</p> <p>Discussion to address the following issues:</p> <ul style="list-style-type: none"> • Make effective use of laying out shapes when pressing blanks from sheet steel • Recycle all materials which will reduce the need to buy / produce new virgin materials • Recycle / reuse materials which means that less will have to be disposed of / sent to landfill sites • Use renewable energy sources / forms at the factory during the manufacture • Use efficient machinery / make sure all machines / lights are turned off when not being used • Reduce transportation to reduce emissions • Control / clean / scrub gas emissions from factory before releasing into the environment <p><i>(Do not accept anything related to packaging since question is related to the manufacture of the scissors)</i></p>	(6)
Level	Mark	Descriptor
	0	No rewardable material
Level 1	1 - 2	Candidate identifies the issues with no development OR identifies and develops one area. Shows limited understanding of the issues. 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 issues with associated developments showing some understanding of the issues. 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 issues with associated developments showing a detailed understanding of the issues. Writing communicates ideas effectively, using a range of appropriately selected D&T terms and organising information clearly and coherently. The candidate spells, punctuates and uses the rules of grammar with considerable accuracy.

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