**NZQA**

**Approved**

Achievement standard: 91054 Version 3

Standard title: Demonstrate understanding of basic human factors in design

Level: 1

Credits: 4

Resource title: Kitchen design

Resource reference: Generic Technology VP-1.11 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-02-2015-91054-02-7368 |
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Vocational Pathway Assessment Resource

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Learner instructions

# Introduction

This assessment activity requires you to demonstrate your understanding of basic human factors used in kitchen design.

You are going to be assessed on how comprehensively you demonstrate understanding of basic human factors used in kitchen design.

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

Write a report that demonstrates your comprehensive understanding of basic human factors used in kitchen design. You could include an annotated mock-up of your kitchen design (for example, you could consider an update of your own family’s kitchen by creating a 3D model in CAD (a computer-aided design program) or the manipulation of an existing photograph through Photoshop).

Explore a range of kitchen designs (Resource B). You could take photographs and record any evidence (see Resource C) that will enable you to analyse the use of any distinctive styles and trends.

Gather and analyse the data you may need by:

* identifying a range of techniques that can be used to gather data about human factors and a range of techniques used to analyse data. How do anthropometric, psychological, and sensory data gathering inform kitchen design? For example, in order to analyse factors affecting layout and function, you could look at different designs (modular, customised) and note factors such as the working triangle
* identifying basic human factors to be considered in kitchen design (this may include user-friendliness, adjustability of components, enjoyment and other positive responses)
* distinguishing between personal preferences and group preferences.

Organise and document all your evidence to support any decision making. You may wish to include your annotated kitchen mock up and examples of current trends and styles.

Your report will need to include:

* Discussions of why human factors need to be considered when designing kitchens. How do human factors (ergonomic and aesthetic) impact on kitchen design and how has your design taken these factors into account? For example, basic human factors may include efficiency, safety, function, ease of use and appearance, and the ergonomic working triangle.
* Explanations of how personal preference, group preference, style and trends impact on kitchen designs.
* Discussions about the suitability of data gathering and analysis techniques that may be used in kitchen designs. For example, discussing why measuring and analysing bench height is a useful anthropometric data gathering technique (Resource C) in kitchen design. Compare and contrast the advantages of specific data gathering techniques (anthropometric, psychological and sensory), and what kinds of information these different techniques provide about the human factors in kitchen design.

Find relevant information of how human factors are used in kitchen design by:

* visiting your local library and hardware shops specialising in modular kitchens, or designers specialising in custom kitchens
* researching websites and books (Resource A)
* accessing a computer with CAD and design software (e.g. Vectorworks, Google SketchUp, Adobe Photoshop).

# Resource A

## Useful information

Woodson, W, Tillman, B and Tillman, P 1992, *Human Factors Design Handbook*, McGraw-Hill Education.

For further books on kitchen design refer to Trends: <http://shop.trendsideas.co.nz/>.

Visits to industrial sites or from practising technologists may also be helpful.

Modular kitchen planner:

<http://www.bunnings.co.nz/learn-how-to-DIY_diy-kitchen-planner1.aspx>

<http://www.nzs.com/new-zealand-articles/business/kitchen-designs.html>

Ergonomics:

<http://ergonomics.about.com/lr/kitchen_ergonomics/340312/1/>

<http://designmuseum.org/design/page75806>

# Resource B

Kitchen designs may include:

* modular kitchens – bought off the shelf, often follow current trends but have standardised measurements and limited cabinetry (e.g. materials, colours and finishes). These are designed to allow individual components (e.g. pantries, drawer units, cupboards, corner units) to be put together into a finished design
* customised kitchens - have no limitations on measurements and cabinetry and can be designed to suit current trends and consumers’ preferences.

# Resource C

## Example of data gathering

This is an example of sensory data gathering based on what you see. After collecting evidence on different kitchen designs this knowledge could be applied to your own kitchen design.

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| **Kitchen designs** | **Ergonomic factors** | **Aesthetic factors** | **Styles and trends** | **Data result** |
| Modular kitchen bought off the shelf | Efficient  Safe  Easy to use  Adjustable  Functional | Very neutral in appearance (e.g. wood look), similar to other kitchens so can be boring.  Mass produced so limited materials, colours and finishes. | Standardised measurements (e.g. optimal counter height is 1 metre) but components can be changed to suit your own requirements, limited styles and trends. Inexpensive. | Modular kitchen is designed for mass production so is functional and efficient but has limited variability in its look. Costs less overall. |
| A design store that specialises in customised designs | Efficiency of work triangle may be comprised by the style/trend.  Safe and functional. | Really different use of layout.  Unlimited materials and components available.  Looks good, personal enjoyment. | Personal preference based on personal style and current trends. Costly. | Customised kitchen, which follows the latest trend of wide-open space, but this may affect the storage requirements needed for a large family. |

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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 learner to demonstrate comprehensive understanding of the basic human factors used in kitchen design.

# Conditions

This is an individual activity. Learners could work individually or in groups to look at ergonomic and aesthetic factors to understand what is meant by the terms personal preference, group preference, style, and trends and how these affect different design tasks. Decide on the format of the final presentation. You may wish to take learner preferences into account in deciding on the format.

# Resource requirements

Learners require access to the internet for research.

# Additional information

None.

## Other possible contexts for this vocational pathway:

* Focus on a design era: learners could consider and discuss a range of furniture that is typical of a particular era, for example art deco or Bauhaus.
* Environmental architecture: learners could consider and discuss spatial design or landscaping, for example for the area outside a mall or on the waterfront.
* Industrial design: learners could consider and discuss the design of an appliance or tool.

# Assessment schedule: Generic Technology 91054 – Kitchen design

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| Evidence/Judgements for Achievement | Evidence/Judgements for Achievement with Merit | Evidence/Judgements for Achievement with Excellence |
| The learner demonstrates understanding of basic human factors used in kitchen design by:   * describing human factors that need to be considered when designing a kitchen   For example:  The learner includes descriptions of the functionality of the working triangle in terms of physical space and positioning of the fridge, oven and sink, accessibility and reach of wall-mounted units, corner storage units and cupboard depths.   * explaining how personal preference, group preferences, style and trends may impact on kitchen design   For example:  The learner explains the impact each of these has when designing a kitchen for a family. The learner also explains how styles and trends may be linked (e.g. the learner explains how the family likes to socialise while cooking and as the current kitchen trend is to have large open plan areas this would suit the design).   * describing data gathering and analysis techniques that may be used when designing a kitchen, such as how each technique is carried out (how the information is collected and analysed) and how it then informs kitchen designs   For example:  The learner identifies observation as one useful data gathering technique for kitchen design. The description includes observations of the family while cooking, the working triangle, layout based on floor space, how much working room was needed, and how important socialising was. By noticing the location of appliances and use of counter space, the learner was able to annotate a diagram showing typical measurements and adjustments that could be made to ensure ease of use.  *The above expected learner responses are indicative only and relate to just part of what is required.* | The learner demonstrates in-depth understanding of basic human factors used in kitchen design by:   * explaining the human factors that need to be considered when designing a kitchen   For example:  The learner explains that one human factor of kitchen design is the ease of use for the intended users, such as a family, who require more counter space to minimise overcrowding and safety issues. The learner goes on to explain the requirements of a kitchen for an environment with multiple users and gives details of how the kitchen design provides space and ease of use for the family.   * explaining how personal preference, group preferences, style and trends may impact on kitchen design   For example:  The learner explains the impact each of these has when designing a kitchen for a family. The learner also explains how styles and trends may be linked (e.g. the learner explains how the family likes to socialise while cooking and as the current kitchen trend is to have large open plan areas this would suit the design).   * explaining how data gathering analysis techniques may be used when designing a kitchen, such as how each technique is carried out (how the information is collected and analysed) and how it then informs kitchen design   For example:  The learner explains more than one data gathering technique and more than one analysis technique. The learner explains how observation is one useful data gathering technique for kitchen designs. The description includes observations of the family while cooking, the working triangle, layout based on floor space, how much working room was needed, and how important socialising was. By noticing the location of appliances and use of counter space, the learner was able to annotate a diagram showing typical measurements and adjustments that could be made to ensure ease of use. The learner explains how anthropometric data could be used to determine counter height and location, and how this type of measurement can be collected into a database which becomes a useful designer’s tool, giving standardised measurements for groups of the population.  *The above expected learner response are indicative only and relate to just part of what is required.* | The learner demonstrates comprehensive understanding of basic human factors used in kitchen design by:   * discussing why human factors identified for kitchen designs need to be considered   For example:  The learner compares and contrasts how designing a kitchen for a group differs from designing for an individual, and how designing a kitchen for one environment (e.g. home) differs from designing a kitchen for another environment (e.g. restaurant).The learner goes on to discuss why the identified human factors of kitchen design are important: the ease of use for the intended users, such as a family, who require more counter space to minimise overcrowding and safety issues. The learner discusses why the human factors identified for a kitchen in an environment with multiple users are important and gives details of how a kitchen design may resolve these issues for a family.   * explaining how personal preference, group preferences, style and trends may impact on kitchen designs   For example:  The learner explains the impact each of these has when designing a kitchen for a family. The learner also explains how styles and trends may be linked (e.g. the learner explains how the family likes to socialise while cooking and as the current kitchen trend is to have large open plan areas this would suit the design).   * discussing the suitability of data gathering and analysis techniques that may be used in kitchen design   For example:  The learner compares and contrasts the advantages and disadvantages of data gathering techniques and analysis techniques, and gives examples of the useful information they may provide for kitchen designers. The learner discusses the advantages and disadvantages of interviews and compares these with the advantages and disadvantages of observing in order to decide which of these techniques may provide better qualitative data for their specific purpose. The learner also discusses the advantages and disadvantages of modular kitchens, which involves people comparing existing products to a prototype created within kitchen design software.  *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.