**NZQA**

**Approved**

Achievement standard: 91354 Version 3

Standard title: Undertake brief development to address an issue

Level: 2

Credits: 4

Resource title: Lighting solutions

Resource reference: Generic Technology VP-2.1 v2

Vocational pathway: Construction and Infrastructure

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| Quality assurance status | These materials have been quality assured by NZQA. NZQA Approved number A-A-02-2015-91354-02-8246 |
| Authenticity of evidence | Assessors/educators must manage authenticity for any assessment from a public source, because learners may have access to the assessment schedule or exemplar material.  Using this assessment resource without modification may mean that learners’ work is not authentic. Assessors/ educators may need to change figures, measurements or data sources or set a different context or topic to be investigated or a different text to read or perform. |

Vocational Pathway Assessment Resource

Achievement standard: 91354

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Vocational pathway: Construction and Infrastructure

Learner instructions

# Introduction

This assessment activity requires you to undertake brief development to address an issue relating to LED (light-emitting diode) lighting solutions for the construction industry.

You are going to be assessed on how comprehensively you undertake brief development to address an issue relating to LED lighting – that is, how well you describe the outcome. You will need to justify why the outcome should be developed, and justify the specifications in relation to the physical and functional attributes required for the outcome.

The following instructions provide you with a way to structure your work so you can demonstrate what you have learnt and achieve success in this standard.

Assessor/educator note: It is expected that the assessor/educator will read the learner instructions and modify them if necessary to suit their learners.

# Task

Develop a brief that is made up of a conceptual statement that describes the outcome and its purpose, and specifications that define the outcome’s requirements (its physical and functional nature).

Explore the context by researching different styles of LED lighting (miniature, high-power, colour) and their functions (semi-portable, low cost, energy efficient, low voltage and flexible) to establish the type of solutions that may be used in this industry.

Brainstorm possible LED lighting issues and evaluate the issues in order to identify one that allows you to determine a need or opportunity and associated stakeholders. Consider:

* the social environment (the people who will use and develop the outcome, such as electrical and construction workers)
* the physical environment (where the LED lighting solution will be developed and used)
* the resources available
* the ongoing opinions of all the stakeholders connected to the outcome
* any constraints (for example resources, time and equipment).

Ensure your research is sufficient to enable you to prioritise considerations about where the outcome will be developed and situated. Write a conceptual statement.

Develop a clear set of specifications for your outcome by:

* considering the information you have gathered (such as any physical and functional requirements) and any additional information relating to your stakeholders’ needs and the social and physical environment in which the outcome will be used
* using research of existing solutions (such as LED lighting solutions used in houses, apartments, businesses).

As a result of this research, explain the desired:

* physical attributes (aesthetic look, such as colour, shape, form)
* functional attributes (safety considerations, installation requirements).

As a result of functional modelling and ongoing key and wider stakeholder consultation and consideration of the environment, justify the specifications in relation to the physical and functional attributes required for the outcome.

Present your final brief, which includes your fully developed conceptual statement and specifications. Your conceptual statement should clearly communicate what is to be done and why. It should:

* describe the purpose of the outcome
* describe the social and physical environment (for example where the outcome will be used and who will use it)
* justify why the outcome should be developed.

Your set of specifications should clearly justify the requirements of the outcome in terms of its physical nature (what it looks like, how it is made) and its functional nature (what it can do). They must enable you to judge whether the outcome defined by your brief has the potential to be ‘fit for purpose’.

You are not required to create your outcome as part of this assessment activity.

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Assessor/Educator guidelines

# Introduction

The following guidelines are supplied to enable assessors/educators to carry out valid and consistent assessment using this internal assessment resource.

As with all assessment resources, education providers will need to follow their own quality control processes. Assessors/educators must manage authenticity for any assessment from a public source, because learners may have access to the assessment schedule or exemplar material. Using this assessment resource without modification may mean that learners' work is not authentic. The assessor/educator may need to change figures, measurements or data sources or set a different context or topic. Assessors/educators need to consider the local context in which learning is taking place and its relevance for learners.

Assessors/educators need to be very familiar with the outcome being assessed by the achievement standard. The achievement criteria and the explanatory notes contain information, definitions, and requirements that are crucial when interpreting the standard and assessing learners against it.

# Context/setting

This activity requires learners to undertake comprehensive brief development to address an issue relating to LED lighting solutions for the construction industry.

Learners are not required to create the technological outcome as part of this assessment activity.

# Conditions

This is an individual assessment activity.

The evidence of brief development will be collected in the form of notes, drawings and photographs within a portfolio.

# Resource requirements

Learners will require access to:

* stakeholders (both key and from the wider community)
* the internet and a library
* a camera.

# Additional information

The *Technology* *Online* website [http://technology.tki.org.nz](http://technology.tki.org.nz/) provides useful definitions of technology terms.

# Assessment schedule: Generic Technology 91354 – Lighting solutions

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| Evidence/Judgements for Achievement | Evidence/Judgements for Achievement with Merit | Evidence/Judgements for Achievement with Excellence |
| The learner undertakes brief development to address an issue by:   * identifying an issue as a result of exploring the context of LED lighting * determining a need or opportunity and associated stakeholders * reflecting ongoing consideration of the social and physical environment where the outcome will be developed and situated * reflecting ongoing key stakeholders’ opinions * describing the outcome to be developed and explaining why such an outcome should be developed * explaining the physical and functional attributes required for an outcome * producing a final brief comprised of a conceptual statement and specifications   For example:  The learner determines through research that the flexible nature of LED lighting (efficient, low cost) is becoming a popular choice in the construction industry. Designing easy to install, fun, application specific LED lighting (i.e. coloured ribbon strips) is identified as an issue.  The learner researches the hazards of working with LED lighting and identifies that when construction workers (stakeholders) are setting up lighting, safety and easy set-up are the main concerns. There is a need to design a LED lighting solution that takes these considerations into account but still takes advantage of the creativity LED lighting allows.  The learner considers the view of an electrician in relation to the development and setting up of LED lighting and also considers expert opinions (online and in the community) about creative solutions in lighting design.  The learner describes how a coloured LED light that is flexible, yet safe and easy to install could be developed. Physical attributes that take advantage of LED’s unique creative properties are explained (colour, flexibility, lightweight) along with the considered functional attributes (safe and easy to install).  The learner confirms the conceptual statement saying what is to be done and why, and carries out further research, functional modelling and stakeholder consultation to establish specifications that define the requirements of the outcome in terms of its physical and functional nature. Specifications allow for the LED lighting solution to be judged as ‘fit for purpose’ e.g. a RGB colour changing LED lighting strip that is composed of a flexible lightweight ribbon, and has durable components that are designed to illuminate exterior architectural elements. The LED lighting strip supports sustainable design by using less energy and lasts longer. Its design allows easier accessibility and safety for the worker.  *The above expected learner responses are indicative only and relate to just part of what is required.* | The learner undertakes in-depth brief development to address an issue by:   * identifying an issue as a result of exploring the context of LED lighting * determining a need or opportunity and associated stakeholders * prioritising social and physical environmental considerations related to where the outcome will be developed and situated * reflecting ongoing feedback from key and wider stakeholders * describing the outcome to be developed and explaining why such an outcome should be developed * explaining the physical and functional attributes required for an outcome * producing a final brief comprised of a conceptual statement and specifications   For example:  The learner determines through research that the flexible nature of LED lighting (efficient, low cost) is becoming a popular choice in the construction industry. Designing easy to install, fun, application specific LED lighting (i.e. coloured ribbon strips) is identified as an issue.  The learner researches the hazards of working with LED lighting and identifies that when construction workers (stakeholders) are setting up lighting, safety and easy set-up are the main concerns. There is a need to design a LED lighting solution that takes these considerations into account but still takes advantage of the creativity LED lighting allows.  The learner considers the views of an electrician and builder in relation to the development of LED lighting and observes the set-up process to determine safety requirements and tips on easy set-up. Both stakeholders expressed the need to have the LED lighting solution meet all safety requirements and that it did not necessarily need specific equipment (i.e. using a control interface for colour changes or timers) to install, therefore safety and convenience are priorities. Wider stakeholders’ opinions (experts in creative solutions in lighting design) were also considered by looking online at examples and using community feedback.  The learner describes how a coloured LED light that is flexible, yet safe and easy to install could be developed. Physical attributes that take advantage of LED’s unique creative properties (colour, flexibility, lightweight) are explained along with functional attributes (safety, easy installation). Functional modelling is used to consider the physical and social environment (technical feasibility) related to the design ideas.  The learner confirms the conceptual statement saying what is to be done and why, and carries out further research and stakeholder consultation to establish specifications that define the requirements of the outcome in terms of its physical and functional nature. Specifications allow for the LED lighting solution to be judged as ‘fit for purpose’ e.g. a RGB colour changing LED lighting strip that is composed of a flexible lightweight ribbon, and has durable components that are designed to illuminate exterior architectural elements. The LED lighting strip supports sustainable design by using less energy and lasts longer. Its design allows easier accessibility and safety for the worker.  *The above expected learner responses are indicative only and relate to just part of what is required.* | The learner undertakes comprehensive brief development to address an issue by:   * identifying an issue as a result of exploring the context of LED lighting * determining a need or opportunity and associated stakeholders * prioritising social and physical environmental considerations related to where the outcome will be developed and situated * reflecting ongoing feedback from key and wider stakeholders * describing the outcome to be developed and justifying why that particular outcome should be developed * justifying the specifications in relation to the physical and functional attributes required for an outcome * producing a final brief comprised of a conceptual statement and specifications   For example:  The learner determines through research that the flexible nature of LED lighting (efficient, low cost) is becoming a popular choice in the construction industry. Designing easy to install, fun, application specific LED lighting (i.e. coloured ribbon strips) is identified as an issue.  The learner researches the hazards of working with LED lighting and identifies that when construction workers (stakeholders) are setting-up lighting, safety and easy set-up are the main concerns. There is a need to design a LED lighting solution that takes these considerations into account but still takes advantage of the creativity LED lighting allows.  The learner considers the views of an electrician and builder in relation to the development of LED lighting and observes the set-up process to determine safety requirements and tips on easy set-up. Both stakeholders expressed the need to have the LED lighting solution meet all safety requirements and that it did not necessarily need specific equipment (i.e. using a control interface to allow colour changes or timers) to install, therefore safety and convenience are priorities. Wider stakeholders’ opinions (experts in creative solutions in lighting design) were also considered by looking online at examples and using community feedback.  The learner describes how a coloured LED light that is flexible, yet safe and easy to install could be developed. Physical attributes that take advantage of LED’s unique creative properties (colour, flexibility, lightweight) are explained along with functional attributes (safety, easy installation). Functional modelling is used to consider the physical and social environment (technical feasibility) related to the design ideas. Experts in the lighting community confirm LEDs as safer and more efficient than other lighting solutions.  The learner carries out further research, and stakeholder consultation to establish specifications that define the requirements of the outcome in terms of its physical and functional nature e.g. a RGB colour changing LED lighting strip is composed of a flexible lightweight ribbon, and has durable components that are designed to illuminate exterior architectural elements and support sustainable design. It must be easily accessible and safe to install. The learner researches the effects LED lighting has on building and design practices (less energy use, lasts longer, aesthetic appeal, new technology) and determines that the use of multiple complex design components was an issue. Workers, when consulted, explained how they were not always able to carry specialised tools to every job so it was important to them that the LED lighting solution did not require them on site (i.e. pre-set in a workshop if required). Possible LED types and the availability of different components (i.e. wireless technology) are researched. The idea of flexible ribbon strips, pre-made in the workshop, with IPT (inductive power transfer) components, which allow power to be transferred without cables, are decided on and justified.  The learner confirms the conceptual statement saying what is to be done and why, and the specifications that allow for the LED lighting solution to be judged as ‘fit for purpose’ e.g. the ribbon is lightweight and durable, flexible enough to hold onto the buildings’ elements, suits most environmental considerations (i.e. weather) and its design allows easy accessibility and safety for the worker.  *The above expected learner responses are indicative only and relate to just part of what is required.* |

Final grades will be decided using professional judgement based on an examination of the evidence provided against the criteria in the Achievement Standard. Judgements should be holistic, rather than based on a checklist approach.