

EXAMINATIONS COUNCIL OF ESWATINI

EGCSE

EXAMINATION REPORT

FOR

DESIGN AND TECHNOLOGY (6902)

YEAR

2020

Table of Contents

<u>Subject Code:</u>	<u>Name of Component:</u>	<u>Page No:</u>
6902	Design and Technology P1	3 - 10
6902	Design and Technology P2	11 - 14
6902	Design and Technology P3	15 - 25
6902	Design and Technology P4	26 - 30

EGCSE DESIGN AND TECHNOLOGY**Paper 6902/01****Design Core****General Comments**

Candidates responded as intended to all three optional questions and there was an increase in the number of candidates opting for **Question 2** but a decline opting for Paper 3 than in previous years. **Question 1** was, by far, the most popular choice question for candidates. Question 3 was the next most popular choice followed by **Question 2**.

Statistically eight hundred and fourteen (858) candidates wrote this Paper. Of these candidates seven hundred and twenty-seven (760) opted for **Question 1**, whilst only forty (76) chose **Question 2** and forty-seven (22) picked **Question 3**.

Successful candidates followed the design process as set out on the A3 answer sheets showing that they could apply their design skills in an imaginative and creative way. Candidates tended to respond very well when they focused their answers on the precise stage of the design process as set out on the A3 answer sheets. However, very few candidates evaluated their ideas in Part 'C' using the matrix format, but they went on to use the spaces provided for in part **(d)**, which led them to lose a lot of time.

Comments on Specific Questions**Question 1**

Design a display unit that will advertise products for sale for vendors.

All candidates who attempted this question clearly understood the requirements of a unit for displaying and advertising goods sold by street vendors in Eswatini. It was clearly a design idea with which they were able to imagine in their normal day-to-day experiences. Suggested ideas showed evidence of original thinking with imaginative outcomes.

- (a) Very few candidates were able to list correctly four additional functions of such a unit. However, there were responses that had nothing to do with the functions of the unit. Some candidates repeated the given function points instead of adding four additional points as the question required. Successful responses included; separate different products, easy to see the displayed items, access items, durable, weather resistant, stable in use, easy to clean, secure displayed items, safe to use, attract customers.
- (b) The majority of candidates were able to sketch two different methods that might be for displaying the sold products. Candidates produced some good sketches; however, some sketches lacked aspects of proper representation of the idea also lack of good proportions, parallelism, orientation that led to loss of valuable marks.

Most responses lacked annotations or notes to give clarity to the sketches, which was a requirement for this part of the question. Such responses resulted in loss of mark. However, well-presented sketches giving clarity and good communication got full marks.

Expected responses included the following displaying methods: shelves, pockets, hooks, pins, pegs, hanger etc.

- (c) The majority of candidates presented three ideas and showed that they were able to be quite creative in their response to the design problem; very few came out with less than the three required concepts. These were marked on pro-rata basis. However, most of the candidates lost valuable marks for failing to colour or enhance their ideas.

Successful candidates enhanced their drawings with colour or other forms of highlighting and added annotations to provide information on the nature and detail of each design idea, including some dimensions to show the size and the suitability of the ideas. Candidates are to use all the space allocated to the answer for this part of the question so that they can show all information clearly.

- (d) Very few candidates gave types of materials and joints instead of giving advantages and disadvantages about their designs. The majority of candidates gave both the positives and the negatives aspects so that they could discriminate between all three of their design ideas in relation to the context of the question. By far, most evaluations were precise and focussed on the desired use of each idea. Candidates who repeated evaluations on the difference of ideas lost valuable marks.

Candidates were able to choose one idea and justify their choice. Few candidates used the justification that they chose a particular idea because it meets all specifications, which led to a loss of a valuable mark. Most candidates were able to state the advantages that influenced their decision.

- (e) Candidates are at liberty to use any drawing method to produce a full solution to a given problem as long as they provide the required constructional details and dimensions. The level of response to this part of the question has shown improvements compared to past examinations.

Successful candidates selected a drawing format appropriate to and large enough for the design presented. They drew high standard of drawings with wide range of enhancing techniques and then added constructional details in the form of sketched and written annotations. Quite a number of candidates lost marks for poor line quality showing little or no constructional details and only showing overall dimensions.

- (f) Many candidates selected specific materials appropriate to the design presented in the previous section although some were just naming irrelevant materials to their designs. Few candidates gave generic responses such as wood/metal/plastic. Such responses were not awarded marks. Reasons given for choice indicated that candidates had considered the structure of their design and were familiar with the strengths and weaknesses of a range of specific materials in this context.

- (g) Quite a number of candidates were able to give a detailed description of manufacturing one part including appropriate processes. Such candidates scored the deserved mark. However, there were those that gave scanty description of the processes through annotated sketches.

Responses to this part need to develop and include details beyond general marking out and preparation methods done to any product. Other details such as shaping, cutting of joint to the selected part till it is ready to be assembled to the product is also very much needed. The use of simple drawings in addition to written text was generally successful. Even though some sketches did not have annotations, they were marked on quality and communication and as such awarded deserved marks.

Question 2

Design a promotional card which includes some type of feature that attracts attention to be distributed to people that will attend the for Pre-school children games.

This question, intended for those following the Graphic Products option, was by far, the least popular choice question for candidates registering only 75 attempts out of 858 candidates. Candidates appeared familiar with the requirements of a lightweight souvenir that would act as a desk, which will be made of card and other lightweight materials.

- (a) A fair number of candidates who attempted this question responded quite satisfactory to this introductory part of the question when listing four additional points about the function of such a souvenir. Successful responses included very appealing card, attractive shape, easy to read, invite people, attractive colours, communicate clear, visible words, has impression, safe to use, has club name. Very few candidates repeated functions stated in the design brief, which led them to lose marks.
- (b) Candidates had difficulty showing two features that would attract attention on such a card. Successful responses included pop-up, window to open, font size, slider, produces sound, raised features, font colour, picture. There were variations though in the quality of sketches with some candidates, producing sketches with little or no annotations, which made them loose marks.
- (c) The majority of candidates presented three ideas and showed that they were able to be quite creative in their response to the design problem; very few came out with less than the three required concepts. These were marked on pro-rata basis. However, most of the candidates lost valuable marks for failing to colour or enhance their ideas.

Successful candidates enhanced their drawings with colour or other forms of highlighting and added annotations to provide information on the nature and detail of each design idea, including some dimensions to show the size and the suitability of the ideas. Candidates are to use all the space allocated to the answer for this part of the question so that they can show all information clearly.

- (d)** Very few candidates gave types of materials and joints instead of giving advantages and disadvantages about their designs. Majority of candidates gave both the positives and the negatives aspects so that they could discriminate between all three of their design ideas in relation to the context of the question. By far, most evaluations were precise and focussed on the desired use of each idea. Candidates who repeated evaluations on the different of ideas lost valuable marks.

Candidates were able to choose one idea and justify their choice. Few candidates used the justification that they chose a particular idea because it meets all specifications, which led to a loss of a valuable mark. Most candidates were able to state the advantages that influenced their decision.

- (e)** Candidates are at liberty to use any drawing method to produce a full solution to a given problem as long as they provide the required constructional details and dimensions. The level of response to this part of the question had shown improvements compared to past examinations.

Successful candidates selected a drawing format appropriate to and large enough for the design presented. They drew high standard of drawings with wide range of enhancing techniques and then added constructional details in the form of sketched and written annotations. Quite a number of candidates lost marks for poor line quality showing little or no constructional details and only showing overall dimensions.

- (f)** Many candidates selected specific materials appropriate to the design presented in the previous section although some were just naming irrelevant materials to their designs. It was noticed that majority of candidates had knowledge of graphic materials such as card, corrugated boards, foam board, rigid foam and plastic sheet. Reasons given for

choice were not indicating that candidates had considered the structure of their design and were familiar with the strengths and weaknesses of a range of specific materials in this context.

- (g) Very few candidates were able to give a detailed description of producing a prototype of the card in the school's Graphics studio, including appropriate processes. Such candidates scored the deserved mark. However, there were those that gave scanty description of making one part of the card instead of making the whole prototype.

Responses to this part need to develop and include detail beyond general marking out and preparation methods done to any product. Other details such as: shaping, scoring, printing of words, decorating the card, cutting of parts until it is ready to be assembled is also very much needed. The use of simple drawings in addition to written text was generally successful.

Question 3

Design a mortar lifting device with some form of mechanism to be used around buildings.

Only 22 out of 858 candidates answered this question. In this, question candidates required to design a mortar-lifting device with some form of mechanism. The requirement for the device was such that candidates could make the use of their knowledge and experience of systems and control and the use of mechanisms in interesting context.

- (a) Majority of candidates who attempted this question responded quite satisfactory to this introductory part of the question when listing four additional points about the function of such a souvenir. Correct responses included lift plaster to different heights, not spill the mortar, stable in use, easy to clean, little maintenance, easy to operate, resist weather condition, safe to the user, durable.
- (b) Candidates had no difficulty showing two attachments that would allow the net to be adjusted for different heights. Best responses showed bolts and nuts, pulleys, rack and pinions, cam and followers and any appropriate mechanism.

- (c) The majority of candidates presented three ideas and showed that they were able to be quite creative in their response to the design problem; very few came out with less than the three required concepts. These were marked on pro-rata basis. However, most of the candidates lost valuable marks for failing to colour or enhance their ideas.

Successful candidates enhanced their drawings with colour or other forms of highlighting and added annotations to provide information on the nature and detail of each design idea, including some dimensions to show the size and the suitability of the ideas. Candidates are to use all the space allocated to the answer for this part of the question so that they can show all information clearly.

- (d) Very few candidates gave types of materials and joints instead of giving advantages and disadvantages about their designs. Majority of candidates gave both the positives and the negatives aspects so that they could discriminate between all three of their design ideas in relation to the context of the question. By far, most evaluations were precise and focussed on the desired use of each idea. Candidates who repeated evaluations on the difference of ideas lost valuable marks.

Candidates were able to choose one idea and justify their choice. Few candidates used the justification that they chose a particular idea because it meets all specifications, which led to a loss of a valuable mark. Most candidates were able to state the advantages that influenced their decision.

- (e) Candidates are at liberty to use any drawing method to produce a full solution to a given problem as long as they provide the required constructional details and dimensions. The level of response to this part of the question has shown improvements compared to past examinations.

Successful candidates selected a drawing format appropriate to and large enough for the design presented. They drew high standard of drawings with wide range of enhancing techniques and then added constructional details in the form of sketched and written annotations. Quite a number of candidates lost marks for poor line quality showing little or no constructional details and only showing overall dimensions.

- (f) Many candidates selected specific materials appropriate to the design presented in the previous section although some were just naming irrelevant materials to their designs. Few candidates gave generic responses such as wood/metal/plastic. Such responses were not awarded marks, Reasons given for choice indicated that candidates had considered the structure of their design and were familiar with the strengths and weaknesses of a range of specific materials in this context.
- (g) Quite a number of candidates were able to give a detailed description of manufacturing one part including appropriate processes. Such candidates scored the deserved mark. However, there were those that gave scanty description of the processes through annotated sketches.

Responses to this part need to develop and include details beyond general marking out and preparation methods done to any product. Other details such as shaping, cutting of joint to the selected part till it is ready to be assembled to the product is also very much needed. The use of simple drawings in addition to written text was generally successful. Even though some sketches did not have annotations, they were marked on quality and communication and as such awarded deserved marks.

EGCSE DESIGN AND TECHNOLOGY

Paper 6902/02 Graphic Products

General Comments

In this component, candidates were required to answer all three questions in Section A (A1, A2, and A3) and then proceed to answer either B4 or B5 from Section B. Very few candidates did not attempt any question in Section B. Such candidates lost valuable marks allocated to this part of the question. By far, **Question B5**, was the most popular optional choice question in Section B for most candidates.

As noted in previous reports, there are areas in the syllabus that need improvements. Such areas are proper application of geometric construction, drawing of centre lines, projection lines, and use of the thick and thin lines, correct orientation of drawings in pictorial drawings and the correct method of projection views in orthographic projection.

Comments on Specific Questions

Section A

Question A1

A floor plan

A floor plan for displaying items sold at Mavela Sports shop was shown with all the measurements. Candidates were to complete the floor plan by constructing the missing details using a given scale of 1:100

This Graphic Products introductory and compulsory question was attempted by all candidates and a very few obtained satisfactory marks allocated for this question.

Generally, most candidates displayed good competences in drawing of the side 30mm hexagons in the correct position, R50 arc from the right top corner of the shop wall, but lost valuable marks for failing to find the R30 centre. All candidates were able to use the given scale to complete the shop walls and most of the details on the bottom corner.

Question A2

A child shape sorter

This question required candidates to draw full size a plan view of the shape sorter box with one shape already drawn. The other shapes to be drawn were a rectangular octagon side 20; a diamond 40 x 50 diagonals; a rectangle hole 40 x 30; a semi-circle Ø50 and an equilateral triangle side 40. Majority of candidates were able to draw the diamond and an accurate 20mm side regular octagon. It was surprising that quite a number of candidates could not draw the semicircle and an equilateral triangle side 40mm, some candidates left the page blank.

Question A3

Mavela Sports shop logo

Candidates were required to complete the logo by constructing the missing details of the logo that include the quarter of an ellipse given only a minor axis. Majority of candidates did very well on this question, they demonstrated very good creativity in constructing the quarter elliptical shape, some used concentric circle method others a rectangular method. No candidate used trammel method this time. It was evident to some candidates that there are not competent with the rectangular method as they missed certain steps.

All candidates who attempted this question did drawing of the R20 circle very well, but the construction of the 104mm equilateral triangle was a problem to many. They lost the mark for the accurate triangle they only got the evident mark instead.

Section B - two optional questions

This section compromised of two optional questions. Candidates were required to answer any one question of their choice.

Question B4***The Raffle Ticket box***

This question was from an actual 'Graphic Product' used as a raffle ticket box made from 2mm thick card.

Majority of candidates attempted this question. Overall, candidates gained a wide range of marks for their answers.

The candidates were required to draw full size, a development (net) of the raffle ticket box. They were required to clearly show all folding lines, include the top, base and all flaps to enable assembly and to ignore thickness of the card.

- (a)** Many candidates were able to complete the six (6) surface panels of the hexagonal raffle ticket box. Very few candidates lost valuable marks by failing to provide measurement accurately especially for overall length and height. The addition of the glue flaps proved to be a problem to Majority of candidates, which led to a loss of very good marks. Few candidates had a problem with fold lines. Minimal numbers of candidates were able to represent folding lines properly (i.e. centre lines) thus resulting in a loss of marks. Construction of the 25mm hexagonal base and top and placing them in the correct position was a very big problem to many candidates, most of them were making the sides too big or too small.
- (b)** In the box at the bottom of the page, candidates were required to draw a design of an appropriate lid for the box and show a suitable handle for the lid for easy opening.

Most candidates were able to come with some designs for the lid, but majority of their ideas were not clearly communicating, which made them not suitable for the given situation and this made candidates to miss some important marks.

Question B5***Data representation of sporting items sold at Mvela sport shop.***

This question was a 'Graphic Representation' exercise and a much smaller number of candidates compared to question attempted it.

B5. Pie chart

Candidates were required to draw a pie chart to show the distribution of each product as part of the total sales in the shop. Most candidates who attempted this question managed to draw the pie chart. Very few candidates had a challenge in having correct angles for the sectors representing the sold items others failed to label the section correctly. A majority of candidates also lost the mark for not writing the pie chart heading.

Two-dimensional bar chart

Candidates were required to draw a two-dimensional bar chart to show the sales of soccer jersey for the three seasons.

Majority of candidates who attempted this question did very well. They were able to draw the 3D bar chart showing the three seasons correctly referenced, showing the rise and fall of soccer jersey for the athletics, soccer and volleyball seasons. However, some lost marks for missing the heading and not drawing the bars showing the correct scale.

Three-dimensional bar chart

Candidates who scored high marks on this question were able to draw the 3D bar chart showing the sales of all three playing kits during the athletics and soccer seasons to correct values to scale. They also correctly labelled the two seasons and the three playing kits (spike shoes, soccer jersey and volleyball kits). However, some candidates did not include the chart heading, others lost marks for not labelling correctly and some for including incorrect scale.

EGCSE DESIGN AND TECHNOLOGY**Paper 6902/03
Resistant Materials****General Comments**

This paper consists of two sections, Section A and Section B. Candidates were required to answer all questions in Section A and then proceed to answer 11, 12 or 13. Most candidates in all centres followed this requirement. As pointed out in previous year's examination reports, candidates still showed challenges in understanding and execution of basic skills and technique in working with materials. When showing processes using sketches and notes, they should show the correct tools used to carry out the tasks.

Section A

This Section tests knowledge and understanding concerned with materials, tools and processes used when working with plastic, metal and wood. The syllabus requires that candidates should have an all-round knowledge and understanding of the three content areas named herein to perform well in this Paper.

Comments on Specific Questions**Question 1**

Candidates were required to name any safety equipment that should be worn when brazing.

Most candidates were able to name leather gloves, goggles and apron as safety equipment worn when brazing. Although majority were just writing gloves instead of mentioning, they are leather gloves.

Question 2

This question showed two tools used to mark out the centre of a metal rod. Candidates were required to name the tool A and tool B.

Quite a significant number of candidates were able to name tool 'A' but majority could not name tool 'B'. Scriber for tool 'A' and centre square for tool 'B' were the correct responses.

Question 3

This question required candidates to complete a sketch of a bridle joint.

Very few candidates were able to complete the bridle joint sketch. Most of candidates were losing marks for failing to show correct proportion on the bottom part.

Question 4

This question showed a car rear light unit where there to name a suitable plastic for it and give two properties of the selected plastic that makes it suitable for making the unit.

- (a) Most candidates were able to give acrylic, polystyrene and ABS as suitable plastics for the car rear lighting unit. Some candidates were giving thermosetting plastics such as polyester resin and polyurethane instead of thermoplastics stated above.
- (b) The expected properties were any two of the following; easy to mould, weather resistant, inherent colour, durable, strong, hard, stiff, lightweight, transparent. Most candidates did very well this question.

Question 5

Candidates were required to name the nailing method shown in Fig. 4, give one reason for using such nailing lastly give a tool used to drive nails below the wood surface.

- (a) Some candidates named the type of nailing method as staggered nailing which led them to lose valuable mark. The correct answer was dovetail nailing.
- (b) The expected reason was for adding strength: Majority of candidates who were able to state the correct method of nailing in (a) managed to give the correct reason.
- (c) Very few candidates correctly named nail punch being the tool used to punch nails below the wood surface. Majority of candidate were naming hammers for that job and they did not get that mark.

Question 6

Candidates were required to state the method of filling shown in Fig. 5, also state the purpose of that filling method.

- (a) Most candidates were able to identify the method of filling as draw filling.
- (b) Majority of candidates who got (a) correctly managed to state the correct purpose of draw filling which is to finish or smoothing the surface being filed.

Question 7

Candidates were required to explain the purpose of knurled surfaces on scriber and centre punch, name a machine, tool used to produce knurled surfaces and tool a marking out tool which has some knurling pattern on it.

- (a) It was very disappointing that most candidates had no idea why the above-mentioned tools have knurled surfaces. Very few candidates provided the correct answer, which was to provide firm grip or for decoration purposes.

Very few candidates were able to name the centre lathe as a machine for producing knurled surfaces. Very few candidates correctly named the tool for producing the knurling surfaces: The correct answer was knurling tool.

Question 8

Candidates were required to complete a sketch of a tee hinge.

Quite a number of candidates did complete the sketch of the tee hinge accurately, but some were sketching butt hinges instead and they lost marks.

Question 9

An incomplete table showing two products manufactured. Candidates were required to complete the table by naming one use of epoxy resin and naming adhesives used for building wooden boat and gluing plastic laminates to manufacture board table-top.

Very few candidates got all the marks in this question. Most of them got only one mark out of the three marks. The expected responses as shown in the table below.

Uses	Adhesive
Sandwich container	<i>Synthetic resin</i>
<i>Gluing metal parts together</i>	Epoxy resin
Gluing plastic laminate to manufactured board table top	<i>Impact glue, contact glue</i>

Question 10

Candidates were required to name a process that could be used to produce the bowl in a school workshop and give a suitable plastic from which the bowl could be made from.

- (a)** Most candidates managed to state vacuum forming, press forming and blow moulding as a method of producing the bowl. However, some candidates did not consider the stated condition which was to be performed in a school workshop that is why they gave injection moulding and they were marked wrong.
- (b)** Majority of candidates were able to give a suitable plastic from which the bowl could be made using the method named in part **(a)**. The expected response was; acrylic, polystyrene, ABS, polypropylene and high-density polyethylene.

Section B

This section has three structured questions with large marks requiring a combination of clear and accurate sketches with detailed written notes.

Question 11

A play table for children made of 10 mm MDF shown in Fig. 8.

- (a) Candidates were required to describe two features of the design that makes it suitable for children 3-6 years of age.**

Quite a number of candidates were able to identify two features of the playing table that makes it suitable for age 3-6 years children. The most common responses were; appropriate height and curved edges. Some candidates were mentioning specifications such as colourful, cheap and easy to make instead of choosing or identifying features on the given table.

- (b) (i) Candidates were to give two benefits of using template to mark out the shapes of the sides and ends.**

Most candidates provided the correct benefits of using template to mark out the sides and ends of the table. Candidates, who got full marks gave responses such as quicker, can be used many times, more accurate than individual marking out and easier to mark out with.

- (ii) This part required candidates to name one electric power saw that could be used to cut out the shapes of the sides and ends of the table.**

Majority of candidates who got the question right mentioned jigsaw, bend saw, scroll/hegner saw. Very few candidates gave circular saw and other hand saws in response to this question and they lost a valuable mark.

- (c) (i) Candidates were required to state two benefits of using MDF for the play table.**

Most candidates who answered this part did fairly well by giving benefits such as has a better surface finish, easy to work, MDF has a more consistent structure, it is a relatively cheap material, stable and available in sheet sizes.

Some candidates mentioned that it has uniform thickness, no knots, strong, stiff and does not split ends, which were also appropriate responses.

(ii) Candidates were to give two advantages of spray painting over applying paint with a brush.

Many candidates who answered this question managed to give the benefits of spray painting the table over applying the paint using a brush. They were giving responses such as it is quicker, more even finish possible, no brush strokes and easier to cover large area.

(d) Candidates were to give two reasons for covering the table top with a plastic laminate.

Very few candidates got the two reasons correctly: The majority were only getting one out of two. Those who scored all two marks gave the following reasons; to make the surface more hardwearing, easier to wipe, protect the MDF and to improve the MDF appearance.

(e) Candidates were to show the end and the side being joined using KD (knock-down) fittings.

Most candidates drew good sketches showing the two parts joined with modesty blocks, some used plastic or wooded blocks. Others used brackets and scan fittings. Very few candidates showed traditional joints instead of KD and they lost valuable marks, others lost mark for leaving out annotations.

(f) Candidates were to show by sketches and notes how the table top can be supported inside the sides and ends and must allow quick removal.

Quite a number of candidates were able to show how to stop or support the top from falling they used many different methods. However, very few showed how to make it to be removed quickly as per the requirement and that led them to loss marks.

- (g) Candidates were required to show how to join the side to the end if it is made of 2 mm mild steel.**

A good number of candidates used a metal bracket to join the mild steel side and the MDF end. Some bent the mild steel to form a right angle and have holes for the fixing. Those who scored very good marks in this question further showed how the side is fixed to the bracket and how the bracket is joined to the MDF end, and also show the correct fixings lastly write clear annotations.

Question 12

A pictorial view and a development of a DVD rack made of 16 mm thick sheet metal was given.

- (a) (i) Candidates were to name two tools used to mark out the slots as shown.**

Most candidates did very well by naming two of following metal marking tools; scribe, engineers try square, steel rule, odd-leg callipers and scribing block.

- (ii) Candidates were required to show how cut out one slot and the edges made smooth and name the tools and equipment used.**

Majority of candidates did very well on this question; they showed a hole/s on the sheet metal for inserting a blade or abrafile, they showed how to remove the waste then filing the edges smooth. Some candidates lost valuable marks for not naming the tools as requested.

- (b) (i) Candidates were to name a suitable finish to be applied on the steel DVD rack.**

Majority of candidates were able to mention the following finishes; plastic/dip coating, anodizing and painting.

(ii) Candidates were required to describe how aluminium is self-finished.

Most candidates showed that they are lacking on this topic. Majority could not even list the stages followed when self-finishing aluminium. Candidates were expected to include the following stages in their descriptions; cleaning of the metal surfaces/degreasing, use at least 2 grit of wet and dry (silicon carbide) paper then use polish compound with mop to shine and add a protecting film on the aluminium surface.

(c) (i) Candidates were to show how to mark out the wooden former.

Many candidates correctly showed how to mark out the semi-circular and the rectangular shapes on the wooden block using compass/template, steel rule, pencil and try square. Very few candidates misinterpreted the question, they were marking along the wooden block making straight lines across it and it led them to lose most valuable marks.

(ii) Candidates were to show how to cut out waste and make the wooden former smooth.

Majority of candidates who did very well on this question drew the wooden block held in a vice or clamp cut out the waste with a ripsaw then plane down to the finish line. Some used rasp to remove the waste, then plane or file to make the surface smooth and used a sander or glass paper for final smoothing.

(d) Candidates were to show the aluminium sheet could be bent to shape and name the tools and equipment used.

Majority of candidates sketched the sheet metal and the former securely held, also showed a mallet or ballpein hammer force to bend the metal sheet over the former, a scrap piece of wood was used to protect the precious aluminium. Very few candidates who used a hammer as bending force did not protect the metal sheet with a scrap wood and they lost very important marks.

- (e) (i) **Candidates were to name two suitable plastics the DVD rack.**

Majority of candidates who got maximum marks on this question gave acrylic and ABS

- (ii) **Candidates were to give two properties that make plastic a suitable material for the DVD rack.**

Many candidates gave the following properties to get full marks; easy to mould/shape, will not scratch the DVD case, available in different colours, durable.

- (f) **Candidates were to state how the plastic DVD racks could be disposed at the end of its life.**

Many candidates who got the mark mentioned that it could; be re-used or recycled. However, some were saying it could be burnt and they were marked wrong.

Question 13

An illustration of a tray made from 6 mm thick acrylic sheet. Candidates were required to:

- (a) **Give one reason for using a marker pen rather than a scribe when marking out lines on the acrylic.**

Most candidates had no problem with stating the reason of using marker pen. They gave the following good responses; marker pen lines can be erased if errors are made, they do not scratch the surface.

- (b) **Give two reasons for the gap at each corner of the tray.**

Quite a number of candidates who got both correct answers gave the following reasons; to allow for better fitting bend, for easy cleaning, improve tray's appearance and for easy bending.

- (c) **Complete a given table by listing three main stages followed when finishing cut edges of acrylic to a high quality.**

Very few candidates managed to get full marks in this question many were not giving the stages sequentially which led to a loss of marks. The expected responses; first file/plane, second stage smooth edge with scraper or wet/dry paper then buffing or polishing.

- (d) **Sketch the tray's development indicates bent lines and those where to cut.**

Many candidates did very well on this question, as they were able to show the correct length of the tray including the shaped ends, showed the correct width of tray, show corners to be cut out, showing all bent lines and the correct cut lines. Some candidates drew a pictorial view of the tray, which reflected that they misunderstood the question and the lost very important marks.

- (e) **Show with sketches, notes how the handhold could be cut out, and edges made smooth.**

Majority of candidates gave very good responses such as they were able to show that a hole to insert a saw blade, which will be used to remove the waste. They showed filing down to finish lines then used wet and dry paper to make the edges smooth.

- (f) (i) **Name an appropriate joint the side and the rail of the tray if it is made of wood.**

Majority of candidates gave the following very good responses; dovetail joint, finger joint, corner rebate and dowel joint. Some gave a butt joint and there were marked wrong, as it is a very weak joint and not suitable.

- (ii) Draw exploded views to show how a hardboard base fitted such that it cannot be seen on the sides and ends of the wooden tray.**

Very good sketches drawn on this question by majority of candidates and wrote very useful notes. Best answers showed the hardboard fitted in a groove or a rebate. Some candidates did not draw the exploded views, which led them to lose valuable marks.

- (g) (i) Show by sketches and notes how a 1 mm thick copper sheet could be folded to form a tray shown in Fig. 14.**

Most candidates did not do very well in this question. Successful responses were to show copper sheet in a folding bar, work held in a bench vice then bent to 90° with a mallet also use a scrap piece of wood to protect the copper surface.

- (ii) Describe two processes of finishing the copper tray to achieve and maintain a shiny surface.**

Very few candidates were able to describe polishing/buffing and lacquering as required thus led to loss of marks.

EGCSE DESIGN AND TECHNOLOGY

Paper 6902/04

Project

General Comments

Coursework

Design and Technology Paper 4 is a coursework paper and a school based component of the syllabus that is compulsory to all candidates registered for Design and Technology. Each candidate undertakes a personally identified project centred on the chosen option. The project will be worked over the final two terms of the course, then submitted for marking. Teachers carried out the assessment of work as markers and as internal moderators for only one criterion (Product Realisation). Candidate's folders were presented for marking. One hundred and three centres (103) registered candidates for the coursework. Of the centres, eight hundred and seventy-six (876) candidates were registered and eight hundred and thirty-eight (839) candidates submitted work for this year's examination. **However, there was a serious concern of candidates (thirty-seven (37) candidates) who were registered but could not submit work for 2020 coursework examination.**

Challenges and Recommendations

General, the 2020 performance indicated a slight increase when compared to the previous year (2019). The work presentation displayed on the folios did indicate an improvement from both teachers and candidate's commitment and also in the understanding of the syllabus requirements. The quality of work presented by most candidates was impressive. This was encouraging. However, teachers are requested to guide and encourage candidates throughout the design process.

Folios

It was good to note that all centres used the correct folio paper size. Folios were graphically presentable on A3 size paper and easy to read and follow. Candidates must bind their portfolios neatly and if slide binders are used, it is advisable to staple the sheets together before binding. However, the use of a spiral binder is recommended so as to ensure that no sheets are lost. Centres should arrange their candidates' folios numerically before submitting to Examinations Council.

It was encouraging to realize a slight decrease in the number of candidates who did not submit their work regardless of 2020 challenges. **Teachers are encouraged to collect work of learners as they complete each stage of the design process so as to reduce candidates who at the completion of the work are indicated as absent candidates.**

Product Realisation Form (Realisation Summary Form)

All centres were requested to submit their Product Realization form. Additions (calculations) of the marks entered in the form should be considered for improvement, as centres make mistakes, this may be caused by teachers entering marks at the last minute. Teachers are advised to double check calculations. **It was discouraging to note that some markers and internal moderators did indicate candidates' inflated marks and some candidates were allocated with marks without pictures for product realisation. Such an act is a malpractice.**

Comments on Specific Assessment Objective.

Theme analysis

The THEME was introduced and done for the fourth time in the EGCSE Design coursework. This section was well done by most candidates. Most candidates defined the theme "TRANSPORTATION", but advised to refer to **at least three sources** for their definitions. It was discouraging to note that some candidates indicated little understanding of the theme. Few candidates did not indicate the area of interest in the theme analysis. In some centres candidates provided theme analysis [bubble charts] with limited links (must have at least three links). It was good to note that most candidates did not only indicate the area of interest but also indicated at least four general areas.

Identification of the need

Most candidates formulated personally identified problems that were relevant to the theme and successfully completed this objective. Centre assessment of this objective was reasonably accurate although few were not realistic and indicated limited guidance from the teacher. It is however, vital that the identification of a need may be accompanied with the evidence to prove the need to design. Few candidates used pictures to better explain the situation. The user must be considered and it is important to explain how the user is affected in the situation. Candidates must clearly indicate if the project will be completed as a model.

Candidates must include brief analysis in this criterion. Few candidates did not consider aligning their situation (problem) to the theme.

Research into the design brief resulting in a specification.

There was a wide range of responses to this assessment objective. Very good work was seen, that demonstrated an excellent understanding of the objective requirement. Few candidates indicated researches that were not relevant to the design brief (mostly research on material). Many candidates had evidence of existing ideas, some were sketched or downloaded from internet and others in a form of photographs. However, candidates should note that research should have a variety of existing ideas (**at least eight**). The ideas must not be on a single concept and also include relevant identified and collected data. Most candidates indicated little understanding about the difference between ergonomics and anthropometric data. It was good to note that most candidates included the specification in their research which was clear and concise. It is important that the specification is not only specific but also link with the brief analysis and is a conclusion of the research based on the design brief. Some candidates seem not to understand the meaning of researching on existing ideas, as a result they did not analyse and evaluate their existing ideas. **Candidates must be encouraged to collect relevant data as they research which must align with the design brief.**

Generation of ideas.

The standard in attempting this objective was fair. Most candidates produced a wide range of possible ideas, however some ideas were not evaluated against the design specification. Some candidates work demonstrated that they were lacking drawing skills such as rendering. Few candidates displayed good graphic skills and used pens. Candidates should be discouraged from drawing ideas that tend to focus on a single concept which also resulted in ideas that are similar to existing products. Candidates must also be discouraged from downloading (cutting and pasting) drawings from internet and use them as possible ideas. They must neatly draw ideas either with a pencil or using CAD. It is also good to note that almost all candidates were indicating the chosen idea although some without justification based on the specification.

Development of the proposed solution

Much as there was an improvement in attempting this criterion but it was still a challenging criterion to some candidates. Candidates must be encouraged to show **at least three changes** for an improvement within the development which should be accompanied by notes that explains reasons for improvements. It was good to note that some candidates were able to produce appropriate evidence of testing and or trialing resulting in reasoned decision about material, form and shape. Candidates who did not make models and tested them, lost marks. It is advised that candidates make models, test them and clearly state reasoned decisions about form, materials, construction/production methods etc.

Planning for production

This objective was strength to most candidates. Most candidates performed well, in the sense that they had working drawings, cutting list and part list, Isometric or exploded views and production plans. However, some candidates only came up with the flow chart which did not indicate the sequence of operation. It was observed that most candidates used orthographic projection, although some views had no dimensions. Candidates should be encouraged to include dimensions in their working drawings for this objective. Very few candidates pasted pictures taken during the product realisation as part of planning for production which must be discouraged.

Product Realisation.

This objective carries most marks. Most candidates were able to produce made products. The external marker relies on the mark awarded by the internal moderator. Most candidates had photographs for evidence of realization which helped in the confirmation of the mark that was awarded by the internal moderator. Most centres had some pictures which had a sound sequence of operation. Candidates are encouraged to include pictures as evidence for the production processes while working on the product. It was also noted that few candidates produced artifacts that did not fully meet the requirements of the product specification.

It was unfortunate to candidates who had a mark for realisation on the Realisation Summary Form, yet there were no pictures showing evidence of product realisation. In that way candidates lost marks because external markers rely on both pictures and the mark awarded by the internal moderator. Candidates should be advised to capture all possible views of the product in a form of **clear** pictures.

Testing and evaluation

Most candidates tested and evaluated their work, although to some candidates the evaluation was not against the specification, instead stated general factors about what was done to the product and remarks about problems encountered during manufacture. Few candidates' testing was superficial in that it did not take into account the views of the users or show the product in the environment for which it was designed. Centres are advised to encourage candidates to test and evaluate their products against the specification and include modifications.

Reminder to centres:

- Centres are reminded to ensure that marks are added correctly on the Realization Summary Form.
- All centres should have products for realization internally moderated and clearly show the distribution of the internally moderated mark.
- Markers and internal moderators should also consider the following:
 - Internal moderators should show mark distribution, not just the total.
 - The teacher teaching the group should not mark and do the internal moderation. That is malpractice.
 - Teacher must check if all documents (summary sheet form and attendance register) are appropriately completed and enclosed inside the provided (ECESWA) envelop before submission.
 - **All centres must adhere to the deadline for submission of folios at ECESWA.**