

Mark Scheme (Results)

November 2020

Pearson Edexcel GCSE
In Design & Technology (1DT0)
1F: Timbers

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November 2020
Publications Code 1DT0_1F_2011_MS
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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.

Section A – Core content

Question number	Answer	Mark
1 (a) (i)	 Any one property from: good resistance to corrosion (1) good fluidity / casts well (1) machinability (1) 	(1)

Question number	Answer	Mark
1 (a) (ii)	 Any one property from: water proof / water resistant (1) durable / long lasting (1) plasticity / softened when heated (1) tough / impact resistance (1) 	(1)

Question number	Answer	Mark
1 (a) (iii)	Any one property from:	(1)
	excellent for scoring / bending / folding (1)rigid (1)	
	 hygienic / safe for food use / non-toxic (1) 	
	• pure with no smell or taste (1)	
	good printability (absorbency) / takes ink well (1)stiffness (1)	

Question number	Answer	Additional guidance	Mark
1 (a) (iv)	 Any one property from: hard / resistant to wear / indentation (1) tough / impact resistance (1) good compressive strength (1) 	Do not accept strong / high strength	(1)

Question number	Answer	Additional guidance	Mark
1 (b)	A calculation that includes: • correct working 1.35 x 3.55 = 4.7925 (1)	Award full marks for correct numerical answer without working. Allow for ECF if candidate gets part	(2)
	 correct answer to the nearest penny / 2 decimal places £4.79 (1) 	of calculation wrong.	

Question number	Answer	Mark
1 (c)	 Any one advantage for using polyester for the school tie (1) and a linked justification of that advantage (1). It is stain resistant (1) so it will not mark / stain if food / drink gets spilt on it (1) It hangs / drapes well (1) which means it will look nice / presentable when worn / tied (1) It dries quickly (1) so it can be washed overnight and be ready for school the next day (1) It is resistant to abrasion (1) which means it will not get damaged / scarred if it rubs on a blazer / desk (1) It can be recycled (1) which means it does not have to end up in landfill (1) It does not shrink (1) therefore will not lose shape when it gets washed / wet (1) Polyester has good colour retention (1) so colour will not fade over time / resists fading in sunlight (1) Do not accept generic statements related to the fabric construction rather than the polyester fibres. 	(2)

Question number	Answer	Additional guidance	Mark
2 (a)	 Any one manufactured timber from: MDF / Medium Density Fibre board (1) Plywood (1) Chipboard (1) Blockboard (1) Laminboard (1) 	Do not accept hardboard	(1)

Question	Answer	Mark
number		
2 (b)	Any one reason for using SMAs (1) and a linked justification of that reason (1).	(2)
	 If they have been plastically deformed / bent into a shape that is not right / not big enough they can be heated (1) which means they go back to their original shape / can be used again to test a new shape / saves resources (1) Once the correct shape / size / profile has been achieved the material can be heated (1) which means it will go back to its original shape / can be used for something else (1) It is easier to reset / straighten the SMA wire in comparison to copper wire (1) because it can be heated rather than pulled through a die (1) 	

Question number	Answer		Additional guidance	Mark
2 (c) (i)	A calculation that includes:		Award full marks for	(2)
	correct working		correct numerical	
	3/5 x 35	(1)	answer without working.	
	correct answer		Allow for ECF if candidate gets	
	21 mm ((1)	part of calculation wrong.	
	Alternative method 35/5 x 3 = 21 mm			
		(2)		

Question number	Answer		Additional guidance	Mark
2 (c) (ii)	A calculation that includes:		Award full marks for	(2)
	correct working		correct	
	$\pi \times 3.5^2$		numerical	
		(1)	answer without	
	• correct answer 38cm ²		working.	
		(1)	Allow for ECF if candidate gets	
	Accept 38.4895 for 1 mark		part of calculation	
			wrong e.g. they	
			have used mm	
			instead of cm	

Question number	Answer	Mark
2 (d)	Any one reason for using copper for the flowers (1) and a linked justification of that reason (1).	(2)
	 It is malleable / easily bent / formed (1) which means it will hold its shape once formed / stay in that shape permanently without any other form of treatment (1) It is a ductile material (1) which means it can be drawn out into the required long thin wires (1) It is a nice colour (1) and can be left without any additional surface finishing / will tarnish / natural finish (1) It will not rust (1) which would result in the jewellery changing colour / leaving a mark / stain on any clothing (1) 	

Question number	Answer	Additional guidance	Mark
3 (a)	Any one property from:	Do not	(1)
		accept	
	 good electrical insulator (1) 	tough /	
	• lightweight (1)	impact	
	 durable / long lasting / hard-wearing (1) 	resistant	

Question number	Answer	Mark
3 (b)	Any one reason for using corrugated board (1) and a linked justification of that reason (1).	(2)
	 Excellent impact resistance (1) meaning it will cushion / absorb shock / withstand being thrown about in transit / protect the product (1) Excellent strength to weight ratio (1) therefore it provides good protection without adding additional cost to the postal costs (1) It is recyclable (1) which means it does not have to end up being sent to landfill (1) Corrugated board is a cost-effective material / cheap (1) which means it maximises the profits / returns (1) 	

Question number	Answer	Mark
3 (c)	Any one explanation that references the use of robotic materials (1) and a linked justification of that use (1).	(2)
	 They can be used to sense movement by the hand (1) and so can act as steering / directional controllers (1) They can sense pressure / being squeezed (1) therefore eliminating the use of additional buttons (1) Can be used to communicate with users (1) which means that some sensations can be generated back to the hands / vibrations / pulses (1) Robotic materials can be used for computational purposes within 	
	the material (1) therefore reducing the number of internal components (1)	

Question number	Answer	Additional Mark guidance
3 (d)	A calculation that includes:	Award full marks (2) for correct
	correct working	numerical answer
	<u>19 – 12.50</u> x 100 12.50	without working.
	(1) Allow for ECF if
	correct answer	candidate gets
	52%	part of calculation
	(1) wrong.

Question number	Answer	Mark
3 (e)	 Any two explanations that references environmental issues (1) and a linked justification of the issues (1). New materials are required to make the bodies for new games controllers (1) therefore putting pressure on the extraction / mining of finite resources to make plastics (1) Many old controllers are not correctly disposed of / dumped (1) which adds to landfill / increased demand on space / takes hundreds of years to break down (1) Games controllers should be properly disposed of / WEEE regulations (1) which means they are broken down / rare materials / elements taken out for recycling /because they contain hazardous substances / reducing the amount of materials going to landfill / incineration (1) Demand for energy used for materials / during manufacture / fuel for transportation (1) which results in additional demand on finite resources / pollution generated (1) 	(4)

Question number	Answer	Mark
4 (a)	 One electronic sensor given from: Thermistor (1) Thermocouple (1) Thermometer (1) 	(1)

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Question number	Answer	Mark
4 (b)	Any one disadvantage that references the wearing of the uniform (1) and the linked justification of the disadvantage (1).	(2)
	Lack of breathability (1) which means they will sweat / be hot to wear (1)	
	 They are heavy to wear (1) which will sap their energy / slow them down / only able to wear them for a short time / restrict mobility (1) 	
	 Lack of flexibility / stiffness / bulky (1) which makes it difficult for them to move around easily (1) 	

Question number	Answer	Mark
4 (c) (i)	+ - - -	(1)

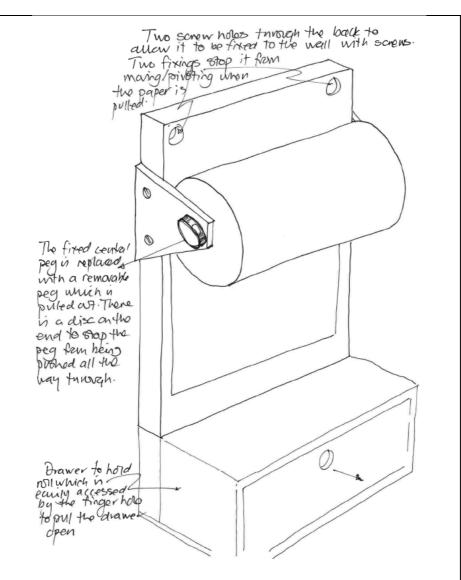
Question number	Answer		Additional guidance	Mark
4 (c) (ii)	A calculation that includes:		Award full marks for correct numerical	(2)
	 correct substitution / transposition 		answer without	
	350 = 1000 x 0.7		working.	
	hours			
	hours = 1000 x 0.7 / 350 = 2 hours		Allow for ECF if	
			candidate gets part	
		(1)	of calculation	
	 correct answer in minutes 		wrong.	
	120			
		(1)		

Question number	Indicative content	Mark
-	Candidates might refer to some/all of the following in their response, but candidates should be rewarded for other pertinent contextualised answers Saves time travelling and reduces cost / expense of travelling / lost time because of travelling Reduction in pollution caused because of travelling Can be recorded to be replayed and shown to those who could not attend Serves as a record of what was discussed and agreed Allows files to be shared over the internet More opportunities for collaborative design Allows for screens to be shared so others can work on ideas and add notes	(6)
	 Requires an investment into physical hardware Needs access to the internet which might not always be available Susceptible to internet reliability and security so might be difficult to access in certain areas and not always able to discuss confidential / sensitive material It relies on a certain etiquette in terms of not interrupting 	

Level	Mark	Descriptor
	0	
Level 1	1 - 2	Attempts to interrogate and deconstruct information but
		connections and logical chains of reasoning are flawed.
		 An unbalanced appraisal of the information/issues, containing
		judgements that show a limited awareness of the interrelationships
		between factors or competing arguments.
Level 2	3 – 4	 Interrogates and deconstructs information and provides some
		connections and logical chains of reasoning.
		A balanced appraisal of the information/issues, containing
		judgements that show an awareness of the interrelationships
		between factors or competing arguments.
Level 3	5 - 6	 Interrogates and deconstructs information and provides sustained
		connections and logical chains of reasoning.
		A well-balanced appraisal of the information/issues, containing
		judgements that show a thorough awareness of the
		interrelationships between factors or competing arguments.

Section B – Timbers

Question number	Answer	Mark
5 (a)	Marks will be awarded for understanding of design and technology, not graphical skills.	(6)
	Notes and sketches that include:	
	 allow for an empty kitchen roll to be easily replaced (1) and held in place without falling off (1) e.g. removable central peg / slot cut in side panel / cap on one end of peg to stop it falling out / off be held vertically on a wall (1) and not move when the kitchen roll is pulled off (1) e.g. two screws fixed into the wall / two mirror plates which fix the holder rigid / firm and does not allow for any rotation / movement / proprietary wall fixings provide storage space for a spare kitchen roll (1) and allow it to be easily accessed (1) e.g. drawer / shelf with clear access / method to open drawer 	
	Example of candidate response.	



Annotated notes:

Two screw holes through the back allow it to be fixed to the wall with screws. The two fixings stop it from moving / pivoting when the roll is pulled down.

Drawer to hold spare roll which is easily accessed by the finger hole to pull the drawer open.

The fixed central peg is replaced with a removable peg which is pulled out. There is a large disc on the end to stop it from being pushed all the way through.

Question number	Answer	Mark
5(b)	 Any two explanations that include a way the markers meet or fail to meet the requirement (1) and a linked justification of that way (1). They have a sharp pointed end (1) which means they will be able to be pushed into the soil (1) The text identifies the planted item (1) therefore allowing the gardener to easily locate the plant / seed so as to be able to provide the necessary aftercare (1) The text is quite small and will have short grain / be quite fragile (1) which means the letters might be easily broken off / will not be able to see / read what veg it is that has been planted (1) The wood will rot / get damp in the wet ground (1) which means they might not last very long / break down (1) 	(4)

Question number	Answer	Mark
6 (a)	 Any two factors which include an explanation (1) and a linked justification (1) Diseases have affected the trees (1) which meant that many had to be cut down and burnt to get rid of the disease (1) Weak / damaged trees are cut down (1) which means diseases cannot spread and cause more damage to other trees in the forest but reduces stock levels overall (1) Storms may have blown down smaller / weaker trees (1) therefore new trees have had to be planted but they take a long time to grow / reach maturity (1) 	(4)

Question number	Answer	Additional guidance	Mark
6 (b)	Marks will be awarded for understanding of design and	Cap at 3	(4)
, ,	technology, not graphical skills.	marks if no	
		sketches or	
	Notes and sketches that include:	all sketches	
		and no	
	Timber sanded down (1)	notes	
	Dust removed with damp cloth and left to dry (1)		
	Rub down with wire wool (1)		
	Apply varnish with brush / spray (1)		
	Leave to dry (1)		
	Rub down once dry and apply a second coat (1)		
	Example of candidate response:		
	Direction of grain. Direction of grain. Direction of grain. Direction of grain. Sanded smooth with glaw papers two fine dust remained with damp cloth 2. Varnish is applied with a brush 3. Its hourd be left to dry 4. Rub days between wats with fine gray paper.		
	 Annotated notes: Wooden handle is sanded down with glasspaper and the fine dust is removed with a damp cloth Varnish is applied with a brush It should be left to dry Rub down between coats with fine glasspaper 		

Question number	Answer	Mark
6 (c)	Any one explanation that includes a reason for buying PSE timber (1) and a linked justification for that reason (1).	(2)
	PSE timber is supplied already planed with a square edge (1) which means the manufacturer can cut it / machine it / knowing that all cuts / dimensions will be accurate / square to an edge (1)	
	 PSE timber is partly prepared / square on two edges (1) which saves the manufacturer time in not having to machine the timber before cutting (1) 	

Question number	Answer	Mark
6 (d)	 Any two explanations that include a property (1), plus two linked justifications of that property (1) + (1). It is tough (1) which means it can withstand knocks and bumps (1) therefore ensuring that it lasts a long time in the workshop / tool bag (1) It has good elasticity / flexibility (1) which means it will bend and flex a bit when hitting nails (1) therefore absorbing some of the impact / shock (1) It is straight grained (1) which means the grain runs along the length of the timber / run off (1) therefore less likely to break / fracture (1) 	(6)

Question number	Answer	Mark
7 (a)	One name given from:	(1)
	Round wire (1)	

Question number	Answer	Mark
7 (b)	 Any two explanations that include an advantage of using a template (1) plus a linked justification for the advantage (1). They can be drawn / traced around (1) therefore saving time / speeds up production time (1) Each one will be identical (1) therefore ensuring that each / subsequent part will marry up / line up (1) The template could also be used to mark out additional features such as holes / fixing points (1) therefore ensuring that all the other parts will fit correctly into place (1) They require little skill when using them (1) therefore they can 	(4)
	be used by workers requiring no specific technical knowledge (1)	

Question	Answer	Additional	Mark
number		guidance	
7 (c)	A calculation that includes:	Award full marks for correct	(5)
	Conversion of units either at the start or at the end	numerical answer without	
	(1)	working.	
	 Calculation of the surface area of the two straight parallel sides 50 x 5 x 2 = 500 cm² (1)	Allow ecf if candidate gets part of calculation wrong.	
	Calculation of semi-circular arc surface area / circumference	_	
	2 πrh = 2 x 3.142 x 20 x 5 = 628.4 cm ²		
	Calculation of half cylinder surface area		
	$628.4 / 2 = 314.2 \text{ cm}^2$ (1)		
	Total surface area		
	500 + 314.2 = 814.2 rounded to 814 cm ² (1)		

Question	Answer	Mark
number		
7 (d)	 Any two explanations that includes a reason for using a bag press (1), plus two linked justifications of that use (1) + (1). The clear bag allows you to see what is happening inside (1) which means you can see if all the pieces have lined up correctly (1) therefore ensuring that there will be no errors / waste (1) As the air is sucked out of the bag you can help shape the pieces around the curve (1) which means you can help bend them around the former / take some of the pressure off (1) which means that they will sit neatly / accurately around the former (1) Once the mould has been made it can be used repeatedly (1) which means many curved parts can be manufactured (1) ensuring that that they are all the same (1) The vacuum applies an even pressure (1) meaning that the joints will be even / have no voids (1) resulting in a shape that retains its form / has a strong bond between layers (1) 	(6)

Question number	Answer	Mark
8 (a)	 Any one explanation that includes a reason for using coloured stains (1) and a linked justification of that reason (1). It will make it more visually appealing / interesting (1) therefore will encourage the young children to play with it / more parents are likely to buy it (1) It can be used from an educational perspective / learning aid (1) because it can be used to teach young children their colours / colour recognition (1) It can be used to create a contrast in colour (1) therefore helping children to be able to identify different parts (1) 	(2)

Question number	Answer	Mark
8 (b)	 Any one explanation that includes a reason for using regular section timber (1), plus one linked justification of that reason (1) + (1). It means they can buy lots of the same sized material / bulk purchase (1) which means they will get a better / cheaper price (1) therefore reducing overall costs / improve profit margin (1) They do not need to have lots of different sized materials (1) which reduces the need for cutting / machining (1) therefore reducing waste / machining time / processes (1) 	(3)

Question number	Answer	Mark
8 (c)	 Any two explanations that include a reason (1) and a linked justification of that reason (1). It reduces the moisture content (1) therefore reducing the risk of the timber moving / cupping / warping / twisting / splitting / makes the timber more dimensionally stable (1) Seasoning reduces fungal growth / attack (1) because it kills off the spores in the wood that feed on moisture (1) Timber is a hygroscopic material / will absorb moisture from the air (1) so the moisture content needs reducing to as close as possible to its final location / environment (1) 	(4)

Question number	Indicative content	Mark
8 (d)	Candidates might refer to some/all of the following in their response, but candidates should be rewarded for other pertinent contextualised answers - Can be used in role play / educational toy / versatile as a play toy - Used to learn colours and hand eye co-ordination - Pressure on traditional toys versus the digital toys / computer games / internet based games / Minecraft - Role play / interactive / imagination games as opposed to online digital world - Pressure on parents / peers to have the most up to date current game / device / electronic game - Hand me down kind of toy / put away in the loft for grandchildren - Long lasting toy made from resistant materials which has no reliance on batteries / digital technology so will not go out of date	(9)

Level	Mark	Descriptor
	0	
Level 1	1 - 3	 Attempts to interrogate and deconstruct information but connections and logical chains of reasoning are flawed. An unbalanced appraisal of the information/issues, containing judgements that show a limited awareness of the interrelationships
		 between factors or competing arguments. A conclusion may be presented but it is likely to be generic assertions rather than supported by relevant judgements.
Level 2	4-6	 Interrogates and deconstructs information and provides some connections and logical chains of reasoning. A balanced appraisal of the information/issues, containing judgements that show an awareness of the interrelationships between factors or competing arguments. A conclusion is presented that is partially supported by relevant judgements.
Level 3	7 - 9	 Interrogates and deconstructs information and provides sustained connections and logical chains of reasoning. A well-balanced appraisal of the information/issues, containing judgements that show a thorough awareness of the interrelationships between factors or competing arguments. A conclusion is presented that is fully supported by relevant judgements.