Enterprise Computing Stage 6 (Year 12) – sample program of learning

Enterprise project

Contents

[About this resource 3](#_Toc164756384)

[Purpose of resource 3](#_Toc164756385)

[Target audience 3](#_Toc164756386)

[When and how to use 3](#_Toc164756387)

[Rationale 4](#_Toc164756388)

[Overview 5](#_Toc164756389)

[Outcomes 7](#_Toc164756390)

[Lesson sequence and details 9](#_Toc164756391)

[Week 1 9](#_Toc164756392)

[Weeks 2 to 4 14](#_Toc164756393)

[Weeks 5 to 9 22](#_Toc164756394)

[Week 10 27](#_Toc164756395)

[Overall program evaluation 31](#_Toc164756396)

[Capturing student voice when evaluating a program 31](#_Toc164756397)

[Additional information 33](#_Toc164756398)

[Further implementation support 33](#_Toc164756399)

[Assessment for learning 33](#_Toc164756400)

[Differentiation 34](#_Toc164756401)

[Support and alignment 35](#_Toc164756402)

[Evidence base 38](#_Toc164756403)

[References 40](#_Toc164756404)

# About this resource

## Purpose of resource

The resource is a sample program of learning for teaching the Enterprise project in Year 12 during the Enterprise Computing 11–12 course.

## Target audience

This resource can be used by teachers to support effective syllabus implementation of Enterprise Computing 11–12.

## When and how to use

This resource is designed for implementing over 10 weeks or a term of learning on the Enterprise project. The resource can be adapted and contextualised to the school setting. Adjustments can be made to the program of learning to suit students in the teaching and learning cycle.

# Rationale

The NSW Department of Education publishes a range of curriculum support materials, including samples of lesson sequences, scope and sequences, assessment tasks, examinations, student and teacher resource booklets, and curriculum planning and curriculum evaluation templates. The samples are not exhaustive and do not represent the only way to complete or engage in each of these processes. Curriculum design and implementation is a dynamic and contextually-specific process. While the mandatory components of syllabus implementation must be met by all schools, it is important that the approach taken by teachers is reflective of their needs and faculty or school processes.

NESA defines [programming](https://educationstandards.nsw.edu.au/wps/portal/nesa/k-10/understanding-the-curriculum/programming) as the process of ‘selecting and sequencing learning experiences which enable students to engage with syllabus outcomes and develop subject specific skills and knowledge’ (NESA 2022). A program is developed collaboratively within a faculty. It differs from a unit in important ways, as outlined by NESA on their [Advice on units](https://educationstandards.nsw.edu.au/wps/portal/nesa/k-10/understanding-the-curriculum/programming/advice-on-units) page. A unit is a contextually-specific plan for the intended teaching and learning for a particular class for a particular period. The organisation of the content in a unit is flexible and it may vary according to the school, the teacher, the class and the learning space. They should be working documents that reflect the thoughtful planning and reflection that takes place during the teaching and learning cycle. There are mandatory components of programming and unit development and this template provides one option for the delivery of these requirements. The NESA and department guidelines that have influenced this template are elaborated upon at the end of the document.

This resource has been developed to assist teachers in NSW Department of Education schools to create learning that is contextualised to their classroom. It can be used as a basis for the teacher’s own program, assessment, or scope and sequence, or be used as an example of how the new curriculum could be implemented. The resource has suggested timeframes that may need to be adjusted by the teacher to meet the needs of their students.

# Overview

**Description**: this program of learning addresses the focus area of the Enterprise Project. The lessons and sequences in this program of learning are designed to allow students develop the knowledge and skills to create a working enterprise computing system. It can be built to a client’s specifications, using one of the project processes and implementation methods as per the syllabus.

The chosen project process is underpinned by the project documentation, which is based on the Enterprise Computing teaching outcomes and content areas. Students are encouraged to find clients and/or generate their own scenario for which these systems are to be built.

During Week 1 of the learning sequence, students will make contact with their client or analyse self-generated scenarios, and ascertain requirements, problem definition and system needs including any system limitations.

During Weeks 2 to 4 of the learning sequence, students will investigate possible solutions to the client’s problem or self-generated scenario, project processes and implementation methods, use systems modelling tools to analyse client requirements and develop possible solutions.

During Weeks 5 to 9 of the learning sequence, depending on the project process and implementation method chosen, students will present the possible solutions to their clients or teacher for final feedback before the full enterprise system is built.

During Week 10 of the learning sequence, students will complete the system. They will then use the problem definition and identified needs, as well as the actual system, to generate a presentation which details the features of the system, its success against the problem definition and identified needs. Students present the system to the class and/or client and submit the project documentation and system.

**Duration**: this program of learning is designed to be completed over a period of approximately 10 weeks in 60-minute lesson sequences but can be adapted to suit the school context.

**Explicit teaching**: suggested learning intentions and success criteria are available for some lessons provided. Learning intentions and success criteria are most effective when they are contextualised to meet the needs of students in the class. The examples provided in this document are generalised to demonstrate how learning intentions and success criteria could be created.

# Outcomes

A student:

* analyses how innovative technologies have influenced enterprise computing systems **EC-12-06**
* explains the social, ethical and legal implications of the application of enterprise computing systems on the individual, society and the environment **EC-12-07**
* justifies the selection and use of tools and resources to design and develop an enterprise computing system **EC-12-08**
* selects and applies methods to record the management and evaluate the development of an enterprise computing system **EC-12-09**
* evaluates the effectiveness of an enterprise computing system **EC-12-10**
* communicates an enterprise computing solution to a specific audience **EC-12-11**

[Enterprise Computing 11–12 Syllabus](https://curriculum.nsw.edu.au/learning-areas/tas/enterprise-computing-11-12-2022/overview) © NSW Education Standards Authority (NESA) for and on behalf of the Crown in right of the State of New South Wales, 2022.

**Prior to planning for teaching and learning, please consider the following**:

**Engagement**

* How will I provide authentic, relevant learning opportunities for students to personally connect with lesson content?
* How will I support every student to grow in independence, confidence and self-regulation?
* How will I facilitate every student to have high expectations for themselves?
* How will I identify and provide the support each student needs to sustain their learning efforts?

**Representation**

* What are some different ways I can present content to enable every student to access and understand it?
* How will I identify and address language and/or cultural considerations that may limit access to content for students?
* How will I make lesson content and learning materials more accessible?
* How will I plan learning experiences that are relevant and challenging for the full range of students in the classroom?

**Expression**

* How will I provide multiple ways for students to respond and express what they know?
* What tools and resources can students use to demonstrate their understanding?
* How will I know every student has understood the concepts and language presented in each lesson?
* How will I monitor if every student has achieved the learning outcomes and learning growth?

# Lesson sequence and details

## Week 1

Table 1 – identifying and defining lesson sequence and details

| **Outcomes and content** | **Teaching and learning activities** | **Evidence of learning** | **Differentiation and adjustments** | **Registration and evaluation notes** |
| --- | --- | --- | --- | --- |
| **Outcome**  **EC-12-08**  **EC-12-09**  **Content**  Students:   * describe the tools and processes used to manage and document the development of an enterprise system   Including:   * problem definition * time and resource management, including Gantt charts * an iterative approach * production process and technical skills * testing and evaluation * explain the effect of the changing nature of enterprise on the development of projects   Including:   * offshore development * working remotely * freelance work * enabling the growth of start-ups. | **Learning intentions**  Develop a clear and concise problem definition.  Establish clear explanations for the use of selected project management tools.  **Success criteria**   * I can generate a detailed problem definition with this broken down into actual system requirements, needs and limitations. * I can justify the use of project management tools and ways of working.   **Teaching and learning activities**  Students are introduced to the Enterprise project assessment task, understanding the outcomes and expectations.  Brainstorm session where students identify potential real-world problems they are interested in solving.  As a class students read through the tools and processes used to manage and document the development of an enterprise system.  Students describe how the tools and processes will be used in their enterprise project.  As a class discuss the following questions:   * What are the key components of an enterprise computing system? * How can enterprise computing address real-world problems? * What are your interests or concerns that could be addressed through this project?   Students decide on either a client or a self-generated enterprise for which to generate a system.  Teacher-led discussion on problem definition, project scope and requirements.  Students start Section 1.1 of the project documentation and document a project proposal, defining the problem, objectives and expected outcomes.  As a class discuss the Identifying and defining stage of development.  Teacher-led discussion unpacking the following questions:   * Can you define the problem you wish to address with your project? * What objectives do you hope to achieve with your project? * How will you measure the success of your project?   Students read about and explain the effect of the changing nature of enterprise on the development of projects.  Students start Section 1.2 of the project documentation and document their responses. | Students understand the requirements of the Enterprise project assessment task.  Students brainstorm possible ideas for inclusion in their enterprise project.  Students develop a clear and concise problem definition and needs analysis in their project documentation.  Students describe the tools and processes used to manage and document the development of an enterprise system.  Students explain the effect of the changing nature of enterprise on the development of projects.  Students recount at any time where they are up to in developing the enterprise project and what else they have to do, given the list of tasks, sections and subsections in their project documentation. | Suggested adjusted activities. This section is also for use in school when making adjustments to support all students to achieve in their learning.  Students can be given glossaries, writing scaffolds, first-language dictionaries and exemplar answers or responses so that they know what and how to write for each section of the project documentation.  Provide visual and/or multimedia examples and check understanding of concepts.  Prompt student discussion with real-world scenarios and examples.  Include multiple opportunities to respond, for example:   * verbally * individually * partner turn and talk * non-verbally * gesture * response cards. |  |

## Weeks 2 to 4

Table 2 – researching and planning lesson sequence and details

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Outcomes and content | Teaching and learning activities | Evidence of learning | Differentiation and adjustments | Registration and evaluation notes |
| **Outcome**  **EC-12-07**  **EC-12-08**  **Content**  Students:   * investigate tools that support the design and development of an enterprise system   Including:   * online collaboration * time/task action plans * process diary, including ongoing evaluation * budget * system flowcharts * data flow diagrams * decision trees * describe how computational, design and systems thinking skills are used in the design and development of an enterprise system * select key collaborating and managing criteria appropriate to the development of an enterprise project   Including:   * designing for ease of operation and maintenance * clarifying each of the relevant informatics within the new system * outlining the role of the participants, data and components used in the system * negotiating user/client needs and wants * working collaboratively. | **Learning intentions**  Investigate project management tools applicable to the enterprise project.  Develop tools that support the design and development of what the final system will look like.  **Success criteria**   * I can use a process diary to document the enterprise project. * I can develop correct data flow diagrams, schemas, interface diagrams/storyboards, decision trees and system flowcharts demonstrating understanding of the enterprise project I am developing.   **Teaching and learning activities**  **Teacher-led introduction to research methods and planning tools like Gantt charts and budgets.**  **As a class discuss the Researching and planning stage of development. Discuss the following questions:**   * **What research methods will you use to gather information for your project?** * **How can a Gantt chart help in planning your project?** * **What budget considerations must you keep in mind for this project?** * **How do data flow diagrams, system flowcharts and decision trees aid in the planning process?** * **Can you identify key milestones and tasks for your project plan?** * **How will online collaboration tools enhance your project development?**   Teacher-led discussion on the symbols and use of system flowcharts.  Teacher-led discussion on the symbols and use of data flow diagrams.  Students complete all of Sections 1 and 2 of their project documentation.  Students select key collaborating and managing criteria appropriate to the development of an enterprise project.  Teacher-led discussion on how computational, design and systems thinking skills are used in the design and development of an enterprise system.  Encourage deeper thinking and problem-solving by asking open-ended questions, including:  **Computational thinking**   * How do you think breaking down a problem into smaller, manageable parts (decomposition) helps in the design and development of an enterprise system? * Can you describe a scenario where pattern recognition would be crucial in optimising an enterprise system's performance? * How might algorithms be utilised in managing data flow within an enterprise system? * In what ways do you think abstraction simplifies the complexity of an enterprise system for users and developers?   **Design thinking**   * Describe a process where empathy for the user (a key component of design thinking) could influence the features of an enterprise system. Why is understanding the user important? * Reflect on an example where creative thinking led to an innovative feature. How can brainstorming and ideation improve the design phase of an enterprise system? * Reflect on a situation where prototyping and testing could lead to significant improvements in an enterprise system. Why is iteration important in design thinking?   **Systems thinking**   * Explain how seeing the ‘big picture’ (systems thinking) is crucial in the integration of different components in an enterprise system. Can you think of a system that failed because it lacked holistic planning? * How does understanding the interdependencies within an enterprise system aid in predicting potential problems? * In what ways can feedback loops be used to enhance the functionality of an enterprise system? Discuss the importance of feedback in maintaining system stability.   **Integrating computational, design and systems thinking**   * Describe a project or scenario where computational thinking, design thinking, and systems thinking would need to work together to create an effective enterprise system. How do these approaches complement each other? * Can you think of a real-world example where the integration of these thinking skills led to a successful enterprise solution? What was the role of each type of thinking in the project's success? * Reflect on your own experience or aspirations in technology. How do you see yourself using these 3 types of thinking in your future projects or career? | Students are able to justify their use of symbols, constructs and identifiers in their systems analysis diagrams.  Students are able to describe how each component of Sections 1 and 2 interlock with each other, thus allowing the systems analysis diagrams to be produced.  Students can document how enterprises use online collaboration.  Students can document how to develop time/task action plans, including developing one for their enterprise project.  Students can document how to develop a process diary, including ongoing evaluation for their enterprise project.  Students can document how to develop a budget for their enterprise project.  Students can document how to develop system flowcharts for their enterprise project.  Students can document how to develop data flow diagrams for their enterprise project.  Students can document how to develop a decision tree for their enterprise project.  Students can engage in class discussions and answer questions posed on the Researching and planning stage of project development.  Students can describe how computational, design and systems thinking skills are used in the design and development of an enterprise system.  Students can demonstrate they have knowledge in selecting key collaborating and managing criteria appropriate to the development of an enterprise project.  Students complete all of Sections 1 and 2 of their project documentation. | Suggested adjusted activities. This section is also for use in school when making adjustments to support all students to achieve in their learning.  Students can be given writing scaffolds, glossaries and first-language dictionaries, as well as templates against which they could develop their systems analysis diagrams.  Provide visual and/or multimedia examples and check understanding of concepts.  Prompt student discussion with real-world scenarios and examples.  Include multiple opportunities to respond, for example:   * verbally * individually * partner turn and talk * non-verbally * gesture * response cards. |  |

## Weeks 5 to 9

Table 3 – producing and implementing lesson sequence and details

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Outcomes and content | Teaching and learning activities | Evidence of learning | Differentiation and adjustments | Registration and evaluation notes |
| **Outcome**  **EC-12-07**  **EC-12-08**  **EC-12-09**  **Content**  Students:   * apply tools to inform the requirements and limitations of an enterprise system   Including:   * interviews * surveys * analytical reports * prototypes * presentations of research results * explore and apply the most suitable development approach to develop, modify and implement an enterprise system.   Including:   * waterfall (structured) * agile * prototyping * end-user * outsourcing * develop an implementation plan and test its feasibility for an enterprise computing system   Including:   * design thinking * thinking and design tools, including storyboards, Gantt chart, decision tree * risk analysis * hardware and software integration * training * preferred system implementation method * methodology for testing the system. | **Learning intentions**  Produce an individual enterprise project.  Develop complete implementation plans to ensure the enterprise project functions as intended.  **Success criteria**   * I can analyse and justify the effectiveness of tools used in the enterprise project. * I can construct implementation plans in areas such as hardware and software integration, training methods, systems implementation method, testing methodology and risk analysis. * I can produce the enterprise project, inclusive of the problem definition and needs identified in the project documentation.   **Teaching and learning activities**  As a class discuss the Producing and implementing stage of development. Encourage deeper thinking and problem-solving by asking open-ended questions, including:   * Why is selecting the right development approach important for your project? * How will you justify your choice of tools and resources? * What are the requirements and limitations of your chosen enterprise system? * What are the key components of your implementation plan? * How does your testing strategy ensure the system’s functionality and user experience? * What training will be necessary for users of your system?   As a class discuss hardware and software integration. Discuss the following questions:   * How will your system integrate with existing hardware and software environments? * What challenges do you anticipate in the integration process? * How will you address potential compatibility issues?   Students complete Section 3 of the project documentation.  Students build their enterprise system for the majority of class time over 5 weeks.  Provide specific, actionable feedback throughout the building and learning process. This could involve real-time feedback during practical tasks or reflective discussions post-completion of stages in the enterprise project development.  Students develop their final presentations. As a class discuss:   * How will you effectively communicate your project's objectives, development process and outcomes? * What visual aids will you use to enhance your presentation? * How can you demonstrate the system’s benefits and address potential challenges in your presentation? | Students can apply tools to inform the requirements and limitations of an enterprise system.  Students use interviews, surveys, analytical reports, prototypes and presentations of research results in developing their enterprise project.  Students can be tested regularly by the classroom teacher and/or the client on their enterprise project functions and use.  Students can work iteratively to make adjustments to their enterprise project.  Students can develop an implementation plan and test its feasibility for an enterprise computing system.  Students can generate a responsive, just-in-time feedback loop so that problems can be fixed quickly and iteratively rather than waiting until the end of the whole project.  Students complete Section 3 of their project documentation.  Students build their enterprise system.  Students develop their final presentations. | Suggested adjusted activities. This section is also for use in school when making adjustments to support all students to achieve in their learning.  Students can be given glossaries, first-language dictionaries and access to previous worksheets which skilled them up in enterprise computing applications.  Provide visual and/or multimedia examples and check understanding of concepts.  Prompt student discussion with real-world scenarios and examples.  Message abundancy may be useful when introducing new terminology. The word is spoken, written on the board and represented by visuals.  Include multiple opportunities to respond, for example:   * verbally * individually * partner turn and talk * non-verbally * gesture * response cards. |  |

## Week 10

Table 4 – testing and evaluating lesson sequence and details

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Outcomes and content | Teaching and learning activities | Evidence of learning | Differentiation and adjustments | Registration and evaluation notes |
| **Outcome**  **EC-12-10**  **EC-12-11**  **Content**  Students:   * verify and validate an enterprise computing system   Including:   * evaluating test data * trialling the operation and maintenance documentation * reviewing the impact of system implementation within relevant environments * modifying designs to improve functionality * testing, evaluating and maintaining the developed enterprise computing system. | **Learning intentions**  Understand the relationship between problem definition and thus, needs, testing method, test data and system effectiveness.  Communicate the effectiveness of the enterprise project solution to a general audience.  **Success criteria**   * I can run tests and generate data on the client’s use of the system using the method identified in Section 3.1 of the project documentation. * I can generate a list of modifications to the current system based on test data. * I can present my enterprise project to the class, simulating a client handover with a walkthrough of the project.   **Teaching and learning activities**  As a class discuss the Testing and evaluating stage of development.  Encourage deeper thinking and problem-solving by asking open-ended questions, such as:   * How will you use test data to evaluate your system’s performance? * What criteria are you using to trial the operation and maintenance documentation? * How will peer feedback contribute to your project refinement? * What modifications are needed based on your testing outcomes? * How does the system implementation impact its intended environment? * How will you document and address the feedback received during testing?   Students complete Section 4 of the project documentation.  Students deliver a 4-minute presentation which simulates the handover of their enterprise system to their client as part of their assessment task. | Students will be able to demonstrate collection of data using the chosen testing method.  Students complete Section 4 of their project documentation.  Students participate in class discussion on the Testing and evaluating stage of development.  Students complete a presentation in class, replicating a client handover with a walkthrough of the project. | Suggested adjusted activities. This section is also for use in school when making adjustments to support all students to achieve in their learning.  Students can be given writing scaffolds to complete the project documentation.  Writing scaffolds can also be used to write the scripted part of their presentation to their clients or peers.  Provide visual and/or multimedia examples and check understanding of concepts.  Prompt student discussion with real-world scenarios and examples.  Message abundancy may be useful when introducing new terminology. The word is spoken, written on the board and represented by visuals.  Include multiple opportunities to respond, for example:   * verbally * individually * partner turn and talk * non-verbally * gesture * response cards. |  |

# Overall program evaluation

Collating ongoing evaluations and reflecting on the strengths and areas for development within the program creates opportunities to enhance student outcomes. The following prompts can be used to support your evaluation of the program:

* Did the program assist all students to improve in their learning?
* How could the sequencing of the program be improved?
* What did the student evaluations of the program indicate? How can these be actioned to improve the program?
* The strategies and resources that were most effective for student learning were …
* Teaching strategies and resources that would benefit from review and refinement are …

## Capturing student voice when evaluating a program

Student voice is useful in the evaluation process for programs. The statements below could be useful as a starting point when asking students to provide feedback on their learning experiences. These statements are derived from some of the themes from [What works best 2020 update](https://education.nsw.gov.au/about-us/education-data-and-research/cese/publications/research-reports/what-works-best-2020-update) (CESE 2020a) and could be useful in teacher reflection on how these themes could be incorporated into a teaching program. The statements could also prompt student reflection on their metacognitive processes while learning.

**Please rate how much you agree with these statements**:

* My teacher had confidence that I could achieve and improve in my learning. (CESE 2020a Chapter 1: High expectations).
* I had a clear idea of what I was learning and why. (CESE 2020a Chapter 2: Explicit teaching)
* I used the feedback provided to improve my performance. (CESE 2020a Chapter 3: Effective feedback)
* I understood the feedback on the assessment task. (CESE 2020a Chapter 3: Effective feedback)
* I was able to predict the marks I achieved in the assessment tasks. (CESE 2020a Chapter 5: Assessment)
* The activities in the unit prepared me for the assessment task. (CESE 2020a Chapter 5: Assessment)
* I found the activities in the lessons interesting to me. (CESE 2020a Chapter 7: Wellbeing)
* I made valuable contributions to the class during this unit. (CESE 2020a Chapter 7: Wellbeing)
* I ask questions in class when I don’t understand yet. (CESE 2020a Chapter 7: Wellbeing)

**Optional open-ended prompts**:

* The lessons and/or activities that I most enjoyed were when we … because …
* When the learning was difficult, the strategy I used was …
* If I was giving advice to a student who was starting this unit, I would tell them to …
* If I was giving advice to a teacher who was teaching this unit, I would tell them to …

# Additional information

For additional support or advice, contact the TAS curriculum team by emailing [TAS@det.nsw.edu.au](mailto:TAS@det.nsw.edu.au).

## Further implementation support

Curriculum design and implementation is a dynamic and contextually-specific process. The department is committed to supporting teachers to meet the needs of all students. The advice below on assessment and planning for the needs of every student may be useful when considering the material presented in this sample program of learning.

## Assessment for learning

Possible formative assessment strategies that could be included:

* Learning intentions and success criteria assist educators to articulate the purpose of a learning task to make judgements about the quality of student learning. These help students focus on the task or activity taking place and what they are learning and provide a framework for reflection and feedback. [Online tools](https://app.education.nsw.gov.au/digital-learning-selector/LearningActivity/Card/622) can assist implementation of this formative assessment strategy.
* Eliciting evidence strategies allow teachers to determine the next steps in learning and assist teachers in evaluating the impact of teaching and learning activities. Strategies that may be added to a learning sequence to elicit evidence include all student response systems, [exit tickets](https://app.education.nsw.gov.au/digital-learning-selector/LearningActivity/Card/543), mini whiteboards (actual or [digital](https://app.education.nsw.gov.au/digital-learning-selector/LearningActivity/Card/575)), [hinge questions](https://app.education.nsw.gov.au/digital-learning-selector/LearningActivity/Card/560), [Kahoot](https://app.education.nsw.gov.au/digital-learning-selector/LearningTool/Card/621), [Socrative](https://app.education.nsw.gov.au/digital-learning-selector/LearningTool/Card/587), or quick quizzes to ensure that individual student progress can be monitored and the lesson sequence adjusted based on formative data collected.
* Feedback is designed to close the gap between current and desired performance by informing teacher and student behaviour (AITSL 2017). AITSL provides a [factsheet to support evidence-based feedback](https://www.aitsl.edu.au/teach/improve-practice/feedback#:~:text=FEEDBACK-,Factsheet,-A%20quick%20guide).
* [Peer feedback](https://app.education.nsw.gov.au/digital-learning-selector/LearningActivity/Card/549) is a structured process where students evaluate the work of their peers by providing valuable feedback in relation to learning intentions and success criteria. It can be supported by [online tools](https://app.education.nsw.gov.au/digital-learning-selector/LearningActivity/Browser?cache_id=1d29b).
* Self-regulated learning opportunities assist students in taking ownership of their own learning. A variety of strategies can be employed and some examples include reflection tasks, [Think-Pair-Share](https://app.education.nsw.gov.au/digital-learning-selector/LearningActivity/Card/645), [KWLH charts](https://app.education.nsw.gov.au/digital-learning-selector/LearningActivity/Card/562), [learning portfolios](https://app.education.nsw.gov.au/digital-learning-selector/LearningActivity/Card/583) and [learning logs](https://app.education.nsw.gov.au/digital-learning-selector/LearningActivity/Card/583).

The primary role of assessment is to establish where individuals are in their learning so that teaching can be differentiated and further learning progress can be monitored over time.

Feedback that focuses on improving tasks, processes and student self-regulation is the most effective. Students engaging with feedback can take many forms including formal, informal, formative, summative, interactive, demonstrable, visual, written, verbal and non-verbal (CESE 2020a).

## Differentiation

Differentiated learning can be enabled by differentiating the teaching approach to content, process, product and the learning environment. For more information on differentiation go to [Differentiating learning](https://education.nsw.gov.au/teaching-and-learning/professional-learning/teacher-quality-and-accreditation/strong-start-great-teachers/refining-practice/differentiating-learning) and [Differentiation](https://education.nsw.gov.au/campaigns/inclusive-practice-hub/primary-school/teaching-strategies/differentiation).

When using these resources in the classroom, it is important for teachers to consider the needs of all students in their class, including:

* **Aboriginal and Torres Strait Islander students**. Targeted [strategies](https://education.nsw.gov.au/teaching-and-learning/aec/aboriginal-education-in-nsw-public-schools) can be used to achieve outcomes for Aboriginal students in K-12 and increase knowledge and understanding of Aboriginal histories and cultures. Teachers should utilise students’ Personalised Learning Pathways to support individual student needs and goals.
* **EAL/D learners**. EAL/D learners will require explicit English language support and scaffolding, informed by the [EAL/D enhanced teaching and learning cycle](https://education.nsw.gov.au/teaching-and-learning/curriculum/literacy-and-numeracy/resources-for-schools/eald/enhanced-teaching-and-learning-cycle) and the student’s phase on the [EAL/D Learning Progression](https://education.nsw.gov.au/teaching-and-learning/curriculum/multicultural-education/english-as-an-additional-language-or-dialect/planning-eald-support/english-language-proficiency). In addition, teachers can access information about [supporting EAL/D learners](https://education.nsw.gov.au/teaching-and-learning/curriculum/multicultural-education/english-as-an-additional-language-or-dialect/planning-eald-support/english-language-proficiency) and [literacy and numeracy support specific to EAL/D learners](https://education.nsw.gov.au/teaching-and-learning/curriculum/literacy-and-numeracy/resources-for-schools/eald).
* **Students with additional learning needs**. Learning adjustments enable students with disability and additional learning and support needs to access syllabus outcomes and content on the same basis as their peers. Teachers can use a range of [adjustments](https://education.nsw.gov.au/teaching-and-learning/disability-learning-and-support/personalised-support-for-learning/adjustments-to-teaching-and-learning) to ensure a personalised approach to student learning. Subject specific curriculum considerations can be found on the [Inclusive Practice hub](https://education.nsw.gov.au/campaigns/inclusive-practice-hub).
* **High potential and gifted learners**. [Assessing and identifying high potential and gifted learners](https://education.nsw.gov.au/teaching-and-learning/high-potential-and-gifted-education/supporting-educators/assess-and-identify#Assessment1) will help teachers decide which students may benefit from extension and additional challenge. [Effective strategies and contributors to achievement](https://education.nsw.gov.au/teaching-and-learning/high-potential-and-gifted-education/supporting-educators/evaluate) for high potential and gifted learners help teachers to identify and target areas for growth and improvement. In addition, the [Differentiation Adjustment Tool](https://education.nsw.gov.au/teaching-and-learning/high-potential-and-gifted-education/supporting-educators/implement/differentiation-adjustment-strategies) can be used to support the specific learning needs of high potential and gifted students. The [High Potential and Gifted Education Professional Learning and Resource Hub](https://schoolsnsw.sharepoint.com/sites/HPGEHub/SitePages/Home.aspx) supports school leaders and teachers to effectively implement the High Potential and Gifted Education Policy in their unique contexts.

All students need to be challenged and engaged to develop their potential fully. A culture of high expectations needs to be supported by strategies that both challenge and support student learning needs, such as through appropriate curriculum differentiation (CESE 2020a:6).

## Support and alignment

**Resource evaluation and support**: all curriculum resources are prepared through a rigorous process. Resources are periodically reviewed as part of our ongoing evaluation plan to ensure currency, relevance and effectiveness. For additional support or advice contact the TAS curriculum team by emailing [TAS@det.nsw.edu.au](mailto:TAS@det.nsw.edu.au).

**Differentiation**: further advice to support Aboriginal and Torres Strait Islander students, EALD students, students with a disability and/or additional needs and High Potential and gifted students can be found on the [Planning programming and assessing 7–12](https://education.nsw.gov.au/teaching-and-learning/curriculum/planning-programming-and-assessing-k-12/planning-programming-and-assessing-7-12) webpage. This includes the [Inclusion and differentiation 7–10 advice](https://education.nsw.gov.au/teaching-and-learning/curriculum/planning-programming-and-assessing-k-12/planning-programming-and-assessing-7-12/inclusion-and-differentiation-advice-7-10) webpage.

**Assessment**: further advice to support formative assessment is available on the [Planning programming and assessing 7–12](https://education.nsw.gov.au/teaching-and-learning/curriculum/planning-programming-and-assessing-k-12/planning-programming-and-assessing-7-12) webpage. This includes the [Classroom assessment advice 7–10](https://education.nsw.gov.au/teaching-and-learning/curriculum/planning-programming-and-assessing-k-12/planning-programming-and-assessing-7-12/classroom-assessment-advice-7-10-). For summative assessment tasks, the [Assessment task advice 7–10](https://education.nsw.gov.au/teaching-and-learning/curriculum/planning-programming-and-assessing-k-12/planning-programming-and-assessing-7-12/assessment-task-advice-7-10) webpage is available.

**Consulted with**: Curriculum and Reform and subject matter experts

**Alignment to system priorities and/or needs**: [School Excellence Policy](https://education.nsw.gov.au/policy-library/policies/pd-2016-0468)

**Alignment to the School Excellence Framework**: this resource supports the [School Excellence Framework](https://education.nsw.gov.au/policy-library/policies/pd-2016-0468) elements of curriculum (curriculum provision) and effective classroom practice (lesson planning, explicit teaching).

**Alignment to Australian Professional Standards for Teachers**: this resource supports teachers to address [Australian Professional Standards for Teachers](https://educationstandards.nsw.edu.au/wps/portal/nesa/teacher-accreditation/meeting-requirements/the-standards/proficient-teacher) 1.1.2, 1.2.2, 1.3.2, 2.1.2, 2.2.2, 2.6.2, 3.2.2, 3.3.2, 3.4.2, 4.5.2, 6.2.2.

**NSW syllabus**: Enterprise Computing 11–12

**Syllabus outcomes**: EC-12-06, EC-12-07, EC-12-08, EC-12-09, EC-12-10, EC-12-11

**Author**: TAS, Curriculum Secondary Learners, Curriculum Reform

**Publisher**: State of NSW, Department of Education

**Resource**: Program of learning

**Related resources**: further resources to support Enterprise Computing 11–12 can be found on the [TAS curriculum page](https://education.nsw.gov.au/teaching-and-learning/curriculum/tas).

**Professional learning**: relevant professional learning is available through [HSC Professional Learning](https://education.nsw.gov.au/teaching-and-learning/professional-learning/hsc-pl) or on the [TAS curriculum page](https://education.nsw.gov.au/teaching-and-learning/curriculum/tas).

**Creation date:** 2024

**Rights**: © State of New South Wales, Department of Education.

# Evidence base

[Enterprise Computing 11–12 Syllabus](https://curriculum.nsw.edu.au/learning-areas/tas/enterprise-computing-11-12-2022/overview) © NSW Education Standards Authority (NESA) for and on behalf of the Crown in right of the State of New South Wales, 2022.

[Higher School Certificate Course Specifications – Enterprise Computing (PDF 2.3 MB)](https://library.curriculum.nsw.edu.au/341419dc-8ec2-0289-7225-6db7f2d751ef/1299d565-a98e-4578-a5c6-53262a5ecc08/enterprise-computing-11-12-higher-school-certificate-course-specifications.PDF) © NSW Education Standards Authority (NESA) for and on behalf of the Crown in right of the State of New South Wales, 2022.

AITSL (Australian Institute for Teaching and School Leadership) (n.d.) [*Learning intentions and success criteria* (PDF 251 KB)](https://www.aitsl.edu.au/docs/default-source/feedback/aitsl-learning-intentions-and-success-criteria-strategy.pdf?sfvrsn=382dec3c_2#:~:text=Learning%20Intentions%20are%20descriptions%20of,providing%20feedback%20and%20assessing%20achievement.), AITSL, accessed 3 April 2024.

AITSL (2017) ‘[Feedback Factsheet](https://www.aitsl.edu.au/teach/improve-practice/feedback#:~:text=FEEDBACK-,Factsheet,-A%20quick%20guide)’, AITSL, accessed 3 April 2024.

Brookhart S (2011) How to Assess Higher-Order Thinking Skills in Your Classroom, Hawker Brownlow Education, Victoria.

CESE (Centre for Education Statistics and Evaluation) (2020a) [*What works best: 2020 update*](https://education.nsw.gov.au/about-us/education-data-and-research/cese/publications/research-reports/what-works-best-2020-update), NSW Department of Education, accessed 3 April 2024.

CESE (2020b) [*What works best in practice*](https://education.nsw.gov.au/about-us/education-data-and-research/cese/publications/practical-guides-for-educators-/what-works-best-in-practice), NSW Department of Education, accessed 3 April 2024.

NESA (NSW Education Standards Authority) (2022) ‘[Advice on units](https://educationstandards.nsw.edu.au/wps/portal/nesa/k-10/understanding-the-curriculum/programming/advice-on-units)’, Programming*,* NESA website, accessed 3 April 2024.

NESA (NSW Education Standards Authority) (2022) ‘[Proficient Teacher Standard Descriptors](https://www.nsw.gov.au/education-and-training/nesa/teacher-accreditation/proficient-teacher/standard-descriptors)’, The Standards, NESA website, accessed 3 April 2024.

NESA (NSW Education Standards Authority) (2022) ‘[Programming](https://educationstandards.nsw.edu.au/wps/portal/nesa/k-10/understanding-the-curriculum/programming)’, *Understanding the curriculum*, NESA website, accessed 3 April 2024.

Rosenshine B (2012) ‘[Principles of Instruction: Research-Based Strategies That All Teachers Should Know](https://eric.ed.gov/?id=EJ971753)’, American Educator, 36(1):12–19 accessed 3 April 2024.

Wiliam D (2013) ‘[Assessment: The Bridge between Teaching and Learning](https://www.researchgate.net/publication/258423377_Assessment_The_bridge_between_teaching_and_learning)’, Voices from the Middle, 21(2):15–20, accessed 3 April 2024.

Wiliam D (2017) Embedded Formative Assessment, 2nd edn, Solution Tree Press, Bloomington, IN.

Wisniewski B, Zierer K and Hattie J (2020) ‘[The Power of Feedback Revisited: A Meta-Analysis of Educational Feedback Research](https://doi.org/10.3389/fpsyg.2019.03087)’, Frontiers In Psychology, 10:3087, doi:10.3389/fpsyg.2019.03087, accessed 3 April 2024.

# References

This resource contains NSW Curriculum and syllabus content. The NSW Curriculum is developed by the NSW Education Standards Authority. This content is prepared by NESA for and on behalf of the Crown in right of the State of New South Wales. The material is protected by Crown copyright.

Please refer to the NESA Copyright Disclaimer for more information <https://educationstandards.nsw.edu.au/wps/portal/nesa/mini-footer/copyright>.

NESA holds the only official and up-to-date versions of the NSW Curriculum and syllabus documents. Please visit the NSW Education Standards Authority (NESA) website <https://educationstandards.nsw.edu.au> and the NSW Curriculum website <https://curriculum.nsw.edu.au>.

[Enterprise Computing 11–12 Syllabus](https://curriculum.nsw.edu.au/learning-areas/tas/enterprise-computing-11-12-2022/overview) © NSW Education Standards Authority (NESA) for and on behalf of the Crown in right of the State of New South Wales, 2022.

[Higher School Certificate Course Specifications – Enterprise Computing (PDF 2.3 MB)](https://library.curriculum.nsw.edu.au/341419dc-8ec2-0289-7225-6db7f2d751ef/1299d565-a98e-4578-a5c6-53262a5ecc08/enterprise-computing-11-12-higher-school-certificate-course-specifications.PDF) © NSW Education Standards Authority (NESA) for and on behalf of the Crown in right of the State of New South Wales, 2022.

**© State of New South Wales (Department of Education), 2024**

The copyright material published in this resource is subject to the Copyright Act 1968 (Cth) and is owned by the NSW Department of Education or, where indicated, by a party other than the NSW Department of Education (third-party material).

Copyright material available in this resource and owned by the NSW Department of Education is licensed under a [Creative Commons Attribution 4.0 International (CC BY 4.0) license](https://creativecommons.org/licenses/by/4.0/).

[](https://creativecommons.org/licenses/by/4.0/)

This license allows you to share and adapt the material for any purpose, even commercially.

Attribution should be given to © State of New South Wales (Department of Education), 2024.

Material in this resource not available under a Creative Commons license:

* the NSW Department of Education logo, other logos and trademark-protected material
* material owned by a third party that has been reproduced with permission. You will need to obtain permission from the third party to reuse its material.

**Links to third-party material and websites**

Please note that the provided (reading/viewing material/list/links/texts) are a suggestion only and implies no endorsement, by the New South Wales Department of Education, of any author, publisher, or book title. School principals and teachers are best placed to assess the suitability of resources that would complement the curriculum and reflect the needs and interests of their students.

If you use the links provided in this document to access a third-party's website, you acknowledge that the terms of use, including licence terms set out on the third-party's website apply to the use which may be made of the materials on that third-party website or where permitted by the Copyright Act 1968 (Cth). The department accepts no responsibility for content on third-party websites.