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**NCEA Level 1 Technology**

**Conditions of Assessment**

**General Information**

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| **Subject References** | Generic Technology, Construction and Mechanical Technologies, Design and Visual Communication, Digital Technologies, Processing Technologies |
| **Domains** | Generic Technology, Construction and Mechanical Technologies, Design and Visual Communication, Digital Technologies, Processing Technologies |
| **Level** | 1 |

This document provides guidelines for assessment against internally assessed standards.   Guidance is provided on:

* appropriate ways of, and conditions for, gathering evidence
* ensuring that evidence is authentic
* any other relevant advice specific to an achievement standard.

NB:  It is expected that teachers are familiar with additional generic guidance on assessment practice in schools published on the [NZQA](http://www.nzqa.govt.nz/providers-partners/assessment-and-moderation/assessment-of-standards/generic-resources/gathering-evidence-of-achievement/assessment-opportunities-in-schools/) website. This should be read in conjunction with these Conditions of Assessment.

For All Standards

Internal assessment provides considerable flexibility in the collection of evidence.  Evidence can be collected in different ways to suit a range of teaching and learning styles and a range of contexts of teaching and learning.  Care needs to be taken to allow students opportunities to present their best evidence against the standard(s) that are free from unnecessary constraints.

It is recommended that the design of assessment reflects and reinforces the ways students have been learning.   Collection of evidence for the internally assessed standards could include, but is not restricted to, an extended task, an investigation, digital evidence (such as recorded interviews, blogs, photographs or film) or a portfolio of evidence.

It is also recommended that the collection of evidence for internally assessed standards should not use the same method that is used for any external standards in a programme/course, particularly if that method is using a time bound written examination.  This could unfairly disadvantage students who do not perform well under these conditions.

A separate assessment event is not needed for each standard.   Often assessment can be integrated into one activity that collects evidence towards two or three different standards from a programme of learning.  Evidence can also be collected over time from a range of linked activities (for example, in a portfolio).This approach can also ease the assessment workload for both students and teachers.

Effective assessment should suit the nature of the learning being assessed, provide opportunities to meet the diverse needs of all students and be valid and fair.

Where manageable, and after further learning has taken place, students may be offered a maximum of one further opportunity for assessment against an assessment standard within a year.

Authenticity of student evidence needs to be assured regardless of the method of collecting evidence.  This needs to be in line with school policy.  For example, for an investigation carried out over several sessions, this could include teacher observations or the use of milestones such as meetings with students, journal or photographic entries recording progress etc.

**Specific Information for Individual Internal Achievement Standards**

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| **Achievement Standard Number** | **91044 Generic Technology 1.1** |
| **Title** | Undertake brief development to address a need or opportunity |
| **Number of Credits** | 4 |
| **Version** | 3 |

The teacher provides opportunities for students to develop evidence for the standard by:

* + providing an appropriate context and issue for the student
  + assisting the student to identify a suitable need or opportunity
  + encouraging the student to undertake research from a range of sources including their own exploration and trialling
  + supporting the student to develop questioning skills and interacting with stakeholders
  + assisting the student to locate resources
  + conferencing with the student during the iterative process of brief development including the establishment of specifications.

Evidence for this achievement standard would be expected to be gathered from in and out of class activities over a period of time specified by the teacher. It is recommended that evidence be presented in a portfolio format. A portfolio could include a variety of media (for example, written notes, annotations, blog entries, video, graphics, photographs, podcasts, interactive mindmaps and other online presentations) in any format.

A portfolio is an *organised* collection of student evidence that clearly communicates the student’s brief development practice. Where a group approach is used the teacher needs to ensure that there is evidence that each student has met all aspects of the standard.

Teachers must closely supervise stages of the development process in order to ensure authenticity of student work.

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| **Achievement Standard Number** | **91045 Generic Technology 1.2** |
| **Title** | Use planning tools to guide the technological development of an outcome to address a brief |
| **Number of Credits** | 4 |
| **Version** | 3 |

The teacher provides opportunities for students to develop evidence for the standard by:

* + ensuring that there is a suitable brief. The brief may be provided by the teacher or developed by the student.
  + supporting students to use planning tools to effectively manage resources
  + supporting the student to develop questioning and self reflection skills
  + conferencing with the student and supporting them to project forward during the development process to ensure the completed outcome meets the brief.

Evidence for this achievement standard would be expected to be gathered from in and out of class activities over a period of time specified by the teacher. It is recommended that evidence be presented in a portfolio format. A portfolio could include a variety of media (for example, written notes, annotations, blog entries, video, graphics, photographs, podcasts, interactive mindmaps and other online presentations) in any format.

A portfolio is an *organised* collection of student evidence that clearly communicates the student’s planning practices including resource management. Where a group approach is used the teacher needs to ensure that there is evidence that each student has met all aspects of the standard.

Teachers must closely supervise stages of the development process in order to ensure authenticity of student work.

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| **Achievement Standard Number** | **91046 Generic Technology 1.3** |
| **Title** | Use design ideas to produce a conceptual design for an outcome to address a brief |
| **Number of Credits** | 6 |
| **Version** | 3 |

The teacher provides opportunities for students to develop evidence for the standard by:

* + ensuring that there is a suitable brief. A suitable brief allows for a range of outcomes and includes the purpose and probable attributes of the outcome. The brief may be provided by the teacher or developed by the student
  + assisting the student to generate and explore a range of design ideas
  + encouraging the student to undertake research from a range of sources including their own exploration through functional modelling
  + providing opportunity to develop drawing and modelling skills to develop and communicate ideas
  + assisting in the refinement of reflective and inquiry questions
  + encouraging the students to self reflect and undertake ongoing evaluation including interaction with stakeholders
  + conferencing with the student and supporting them during the development process.

Evidence for this achievement standard would be expected to be gathered from in and out of class activities over a significant period of time specified by the teacher. It is recommended that evidence be presented in a portfolio format. A portfolio could include a variety of media (for example, written notes, blog entries, video, design sketches/drawings, graphics, photographs, podcasts, interactive mindmaps, 2 or 3D models and other online presentations) in any format.

A portfolio is an *organised* collection of student evidence that clearly communicates the student’s development and evaluation practices leading to a conceptual design. Where a group approach is used the teacher needs to ensure that there is evidence that each student has met all aspects of the standard.

Teachers must closely supervise stages of the development process in order to ensure authenticity of student work.

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| **Achievement Standard Number** | **91047 Generic Technology 1.4** |
| **Title** | Undertake development to make a prototype to address a brief |
| **Number of Credits** | 6 |
| **Version** | 3 |

The teacher provides opportunities for students to develop evidence for the standard by:

* + ensuring that there is a suitable brief. A suitable brief allows for a range of outcomes and includes a conceptual statement and specifications for the prototype to be evaluated against. The brief may be provided by the teacher or developed by the student
  + assisting in the refinement of reflective and inquiry questions
  + assisting the student to locate resources and explore a range of materials/components
  + providing the opportunity to test and use materials/components as part of their development work towards a prototype
  + encouraging the students to self reflect and undertake ongoing evaluation including interaction with stakeholders
  + providing resources to enable students to produce a prototype and evaluate the prototype in terms the fitness for purpose of the outcome in its intended environment
  + conferencing with the student and supporting them during the development process.

Evidence for this achievement standard would be expected to be gathered from in and out of class activities over a significant period of time specified by the teacher. It is recommended that evidence be presented in a portfolio format. A portfolio could include a variety of media (for example, written notes, blog entries, video, design sketches/drawings, graphics, photographs, podcasts, interactive mindmaps, 2 or 3D models and other online presentations,) in any format.

A portfolio is an *organised* collection of student evidence that clearly communicates the student’s development and evaluation practices leading to a prototype. Where a group approach is used the teacher needs to ensure that there is evidence that each student has met all aspects of the standard.

Teachers must closely supervise stages of the development process in order to ensure authenticity of student work.

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| **Achievement Standard Number** | **91051 Generic Technology 1.8** |
| **Title** | Demonstrate understanding of how different disciplines influence a technological development |
| **Number of Credits** | 4 |
| **Version** | 3 |

The teacher provides opportunities for students to develop evidence for the standard by:

* + supporting students to analyse a range of technological developments including but not limited to their own
  + assisting in the refinement of reflective and inquiry questions related to the knowledge, practices, and collaboration of technologists
  + encouraging the students to unpack the knowledge and practices from a range of disciplines that underpin technological developments
  + providing examples of how different disciplines have impacted on the nature of the technological practice undertaken
  + supporting students to explore the collaboration of technologists in the development of technological outcomes.

Evidence for this achievement standard would be expected to be gathered from in and out of class activities to be completed by students over a period of time specified by the teacher. This evidence may be generated from discussion, group work, research, decision making and/or reflection and will be presented in any media that clearly communicates the student’s understanding of the interdisciplinary nature of technology. Where a group approach is used the teacher needs to ensure that there is evidence that each student has met all aspects of the standard.

Teachers must closely supervise the generation of the evidence in order to ensure authenticity of student work.

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| **Achievement Standard Number** | **91052 Generic Technology 1.9** |
| **Title** | Demonstrate understanding of the ways a technological outcome, people and social and physical environments interact |
| **Number of Credits** | 4 |
| **Version** | 3 |

The teacher provides opportunities for students to develop evidence for the standard by:

* providing the opportunity for students to analyse the social and historical context within which a technological outcome is located
* providing examples for students to explore the ways in which a technological outcome, people and social and physical environments interact.

Evidence for this achievement standard would be expected to be gathered from in and out of class activities to be completed by students over a period of time specified by the teacher. This evidence may be generated from discussion, group work, research, decision making and/or reflection and will be presented in any media that clearly communicates the student’s understanding of how of technological outcomes interact with people within environments. Where a group approach is used the teacher needs to ensure that there is evidence that each student has met all aspects of the standard.

Teachers must closely supervise the generation of the evidence in order to ensure authenticity of student work.

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| **Achievement Standard Number** | **91054 Generic Technology 1.11** |
| **Title** | Demonstrate understanding of basic human factors in design |
| **Number of Credits** | 4 |
| **Version** | 3 |

The teacher provides opportunities for students to develop evidence for the standard by:

* providing the opportunity for students to analyse how human factors have been considered in the design of a range of products, systems and environments
* encouraging the students to explore how personal and group preferences, styles and trends impact on the design of products, systems and environments
* providing examples of anthropometric, psychological and sensory data gathering and analysis techniques for students to explore and critique.

Evidence for this achievement standard would be expected to be gathered from in and out of class activities to be completed by students over a period of time specified by the teacher. This evidence may be generated from discussion, group work, research, decision making and/or reflection and will be presented in any media that clearly communicates the student’s understanding of basic human factors in design. Where a group approach is used the teacher needs to ensure that there is evidence that each student has met all aspects of the standard.

Teachers must closely supervise the generation of the evidence in order to ensure authenticity of student work.

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| **Achievement Standard Number** | **91055 Generic Technology 1.12** |
| **Title** | Demonstrate understanding of basic concepts used in manufacturing |
| **Number of Credits** | 4 |
| **Version** | 3 |

The teacher provides opportunities for students to develop evidence for the standard by:

* providing the opportunity for students to analyse a range of different types of manufacturing systems and explore how each type is suited to the particular situation
* providing examples of different manufacturing techniques for students to explore and categorise in terms of purpose
* supporting students to analyse a range of manufacturing processes to determine how yield is determined and the influences on this
* supporting students to analyse a range of manufacturing processes to identify and explore how quality of outcomes are controlled and the influences on this.

Evidence for this achievement standard would be expected to be gathered from in and out of class activities to be completed by students over a period of time specified by the teacher. This evidence may be generated from discussion, group work, research, decision making and/or reflection and will be presented in any media that clearly communicates the student’s understanding of basic manufacturing concepts. Where a group approach is used the teacher needs to ensure that there is evidence that each student has met all aspects of the standard.

Teachers must closely supervise the generation of the evidence in order to ensure authenticity of student work.

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| **Achievement Standard Number** | **91056 Generic Technology 1.13** |
| **Title** | Implement a multi-unit manufacturing process |
| **Number of Credits** | 4 |
| **Version** | 3 |

The teacher provides opportunities for students to develop evidence for the standard by:

* + ensuring that there is a defined outcome suitable for manufacturing with clear manufacturing specifications available to the students
  + assisting in the refinement of reflective and inquiry questions regarding the type of outcome required, the resources available and the suitability of techniques able to be used
  + assisting the student to locate resources, including relevant codes of practice, and explore a range of possible manufacturing processes and quality control procedures
  + providing the opportunity to trial their manufacturing process and quality control procedures in order to undertake a critical review of both
  + encouraging the students to self reflect and undertake ongoing evaluation including interaction with stakeholders
  + conferencing with the student and supporting them as they make selection decisions regarding suitable manufacturing processes and quality control procedures and during trialling of these

Evidence for this achievement standard would be gathered from in and out of class activities over a significant period of time specified by the teacher. It is recommended that evidence be presented in a portfolio format. A portfolio could include a variety of media (for example, visual roughs, written notes, annotations, blog entries, video, design sketches/drawings, graphics, models, photographs, podcasts, interactive mindmap, flowcharts and other online presentations) in any format.

A portfolio is an *organised* collection of student evidence that clearly documents the student’s decision making and design thinking before, during and after the implementation of a manufacturing process and communicates an evaluation of the process in terms of the number of units meeting the manufacturing specifications. Where a group approach is used the teacher needs to ensure that there is evidence that each student has met all aspects of the standard.

Teachers must closely supervise stages of the implementation process in order to ensure authenticity of student work.

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| **Achievement Standard Number** | **91057 Construction and Mechanical Technologies** **1.20** |
| **Title** | Implement basic procedures using resistant materials to make a specified product |
| **Number of Credits** | 6 |
| **Version** | 3 |

The teacher provides opportunities for students to develop evidence for the standard by:

* + ensuring that the product specifications, material/s and techniques to be used and a step-by-step guide have been determined prior to the product being made. These may be teacher-given or developed in negotiation with the student
  + predetermining materials and techniques that are of sufficient rigour to allow the student to meet the standard and providing a step by step guide of procedures.
  + encouraging the students to practise their techniques, and to self reflect and undertake ongoing evaluation of how their techniques are being applied
  + providing an appropriate environment, tools and materials to enable students to work safely with resistant materials to make a product
  + conferencing with the student and supporting them during the making of the product.

Evidence for this achievement standard would be expected to be gathered from in and out of class activities over a significant period of time specified by the teacher. This evidence may be generated from discussion, decision making and/or reflection, teacher observation of procedures and the presentation of the final product that collectively demonstrates the student’s ability to implement basic procedures using resistant materials to make a specified product. Where a group approach is used the teacher needs to ensure that there is evidence that each student has met all aspects of the standard.

Teachers must closely supervise stages of the implementation process in order to ensure authenticity of student work.

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| **Achievement Standard Number** | **91058 Construction and Mechanical Technologies** **1.21** |
| **Title** | Implement basic procedures using textile materials to make a specified product |
| **Number of Credits** | 6 |
| **Version** | 3 |

The teacher provides opportunities for students to develop evidence for the standard by:

* + ensuring that the product specifications, material/s and techniques to be used and a step-by-step guide have been determined prior to the product being made. These may be teacher-given or developed in negotiation with the student
  + encouraging the students to practise their techniques, and to self reflect and undertake ongoing evaluation of how their techniques are being applied
  + providing an appropriate environment, tools and materials to enable students to work safely with textile materials to make a product
  + conferencing with the student and supporting them during the making of the product.

Evidence for this achievement standard would be expected to be gathered from in and out of class activities over a significant period of time specified by the teacher. This evidence may be generated from discussion, decision making and/or reflection, teacher observation of procedures and the presentation of the final product. The evidence generated will collectively demonstrate the student’s ability to implement basic procedures using textile materials to make a specified product. Where a group approach is used the teacher needs to ensure that there is evidence that each student has met all aspects of the standard.

Teachers must closely supervise stages of the implementation process in order to ensure authenticity of student work.

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| **Achievement Standard Number** | **91059 Construction and Mechanical Technologies** **1.22** |
| **Title** | Demonstrate understanding of basic concepts used to make products from resistant materials |
| **Number of Credits** | 4 |
| **Version** | 3 |

The teacher provides opportunities for students to develop evidence for the standard by:

* + providing students with the opportunity to explore a range of products made from resistant materials in order to discuss the materials used, their characteristics and the techniques that would be appropriate to work them safely
  + assisting in the refinement of reflective and inquiry questions related to understanding of how and why resistant materials and techniques are combined differently for particular situations.

Evidence for this achievement standard would be expected to be gathered from in and out of class activities to be completed by students over a period of time specified by the teacher. The evidence for this standard might be generated as students make outcomes from resistant materials or may be generated through project based, group or stand alone activities. This evidence may be generated from discussion, group work, research, decision making and/or reflection and will be presented in any media that clearly communicates the student’s understanding of basic concepts used to make products from resistant materials. Where a group approach is used the teacher needs to ensure that there is evidence that each student has met all aspects of the standard.

Teachers must closely supervise the generation of the evidence in order to ensure authenticity of student work.

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| **Achievement Standard Number** | **91060 Construction and Mechanical Technologies 1.23** |
| **Title** | Demonstrate understanding of basic concepts used to make products from textile materials |
| **Number of Credits** | 4 |
| **Version** | 3 |

The teacher provides opportunities for students to develop evidence for the standard by:

* + providing students with the opportunity to explore a range of products made from textile materials in order to discuss the materials used, their characteristics and the techniques that would be appropriate to work them safely
  + assisting in the refinement of reflective and inquiry questions related to understanding of how and why textile materials and techniques are combined differently for particular situations.

Evidence for this achievement standard would be expected to be gathered from in and out of class activities to be completed by students over a period of time specified by the teacher. The evidence for this standard might be generated as students make outcomes from textile materials or may be generated through project based, group or standalone activities. This evidence may be generated from discussion, or group work, research, decision making and/or reflection and will be presented in any media that clearly communicates the student’s understanding of basic concepts used to make products from textile materials. Where a group approach is used the teacher needs to ensure that there is evidence that each student has met all aspects of the standard.

Teachers must closely supervise the generation of the evidence in order to ensure authenticity of student work.

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| **Achievement Standard Number** | **91061 Construction and Mechanical Technologies 1.24** |
| **Title** | Demonstrate understanding of basic concepts related to structures |
| **Number of Credits** | 3 |
| **Version** | 3 |

The teacher provides opportunities for students to develop evidence for the standard by:

* + providing students with the opportunity to explore a range of structures to identify types of structural members and joints and develop understandings of forces in relation to structures
  + assisting in the refinement of reflective and inquiry questions related to understanding of how structures resist load, safety factors and structural integrity.

Evidence for this achievement standard would be expected to be gathered from in and out of class activities to be completed by students over a period of time specified by the teacher. The evidence for this standard might be generated as students make outcomes from textile materials or may be generated through project based, group or standalone activities. This evidence may be generated from discussion, or group work, research, decision making and/or reflection and will be presented in any media that clearly communicates the student’s understanding of basic concepts related to structures. Where a group approach is used the teacher needs to ensure that there is evidence that each student has met all aspects of the standard.

Teachers must closely supervise the generation of the evidence in order to ensure authenticity of student work.

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| **Achievement Standard Number** | **91062 Construction and Mechanical Technologies 1.25** |
| **Title** | Demonstrate understanding of basic concepts related to machines |
| **Number of Credits** | 3 |
| **Version** | 3 |

The teacher provides opportunities for students to develop evidence for the standard by:

* + providing students with the opportunity to explore a range of mechanical devices to identify lever, inclined planes, screws and mechanical components, and develop understandings of their purpose
  + assisting in the refinement of reflective and inquiry questions related to understanding of how machines work to ensure desired mechanical advantage and/or motion.

Evidence for this achievement standard would be expected to be gathered from in and out of class activities to be completed by students over a period of time specified by the teacher. The evidence for this standard might be generated as students make outcomes that may be generated through project based, group or standalone activities that require the use or incorporation of mechanical devices. This evidence may be generated from discussion, or group work, research, decision making and/or reflection and will be presented in any media that clearly communicates the student’s understanding of basic concepts related to machines. Where a group approach is used the teacher needs to ensure that there is evidence that each student has met all aspects of the standard.

Teachers must closely supervise the generation of the evidence in order to ensure authenticity of student work.

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| **Achievement Standard Number** | **91096 Construction and Mechanical Technologies 1.26** |
| **Title** | Make basic adaptations to a pattern to enable a design to fit a person or item |
| **Number of Credits** | 4 |
| **Version** | 3 |

The teacher provides opportunities for students to develop evidence for the standard by:

* ensuring that the pattern to be adapted and guide sheet have been determined prior to the adaptation commencing.
  + encouraging the students to practise their techniques of pattern adaptation, and to self reflect and undertake ongoing evaluation of how these techniques are applied
  + providing an appropriate environment, tools and materials to enable students to work safely when adapting a pattern to construct a toile or mock up to trial the design interpretation and fit
* conferencing with the student and supporting them to adapt a pattern.

Evidence for this achievement standard would be expected to be gathered from in and out of class activities over a significant period of time specified by the teacher. This evidence may be generated from discussion, group work, decision making and/or reflection, teacher observation of procedures and the presentation of the final pattern, and toile or mock up. The evidence generated will collectively demonstrate the student’s ability to make basic adaptations to a pattern to enable a design to fit a person or item. Where a group approach is used the teacher needs to ensure that there is evidence that each student has met all aspects of the standard.

Teachers must closely supervise the generation of the evidence in order to ensure authenticity of student work.

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| **Achievement Standard Number** | **91066 Design and Visual Communication** **1.33** |
| **Title** | Use rendering techniques to communicate the form of design ideas |
| **Number of Credits** | 3 |
| **Version** | 3 |

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| **Achievement Standard Number** | **91067 Design and Visual Communication** **1.34** |
| **Title** | Use the work of an influential designer to inform design ideas |
| **Number of Credits** | 3 |
| **Version** | 4 |

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| **Achievement Standard Number** | **91068 Design and Visual Communication** **1.35** |
| **Title** | Undertake development of design ideas through graphics practice |
| **Number of Credits** | 6 |
| **Version** | 4 |

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| **Achievement Standard Number** | **91069 Design and Visual Communication** **1.36** |
| **Title** | Promote an organised body of design work to an audience using visual communication techniques |
| **Number of Credits** | 4 |
| **Version** | 4 |

**1.33, 1.34, 1.35, 1.36**

**Collection of Evidence**

The collection of evidence for these achievement standards must be generated in the context of a design project from which a design brief will be generated. The design project may be authentic and identified by the student or teacher initiated brief. The students’ work is collated in the form of a portfolio.

A portfolio is an organised collection of evidence that demonstrates the students’ design thinking and integrates and communicates the candidate’s knowledge, understanding and skills relevant to the standard(s). This could be in the format of visual diaries, models, photography, digital media, display boards or booklets, installations, depending on the students selected mode of visual communication.

Visual communication methods and techniques will be used to show the student’s evolving ideas and design thinking through graphics practice (e.g. visual roughs, design sketches, explorative 3D modelling, drawings and computer generated images/animation, stimulating collage).

**Assessment Opportunities**

During a course of study learners should be exposed to a range of teaching and learning activities. These activities that contribute to the design outcomes to project briefs will produce the evidence for assessment.

The evidence could be drawn from student work that is generated in response to either one design project brief or from several project briefs. Where assessment tasks integrate more than one standard, teachers must ensure that the requirements of the task enables learners to developed sufficient evidence to meet the criteria for each standard(s).

Regular checks at key stages of the learner’s graphics practice during the assessment task, will provide a level of authenticity and monitoring that will ensure learners are being given the opportunity to achieve.

**Authenticity**

Assessment would be expected to take place over an extended period of time and include students working outside of normal class time. Schools are required to ensure that student evidence is authentic using whatever strategies they find suitable such as requiring a parent or caregiver to attest to the authenticity of work undertaken at home and alongside regular observation by the teacher to detect anomalies in a student’s work. School policy of authenticity will apply.

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| **Achievement Standard Number** | **91071 Digital Technologies** **1.41** |
| **Title** | Implement basic procedures to produce a specified digital information outcome |
| **Number of Credits** | 4 |
| **Version** | 3 |

The teacher provides opportunities for students to develop evidence for the standard by:

* + ensuring that the outcome specifications, software and techniques to be used have been determined prior to the outcome being made. These may be teacher-given or developed in negotiation with the student
  + ensuring software resources and techniques provide sufficient rigour to allow the student to meet the standard
  + assisting the students to effectively use the applications and explore a range of techniques and procedures
  + encouraging the students to practise their techniques, and to self reflect and undertake ongoing evaluation of how their techniques are being applied
  + providing resources to enable students to produce an outcome that meets specifications
  + conferencing with the student and supporting them during the production of the outcome.

Evidence for this achievement standard would be expected to be gathered from in and out class activities over a period of time specified by the teacher. This evidence may be generated from discussion, group work, decision making and/or reflection, teacher observation of procedures and the presentation of the final product. The evidence generated will collectively demonstrate the student’s ability to implement basic procedures to produce a digital information outcome. Where a group approach is used the teacher needs to ensure that there is evidence that each student has met all aspects of the standard.

Teachers must closely supervise stages of the implementation process in order to ensure authenticity of student work.

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| **Achievement Standard Number** | **91072 Digital Technologies** **1.42** |
| **Title** | Demonstrate understanding of basic concepts of digital media |
| **Number of Credits** | 3 |
| **Version** | 3 |

The teacher provides opportunities for students to develop evidence for the standard by:

* + providing students with the opportunity to explore a range of digital media outcomes in order to discuss the software resources, tools, techniques, design elements, and ethical considerations used in their development.
  + providing students with a digital media outcome that demonstrates an integration of digital media types, and is of sufficient rigour to allow the student to meet the standard (students may use their own digital media outcome)
  + assisting in the refinement of reflective and inquiry questions related to the understanding of software resources, tools, techniques, design elements, and ethical considerations used to develop a digital media outcome.

Evidence for this achievement standard would be expected to be gathered from in and out of class activities to be completed by students over a period of time specified by the teacher. This evidence may be generated from discussion, group work, research, decision making and/or reflection and will be presented in any media that clearly communicates the student’s understanding of basic concepts of digital media. Where a group approach is used the teacher needs to ensure that there is evidence that each student has met all aspects of the standard.

Teachers must closely supervise the generation of the evidence in order to ensure authenticity of student work.

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| **Achievement Standard Number** | **91073 Digital Technologies** **1.43** |
| **Title** | Implement basic procedures to produce a specified digital media outcome |
| **Number of Credits** | 4 |
| **Version** | 3 |

The teacher provides opportunities for students to develop evidence for the standard by:

* + ensuring that the outcome specifications, software and techniques to be used have been determined prior to the outcome being made. These may be teacher-given or developed in negotiation with the student
  + ensuring the media types and techniques provide sufficient rigour to allow the student to meet the standard
  + assisting the students to effectively use the applications and explore a range of techniques and procedures
  + encouraging the students to practise their techniques, and to self reflect and undertake ongoing evaluation of how their techniques are being applied
  + providing resources to enable students to produce an outcome that meets specifications
  + conferencing with the student and supporting them during the production of the outcome.

Evidence for this achievement standard would be expected to be gathered from in and out of class activities over a period of time specified by the teacher. This evidence may be generated from discussion, group work, decision making and/or reflection, teacher observation of procedures and the presentation of the final product. The evidence generated will collectively demonstrate the student’s ability to implement basic procedures to produce a digital media outcome. Where a group approach is used the teacher needs to ensure that there is evidence that each student has met all aspects of the standard.

Teachers must closely supervise stages of the implementation process in order to ensure authenticity of student work.

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| **Achievement Standard Number** | **91075 Digital Technologies** **1.45** |
| **Title** | Construct a plan for a basic computer program for a specified task |
| **Number of Credits** | 3 |
| **Version** | 4 |

The teacher provides opportunities for students to develop evidence for the standard by:

* providing task(s) which allow students to develop the ability to design the structure of a basic software program
* providing resources to enable students to independently construct flexible and robust plans for basic programs that include using actions, conditions and control structures such as: checking input data for validity; correctly handling expected, boundary and invalid inputs; and using constants, variables and derived values in place of literals.
* supporting students to set out program codes clearly and to document programs with comments, including how to specify variables and their data types
* providing opportunity for students to specify procedural structures that combine well-chosen actions, conditions and control structures that constitute well-structured logical solution to tasks, which have no unnecessary duplication or repetition
* supporting students to specify comprehensive sets of test cases with expected, boundary and invalid input for testing programs
* conferencing with the student and supporting them during the development process.

Evidence for this achievement standard would be expected to be gathered from in and out of class activities to be completed by students over a period of time specified by the teacher. The evidence for this standard might be one aspect of a larger integrated or a standalone project. The form of this evidence will vary with the type of project.

This evidence may be generated from discussion, group work decision making and/or reflection, teacher observation of procedures and the presentation of the plan for a basic computer program. The evidence generated will collectively demonstrate the student’s ability to construct a plan for a basic computer programme. Where a group approach is used the teacher needs to ensure that there is evidence that each student has met all aspects of the standard.

Teachers must closely supervise stages of the construction process in order to ensure authenticity of student work.

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| **Achievement Standard Number** | **91076 Digital Technologies** **1.46** |
| **Title** | Construct a basic computer program for a specified task |
| **Number of Credits** | 3 |
| **Version** | 4 |

The teacher provides opportunities for students to develop evidence for the standard by:

* ensuring a basic computer program plan is available (either provided to the student or created by the student and verified by the teacher as of suitable rigour for the standard)
* providing task(s) which allow students to independently implement a plan for a basic program in a suitable programming language (e.g. drag-and-drop language, specialised programming language, or a general purpose programming language) that uses a procedural structure with well-chosen actions, conditions and control structures that ensures the program is flexible and robust
* supporting students to set out program code concisely, and document programs with variable names and succinct comments that accurately explain and justify code function and behaviours
* support students to comprehensively test and debug programs in an organized time effective way to ensure that they work on expected, boundary and invalid inputs
* conferencing with the student and supporting them during the program development process.

Evidence for this achievement standard would be expected to be gathered from in and out of class activities to be completed by students over a period of time specified by the teacher. The evidence for this standard might be one aspect of a larger integrated or a standalone project. The form of this evidence will vary with the type of project.

This evidence may be generated from discussion, group work decision making and/or reflection, teacher observation of procedures and the presentation of the final working computer program that correctly solves the problem. The evidence generated will collectively demonstrate the student’s ability to construct a basic computer program for a specified task. Where a group approach is used the teacher needs to ensure that there is evidence that each student has met all aspects of the standard.

Teachers must closely supervise stages of the construction process in order to ensure authenticity of student work.

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| **Achievement Standard Number** | **91077 Digital Technologies** **1.47** |
| **Title** | Demonstrate understanding of basic concepts used in the design and construction of electronic environments |
| **Number of Credits** | 3 |
| **Version** | 3 |

The teacher provides opportunities for students to develop evidence for the standard by:

* providing appropriate contexts and scenarios in which the required understanding can be developed.
* providing learning resources and suggesting additional sources of information which can be used to develop the required understanding
* providing formative feedback on the students initial attempts to demonstrate the required understanding.
* supporting the student to develop a level of reflective practice that allows them to critique their own work in relation to the required understanding.

Evidence for this achievement standard would be expected to be gathered from in and out of class activities over a period of time specified by the teacher. Evidence for the understanding of basic concepts could be generated by:

* annotating a circuit diagram
* applying a concept to solve a problem in a practical scenario
* reporting on evidence gathered from an experimental investigation
* generating a sound track for a short movie clip in which the teacher interviews the student about the operation of an electronic and embedded system.

Evidence for the understanding of the operational function of components could be demonstrated by a photograph or graphic showing the component in a functioning circuit accompanied by a caption which briefly and accurately communicates how that component functions in that context.

Evidence for the achievement of this standard can also be generated by using short tests in which the students solve problems or answer questions relating to the functioning of components or the concepts that underpin operational systems.

This evidence will be presented in any media that clearly communicates the student’s understanding of basic concepts used in the design and construction of electronic environments.

Teachers must closely supervise the generation of the evidence in order to ensure authenticity of student work.

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| **Achievement Standard Number** | **91078 Digital Technologies** **1.48** |
| **Title** | Implement basic interfacing procedures in a specified electronic environment |
| **Number of Credits** | 3 |
| **Version** | 3 |

The teacher provides opportunities for students to develop evidence for the standard by:

* + providing a specified electronic environment and simple programme structures suitable for students to implement interfacing procedures
  + ensuring that the specifications for the electronic environment have been determined prior to the procedures being carried out. These may be teacher-given or developed in negotiation with the student
* supporting students to explore a range of interfacing procedures and exploring how these rely on the selection, testing and debugging of hardware and software that allow different devices to work together compatibly
* providing opportunity for students to explore how a working interface can be tested for a given scenario
* conferencing with the students and supporting them as they implement and test their interfacing procedures.

Evidence for the implementation of interfacing procedures could be generated by:

* using emulation software to model and test a working interface for a given scenario
* using a breadboard to develop, test and debug a real interface
* modifying and debugging a given interface so that it works correctly
* making a video clip that demonstrates the interface in action, possibly with a sound track that explains it as it operates.

This evidence collectively demonstrates the student’s ability to implement interfacing procedures in a specified electronic environment.

Teachers must closely supervise all stages of the implementation process to ensure authenticity of student work.

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| **Achievement Standard Number** | **91079 Digital Technologies** **1.49** |
| **Title** | Implement basic techniques in constructing a specified electronic and embedded system |
| **Number of Credits** | 3 |
| **Version** | 3 |

The teacher provides opportunities for students to develop evidence for the standard by:

* + ensuring that the system specifications have been determined prior to the basic electronic and embedded system being made. These may be teacher-given or developed in negotiation with the student
* supporting students to explore a range of electronic and embedded systems and exploring how these address reactive, real-time and physical size constraints
* providing opportunity for students to explore techniques associated with laying out and constructing functional circuits, writing annotated programmes based on commands and supplied programme structures, testing and debugging programmes and circuits to ensure they meet specifications
* providing opportunity for students to understand safe workshop practice
* conferencing with the students and supporting them as implement techniques.

Evidence for the implementation of construction techniques could be generated by:

* a video clip of a working system constructed by the student with a sound track explaining how it works
* a written or digital portfolio typically including photos, graphics and schematics which documents how the student developed the system
* a sound track of an interview in which the student discusses the development of a working model he or she has constructed.

Such evidence, along with the presentation of the final working electronic and embedded system, collectively demonstrates the student’s ability to implement basic techniques in constructing a specified electronic and embedded system

Teachers must closely supervise all stages of the implementation process to ensure authenticity of student work.

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| **Achievement Standard Number** | **91080 Digital Technologies** **1.50** |
| **Title** | Demonstrate understanding of the common components of basic digital infrastructures |
| **Number of Credits** | 3 |
| **Version** | 3 |

The teacher provides opportunities for students to develop evidence for the standard by:

* + providing students with the opportunity to explore digital infrastructure in order to identify personal computer hardware, associated peripherals and system software
  + providing opportunity for students to explore the purpose of components and their characteristics
  + assisting in the refinement of reflective and inquiry questions related to the understanding of procedures and protocols associated with basic infrastructure.

Evidence for this achievement standard would be expected to be gathered from in and out of class activities to be completed by students over a period of time specified by the teacher. This evidence may be generated from discussion, group work, research, decision making and/or reflection and will be presented in any media that clearly communicates the student’s understanding of common components of basic infrastructure. Where a group approach is used the teacher needs to ensure that there is evidence that each student has met all aspects of the standard.

Teachers must closely supervise the generation of the evidence in order to ensure authenticity of student work.

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| **Achievement Standard Number** | **91081 Digital Technologies** **1.51** |
| **Title** | Implement basic procedures for servicing a personal computer system |
| **Number of Credits** | 4 |
| **Version** | 3 |

The teacher provides opportunities for students to develop evidence for the standard by:

* + providing a personal computer system with specified configuration requirements
  + predetermining installation and configuration faults for students to resolve
  + assisting the students to explore standard installation, configuration, troubleshooting and testing procedures
  + encouraging the students to practise their techniques, and to self reflect and undertake ongoing evaluation of how their techniques are being applied
  + providing resources to enable students to work within manufacturer guidance and other relevant codes of practice and regulations
  + conferencing with the student and supporting them during their installation, configuration, troubleshooting and testing procedures.

Evidence for this achievement standard would be expected to be gathered from in and out of class activities to be completed by students over a period of time specified by the teacher. This evidence may be generated from discussion, group work, decision making and/or reflection, teacher observation of procedures during the servicing of a personal computer system. The evidence generated will collectively demonstrate the student’s ability to implement basic procedures for servicing a personal computer system. Where a group approach is used the teacher needs to ensure that there is evidence that each student has met all aspects of the standard.

Teachers must closely supervise stages of the implementation process in order to ensure authenticity of student work.

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| **Achievement Standard Number** | **91082 Processing Technologies** **1.60** |
| **Title** | Implement basic procedures to process a specified product |
| **Number of Credits** | 4 |
| **Version** | 3 |

The teacher provides opportunities for students to develop evidence for the standard by:

* + ensuring that the product specifications, material/s and operations to be used, and a step-by-step guide have been determined prior to the product being made. These may be teacher-given or developed in negotiation with the student
* predetermining materials and techniques that are of sufficient rigour to allow the student to meet the standard and providing a step by step guide of procedures
* encouraging the students to practise a range of techniques, operations and tests and to self reflect and undertake ongoing evaluation of how these are being applied
* supporting students to develop confidence, independence in executing procedures
* supporting students to develop skills in safety, process control and accuracy
* encouraging students to practice time management, minimising effort and efficient use of materials when processing products
* conferencing with the student and supporting them during the making of the product.

Evidence for this achievement standard would be expected to be gathered from in and out of class activities to be completed by students over a period of time specified by the teacher and/or a final practical assessment.

This evidence may be generated from discussion, group work, decision making and/or reflection, teacher observation of procedures and the presentation of the product. The evidence generated will collectively demonstrate the student’s ability to implement basic procedures to process a specified product. Where a group approach is used the teacher needs to ensure that there is evidence that each student has met all aspects of the standard.

Teachers must closely supervise stages of the implementation process in order to ensure authenticity of student work.

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| **Achievement Standard Number** | **91083 Processing Technologies** **1.61** |
| **Title** | Demonstrate understanding of basic concepts used in processing |
| **Number of Credits** | 4 |
| **Version** | 3 |

The teacher provides opportunities for students to develop evidence for the standard by:

* + providing students with the opportunity to explore a range of processing operations, testing techniques and appropriate safety procedures in processing
* assisting in the refinement of reflective and inquiry questions related to understanding of the importance of correct processing sequences to the success of a product and the relationship between processing operations, testing techniques and materials and how they lead to desired outcomes.

Evidence for this achievement standard would be expected to be gathered from in and out of class activities to be completed by students over a period of time specified by the teacher. The evidence for this standard might be generated as students process their own products or may be generated by project based, group or stand alone activities.

This evidence may be generated from discussion, group work, research, decision making and/or reflection and will be presented in any media that clearly communicates the student’s understanding of basic concepts in processing. Where a group approach is used the teacher needs to ensure that there is evidence that each student has met all aspects of the standard.

Teachers must closely supervise the generation of the evidence in order to ensure authenticity of student work.

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| **Achievement Standard Number** | **91084 Processing Technologies** **1.62** |
| **Title** | Demonstrate understanding of basic concepts used in preservation and packaging techniques for product storage |
| **Number of Credits** | 4 |
| **Version** | 3 |

The teacher provides opportunities for students to develop evidence for the standard by:

* + providing students with the opportunity to explore different products requiring diverse preservation and packaging techniques used to address types of decay and legal requirements
* assisting in the refinement of reflective and inquiry questions related to understanding how product integrity can be established and/or maintained through preservation and packaging suitable for storage conditions in local environments.

Evidence for this achievement standard would be expected to be gathered from in and out of class activities to be completed by students over a period of time specified by the teacher. The evidence for this standard might be generated as students preserve and package their own products or may be generated by project based, group or stand alone activities.

This evidence may be generated from discussion, group work, research, decision making and/or reflection and will be presented in any media that clearly communicates the student’s understanding of basic concepts used in preserving and packaging techniques for product storage. Where a group approach is used the teacher needs to ensure that there is evidence that each student has met all aspects of the standard.

Teachers must closely supervise the generation of the evidence in order to ensure authenticity of student work.