# iSTEM – STEM fundamentals sample assessment package

**Learning portfolio**



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## Advice to teachers

**Note:** The examples in this package are provided so that schools and teachers may choose relevant information and adjust for their contexts and their school-based practices. Relevant information should be transferred into the school’s assessment task template.

Students will work in groups to discuss, plan, design, analyse results, and communicate findings from a series of design challenges. The final submission should include examples of work to cover all the components of the iSTEM engineering design process.

Teachers should understand the language and cultural demands related to the topic and consider how EAL/D learners can be supported to access the required basic skills. They will need to be confident in their explanations of third angle orthographic drawings, isometric projections, data collection and representation. Teachers should practice utilising basic CAD software and coding of microcontrollers to prepare to help troubleshoot issues that may occur.

Consider creating a glossary of STEM terminology and exemplars of portfolio items to provide students with a better understanding of task appropriate visual and written communication.

### Learning portfolio

Learning portfolios are a purposefully selected compilation of student work and should be presented in a logical manner. They showcase student learning, and academic growth over time. They can be presented in different formats and are usually presented in a physical or digital folder; however, consideration should be given to the student’s preferred communication method.

### Evidence of learning

One of the aims of this assessment is for students to demonstrate knowledge, skills and understanding of essential STEM principles and processes, which are fundamental for specialised topics.

Students will:

* be able to identify how engineering design processes can be used to solve problems.
* brainstorm ideas, consider goals and constraints, and create and label sketches.
* construct physical design solutions based on design sketches and technical drawings and be able to provide reasoning for the choices they made during the design process.
* utilise basic CAD and coding skills to complete some of the challenges.

### Assessment type

This task is intended to directly contribute to the final course assessment.

Summative assessment occurs at the end of a topic and indicates a student’s achievement level against learning outcomes. It gives teachers information they use to make accurate, consistent judgements about a student’s learning progress.

This task is intended to collate student work from the topic and create opportunities for teachers to assess student progress. Setting milestones to ensure students are collating their design solutions will help them with managing the task. Students will be assessed on their ability to engage appropriately with each part of the engineering design process. Teachers should ensure that assessment activities are accessible to [students with disability.](https://educationstandards.nsw.edu.au/wps/portal/nesa/k-10/diversity-in-learning/special-education/assessment-and-reporting) Teachers will outline the number and type of portfolio entries for their individual school.

### Duration

Over the course of 10 weeks students will participate in multiple design challenges that will be included in the portfolio. Assessment guidelines should be given to students in Week 2 so they can begin to collate their work with the task in mind. Students should be given 2 periods of class time to finish bringing together their group's portfolio at the end of the topic. Assessment advice and due dates should be informed by school assessment policy and assessment schedules.

### Scheduling and weighting

STEM fundamentals is intended to be the first topic delivered in the iSTEM course. Weightings are a school-based decision.

### Inclusion and wellbeing

This assessment package has been prepared by the NSW Department of Education. It has been developed as a model for teachers to assist in the development of an assessment task that can be contextualised to an individual school's needs.

Plan assessment tasks that are inclusive and accommodate the needs of all students in your classroom. Some students may require more specific adjustments and enhancements to allow them to participate on the same basis. The iSTEM [learning sequences](https://education.nsw.gov.au/teaching-and-learning/curriculum/department-approved-courses/istem#/asset4) have example adjustments and enhancements. For further advice, see [Inclusive practice resources for secondary school](https://education.nsw.gov.au/campaigns/inclusive-practice-hub/secondary-school).

Outcomes referred to in this document are from the [iSTEM course document](https://education.nsw.gov.au/teaching-and-learning/curriculum/department-approved-courses/istem#/asset2) © NSW Department of Education, 2021 for and on behalf of the crown in the State of New South Wales (2021).

## Advice to students

Teachers should include their details of due date, weighting, and submission guidelines as per their school practice.

### Task details

**Type of task:** Design challenges

**Format:** Learning portfolio

**Weighting:** School-based decision

**Submission:** Students complete challenges and portfolios in groups.

**Description:** Students construct a learning portfolio to demonstrate successful completion of various design challenges, evaluations, and reflections conducted over the course of the STEM fundamentals topic. Collection of physical or digital documents as determined with teacher.

**Outcomes assessed:**

* **ST5-1** designs and develops creative, innovative, and enterprising solutions to a wide range of STEM-based problems
* **ST5-2** demonstrates critical thinking, creativity, problem-solving, entrepreneurship and engineering design skills and decision-making techniques in a range of STEM contexts
* **ST5-3** applies engineering design processes to address real-world STEM-based problems
* **ST5-4** works independently and collaboratively to produce practical solutions to real-world scenarios
* **ST5-6** selects and safely uses a range of technologies in the development, evaluation, and presentation of solutions to STEM-based problems
* **ST5-9** collects, organises, and interprets data sets, using appropriate mathematical and statistical methods to inform and evaluate design decisions.

### Managing your time

Use this checklist as a progress guide during the topic.

Table – Student progress

|  |  |
| --- | --- |
| Steps | Complete |
| Brainstorming ideas |  |
| Thumbnail sketches |  |
| Technical drawings |  |
| Scale drawings |  |
| CAD and prototyping |  |
| Coding |  |
| Collecting and preparing data (spreadsheets) |  |
| Communication |  |
| Reflections |  |
| Effective groupwork |  |

### Creating your learning portfolio

Your learning portfolio will need to show evidence of each of the following areas.

#### Brainstorming ideas

Components of the iSTEM engineering design process should be incorporated into each design challenge, including defining problems, identifying constraints, and brainstorming possible solutions. Show the techniques used to achieve each part of the process. Mind maps and other brainstorming activities will be presented in the learning portfolio.

Incorporate knowledge gained in class to help with the research of ideas for each design solution. Consider assistive and traditional technologies to help generate new solutions to presented design challenges.

#### Designing possible solutions

Designs of solutions will be included in the learning portfolio, including:

* thumbnail sketches
* technical drawings (orthographic and isometric)
* scale drawings.

All sketches and drawings will be labelled and include reflections on changes made throughout the design process. CAD software will be used to create scale drawings and models of selected solutions.

#### Prototyping

Prototypes should be:

* innovative
* representative of drawings
* photographed at different stages of building.

Different versions of the prototype should have clear explanations of any changes you made based on testing.

#### Coding

Features of a program written in the selected general-purpose coding language will be uploaded to a microcontroller. Evidence of code writing and use with connected devices will be given as part of the learning portfolio. Document the coding process to show steps taken to create properly functioning code.

To demonstrate successful code writing you should have evidence of:

* properly functioning code
* debugging of syntax errors
* correction of code’s logic errors.

This can be done with videos if the final portfolio is in a digital format.

Collecting and charting data

Accurate collection and recording of data are required to inform analysis, evaluations, and iterations. Data will be collated into an appropriate format. Charts showing a comparison between the results of different iterations of designs should be produced and presented. Spreadsheet software, previously demonstrated in class, should be used to analyse the data, and produce the charts.

#### Communication

All aspects of the engineering design process should be included somewhere in the final portfolio. Suitable forms of digital, visual, and written communication should be used to convey gained knowledge. Appropriate use of terminology should be used throughout.

#### Reflections and effective groupwork

The learning portfolio should have a collection of reflections from different group members of each different part of the design process. The reflections should be about how well different parts of the challenge were completed and how they could be improved. For example:

* Was our brainstorming effective and why?
* What parts of our design worked according to plan and why?
* How effective was our method of data collection? And how could we improve?
* Did iterations of designs improve the outcome? Why or why not?
* Given more time or different resources what could be done differently?
* How well did our group work as a team and what did I contribute?

All group members should communicate opinions and ideas respectfully and encourage each other to share solutions. Goals and timelines should be met, and the progress of the design challenge monitored. There should be an active discourse between different groups in the class to help make critical evaluations of solutions and iterations.

## Marking rubric

**Note:** The criteria and outcomes presented in this table are not mandatory for assessing the task. Teachers are encouraged to select and/or adjust criteria based on their students’ needs and the assessment and reporting requirements of their school.

Table 2 – Marking rubric

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Criteria | A | B | C | D | E |
| Brainstorming ideas  ST5-2 | Demonstrates critical thinking skills to ideate solutions to design challenges. | Demonstrates ability to ideate solutions to design challenges. | Demonstrates ability to ideate solutions that could meet design challenge requirements. | Ideates simple solutions that could meet some aspects of design challenges. | Suggests a solution that could meet design challenge requirements. |
| Designing solutions – Sketches  ST5-1 | Documents multiple labelled and annotated design solution sketches that are appropriate for the planned challenges. | Documents multiple labelled design solution sketches that are appropriate for the planned challenges. | Documents design solution sketches that are appropriate for the planned challenges. | Documents basic design solution sketches. | Sketches are missing or incomplete. |
| Designing solutions – Technical drawings  ST5-6 | Accurately demonstrates a wide range of graphical communication techniques, including third angle orthographical drawings and isometric projections, with point-to-point dimensions. | Accurately demonstrates a range of graphical communication techniques, including orthographical drawings and isometric projections. | Demonstrates a range of graphical communication techniques, including orthographical drawings and/or isometric projections. | Demonstrates graphical communication techniques, including orthographical drawings or isometric projections. | Demonstrates limited graphical communication techniques. |
| Designing solutions – CAD  ST5-6 | 3D models precisely match drawings, are proportional, and have been appropriately rendered. | 3D models match drawings and are proportional. | 3D models match drawings. | 3D models are similar to drawings. | 3D model presented with limited relationship to drawings. |
| Prototyping  ST5-3 | Creates an innovative prototype able to exceed challenge criteria based on chosen sketches.  Efficient selection and use of materials and equipment. | Creates a prototype able to meet challenge criteria based on chosen sketches.  Appropriate selection and use of materials and equipment. | Creates a prototype based on chosen sketches.  Clear selection and use of materials and equipment. | Creates a prototype.  Use of materials or equipment. | Incomplete prototype.  Limited use of materials or equipment. |
| Coding  ST5-2 | Correctly and efficiently enters instructions or code into the coding environment and successfully uploads it onto a microcontroller.  Identifies when code is not functioning properly and can efficiently debug syntax errors and correct logic. | Enters instructions or code into the coding environment and successfully uploads it onto a microcontroller.  Identifies when code is not functioning properly and can debug syntax errors and correct logic. | Enters instructions or code into the coding environment and uploads it onto a microcontroller.  Identifies when code is not functioning properly and can debug syntax errors and/or correct logic. | Enters instructions or code into the coding environment and attempts to upload it onto a microcontroller.  Identifies when code is not functioning properly and attempts to debug syntax errors or correct logic. | Enters instructions or code incorrectly into the coding environment and/or does not upload it onto a microcontroller.  Identifies when code is not functioning properly. |
| Collecting and charting data  ST5-9 | Accurately collects, organises, and interprets data sets, using mathematical and statistical methods.  Appropriate charts with accurate labels and data. | Collects, organises, and interprets data sets, using mathematical methods.  Charts with accurate labels and data. | Collects, organises, and interprets data sets.  Charts with mostly accurate labels and data. | Collects and organises data sets. Charts with labels and data. | Collects and/or interprets data in a limited manner. |
| Communication  ST5-6 | Effectively selects and uses high level STEM terminology and compelling persuasive forms of digital, visual, and/or written communication.  Language enhances the communication by its use of descriptive verbs and has correct spelling, punctuation and grammar. | Uses effective STEM terminology and persuasive digital, visual or written communication.  Spelling, punctuation and grammar are correct and appropriate. | Uses some STEM terminology and persuasive digital, visual or written communication.  Spelling and grammar are appropriate and generally correct. | Uses basic STEM terminology and digital, visual or written communication.  Frequent spelling, punctuation and grammatical errors. | Uses limited or incorrect STEM terminology and digital, visual or written communication.  Language or grammar is unclear. |

## Student collaboration

**Note:** The criteria and outcomes presented in this table are not mandatory for assessing the task. Teachers are encouraged to select and/or adjust criteria based on their students’ needs and the assessment and reporting requirements of their school. This table allows teachers to give individual collaboration marks to different members of a group. Teachers may consider student self-evaluation when utilising this table.

Table – Student collaboration rubric

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Criteria | A | B | C | D | E |
| Effective groupwork  ST5-4 | Communicates opinions and ideas respectfully, succinctly, and logically. Encourages others to share problems and solutions and gives effective feedback. | Communicates opinions and ideas respectfully. Encourages others to share problems and solutions and gives feedback. | Respectfully expresses opinions and ideas.  Asks others to share problems and solutions. | Expresses opinions and ideas. | Expresses limited opinions or ideas. |
| Reflections  ST5-4 | Critical reflection of personal motivations and expectations that drove them to chosen solutions. | Reflection of personal motivations and expectations that drove them to chosen solutions. | Reflection of expectations that drove them to chosen solutions. | Reflection of what drove them to chosen solutions. | Limited reflection of what drove them to chosen solutions. |
| Discourse  ST5-4 | Demonstrates meaningful discourse with other groups to gain ideas for iteration of solutions. | Demonstrates discourse with other groups to gain ideas for iteration of solutions. | Demonstrates discourse with other groups about their chosen solutions | Explains their chosen solutions to other groups. | Limited interaction with other groups. |

## STEM skills student self-evaluation

**Note:** The self-evaluation tool is designed to be used as a prompt and a continuous reflection tool for students. Teachers ask students to submit it at the end of a task use with the marking guideline. However, the self-evaluation tool can be used throughout iSTEM topics and tasks. Teachers can demonstrate the use of this self-evaluation tool.

Table – Student self-evaluation rubric

|  |  |  |  |
| --- | --- | --- | --- |
| Skill | Developing | Sound | Outstanding |
| Role allocation | Identifies some specific individual roles within the team. | Identifies specific individual roles within the team and makes suggestions as to how they should be allocated. | Matches team members to roles according to the specific requirements of the task based on the skills of the individual. |
| Open communication | Expresses opinions and ideas. | Respectfully expresses opinions and ideas. | Communicates opinions and ideas respectfully, succinctly, and logically. Encourages others to share problems and solutions. |
| Listening and negotiation | Uses some active listening and negotiation skills. | Demonstrates skills in active listening and negotiation. | Demonstrates high-level active listening and negotiation skills. |
| Engages in and monitors teamwork | Takes responsibility in a negotiated role to follow a plan to meet goals and timelines. | Takes responsibility for roles within the team and works with others to meet goals and timelines and monitor progress of the task. | Demonstrates responsibility in several roles and in decision-making so that goals and timelines are met, and the progress of the task is monitored. |
| Safely uses a range of technologies | Takes responsibility for maintaining a safe working environment when reminded by others. | Takes responsibility for maintaining a safe working environment. | Demonstrates a high level of responsibility for maintaining a safe working environment. |
| Applies project management strategies | Identifies some processes that assisted the team to complete the task. | Describes the effectiveness of some parts of the plan and some processes used by the team to complete the task. | Evaluates the effectiveness of the planning and processes used by the team in completing the task. |

## Additional information

Please complete the following [feedback form](https://forms.office.com/Pages/ResponsePage.aspx?id=muagBYpBwUecJZOHJhv5kbKo2q_ZUXlHndJMnh2Wd8NUOUk0VTIzUDVVSlVFQVM5MkdOMkJGTjVKNCQlQCN0PWcu) to help us improve our resources and support.

The information below can be used to support teachers when using this assessment package for iSTEM.

### Rationale

Australian businesses competing in a global economy will need more employees trained in science, technology, engineering, and mathematics (STEM). Research indicates that 75% of the fastest-growing occupations require STEM skills. Global accounting firm PwC (formerly known as PricewaterhouseCoopers) produced a report titled [‘A smart move’](https://www.pwc.com.au/publications/a-smart-move.html) where it found that shifting just 1% of the Australian workforce into STEM roles would add $57.4 billion to the Gross Domestic Product (GDP) (net present value over 20 years).

iSTEM is a student-centred Stage 5 elective course that delivers science, technology, engineering, and mathematics education in an interdisciplinary, innovative, and integrated fashion. It was developed in direct response to industry’s urgent demand for young people skilled in science, technology, engineering, and mathematics.

The course was developed in collaboration with, and is supported by, industry, business, government, and universities, ensuring that students develop future-focused STEM skills. The course has a number of specialised topics, many of which are aligned with NSW State Government priority industries, identified in the [NSW Industry Development Framework](https://www.investment.nsw.gov.au/living-working-and-business/nsw-industry-development-framework/).

iSTEM develops enabling skills and knowledge that increasingly underpin many professions and trades, and the skills of a technologically enabled workforce. It provides students with learning opportunities to develop knowledge and skills to use the most up-to-date technologies including additive manufacturing (3D printing), laser cutters, augmented and virtual reality, drones, smart robotics and automation systems, Artificial Intelligence (AI) and a range of digital systems.

Students gain and apply knowledge, deepen their understanding, and develop collaborative, creative and critical thinking skills within authentic, real-world contexts. The course uses inquiry, problem and project-based learning approaches to solve problems and produce practical solutions utilising engineering design processes.

iSTEM is aligned to the concept of ‘[Industry 4.0](https://www.weforum.org/agenda/2019/01/why-companies-should-strive-for-industry-4-0/)’ which refers to a new and emerging phase in the industrial revolution that heavily focuses on interconnectivity, automation, machine learning and real-time data.

iSTEM has been developed to meet the goals of National Federation Reform Council (NFRC) Education Council’s [National STEM School Education Strategy (2016-2026)](https://www.dese.gov.au/education-ministers-meeting/resources/national-stem-school-education-strategy), and supports the NSW Government’s [NSW Industry Development Framework](https://www.investment.nsw.gov.au/living-working-and-business/nsw-industry-development-framework/), the NSW Department of Education’s [Rural and Remote Education Strategy (2021-2024)](https://education.nsw.gov.au/about-us/strategies-and-reports/rural-and-remote-education-strategy-2021-24) and the [High Potential and Gifted Education policy](https://education.nsw.gov.au/policy-library/policies/pd-2004-0051).

### Aim

The aim of the course is to engage and encourage student interest and skills in STEM, appreciate the scope, impact and pathways into STEM careers, and learn how to work collaboratively, entrepreneurially, and innovatively to solve real-world problems.

### Purpose and audience

This assessment package provides a range of assessment strategies and supplementary material that can be used to support student achievement in the task outlined. This resource is for teachers when creating a program of assessment for the iSTEM course.

### When and how to use this document

Use the assessment package in the context that best supports your school context.

### 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/557), [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/564).

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.

[What works best update 2020](https://education.nsw.gov.au/about-us/educational-data/cese/publications/research-reports/what-works-best-2020-update) (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. In addition, the [Universal Design for Learning planning tool](https://education.nsw.gov.au/teaching-and-learning/learning-from-home/teaching-at-home/teaching-and-learning-resources/universal-design-for-learning) can be used to support the diverse learning needs of students using inclusive teaching and learning strategies. Subject specific curriculum considerations can be found on the [Inclusive Practice hub](https://education.nsw.gov.au/campaigns/inclusive-practice-hub/primary-school/teaching-strategies/differentiation).
* **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).

### About this resource

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 Teaching and Learning Curriculum team by emailing [secondaryteachingandlearning@det.nsw.edu.au](mailto:secondaryteachingandlearning@det.nsw.edu.au).

**Alignment to system priorities and/or needs**:

This resource aligns to the School Excellence Framework elements of curriculum (curriculum provision) and effective classroom practice (lesson planning, explicit teaching).

This resource supports teachers to address [Australian Professional Teaching Standards](https://educationstandards.nsw.edu.au/wps/portal/nesa/teacher-accreditation/meeting-requirements/the-standards/proficient-teacher) 5.1.2, 5.5.2

This resource has been designed to support schools with successful implementation of new curriculum, specifically the NSW Department of Education approved elective course, [iSTEM](https://education.nsw.gov.au/teaching-and-learning/curriculum/department-approved-courses/istem#/asset2) © 2021 NSW Department of Education for and on behalf of the Crown in right of the State of New South Wales.

The resource is produced to assist schools with promoting and implementing the course for the first time. As the course may be taught by teachers from a range of key learning areas, the resource is designed to support teachers from a variety of KLA expertise.

**Department approved elective course**: iSTEM

**Course outcomes**: ST5-1, ST5-2, ST5-3, ST5-4, ST5-6, ST5-9

**Author**: Curriculum Secondary Learners

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

**Resource**: Teaching resource

**Related resources**: Further resources to support iSTEM can be found on the Department approved elective courses webpage including course document, sample scope and sequences, assessment materials and other learning sequences.

**Professional Learning**: Join the [Teaching and Learning 7-12 statewide staffroom](https://education.nsw.gov.au/teaching-and-learning/curriculum/statewide-staffrooms) for information regarding professional learning opportunities.

**Universal Design for Learning Tool**: [Universal Design for Learning planning tool](https://education.nsw.gov.au/teaching-and-learning/learning-from-home/teaching-at-home/teaching-and-learning-resources/universal-design-for-learning). Support the diverse learning needs of students using inclusive teaching and learning strategies.

**Consulted with**: Aboriginal Outcomes and Partnerships, Inclusion and Wellbeing, and EAL/D.

**Reviewed by**: This resource was reviewed by Curriculum Secondary Learners and by subject matter experts in schools to ensure accuracy of content.

**Creation date**: 21 October 2022

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**Evidence base**

The range of assessment strategies outlined in the advice encourages ‘a variety of assessment methods each lesson to check for students’ understanding and inform what should be taught next’. (CESE, 2020a, p 22). The assessment strategies outlined are student-centred, providing ‘students with opportunities to reflect on their progress to inform future learning goals’ (CESE, 2020a, p 22).

The assessment advice complies with NESA’s assessment advice, outlined on NESA’s ACE website, NESA official notices and department memorandums. They:

* include statements of school procedures for allocating grades in Year 10
* set out requirements to retain student work samples to support grade allocation as required by NESA for the RoSA (NESA, 2006).

The assessment strategies outlined provide teachers with important information about whether students learned what was intended. Wiliam (2013) claims ‘the term formative should apply not to the assessment but to the function that the evidence generated by the assessment actually serves’.

## References

**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.

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