Level 1 - Unit 1 - Product Design and Visualisation (5 credits)

Overview

Product Design and Visualisation at Level 1 requires the candidate to identify and record some of the potential problems that might occur with their designs, as well as thinking more long term about the impact of what they make. It requires the learners to think carefully about their design and make a detailed brief which shows a good process of ideas through trials and prototypes to the completed item. They will also need to present their designs and be capable of evaluating their products and acting on feedback received.

A work activity will typically be ‘straightforward or routine’ because:

The task or context will be familiar and involve few variable aspects. The techniques used will be familiar or commonly undertaken.

Example of context – Candidates might make a name plate for their bedroom door.

Assessor's guide to interpreting the criteria

General Information

RQF general description for Level 1 qualifications

- Achievement at RQF level 1 (EQF Level 2) reflects the ability to use relevant knowledge, skills and procedures to complete routine tasks. It includes responsibility for completing tasks and procedures subject to direction or guidance.
- Use knowledge of facts, procedures and ideas to complete well-defined, routine tasks. Be aware of information relevant to the area of study or work
- Complete well-defined routine tasks. Use relevant skills and procedures. Select and use relevant information. Identify whether actions have been effective.
- Take responsibility for completing tasks and procedures subject to direction or guidance as needed

Requirements

- Standards must be confirmed by a trained Silver Level Assessor or higher
- Assessors must at a minimum record assessment judgements as entries in the on-line mark book on the INGOTs.org certification site.
- Routine evidence of work used for judging assessment outcomes in the candidates' records

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of their day to day work will be available from their e-portfolios and on-line work. Assessors should ensure that relevant web pages are available to their account manager on request by supply of the URL.

- When the candidate provides evidence of matching all the criteria to the specification subject to the guidance below, the assessor can request the award using the link on the certification site. The Account Manager will request a random sample of evidence from candidates' work that verifies the assessor's judgement.

- When the Account Manager is satisfied that the evidence is sufficient to safely make an award, the candidate's success will be confirmed and the unit certificate will be printable from the web site.

- This unit should take an average level 1 learner 30 hours of work to complete.

Assessment Method

Assessors can score each of the criteria N, L, S or H. N indicates no evidence and it is the default setting. L indicates some capability but some help still required to meet the standard. S indicates that the candidate can match the criterion to its required specification in keeping with the overall level descriptor. H indicates performance that goes beyond the expected in at least some aspects. Candidates are required to achieve at least S on all the criteria to achieve the full unit award. Once the candidate has satisfied all the criteria by demonstrating practical competence in realistic contexts they achieve the unit certificate.

Expansion of the assessment criteria

1. The candidate will relate opportunities and constraints to a product design.

1.1 I can identify opportunities for a product or solution.

Candidates should be able to make connections between the opportunities presented and the product proposal.

Evidence: Documentation in portfolios, assessor observations.

Additional information and guidance

At level 1, simple associations are good enough. This could be an opportunity to introduce some basic research methods to find out what demand there might be for a product of this type. If possible, there should be a focus on the local area and this will vary greatly depending on what manufacturing firms exist locally.

1.2 I can identify constraints on a product or solution.

Candidates should be able to identify possible constraints on the proposed product.

Evidence: Documentation in portfolios, assessor observations.

Additional information and guidance

The candidate should be able to appreciate that any proposal will have constraints. These could be classified e.g. materials, costs, safety, accessibility, precision, market groups etc. Level 1 candidates

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should be guided in classifications but they should be able to identify the constraints within the classifications. It can also be linked to other subject areas, for example costs could be cross curricular with Maths or Busness Studies.

1.3 I can consider commercial sustainability of a product or solution.

The candidate will consider the issues related to achieving commercial sustainability for a prototyped product.

Evidence: From portfolios, assessor observations.

Additional information and guidance

Candidates consider the issues involved in going from a prototype to a commercial product. Cost of materials, cost of manufacture, cost of distribution and advertising. They should know some of the ways of raising finance for a project. Environmental issues such as disposal and energy generation in the manufacturing process, health and safety, intellectual property can all be important. How would they go about getting a patent? Would an open source hardware route be better? At level 1 it is enough to generate awareness of the issues and focus on a limited number of interests. Commercial sustainability is not necessarily with profit from direct sales margins. it simply means there is some way of sustaining a product once it is developed. It could be a service around the product, something that is increasingly the case with software.

2. Visualise product solutions to meet identified needs.

2.1 I can identify key aspects in a design brief.

The candidate will be able to take a design brief and identify key aspects in order to consider their approach.

Evidence: From portfolios, local testing, assessor observations

Additional information and guidance

Candidates should be familiar with the concept of a design brief. They should be presented with several design briefs and demonstrate the capacity to consider specific requirements that might be needed for each key aspect. At Level 1 the design briefs can be fairly structured. For example, what material is specified? How is it machined? What does it cost? Is it available? The key point of this criterion is getting candidates to focus on the priorities for research and planning in response to identified needs.

2.2 I can gather information to develop a solution

The candidate will be able to gather information from several sources in order to develop their design.

Evidence: From portfolios, assessor observations.

Additional information and guidance

Candidates should be able to use the key facts identified in the design brief to consider design parameters such as shape, size, form, or constraints such as having to fit and accommodate existing or external systems, environmental impact and other factors within their own knowledge base and then use research from books, the internet and people to support their own ideas. Candidates should produce a blog or diary to document their findings and organise the information they gather. This should include relevant details, for example, sizing, form, fit, or function, performance or user experience.

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2.3 I can design and test sketches and models to visualise a solution.

The candidate will be able to create and test ideas through visual means.

Evidence: From portfolios, assessor observations

Additional information and guidance

Candidates will produce a range of visual evidence of their approach to the problem demonstrating the evolution of their thinking. This will include for example, mind-maps, sketches, collages, computer drawings, and might be supplemented with written or audio supporting commentary. There should be clear evidence of how their research helped them develop their ideas beyond what they already knew themselves. At Level 1 structured guidance will need to be given in order for the candidate to achieve rich outcomes.

2.4 I can use appropriate digital and physical media to design a product.

The candidate will use a range of media to contribute to product design.

Evidence: From portfolios, the visual prototype, assessor observations.

Additional information and guidance

The design tools will include an increasing understanding of software principles used in design and any other appropriate modeling materials such as paper, Plasticine, plastic etc.

2.5 I can prepare a visual prototype of a product.

The candidate will produce a visual prototype of a product.

Evidence: Portfolio images of the digital prototype at various stages, assessor observations.

Additional information and guidance

Candidates will produce a visual prototype through the input of information and data into suitable software and media to realise their visual prototype. This could be 2D or 3D models in CAD, computer based drawing and design tools and/or physical models. Any information and data required to create suitable digital models for a project can be accepted as long as it clearly meets the project brief or solution. Candidates' briefs should include the need for at least one Smart technology or element that invites user interaction. For example, a learner could use Computer Aided Design to design the external form of a Smart food packaging. This would involve drawing on a computer and contribute information on RFID sensor functionality. At this stage it is a visual prototype and so the key priority is to be able to show sufficient detail of what the product might look like given the functional needs required from it. Project design should take into account any physical products or systems which it may need to reasonably accommodate within the project. At a simple level it could be cut outs or blanks in a casing or housing that allow external peripherals to be inserted during assembly. The sketch designs in this integrated form should explore both form and function, at a simple level. At Level 1 guidance will be needed in keeping with the QCF global level descriptor.

3. Present evaluations of designs.

3.1 I can collect evidence for presenting the design.

The candidate will prepare their presentation using the evidence gathered and collected in their portfolio.

Evidence: Portfolios, presentations, assessor observations.

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Additional information and guidance

Candidates will gather the information they need to make their presentation. Level 1 candidates should be able to gather information but they will need help with structure and organisation.

3.2 I can present strengths and weaknesses in a visual prototype

The candidate will identify a range of strengths and weaknesses in the visual prototype of the design.

Evidence: Portfolios, presentations, assessor observations.

Additional information and guidance

Candidates should be taught to be critical of their work and to classify strengths and weaknesses both from their perspective and through peer review and asking others. At Level 1 this is likely to be incomplete but it is desirable to get them started on critical approaches at least in principle.

3.3 I can use appropriate digital and/or physical models to support a presentation of the design.

Candidates should be taught how to use a range of tools in order to have a clear understanding of how their designs will turn out.

Evidence: Portfolios, presentations, assessor observations.

Additional information and guidance

Candidates should use a range of means to support their presentation. Designing for manufacture requires candidates to understand a number of external product requirements including designing for assembly, clearances and tolerances, regulatory requirements for specific types of products or specific uses. Candidates should be aware that the first way to evaluate their final product is against the specification in the design brief and any visual prototypes should relate strongly to the brief. Their digital and physical models should be used to demonstrate this. If things have changed they should be able to say why. At Level 1 they will need support in explaining and communicating the reasons but they should demonstrate that they can identify them. Being able to describe and explain them is a characteristic of Level 2.

3.4 I can receive feedback from presenting a design.

Candidates should be given the opportunity to present their ideas and get feedback from an audience who understand what they are trying to achieve.

Evidence: Portfolios, presentations, assessor observations.

Additional information and guidance

Candidates should receive feedback graciously from any source and should consider it objectively. At Level 1 this might need support and time for them to gain control over emotions and part of the purpose is to achieve a mature response to criticism even where it appears to be unjustified.

3.5 I can act on feedback to improve a design.

Candidates should be encouraged to use the valuable feedback they receive and build this into future improvements in their designs.

Evidence: Portfolios, presentations, assessor observations.

Additional information and guidance

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Candidates should show evidence of acting on feedback even if it is in the end to do nothing because they have considered the evidence and make a judgement that any changes will be detrimental or inappropriate in some way. In most cases some changes will be needed to the design before it is used to start producing the product. These changes could be in structure, colour, functional aspects or aesthetics.

Moderation/verification

The assessor should keep a record of assessment judgements made for each candidate guided by the above guidance. Criteria should be interpreted in the context of the general descriptors of QCF Level 1 qualifications. They should make notes of any significant issues for any candidate and be in a position to advise candidates on suitable routes for progression. They must be prepared to enter into dialogue with their Account Manager and provide their assessment records to the Account Manager through the on-line mark book. They should be prepared to provide evidence as a basis for their judgements through reference to candidate e-portfolios. Before authorising certification, the Account Manager must be satisfied that the assessors judgements are sound. In the event of missing evidence, the assessor will be requested to gather appropriate information before the award can be made.

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