



EXAMINERS' / MODERATORS' REPORTS

**LEVEL 1 / LEVEL 2 AWARD IN
ENGINEERING**

JANUARY 2022

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<https://www.wjecservices.co.uk/MarkToUMS/default.aspx?l=en>

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Annual Statistical Report

The annual Statistical Report (issued in the second half of the Autumn Term) gives overall outcomes of all examinations administered by WJEC.

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ENGINEERING

Level 1 / Level 2 Award

January 2022

UNIT 1 – 9791 – ENGINEERING DESIGN

General Comments

The 2022 January series saw a small range of submissions with the majority of Centres submitting work in the Unit 1 area. This report will therefore focus on the submissions of Unit 1 as there was not enough candidates in the Unit 2 to gain a wide contrast of work.

During the moderation, of both Unit 1 and Unit 2, there were some excellent examples of work seen from the small range of Centres that has submitted work. Centres for Unit 1 were broadly split in two by those following the original sample assessment materials from the specification, and those deciding on their own independent briefs.

Both types of submission allowed learners to access the whole range of assessment grading across the specification.

The use of digital submissions by Centres was done very well in the main, although at this point it is worth highlighting that it is of the utmost importance that Centres ensure that they upload not only the candidate evidence, but also all assessment documentation used during the Centres awarding procedure. Ideally, these need to be attached with the evidence of the candidate and several Centres included them within the same digital file. Please ensure that performance band awards are shown for each Assessment Criteria.

Centres should carefully proof any modified marksheets used to record marks to ensure that they include all AC descriptions and that the structure mirrors exactly those found within the specification document for the course.

There was a further reduction in the level of Centre generated sheets or writing frames in outcomes seen during the moderation process. This makes the awarding of bands far more clear than if candidates' work is very similar in style and content. Writing frames have a tendency to limit the higher mark bands accessibility. As mentioned, the majority of briefs undertaken were appropriate and again this year, several original and inventive products were seen during the moderation period.

There were also several excellent examples of Centres which had allowed candidates to create their own presentation format for the work submitted, which really emphasised strengths and outcomes in a far more consistent way.

Delivery Issues

Specification guidelines were followed closely in the main, however, there were a number of issues which Centres should be aware of. These were mainly in the administration of the moderation process.

Administrative issues

Centres must ensure that the following requirements are met for assessing and authenticating work.

All Centres met the submission deadline using the electronic moderation method. It is still possible that late submission may result in candidates' work not being able to be moderated in time for awarding.

If a Centre has any issues with meeting the set deadline, they must contact the Subject Officer to inform WJEC of a potential late submission.

The following points should also be noted for future digital submission:

1. All Centres included written annotation with their assessment documentation. The justification of the assessment criteria awarded to candidates by a Centre is vital. This is an opportunity to support the ACs awarded. This helps with the moderation process. Comments are more beneficial when detailed and not simply re-quoting the assessment descriptors.
2. Please ensure that evidence pictures and scans are of a sufficient resolution for moderators to see the candidates' work. Issues in the past have occurred where Centres included either poor quality images or pictures that were simply too small to evidence sufficiently. This is particularly important on Merit and Distinction outcomes for both units.
3. Centres should ensure that a copy of the technical information and briefs etc., given to candidates are included in the digital moderation sample. There only needs to be one pack of information and it is not required that a pack is included with each of candidates' work (unless annotated information has been added by the candidate).

Assessment of Unit 1

Centres applied the assessment criteria consistently across all grade boundaries in the unit of work. There were only a very small number of instances where assessment was deemed too generous and no instances where a Centre was considered to be too harsh.

There was a small number of instances of Centres making incorrect final grade calls on assessment documents. It would be worth taking this opportunity to remind Centres that to achieve a Merit award, a candidate must achieve a minimum of Merit in each assessment criteria. If a candidate achieves one Level 2 Pass, and all others are Merits, then the overall grade will be a Level 2 Pass awarded.

Commentary on Unit 1

Assessment Criteria 1.1 and 1.3 focuses on features and function of engineered products. Most Centres addressed this section well by including pictorial references to either their sketches with justifications for as to why this particular element would be suitable to address the problem etc. The references to other products were appropriate and clearly justified by most candidates. Adaptions to the assessment regarding the removal of AC 1.2 was correctly implemented by all Centres.

Assessment Criteria 2.1 saw a continued improvement in this section this year with candidates producing outcomes with more detail and more to the expected standards for engineering drawing.

Although not a requirement, CAD submissions were again well applied in this AC and the ability to modify and alter, as well as produce isometric views, is clearly an advantage. Again, Centres should be reminded that to achieve a Merit or higher in this AC, it is expected that hidden detail, dimensions for linear, angular and radius sizes and an isometric drawing be present in the outcomes.

Assessment Criteria 2.2 communicating design. This section was generally done well this year with most candidates applying attention to their annotation and detail. It is important that candidates undertake a good range of ideas and development to ensure that the information is more easily transferred to the outcomes to AC 2.1. Annotation is also a key factor to ensure access to the higher performance bands.

Assessment Criteria 3.1 is still an area which requires development as there is a wide tendency to rely mainly on the candidates' original sketch, often just quite basic, rather than showing some development of the original idea. Again, references to other engineered products are needed to be able to access the Merit performance band. This section is another where candidates can also address or reinforce work undertaken for AC's 1.1, 1.2 & 1.3. CAD can also be implemented well in this section as it allows quick iterative development of ideas.

Assessment Criteria 3.2 This was again done in a variety of ways, using ranking systems or colour coding. Successful outcomes in this area have looked at various areas to apply evaluative statements including decisions made against the specification, the actual design ideas or a combination of the two. The key area to remember for this section is that for candidates' to be successful in the Merit and Distinction performance, candidates must give conclusions with justifications or reasons.

Assessment Criteria 3.3 Many candidates displayed clear specifications that were more relevant to the brief and which contained more achievable and measurable outcomes. The presentation methods used were varied in style and layout and this should be promoted, rather than issuing prepopulated worksheets to candidates.

Finally, I would like to take this opportunity to thank Centres for their hard work and commitment to the specification. Although this report focuses on a small number of submissions in the January 2022 series, the process was again very positive for both Centres and moderators. At a particularly stressful and difficult time in education, it is very positive to see some of the excellent examples displayed during this session.

I hope the process of moderation remains positive in helping Centres further develop and modify their courses to best suit their candidates' requirements.

ENGINEERING

Level 1 / Level 2 Award

January 2022

UNIT 2 – 9792 – PRODUCING ENGINEERING PRODUCTS

Fewer than 10 Entries therefore no report.

ENGINEERING

Level 1 / Level 2 Award

January 2022

UNIT 3 – 9793 – SOLVING ENGINEERING PROBLEMS

General Comments

Most candidates attempted all of the questions on the paper but, in a number of cases, there was evidence of candidates not having read questions carefully before answering. It is most important that candidates take the time to read through the question paper before attempting to answer questions, as this can help to ensure that basic errors are avoided. Detailed knowledge of basic engineering terminology remains limited in many cases.

- Q.1**
- (a)** **(i)** Most candidates were able to successfully give a reason for the use of neoprene/foam to manufacture the handrail covers.
The majority of candidates were able to name polypropylene or ABS as a suitable material to manufacture the cup holder.
 - (a)** **(ii)** Most candidates were able to successfully list an advantage of the treadmill being able to fold up, with the majority stating that it was to take up less space in the room/house.
 - (b)** **(i)** Most candidates correctly identified aluminium as the material used to manufacture the treadmill frame. However, the response for the second part of the question varied in accuracy and showed a lack of knowledge about the metal.
 - (b)** **(ii)** Most candidates correctly identified nylon as the material used to manufacture the transport wheels. Once again, the response for the second part of the question was not good, with most candidates unable to list two properties of nylon.
 - (c)** This question was answered very well in most cases, with the majority of candidates able to identify and justify two safety features of the treadmill. Most answers related to a safety clip that attached the user to the machine, and the stands/tracks either side of the running track.
 - (d)** This question in its entirety was not answered well. A number of candidates correctly identified the first component as a washer. The majority of candidates could identify the second component as a bolt, but unable to identify the third component as a wing nut.
 - (e)** This question was answered very well. Candidates were able to describe the process of cutting an internal thread in a piece of aluminium, as well as sketch the main steps in the process. There was a good use of engineering terminology, and it was clear that candidates were able to recall the steps from carrying out the Unit 2 Manufacturing task.

- Q.2 (a)** It was good to see that this question was answered very well by most candidates. They were able to identify the main ergonomic differences between both controllers. In some cases, the aesthetic differences were described, which did not answer the question. Candidates also seemed to draw on their own personal experiences when commenting on the modern controller too. This was pleasing to see.
- (b)** This question was answered well by most candidates. Popular answers related to battery development, shorter charge-up times, and no wires necessary that allowed the user to be more mobile while playing. Once again, candidates were able to draw from their personal experiences of using such devices.
- (c)** Responses to this question were very good. Candidates were able to discuss an advantage and disadvantage of using electronic implants. The main advantages were 'more accuracy when playing' and 'user can immerse themselves into the game'. The main disadvantages were 'cost of the implant' and that 'the long-term effects could damage the body'. There were some very good, well-thought-out answers for this question.
- Q.3 (a) (i)** Very few candidates were able to name the micrometer in this question. Without knowing what the engineering equipment is, it is very difficult to write a description of its use. Some candidates incorrectly named the second piece of equipment as a 'drill'. The correct name for the piece of equipment is a 'drill bit or twist drill bit'. However, most candidates were able to write a description of its use and were not penalised twice for the error.
- (b) (i)** This question was answered correctly by the vast majority of candidates, who all said that the statement 'PPE is a regulatory requirement of Health and Safety' was true.
- (b) (ii)** This question was answered very well by the majority of candidates and were able to draw on their experiences at school to give an example of PPE and its use in a school workshop. The main examples of PPE were 'safety glasses/goggles', 'apron' and 'heat resistant gloves'.
- (c) (i)** The majority of candidates successfully calculated that nine lengths could be manufactured from each 1 metre length. Some candidates did not consider the thickness of the parting off tool when doing the calculation, which resulted in the incorrect answer. However, if they used this answer in parts (ii) and (iii), they were not double, or triple penalised.
- (c) (ii)** Most candidates answered this question well. A simple deduction calculation gave them the correct answer.
- (c) (iii)** Another straightforward calculation, with the majority of candidates getting it correct. One mark was awarded for the calculation, and the other for a correct answer.

- (d) This question was answered very well generally. The majority of candidates were able to calculate the area of the trapezium using one of two different methods. Most candidates were able to calculate the volume by multiplying the thickness of the material. Answers were written alongside the correct measurement too for the full 3 marks.
- (e) This question was not answered well at all. Candidates did not show that they understood what a sectional drawing was, nor understood the question. Answers varied from an exact copy of the front view of the wheel drawn next to it, to semicircles with projected lines. It is important that candidates are taught a full range of engineering drawings, not just isometric and orthographic. Only a handful of candidates managed to sketch something that was worth more than 2 marks. They should have been able to draw on their experiences in Units 1 and 2 to answer this question.



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