



Mark Scheme (Results)

Summer 2025

Pearson Edexcel GCSE
Design Technology
Paper 1F: Timbers

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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.

Component 1 mark scheme

Section A – Core content

Question number	Answer	Additional guidance	Mark
1 (a) (i)	Any one property from: • Soft (1) • Insulator of heat (1) • Flexible/flexibility (1) • Warm (1)	Do not accept 'Insulator' on its own	(1)

Question number	Answer	Additional guidance	Mark
1 (a) (ii)	Any one property from: • Stiff / rigid / hard (1) • Waterproof / water resistant / stain resistant / non-absorbent (1) • Food safe / non-toxic (1) • Good heat resistance (1) • Good UV resistance (1) • Lightweight (1)	Do not accept the following on their own: 'Can be recycled' 'Durable' 'Light' 'Strong'	(1)

Question number	Answer	Additional guidance	Mark
1 (a) (iii)	Any one property from: • Good insulator of heat (1) • Good impact resistance (1) • Printability / takes colour well (1) • Food safe / non-toxic (1)	Do not accept the following on their own: 'Insulator' 'Recyclable'	(1)

Question number	Answer	Additional guidance	Mark
1 (a) (iv)	Any one property from: • Corrosion resistance / will not rust (1) • Good fluidity / casts well (1) • Malleability (1)	Do not accept: 'Durable'	(1)

Question number	Answer	Mark
1 (b) (i)	Any one other property of oak that makes it a suitable choice of material for the floorboards (1) and a linked justification of that property (1) • Oak is hard (1) therefore it will withstand abrasive wear from being walked over / on / furniture placed / moved on it (1) • Oak is durable / hardwearing (1) therefore it will be able to withstand abrasive wear / damage from being walked on (1)	(2)

Question number	Answer	Additional guidance	Mark
1 (b) (ii)	A calculation that includes: • correct working out of cost 57.6 / 1.44 (1) • correct answer £40 or £40.00 (1) ECF Award 1 mark if candidates show 1.44 / 57.6 = 0.025 or Award 1 mark if candidates show 57.6 / 1.44² = 27.70 to 27.80	Award full marks for correct numerical answer without working. Allow ECF if candidate gets part of calculation wrong.	(2)

Question number	Answer	Additional guidance	Mark
2 (a)	Any one property of copier paper that makes it an appropriate choice of material for the origami rabbit from: • Flexibility (1) • Bendability / easy to bend (1) • Easily creased / holds shape when folded (1) • Biodegradability (1) • Foldability / easy to fold / easily folded / easily foldable (1)	Do not accept 'Foldable' or 'Folded' on their own	(1)

Question number	Answer	Additional guidance	Mark
2 (b)	Any one advantage explained of using recycled copier paper to manufacture the origami rabbit (1) and a linked justification of that advantage (1) • Using recycled paper will reduce the need to make new paper / reduce environmental damage / is more sustainable / lowers carbon footprint (1) which reduces the need for cutting down trees to make the pulp required for paper production / reduces deforestation / reduces energy consumption / emissions (1) • Recycling paper stops it going to landfill / being thrown away / reduces waste (1) which keeps the space in landfill available for materials that cannot be recycled (1)	Do not accept 'Recycled' on its own	(2)

Question number	Answer	Additional guidance	Mark
2 (c)	Any one feature explained of how SMAs can be used to animate the origami rabbit (1) and a linked justification for that feature (1) • SMAs can be added / connected to the ears / nose / head / tail (1) which can be made to twitch / spring / straighten / fold when activated / heated / cooled / deformed (1) • SMAs can be added / connected to the legs / front paws / arms (1) which can create the impression of the rabbit hopping when activated / heated / cooled / deformed (1) Marking points can be accepted in reverse	Do not accept any reference to 'Move' on its own	(2)

Question number	Answer	Additional guidance	Mark
2 (d)	A calculation that includes: • correct calculation for the area of the standard sheet of A4 paper (Step 1) $29.7 \times 21.0 = 623.7 \text{ cm}^2$ (1) • correct calculation for area of the square sheet (Step 2) $21.0 \times 21.0 = 441 \text{ cm}^2$ (1) • correct calculation of waste percentage (Step 3) $((623.7 - 441) / 623.7) \times 100$ $= 29.29(2929)\%$ (1) • Correct answer rounded to 29% (Step 4) (1) Alternative method for Steps 2 and 3: • correct calculation for waste area cut off (Step 2) $(29.7 - 21.0) \times 21 = 182.7 \text{ cm}^2$ (1) • correct calculation of waste percentage (Step 3) $(182.7 / 623.7) \times 100 = 29.29\%$ (1)	Award full marks for correct numerical answer without working. Allow ECF if candidate gets part of calculation wrong. Award one mark for the correct rounding of an ECF calculation.	(4)

Question number	Answer	Mark
3 (a)	Award one mark from: • Resistor (1) • Fixed resistor (1) Do not accept: • Variable resistor • Preset resistor • Surface mount resistor	(1)

Question number	Answer	Mark
3 (b)	Any one advantage for the manufacturer of making the electronic circuit in batches of 1,000 (1) and a linked justification for the advantage (1) • A batch of circuit boards will take a set amount of time to manufacture (1) therefore the manufacturer can plan how to make best / efficient use of their time / machines / staffing (1) • Any changes in component / material prices can be reflected when a new batch is ordered / manufactured (1) therefore the manufacturer does not have to bear / stand any price increases (1) • If faults are found in a batch of completed / assembled circuit boards modifications can be made / products do not sell (1) therefore material / components wastage / financial loss is kept to a minimum (1) • The manufacturer does not need to buy lots of stock (1) therefore they do not have to invest / tie up money in stock / storage space (1) • The manufacturer can bulk buy components / get discounts (1) therefore being able to take advantage of economies of scale / pass on savings to the customer (1)	(2)

Question number	Answer	Additional guidance	Mark
3 (c)	A calculation that includes: - Correct calculation of number of circuit boards that can be cut from the larger sheet $(32 / 4) \times (16 / 4) = 8 \times 4 = 32$ (1) - Correct calculation of cost of one circuit board $£3.20 / 32 = £0.10$ or 0.1 (1)	Award full marks for correct numerical answer without working. Allow ECF if candidate gets part of calculation wrong.	(2)

Question number	Answer	Mark
3 (d)	Any one advantage of using batteries (1) and a linked justification of the advantage (1) - They do not need to be plugged into a mains power source / require a cable (1) which means the device is free to be used anywhere / fully mobile / portable (1) - The batteries are a small / discrete component (1) which means they do not take up too much space within the circuit / product (1) - You can use rechargeable batteries (1) which means one set can be used again and again (1) - You can use the voice recorder in remote areas / campsites / beach / power cuts (1) because it does not need to be plugged into the mains power supply (1) - The batteries can simply be replaced with new ones (1) which means no time is wasted having to wait to charge it / can be used straightaway (1)	(2)

Question number	Answer	Mark
3 (e)	Any two benefits of using HIPS for the case of the Sing Along Box (1) and a linked justification of that benefit (1) • HIPS is lightweight / has a low density (1) therefore it will be easier for young children to carry / move it around / it is portable (1) • HIPS has good / excellent impact resistance / tough (1) therefore if the box is dropped the contents inside will be protected from damage / the box is unlikely to break (1) • HIPS does not absorb water / is waterproof (1) therefore it can be easily cleaned / wiped down without any risk of damaging the materials / moving / working parts / electronic circuit (1) • As a thermoplastic / thermoforming polymer HIPS can be formed / moulded (1) therefore it is capable of being used to form complex shapes / forms / intricate details (1)	(4)

Question number	Answer	Mark
4 (a)	Any two explanations of a working characteristic of stainless steel (1) and a linked justification of that characteristic (1) • Stainless steel is corrosion resistant / rust proof / non-toxic (1) therefore it will not be affected by the corrosive salt / react with / contaminate the contents / surface will not become blemished / food safe (1) • Stainless steel has good torsional resistance (1) therefore it will not distort / twist when the grinder is rotated (1) • Stainless steel is hard (1) which means it will withstand the abrasive wear / scratching from grinding the salt / will not wear / will extend life span of product (1)	(4)

Question number	Answer	Additional guidance	Mark
4 (b)	A calculation that includes: • Correct calculation of the percentage of material that CANNOT be recycled $100 - 80 = 20 \%$ (1) • Correct calculation of the weight of material that CANNOT be recycled $(20 / 100) \times 270 = 54 \text{ grams}$ (1) ECF Award 1 mark for an answer of 216 grams which is what 80% represents	Award full marks for correct numerical answer without working. Allow ECF if candidate gets part of calculation wrong. 216 alone with no working out is zero marks.	(2)

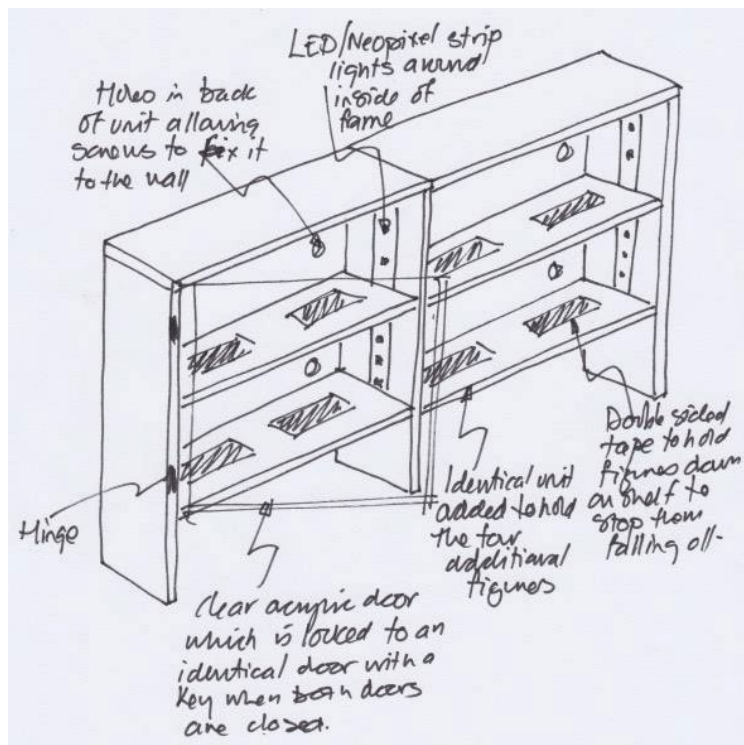
Question number	Indicative content	Mark
4 (c)	• Designers can see / get a better idea of how products work when they are taken apart • Designers can see / draw each individual part that they may be able to improve / refine / combine / design them out / combine them into one individual part • Designers may be able to introduce standardised components into their new designs • Designers can look at ways of trying to reduce material usage / wastage when designing a new product • Designers can take measurements of existing products • Designers can look at how they might improve the assembly / manufacture of a new product to reduce time • Designers take inspiration that they can use in their own work • Designers can analyse / evaluate the materials that have been used • Designers can get to see the intricate workings of the product • Designers are able to evaluate products in terms of working out / discovering what is wrong with them / identify flaws • Designers can work out how they can be improved / made more reliable / energy efficient	(6)

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. Notes and sketches that include: • be able to display an additional four collectable figures (1) and include a method to stop them falling off the shelves (1) e.g. unit is made taller / wider to show extra four spaces and double sided tape / glue dots / slots / recessed grooves / lipped front edge ('door' will also attract credit for stopping the figures falling off the shelf) • include a method to stop the collectable figures from being stolen (1) that still allows them to be seen (1) e.g. hinged / sliding doors & lock / lockable / padlock / hasp and staple and clear acrylic / glass screen • be capable of being fixed to a wall (1) and include a lighting system (1) e.g. screws / bolts / wall / flat plates / hooks and LEDs / neo pixels / bulbs / strip lights (reference to 'lights' generically without any subsequent graphical indication or reference to wiring does not attract a mark)	(6)

Example of candidate response:

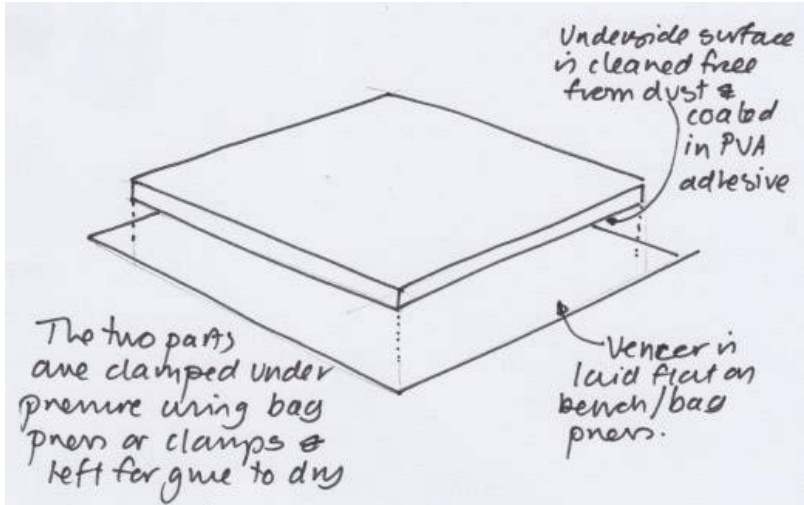


Notes:

- Double sided tape to hold figures down on the shelf to stop them falling off
- Hinges
- Clear acrylic door which is locked to an identical door with a key when both doors are closed
- Identical unit added to hold the additional four figures
- LED / neo pixel strip lights around inside of frame
- Holes in back of unit allowing screws to be used to fix it to the wall

Question number	Answer	Mark
5(b)	Any two explanations that include a way the number play set meets or fails to meet the requirement (1) and a linked justification of that way (1) • There is a full set / lots of numbers and maths symbols (1) therefore the child will be able to make up lots of different sums / equations (1) • The numbers are all very clear / easy to read (1) therefore there can be no confusion as to what the number is / 6 and 9 cannot be confused (1) • Helps teach them about how the numbers look / differentiate numbers / symbols (1) without the need of having to be able to write (1) • The numbers are easily moved around / rearranged (1) therefore they can learn that some problems / calculations have the same answer (e.g. $6 \times 4 = 24$ and $4 \times 6 = 24$) (1) • There might not be enough numbers / symbols to make up some questions / answers [e.g. $11 \times 11 = 121$ so the set will not be very useful as you will not be able to make the correct answer since you need 6 1s and there are only 3 in the set] (1) therefore some extended calculations will not be able to be completed (1) [Accept the opposite to the above in that there are enough counters (1) to make some large sums / calculations (1)] • Some of the numbers / symbols might get lost (1) therefore you will not be able to carry out a full range of sums / equations (1) • The plus / multiply symbols are quite similar (1) therefore the child might get confused as to what the sum / equation actually is (1) • There is one disc that is the greater / less than symbol which the child might not be able to identify (1) therefore they may not understand what the purpose of the question / task is (1)	(4)

Question number	Answer	Additional guidance	Mark
6 (a)	Any two explanations for using MDF for the desk tidy (1) and a linked justification (1) • MDF does not warp / cup / twist (1) therefore it will stay flat / in shape (1) • MDF is available in large sheets (1) therefore bits of wood do not need to be stuck together to make a panel / piece big enough for the side panel (1) • MDF is a plain brown colour / smooth / flat surface / can be finished in a number of ways / veneer added (1) therefore it can be customised / finished in a number of ways / colours to increase potential sales / appeal to a wider audience / increase aesthetic appeal (1) • MDF is relatively cheap / cost effective (1) therefore it keeps the overall cost of the product down (1) • MDF is easily machined / quite soft (1) therefore the slots for the adjustable shelves can be cut / slots machined on a router (1) • MDF is readily available (1) can be purchased in large volumes for mass production (1) • MDF has no grain (1) therefore it does not give rise to splinters (1)	Do not credit 'Cheap' or 'Lightweight' on their own	(4)

Question number	Answer	Additional Guidance	Mark
6 (b)	Marks will be awarded for understanding of design and technology, not graphical skills. Notes and sketches that include: • Surface / edges of the MDF are rubbed / sanded down / dust cleaned off (1) • Glue is applied to the surface / self-adhesive backing removed (1) • The side panel and veneer are put into contact together / aligned (1) • Pressure is applied by the clamps / bag press / heat applied with iron (1) • The side panel and veneer are left for an amount of time for the glue / adhesive to dry (1) Example of candidate response: 	Cap at 3 marks if no sketches or all sketches and no notes	(4)

	Notes: • Underside surface is cleaned free from dust • Underside surface is coated with PVA adhesive • Veneer is laid flat on the bench / bag press • The two parts are clamped under pressure using a bag press or clamps and left to dry		
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Question number	Answer	Mark
6 (c)	Any one explanation of a physical characteristic of beech (1) and a linked justification of the characteristic (1) • Beech is a pink / pale colour (1) which means that it will compliment most desk areas / offices (1) • Beech has a distinctive grain pattern (1) which creates a very pleasant / nice aesthetic appearance (1) • Beech is close / fine grained (1) therefore it does not split / splinter easily (1)	(2)

Question number	Answer	Mark
6 (d)	Any two explanations that include a semi-permanent method of assembly (1), plus two linked justifications of that method (1) + (1) Dowel / dowelling (1) - The top of the desk tidy is supported by the dowel but can still be pulled apart from the side panel (1) as the holes are drilled into each part and a dowel is inserted equally into both parts at right angles / 90° (1) Screws (1) - The two parts can be taken apart when the screw is undone (1) as a hole is drilled through the side panel / smaller hole in the top and a screw is inserted and tightened / untightened (1) Knock down fitting / brackets (1) - The two parts can be taken apart when the block / knock down / bracket fitting is removed (1) as the screws are fixed into the side panel / top of the block / knock down fitting / bracket and can be tightened / untightened (1) CAM lock (1) - It can be undone by rotating the cam lock and releasing the side panel (1) as the pin / dowel is screwed into the side panel and a cam lock is inserted into the underside of the top which pulls the parts together / allows them to be disassembled / taken apart (1) Barrel and bolt / cross dowel (1) - It can be undone by removing the bolt through the side panel (1) as the bolt is screwed into the cross dowel / barrel on the underside of the top allowing the two parts to be disassembled (1)	(6)

Question number	Answer	Additional guidance	Mark
7 (a)	Award one mark from: • Tenon / tenon saw (1) • Dovetail / dovetail saw (1) Award different / phonetic spellings of tenon, including (there are other variations): • Tennon • Tennan • Tenoon • Teenon	Do not credit 'Saw' on its own	(1)

Question number	Answer	Mark
7 (b)	Any two benefits for the manufacturer of using stock materials (1) plus a linked justification of the benefit (1) • It means the materials will be widely / readily available / can be bulk purchased / do not have to be machined to a specific non-standard size (1) therefore the materials will be cheaper / reducing overall costs / improve profit margin (1) • The manufacturer does not need to have / hold lots of different sized materials (1) which reduces the need for cutting / machining / reducing waste / machining time / processes (1) • Machines do not have to be reset each time a different sized material is used (1) therefore it helps to reduce the manufacturing time / speed up manufacturing / reduce potential errors that might be introduced (1)	(4)

Question number	Answer	Additional guidance	Mark
7 (c)	A calculation that includes: • Conversion of units at any stage (1) • Calculation of the cost of Part number 1 and 2 (1) 2 at 100 mm = 200 mm or 0.2 m x 2.80 = £0.56 • Calculation of the cost of Part number 3 (1) 1 at 75 mm = 75 mm or 0.075 m x 2.80 = £0.21 • Calculation of the cost of Part number 4 (1) 3 at 100 mm = 300 mm or 0.3 m x 3.30 = £0.99 • Total cost of the material (1) 0.56 + 0.21 + 0.99 = £1.76 Any response of £1760 or £17.60 or equivalent without any working out shown must be awarded 0 marks	Award full marks for correct numerical answer without working. Allow ECF if candidate gets part of calculation wrong. £1760 or £17.60 are partially correct answers given some incorrect conversion of units has taken place but can be awarded 4 marks	(5)

Question number	Answer	Additional guidance	Mark
7 (d)	Any two explanations that include a benefit of using varnish (1), plus two linked justifications of that benefit (1) + (1) • The varnish will provide a waterproof finish / seal / close the grain (1) which means that any water / rain will be repelled from the surface (1) therefore it will not soak into the wood and rot it / easier to clean / prevent staining from pots / soil (1) • The varnish will provide a tough surface finish (1) which will protect the timber when putting in and taking out the plant pots (1) therefore prolonging the life of the product (1) • The varnish will enhance / allow the natural grain of the timber to be seen / is clear (1) which results in a more aesthetic / shiny / glossy / nicer looking product (1) therefore resulting in greater sales (1)	Do not accept anything related to a smoother surface	(6)

Question number	Answer	Mark
8 (a)	Any one explanation of a physical characteristic of ash (1) and a linked justification of that characteristic (1) • Ash is a creamy white material (1) therefore it will contrast / be eye-catching in comparison / in colour to the mahogany eyes and nose / will not need painting (1) • Ash has a distinctive grain / pleasing pattern / texture (1) therefore the grain could be enhanced / featured to create a more 3D shape / form for the bear shape (1)	(2)

Question number	Answer	Mark
8 (b)	Any one explanation of an issue associated with the ecological footprint of using mahogany (1) plus two linked justifications of that explanation (1) + (1) • The demand for mahogany results in trees being cut down (1) which results in loss of natural habitats (1) therefore birds / animals are having to move into the cities / find other places to live / drop in numbers / potential loss of species (1) • The logging of mahogany results in deforestation (1) which results in land being exposed to the rain (1) therefore resulting in potential flooding / loss of nutrients from the soil / poor growing conditions (1) • Mahogany is sourced from Amazonian / tropical rainforests (1) which means that the timber has to be transported to reach factories (1) therefore resulting in lots of pollution through the burning of fuels / time taken to get the timber to the manufacturer (1)	(3)

Question number	Answer	Mark
8 (c)	Any two reasons for manufacturing the features of the jewellery box to a tolerance (1) and a linked justification (1) • The length of the two small drawer knobs need to be of a certain length (1) otherwise they will not be long enough to be able to get hold of / grip to be able to open the drawers (1) • The shape and size of the drawers must be sanded / cut / finished to a certain size (1) otherwise they will not move in and out freely (1) • The eyes / nose must be positioned within a certain set of dimensions (1) otherwise they may look odd / cross eyed / nose in the wrong place relative to the eyes (1) • The spaces / holes for the eyes / nose / drawers must be manufactured to the correct size (1) so that the separate pieces can fit in correctly / neatly (1) • Identical parts / face / feet / belly (1) therefore they will be interchangeable / will fit into any manufactured body when assembled / left or right hole (1)	(4)

Question number	Indicative content	Mark
8 (d)	Impact on cost factors in relation to: • Ash tends to have quite a big open grain and has a tendency to splinter which could cause problems given the product • There will be lots of manufacturing processing of the material to manufacture the jewellery box in this shape from the original supply of the material in plank / slab form, it will need to be planed, cut and sanded into shape • Products of this nature tend to be handmade / hand finished given the batch size and the location where the products are being sold • The drawers will need to be cut out accurately so that they can fit back into the space they come from once they have been hollowed out • The shape once cut out may need to be carved to create the form / shape of the bear • There will need to be some gluing of parts such as the nose and eyes • Some of the parts are very small and a great deal of care will need to be taken on machines when making parts so small • Due to batch production stages / steps should be planned so as to maximise machine processes / times / set up • The box will need to be sanded to a fine finish before any surface finish such as wax or varnish is applied • The choice of surface finish needs to be considered so that it does not affect the jewellery in any way such as oils	(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.