



WJEC LEVEL 1-2 AWARDS IN ENGINEERING :

**INTERNAL SPECIMENT ASSESSMENT
MATERIAL**

MODEL ASSIGNMENT

UNIT 1: ENGINEERING DESIGN

For first teaching from 2013

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LEARNER ASSIGNMENT BRIEF

BRIEF

DERRY
Accessories



Derry Accessories Ltd. manufactures parts and accessories for mobile phones. The company successfully manufactures replacement mobile phone chargers, similar to the one in the photograph.

Derry Accessories Ltd. manufactures many different chargers for different brands of mobile phones. All current models of charger include a cable which links the mobile phone to an electrical plug.

The company has been successful for a number of reasons:

- There is a large range of mobile phones on the market, each range needing its own type of charger.
- Mobile phone manufacturers are continually developing new models and Derry Accessories Ltd. ensures it has a replacement charger available.
- New mobile phones have a shorter battery life and need regular charging and many people need more than one charger so that phones can be charged at home or elsewhere.

However, these issues also have a negative impact on the company as each charger requires the design team to develop a new specification which uses slightly different materials and components. This increases design, manufacturing and warehousing costs. There are also environmental impacts as each charger uses materials that are not bio-degradable. They would however be recyclable and broken down into their component parts as part of the WEEE directive.

Feedback from retailers and mobile phone manufacturers indicates that consumers have a number of concerns about replacement chargers. These include:

- Mobile phones being charged in homes and offices are generally unsightly.
- Many households charge two or more phones at any time.
- In businesses, employees use facilities to charge their phones which can look unprofessional.
- Existing chargers do not complement the style of modern phones.
- Over time the cable loses elasticity becoming unsightly in appearance.

Derry Accessories Ltd. is looking to design a new 'generic' type of mobile phone charger. The company is prepared to consider any options for charging mobile phones but is eager to ensure that all phone functions are accessible when charging. Derry Accessories Ltd. views the development of this new model as an opportunity to promote the company and wants to see the logo on all future products.

Your task is to design a new generic mobile phone charger.

TASKS

1. Identify the key features and functions required from the information provided. Use this information to develop a design specification.
2. Suggest three options to meet the design specification which are based on successful engineered products. Review the suitability of each and recommend the best option.
3. Using accepted standards and conventions, draw your preferred solution.

Task Number	Evidence	AC	Controls
1	Design specification	<p>AC1.1 Identify features that contribute to the primary function of engineered products</p> <p>AC1.2 Identify features of engineered products that meet requirements of a brief</p> <p>AC3.3 Produce design specifications</p>	<p>Time: 1.5 hours</p> <p>Resources: You may have access to ICT software and Internet; class notes; images of or actual examples of mobile phones and chargers.</p> <p>Supervision: You will be supervised throughout.</p> <p>Collaboration: This is an individual task.</p> <p>Feedback: You cannot be given feedback on the work you produce until it has been marked.</p>
2	Annotated sketches	<p>AC1.3 Describe how engineered products function</p> <p>AC2.2 Communicate design ideas</p> <p>AC3.1 Develop creative ideas for engineered products</p> <p>AC3.2 Evaluate options for design solutions</p>	<p>Time: 2.5 hours</p> <p>Resources: You may have access to class notes; access to ICT software; images of or actual examples of mobile phones and chargers.</p> <p>Supervision: You will be supervised throughout.</p> <p>Collaboration: This is an individual task.</p> <p>Feedback: You cannot be given feedback on the work you produce until it has been marked.</p>
3	Drawing	<p>AC2.1 Draw engineering design solutions</p>	<p>Time: 3 hours</p> <p>Resources: You will not have access to class notes. You will have access to A3 paper; drawing materials; images of or actual examples of mobile phones and chargers.</p> <p>Supervision: You will be supervised throughout.</p> <p>Collaboration: This is an individual task.</p> <p>Feedback: You cannot be given feedback on the work you produce until it has been marked.</p>

ASSESSOR INFORMATION

WJEC Approach to Assessment

Units 1 and 2 of the WJEC Level 1/2 Awards in Engineering are internally assessed and externally moderated. The following principles apply to the assessment of these units:

- All units are assessed through summative controlled assessment. Details of controls for this unit are provided in this model assignment.
- All assessment criteria must be met under controlled conditions, as specified in this model assignment, for the unit learning outcomes to be achieved. Performance bands for Level 2 Merit and Level 2 Distinction can only apply once a candidate has achieved all assessment criteria at the level of qualification to be awarded. Evidence must clearly show how the candidate has met the standard for the higher grades.

The WJEC Level 1/2 Awards in Engineering have adopted the principles of controlled assessment as set out in the Joint Council for Qualifications document 'GCSE, GCE, ELC, Functional skills, Principal learning in the Diploma and Project Qualifications – instructions for conducting coursework'. This document can be accessed through the JCQ website (www.jcq.org.uk). Each centre must ensure that internal assessment is conducted in accordance with these controls.

There are three stages of assessment that will be controlled:

- Task setting
- Task taking
- Task marking.

Task setting

WJEC has produced this model assignment for the assessment of this unit. Centres are, however, allowed to modify the assignment, as outlined in the 'Accepted changes to Assignments' section of this model assignment. This will allow centres to tailor the assessment to local needs. This model assignment has been written to ensure the following controls are in place:

- Each unit is assessed through one assignment.
- Each assignment must have a brief which sets out an applied purpose. An applied purpose is a reason for completing the tasks that would benefit a business or society. Further details are in Section 1.2 of the specification.
- The assignment can specify a number of tasks but tasks must be coherent, i.e. show how the assessment requirements contribute to the achievement of the applied purpose of the assignment.
- The assignment must provide each candidate with the opportunity to address all assessment criteria and all performance band requirements.
- The assignment must indicate the acceptable forms of evidence.
- Where a centre has adapted the model assignment, there must be evidence of quality assuring its fitness for purpose. Sample documentation for this activity is provided with each model assignment.

How the learner assignment brief meets these controls

This is a single assignment that addresses all assessment criteria for this unit. There is a clear applied purpose - to identify the key features and functions of a mobile phone charger and propose design solutions to meet the needs of the manufacturer. Although the context and organisation in the scenario is fictitious, it has been developed through discussions with representatives of a real organisation to ensure that the requirements are realistic. The tasks are all coherently related to the applied purpose. The summary table makes clear the evidence requirements.

Task taking

There are five areas of task taking that are controlled: time, resources, supervision, collaboration and resubmission.

Time

'Time' has limited control. There are **7** hours available for the assessment of this unit. The learner assignment brief suggests how this time can be allocated.

Resources

'Resources' has limited control. The assignment makes clear the type of resources that learners must have access to. Learners do not need a mobile phone or charger to complete the tasks. Learners can, however, be provided with images or examples of actual products. Learners may access ICT software to develop their outputs for tasks 1 and 2. Learners can access class notes for tasks 1 and 2 but not for task 3. Class notes can include any outcomes of formative assessment, unless the context for the formative assessment is similar to the context for this summative assessment.

Supervision

'Supervision' has medium control. Learners must be supervised by an assessor whilst completing all tasks. Centres must have in place systems to ensure that learners cannot access evidence they have been developing outside of supervised activities.

Authentication

Supervision is in place to ensure the authenticity of evidence produced for summative assessment. Assessors are not expected to provide input or guidance to learners during the controlled assessment time. This includes providing formative feedback on the evidence being produced. Assessors can provide guidance on the requirements of the task and remind learners of the performance bands and how they can be interpreted. Assessors must intervene where there is a health and safety hazard observed.

Candidates can review and redraft evidence independently within the time controls for the assessment. Candidates cannot redraft based on feedback from an assessor.

Learners must sign the declaration in this model assignment to confirm that all evidence submitted for moderation is their own work and that any sources used have been acknowledged.

Assessors must sign the declaration in this model assignment to confirm that evidence submitted for moderation was completed under the controlled conditions set out in the model assignment.

Collaboration

'Collaboration' refers to group work and has limited control. For this model assignment group work is not allowed when learners are producing evidence for assessment.

Task marking

All marking of evidence must be made against the performance band statements given in each unit specification. Evidence marked must comply with the controlled requirements set out in this model assignment.

Written evidence must be annotated to show how it relates to the assessment criteria and performance band requirements.

Marking should only be undertaken by a designated assessor. An assessor should have appropriate expertise in the subject and level for a specified unit. The assessor is responsible for ensuring that:

- The assessment is conducted under the specified controlled conditions.
- The learners understand the requirements of the learning outcomes, assessment criteria and performance band statements prior to commencing controlled assessment.
- Evidence presented for assessment is authentic.
- Assessment decisions are accurately recorded.
- Evidence is appropriately annotated.
- Observation records contain sufficient detail for objective corroboration of decisions.
- Judgements are only made against the performance band statements.

SUGGESTED ASSESSMENT PLAN (FOR ASSESSOR)

Stage	Activity
1	The assessor meets with employers, agrees to use the set brief or change the context. Data and information on individuals may need to be provided and employer engagement negotiated.
2	The assignment brief is quality assured.
3	Prior to commencing the summative assessment, the assessor presents the assignment brief to the learners, but not the tasks. The assessor advises the learners of the date when the employer will visit the centre to provide further details of the brief, where appropriate.
4	The assessor informs learners that they may conduct initial research, including preparation of any questions for the employer. This work can be unsupervised and can take place outside of the time controls.
5	The assessor organises the employer representative to meet with learners to present the brief and tasks. The assessor informs the learners that they will be provided with opportunities to ask questions of the employer representative. The assessor will inform the learners that this is not part of the assessment task but will contribute to their learning and research. It also provides an opportunity to develop communication skills.
6	The assessor directly supervises learners when completing task 1.
7	The assessor directly supervises learners when completing task 2.
8	The assessor directly supervises learners when completing task 3.
9	The assessor meets with the employer representatives for feedback.
10	The assessor annotates the evidence and marks it against the performance bands and assessment criteria. All assessment documentation is completed.
11	Assessment decisions are quality assured.
12	The assessor provides opportunities for the learners to present their drawings and proposed solutions to the employer representatives. They receive feedback from the employers. This is not part of the assessment task but will contribute to the learning and development of communication skills.

ACCEPTED CHANGES TO THIS MODEL ASSIGNMENT

Assignment Brief (Task setting)

Type of evidence

For tasks 1 and 2, no format is specified within the assignment brief for the type of evidence. Any format is acceptable. Learners can present their reports using ICT software or they can be handwritten. Learners can use images, supported by annotation, where they deem it to be appropriate. Learners can also present tasks 1 and 2 orally. Observation records will be needed as evidence, together with any notes produced and support materials used. Observation records will include a description of candidate performance as well as a summative statement on the quality of that performance. Where performance is observed by someone other than an assessor, the 'witness' must complete a witness statement. Assessors will need to authenticate the statement either through scrutiny of supporting evidence and/or questioning of the learner and/or witness. If the statement is authenticated, it can be allowed to contribute to the evidence for assessment. Evidence of authentication will also need to be included. A standard pro-forma should be developed and used for all learners. Learners should receive a copy of the pro-forma in advance. For task 3, drawings can be produced by CAD or can be hand drawn.

Tasks

No changes allowed, except for references to the specific context of the assignment brief.

Purpose

No changes allowed.

Context

The context must be realistic and credible. There must be an existing product. Details of the product and issue should be provided to the learner. This should include sufficient detail for the learner to discern key issues for a design specification. There should also be sufficient detail for an analysis of the product to be carried out. Learners can be provided with a real product that can be analysed or photographs and images of the product. The product must require adaptation for a different need such as a different type of user or different use. There must be at least three options that learners at this level could generate as ideas. It must be possible for these ideas to be drawn by the learner and which can be based on successful products encountered by the learner through the learning process. The assessor must ensure that any change to the context does not adversely affect any learner achieving distinction criteria. The scenario should not be too complex or sophisticated for learners at this level to engage with. In addition, the options should not require detailed engineering knowledge.

How Assessment is Managed (Task taking)

Time

The time suggested for each task, as set out in the learner assignment brief, takes account of the contribution of the task to the overall assessment requirements. There can be no changes to the total time available for controlled assessment, as set out in this model assignment. Centres can, however, amend the suggested time available for each task.

Resources

Learners must have access to an assessment grid. Details of essential resources are provided in the Summary Table of the Learner Assignment Brief and the Task taking: resource section of this Assessor Guidance. There should be no changes to these.

Collaboration

Group work is not allowed for this unit when learners are producing evidence for assessment.

Supervision

No changes are allowed.

Feedback

No changes are allowed.

WJEC LEVEL 1/2 AWARDS IN ENGINEERING MARK RECORD SHEET

UNIT 1: ENGINEERING DESIGN

Learner Name:

I confirm that the evidence submitted for assessment has been produced by me without any assistance beyond that allowed.

Signature:

Date:

Assessor Name:

The assignment brief used for summative assessment is attached, together with evidence of quality assurance.

I confirm that the evidence submitted by the learner has been produced under the controlled conditions set out in the qualification specification and model assignment.

The overall grade awarded for this unit is _____

Signature:

Date:

Lead Assessor Name:

I confirm that the evidence submitted by this learner for summative assessment has been quality assured and the grade awarded is confirmed as accurate.

Signature:

Date:

Assessment Criteria	Performance bands				Grade Awarded
	Level 1 Pass	Level 2 Pass	Level 2 Merit	Level 2 Distinction	
AC1.1 Identify features that contribute to the primary function of engineered products	Identifies features that contribute to the function of engineered products although some features may not contribute to primary function.	Identifies accurately a limited range of features that contribute to the primary function of engineered products.	Identifies accurately a range of features that contribute to the primary function of engineered products.		
	Assessor comments				
AC1.2 Identify features of engineered products that meet requirements of a brief	Identifies features of engineered products although some features may not meet the requirements of a brief.	Identifies accurately a limited range of features that meet requirements of a brief.	Identifies accurately a range of features that meet requirements of a brief.		
	Assessor comments				

Assessment Criteria	Performance bands				Grade Awarded
	Level 1 Pass	Level 2 Pass	Level 2 Merit	Level 2 Distinction	
AC1.3 Describe how engineered products function	Outlines how engineered products function with limited accuracy.	Describes how engineered products function.	Describes in some detail and with some accuracy how a range of engineered products function.	Accurately describes in detail how a range of engineered products function.	
	Assessor comments				
AC2.1 Draw engineering design solutions	Drawings will be in proportion but there may be significant omissions and limitations in use of conventions. Evidence is likely to be focussed on two dimensional sketching.	Drawings will be in scale and proportion but there may be errors omissions and limitations in use of conventions. Evidence is likely to be weighted towards one type of sketching.	Drawing will be to scale and in proportion but there may be omissions or excesses in content in use of conventions. Evidence is balanced in terms of isometric and 3 rd angle orthographic.	Drawings will be fully dimensioned and in proportion and will use the appropriate conventions. Evidence is balanced in terms of isometric and 3 rd angle orthographic.	
	Assessor comments				

Assessment Criteria	Performance bands				Grade Awarded
	Level 1 Pass	Level 2 Pass	Level 2 Merit	Level 2 Distinction	
AC2.2 Communicate design ideas	Essential elements of design ideas are communicated with some clarity. There is limited effective use of visual aids.	Design ideas are communicated with some clarity. Essential elements of ideas are conveyed effectively. There is some effective use of visual aids.	Design ideas are communicated clearly and effectively. There is effective use of visual aids.		
	Assessor comments				
AC3.1 Develop creative ideas for engineered products	Ideas developed show limited creativity and reference to other engineered products.	Ideas developed show limited creativity. There is limited evidence of exploration of ideas and reference to other engineered products.	Ideas developed show creativity. There is evidence of exploration of ideas with some links between other engineered products and ideas demonstrated.	Ideas developed show creativity. There is clear evidence of exploration of ideas with links between other engineered products and ideas demonstrated.	
	Assessor comments				

Assessment Criteria	Performance bands				Grade Awarded
	Level 1 Pass	Level 2 Pass	Level 2 Merit	Level 2 Distinction	
AC3.2 Evaluate options for design solutions	Options are evaluated against a limited range of relevant criteria. Conclusions are mainly stated.	Options are evaluated against a limited range of relevant criteria. There is limited reasoning in conclusions.	Options are evaluated against a range of relevant criteria. Conclusions are reasoned.	Options are evaluated against a range of relevant criteria. Conclusions are clear with detailed reasoning.	
	Assessor comments				
AC3.3 Produce design specifications	Design specifications are produced. There may be errors in content and presentation.	Design specifications are produced with some accuracy and clarity.	Design specifications are produced with accuracy and clarity.		
	Assessor comments				