Computing Technology Stage 5 (Year 10) – sample program of learning

Enterprise systems – designing for user experience

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# 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/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 design for user experiences. The lessons and sequences in this program of learning are designed to allow students to develop the knowledge and skills to design for user experience as a solution to a user’s needs.

During Weeks 1 to 5 of the learning sequence, students will gain an understanding of the evolution of the development and impacts of user interfaces and interactive media, they will explore the functional and non-functional requirements of a variety of media, and will examine real-world problems evaluating social, ethical and legal impacts.

During Weeks 6 to 10 of the learning sequence, students will work to design and author a data dashboard utilising simulated or live data with consideration to privacy and cybersecurity. Students will demonstrate their understanding of presenting data by utilising filters and functions, making predictions, and identifying trends and outliers.

During Weeks 11 to 18 of the learning sequence, students will explore augmented reality (AR), mixed reality (MR), and virtual reality (VR) to understand how they develop immersive experiences. They will learn to effectively plan and oversee projects through an iterative approach. Students will also engage in the design and authoring of an interactive media product, while honing skills in managing, documenting, and explaining work practices during project development.

During Weeks 19 to 20 of the learning sequence, students will gain the skills to critically evaluate their own projects as well as those of their peers. They will develop a deep understanding of project assessment and feedback processes. Additionally, students will explore various career opportunities within the realms of user interface (UI) design and interactive media. This will provide them with insights into potential professional pathways in the field and help them make informed decisions about their future endeavours.

**Duration**: this program of learning is designed to be completed over a period of approximately 20 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:

* selects and applies safe, secure and responsible practices in the ethical use of data and computing technology **CT5-SAF-01**
* applies iterative processes to define problems and plan, design, develop and evaluate computing solutions **CT5-DPM-01**
* manages, documents and explains individual and collaborative work practices **CT5-COL-01**
* explains how data is stored, transmitted and secured in digital systems and how information is communicated in a range of contexts **CT5-DAT-01**
* communicates ideas, processes and solutions using appropriate media **CT5-COM-01**
* applies computational, design and systems thinking to the development of computing solutions **CT5-THI-01**
* acquires, represents, analyses and visualises simple and structured data **CT5-DAT-02**
* designs and creates user interfaces and the user experience **CT5-DES-01**

[Computing Technology 7–10 Syllabus](https://curriculum.nsw.edu.au/syllabuses/computing-technology-7-10-2022) © 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 – Week 1 – identifying and defining lesson sequence and details

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Outcomes and content | Teaching and learning activities | Evidence of learning | Differentiation/ adjustments | Registration and evaluation notes |
| **CT5-SAF-01****CT5-COL-01**Students:* describe the purpose of user interfaces (UIs).
 | **Learning intention**Investigate the development and impact of user interfaces (UIs) and interactive media and how these affect the user experience (UX).**Success criteria*** I can define and describe user interface (UIs).
* I can define and describe user experience (UX).
* I can define and describe interactive media (IM).
* I can use specialist terminology.
* I understand the difference between a UI designer and UX designer.

**Teaching and learning activity**Teacher introduces the learning sequence and gives an overview of the semester, outlining the sequence of activities and assessments.Students fill in a glossary as required or complete the glossary to ensure they are pre-taught vocabulary and can select and use specialist terminology in context.Teacher discusses the concepts and purpose of designing [user interfaces and user experience (10:07)](https://www.youtube.com/watch?v=5CxXhyhT6Fc), comparing these roles.Students fill in a glossary as required or complete the glossary to ensure they are pre-taught vocabulary and can select and use specialist terminology in context.Class discussion and analysis of a variety of user interfaces and the UI and UX design aspects of each, for example, mobile applications, web applications, game console dashboards and smart wear device interfaces.Students evaluate a variety of user interfaces constructing a [Plus, Minus, Interesting (PMI) table](https://app.education.nsw.gov.au/digital-learning-selector/LearningActivity/Card/551). | Students add to their glossary throughout the learning sequence to assist in correct use of specialist terminology.Students can define the concepts of user interface and user experience in a variety of real-world contexts.Students can explain the different roles of a UI designer and UX designer in the creation of an application or web system. | This section is also for use in school when making adjustments to support all students to achieve in their learning.Pre-teach key vocabulary and concepts prior to viewing videos, provide a transcript, and use closed captions when viewing.Provide a glossary and allow the use of bilingual dictionaries for uncommon terms and use visuals where appropriate. |  |
| **CT5-DPM-01**Students:* describe the purpose of user interfaces (UIs) and interactive media and how these affect the user experience (UX).
 | **Learning intention**Investigate the development and impact of user interfaces (UIs) and interactive media and how these affect the user experience (UX).**Success criteria*** I can describe the purpose of interactive media (IM).
* I have the knowledge to identify user interfaces (UIs) and interactive media and understand how these affect the user experience (UX).

**Teaching and learning activity**Teacher-led discussion on the term [interactive media](https://www.britannica.com/technology/interactive-media) and the interaction between digital systems and users including:* elements of interactive media
* integration of information technologies
* static vs dynamic.

Students define and describe the terms ‘static’ and ‘dynamic’, adding these to their glossary of terms.Students discuss and investigate the user experience of interactive and non-interactive media.Students examine the effect interactive media has on [user experience (5:48)](https://www.youtube.com/watch?v=-XvfcBpwVGY) in real-world applications including:* social networking applications (for example, Facebook, X)
* video games (utilising hardware to interact with audio and visuals)
* smart phone applications [(weather](https://www.ventusky.com/) and [map](https://www.google.com/maps) applications that change based on your location)
* [virtual (1:29)](https://www.youtube.com/watch?v=YLb1gnmsceA) and augmented reality.

Students identify the UI and IM components of a digital application and analyse the impact on user experience. | Students can describe the purpose of interactive media in a variety of real-world contexts.Students can identify user interfaces (UIs) and interactive media (IM) and understand how the designer creates and controls their effect in the creation of an application or web system.Students can document this research and their findings on IM, UIs and UX. | This section is also for use in school when making adjustments to support all students to achieve in their learning.Provide visual and/or multimedia examples and check understanding of concepts.Prompt student discussion with real-world scenarios and examples.Continue glossary and allow the use of bilingual dictionaries for uncommon terms and use visuals where appropriate. |  |
| **CT5-DPM-01**Students:* explore inputs, storage, transmission, processes and outputs in UIs or interactive media.
 | **Learning intention**Investigate the development and impact of user interfaces (UIs) and interactive media and how these affect the user experience (UX).**Success criteria*** I can define and describe input, storage, transmission, process and outputs in relation to digital applications.
* I can apply my understanding of inputs, storage, transmission, processes and outputs to describe UIs or interactive media.

**Teaching and learning activity**Teacher-led discussion and reflection on previous learning of a variety of real-world applications of UI and IM applications, and as a class discuss:* inputs, storage, transmission, processes and outputs of several applications.

As a class, view the [Adobe Creative Types website](https://mycreativetype.com/) and answer the following questions:* What inputs are present for the user?
* What media is involved and how would it be stored?
* How is data transmitted within the website and between devices?
* What processes are being undertaken?
* What and how does that affect the output visually?

Students research and investigate a UI or IM application of their choice, exploring the inputs, storage, transmission, processes and outputs.Teacher-led discussion on the implications that interactivity has specifically on data storage and transmission speed. | Students can define and use terms correctly to describe input, storage, transmission, process, and outputs in relation to digital applications.Students complete a research activity and demonstrate understanding and acquired knowledge through their documentation.Students investigate a UI or IM application of their choice, recording the inputs, storage, transmission, processes and outputs.Students are able to participate in class discussions on interactivity and the effects on data storage and transmission speed. | This section is also for use in school when making adjustments to support all students to achieve in their learning.Prompt student discussion with real-world scenarios and examples.Complete the first question of the activity as a class with a prepared response or students can complete in pairs or small groups. |  |

## Week 2

Table 2 – Week 2 – identifying and defining lesson sequence and details

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Outcomes and content | Teaching and learning activities | Evidence of learning | Differentiation/ adjustments | Registration and evaluation notes |
| **CT5-DPM-01**Students:* specify the functional requirements of a UI or interactive media product, including stating the purpose of a solution, describing use cases and developing test cases of inputs and expected outputs
* specify the non-functional requirements of a UI or interactive media solution
* branding and marketing of the solution
* minimising cognitive load and physical movement to use the interface.
 | **Learning intention**Explore how user interface or interactive media systems have functional and non-functional requirements.**Success criteria*** I can define and describe functional and non-functional requirements.

**Teaching and learning activity**Teacher-led discussion on the term [functional and non-functional requirements](https://www.altexsoft.com/blog/business/functional-and-non-functional-requirements-specification-and-types/#:~:text=Functional%20requirements%20define%20what%20a,also%20known%20as%20quality%20attributes.):* functional requirements are features or functions that enable users to accomplish their tasks (user requirements)
* [non-functional requirements (9:28)](https://www.youtube.com/watch?v=fc-5HJPBZMQ&t=40s) are how the system should perform (user expectation).

Students define and describe the terms ‘functional requirements’ and ‘non-functional requirements’, adding these to their glossary of terms.Students discuss differences between functional and non-functional requirements.Teacher models and discusses how to develop and document functional and non-functional requirements using real-world examples. | Students can define and describe functional and non-functional requirements.Student responses demonstrate an understanding of the concepts addressed.Students can apply functional and non-functional requirements to a range of UI or IM systems. | This section is also for use in school when making adjustments to support all students to achieve in their learning.Provide visual and/or multimedia examples and check understanding of concepts.Prompt student discussion with real-world scenarios and examples.Continue glossary and allow the use of bilingual dictionaries for uncommon terms and use visuals where appropriate. |  |
| **CT5-DPM-01**Students:* specify the functional requirements of a UI or interactive media product, including stating the purpose of a solution, describing use cases and developing test cases of inputs and expected outputs
* specify the non-functional requirements of a UI or interactive media solution
* branding and marketing of the solution
* minimising cognitive load and physical movement to use the interface.
 | **Learning intention**Explore the components of a software requirements specification (SRS) document.**Success criteria*** I have specified in a table the functional and non-functional requirements of a chosen system.
* I have the skill to create a UI software requirements specification document.

**Teaching and learning activity**Teacher-led discussion on a software requirements specification (SRS) document including the structure:* Introduction (purpose and scope)
* Description (features, characteristics, constraints, environment)
* Features (functional requirements)
* Interface requirements (hardware, software interfaces)
* Non-functional requirements (performance, security and quality)

Model and discuss a software requirements specification document in relation to a user interface or interactive multimedia.Students investigate and examine an app or website and create a functional and non-functional specification report including the purpose of the system.Teacher-led discussion on the effect the type and style of a website has on its UI and functional and non-functional specification.Students investigate and compare 2 of the following:* [business or corporate website](https://www.adobe.com/au/)
* [e-commerce website](https://www.amazon.com.au/)
* [educational website](https://kids.nationalgeographic.com/)
* [non-profit website](https://www.redcross.org.au/).
 | Student responses demonstrate an understanding of the concepts addressed.Students can document functional and non-functional requirements.Students document a comparison of 2 different real-world applications. | This section is also for use in school when making adjustments to support all students to achieve in their learning.Provide visual and/or multimedia examples and check understanding of concepts.Prompt student discussion with real-world scenarios and examples. |  |
| **CT5-DPM-01****CT5-DAT-01**Students:* specify the functional requirements of a UI or interactive media product, including stating the purpose of a solution, describing use cases and developing test cases of inputs and expected outputs
* explain simple compression of data and types of compression, including lossy and lossless compression.
 | **Learning intention**Explore test case diagrams in user interface and interactive media systems and the compression of data.**Success criteria*** I have the skills to discuss functional requirements, including the purpose of a system, describing user cases and developing test cases of inputs and expected outputs.
* I can explain simple compression of data and types of compression, including lossy and lossless compression.

**Teaching and learning activity**Teacher-led discussion on use case diagram and its components.As a class, watch [UML Use Case Diagram Tutorial (13:23)](https://www.youtube.com/watch?v=zid-MVo7M-E).Teacher models and discusses the creation of a use case diagram.Students create a use case diagram on an app of their choice with the following components:* systems
* actors
* use cases
* relationships.

Teacher-led discussion on data compression. Students read about [data compression](https://www.barracuda.com/support/glossary/data-compression#:~:text=About%20Data%20Compression-,What%20is%20Data%20Compression%3F,bits%20than%20the%20original%20representation.) and summarise its key features including:* the process of encoding
* reduction of bits
* reference dictionaries
* lossy versus lossless.

As a class, watch [Lossy versus Lossless video (9:50)](https://www.youtube.com/watch?v=X88vxU2o4f0&t).Students define and describe the terms ‘lossy’ and’ lossless’, adding these to their glossary of terms.[Think Pair Share](https://app.education.nsw.gov.au/digital-learning-selector/LearningActivity/Card/645) on why data compression is important. Students should consider:* file size (storage)
* transmission speed
* audio and video compression.
 | Student responses demonstrate an understanding of the concepts addressed.Students demonstrate understanding through the creation of a use case diagram.Student responses demonstrate an understanding of data compression and through the completion of a [Think Pair Share](https://app.education.nsw.gov.au/digital-learning-selector/LearningActivity/Card/645). | This section is also for use in school when making adjustments to support all students to achieve in their learning.Provide visual and/or multimedia examples and check understanding of concepts.Continue glossary and allow the use of bilingual dictionaries for uncommon terms and use visuals where appropriate. |  |

## Week 3

Table 3 – Week 3 – identifying and defining lesson sequence and details

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Outcomes and content | Teaching and learning activities | Evidence of learning | Differentiation/ adjustments | Registration and evaluation notes |
| **CT5-SAF-01**Students:* analyse ‘terms of use’ policies and End User License Agreements (EULA) and predict ways in which these can affect attitudes and data protection of individuals and societies.
 | **Learning intention**Examine the social impact, ethical and legal responsibilities of UIs or interactive media products.**Success criteria*** I can consider the social impacts and ethical and legal responsibilities of UIs or interactive media products.

**Teaching and learning activity**Teacher-led discussion on the terms social, ethical and legal responsibilities and End User Legal Agreements:* social (online access to services, remote working, cyber bullying or the filter bubble)
* ethical (black-hat and white-hat hacking, digital literacy codes of conduct or protecting personally identifying information (PII))
* legal (reporting data breaches to users and regulators, anonymising data and disposal of PII).

Students define and describe the terms ‘social’, ‘ethical’ and ‘legal’ responsibility adding these to their glossary of terms.Students explore the following case studies, identifying and describing the social, ethical and legal issues:* [Yes, you should monitor your remote workers – but not because you don’t trust them (The Guardian)](https://www.theguardian.com/business/2022/sep/25/monitor-workers-at-home-security-cybercrime)
* [Being monitored by your boss while working from home – necessary trade-off or 'stupid' surveillance? (ABC News)](https://www.abc.net.au/news/2020-10-16/work-from-home-tracking-software-monitoring/12766020)
* [Australian bosses spying on their staff using webcam, screenshots and keystroke monitoring (News.com)](https://www.news.com.au/finance/work/at-work/australian-bosses-spying-on-their-staff-using-webcam-screenshots-and-keystroke-monitoring/news-story/8182207a7681062dde11a5dae687adae)

Investigate what laws are in place that could apply to social and ethical issues in user interface and interactive media, for example, the Anti-Discrimination Act and the Privacy Act. | Student responses demonstrate an understanding of the key terms.Students can define social, ethical and legal responsibility.Students can investigate and recount the social, ethical and legal responsibilities in the given case studies. | This section is also for use in school when making adjustments to support all students to achieve in their learning.Prompt student discussion with real-world scenarios and examples.Continue glossary and allow the use of bilingual dictionaries for uncommon terms and use visuals where appropriate.Ensure all students understand both technical and culturally-based terms.Include multiple opportunities to respond, for example:* verbally
* individually
* partner turn and talk
* non-verbally
* gesture
* response cards.
 |  |
| **CT5-SAF-01**Students:* investigate and evaluate the influence of communication methods on an audience, including the perspectives of diverse groups that may include Aboriginal and Torres Strait Islander Peoples, culturally and linguistically diverse people, people of different ages and gender, and people with disability
* subtitles for people who are d/Deaf or hard of hearing
* protocols and permissions for displaying images of Aboriginal people who are deceased.
 | **Learning intention**Examine the social impact, ethical and legal responsibilities of UIs or interactive media products.**Success criteria*** I can investigate and evaluate the influence of communication methods on an audience, including the perspectives of diverse groups.
* I can apply my understanding and skills to examine subtitles for people who are d/Deaf or hard of hearing.
* I can apply my understanding and skills to examine protocols and permissions for displaying images of Aboriginal peoples who are deceased.

Teacher-led discussion on the WCAG (Web Content Accessibility Guidelines) standard utilising the [Centre for Accessibility Australia website](https://www.accessibility.org.au/).Watch the [Centre for Accessibility video (2:40)](https://vimeo.com/273843252?embedded=true&source=vimeo_logo&owner=11711030).Students explore the Centre for Accessibility Australia website and answer the following:* What is the WCAG standard?
* What are the 4 key guideline areas? [(P.O.U.R)](https://www.w3.org/WAI/standards-guidelines/wcag/glance/)
* List how UI and UX designers can make their pages more accessible utilising the WCAG standard.
* What [policies](https://www.accessibility.org.au/policy/) relate to digital access in Australia?

Teacher-led discussion on the use of Aboriginal imagery specifically regarding [depicting deceased persons](https://www.sbs.com.au/nitv/article/indigenous-cultural-protocols-what-the-media-needs-to-do-when-depicting-deceased-persons/97xq2otnt).Students review the [ACTCOSS Good Practice Guide: Aboriginal and/or Torres Strait Islander 'warning'](https://actcoss.org.au/publication/gulanga-good-practice-guides/) for ACT and using their own research, answer the following:* What restrictions are in place for the use of images or audio of a deceased Aboriginal person?
* What are some common bereavement practices in Aboriginal communities in relation to image and audio use?
* What warning/advice should be placed on media, apps and websites to alert Aboriginal peoples to the depiction of deceased persons?
 | Student responses demonstrate an understanding of WCAG standard.Students construct answers to questions around the Centre for Accessibility.Students demonstrate their understanding of the use of Aboriginal imagery through their responses in the discussion and through researching and constructing responses to the given questions. | This section is also for use in school when making adjustments to support all students to achieve in their learning.Prompt student discussion with real-world scenarios and examples.Provide visual and/or multimedia examples and check understanding of concepts.Ensure all students understand both technical and culturally-based terms.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.
 |  |
| **CT5-SAF-01**Students:* analyse ‘terms of use’ policies and End User License Agreements (EULA) and predict ways in which these can affect attitudes and data protection of individuals and societies.
 | **Learning intention**Examine the social impact, ethical and legal responsibilities of UIs or interactive media products.**Success criteria*** I can analyse an issue such as ‘terms of use’ policies and End User License Agreements (EULA) and predict ways in which these can affect attitudes and data protection of individuals and societies.

**Teaching and learning activity**Teacher led discussion on [End User License Agreements (1:17)](https://www.youtube.com/watch?v=f8vy-KmHP68) and terms of service (TOS), including the implications to user interface and interactive multimedia systems.Class discussion including the following concepts:* EULA and TOS are agreements between the software licensor and the end user.
* The licensor is the entity who sells the software.
* The end user is the customer who uses the software.

Students answer the following:* Why does software need EULA?
* How do users accept EULA?
* What is a ‘[Terms of service](https://odinlaw.com/the-differences-between-a-eula-tos-and-sla/)’ (TOS)?
* What is the difference between a EULA and TOS?

Teacher-led discussion on the implications of EULA and TOS, specifically on data security, privacy and the use of cookies, including:* What data is being collected?
* How the data is being collected?
* Why is it being collected?
* How will it be shared to third parties?

As a class, students watch [What are cookies and how do they work? (5:07)](https://www.youtube.com/watch?v=rdVPflECed8)Students explore and analyse one side of the debate on cookies, for and against, utilising a real-world EULA. Students consider:* privacy
* security
* data use/storage
* user perception
* company reputation.

Students share their responses and collate the key points for and against as a class.Students define and describe the terms ‘EULA’ and ‘TOS’, adding to their glossary of terms. | Student responses during the discussion demonstrate an understanding of EULA and TOSA.Students construct answers to questions around why, how and what EULA and TOS are.Students participate in a class debate on EULA and the use of cookies, demonstrating their understanding of privacy, security, data use/storage, user perception and company reputation.Students can define the key terms appropriately. | This section is also for use in school when making adjustments to support all students to achieve in their learning.Provide visual and/or multimedia examples and check understanding of concepts.Ensure all students understand both technical and culturally-based terms.Include multiple opportunities to respond, for example:* verbally
* individually
* partner turn and talk
* non-verbally
* gesture
* response cards.
 |  |

## Week 4

Table 4 – Week 4 – identifying and defining lesson sequence and details

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Outcomes and content | Teaching and learning activities | Evidence of learning | Differentiation/ adjustments | Registration and evaluation notes |
| **CT5-DPM-01**Students:* define a real-world problem or need that can be solved by UIs or interactive media, including breaking it down into manageable parts and describing the users of the solution.
 | **Learning intention**Break a real-world problem or need down into manageable parts.**Success criteria*** I can break a real-world problem or need down into manageable parts.
* I can describe the users of the system.

**Teaching and learning activity**Teacher-led discussion on users and human-centred design:* What is a user (direct or indirect)?
* What is human-centred design?
* [Stages of development](https://www.altexsoft.com/blog/uxdesign/ux-vs-ui-design-stages-participants-roles-and-skills/).

As a class, students watch [What is human centred design? (10:22)](https://www.youtube.com/watch?v=KkUor_NTuDA)While watching, the teacher may pause the video to facilitate students to answer the following:* Describe why you need to consider using human-centred design rather than user-centred design. (0:15)
* Identify the 3 components of direct engagement of users. (1:26)
* List 2 ways of researching users. (1:38)
* Describe the term ‘contexts of use’. (2:18)
* Compare the needs of the users in a café versus a supermarket. (2:30–3:50)
* List the 4 key components of user-centred design. (4:54)
* Why is usability testing not enough to improve processes and systems? (5:54–7:17)
* Describe the benefit of having a multidisciplinary team. (8:30)
* Describe why prototypes are important. (9:05)

Students break down one of the following websites, identifying the users, requirements and evaluating the landing page with human-centred design theory:* [Amazon](https://www.amazon.com.au/)
* [WWF](https://www.wwf.org.au/)
* [Ticketek](https://premier.ticketek.com.au/)
* [Ambulance NSW](https://www.ambulance.nsw.gov.au/).
 | Student responses demonstrate an understanding of users and human centred design.Students engage with and answer the corresponding questions to the human-centred design video.Students demonstrate their understanding by breaking down the components of a real-world website, identifying the users, requirements and evaluating the landing page. | This section is also for use in school when making adjustments to support all students to achieve in their learning.Provide visual and/or multimedia examples and check understanding of concepts.Ensure all students understand both technical and culturally-based terms.Message abundancy may be useful when introducing new terminology. The word is spoken, written on the board and represented by visuals.Complete the first question of the activity as a class with a prepared response or students can complete in pairs or small groups. |  |
| **CT5-DPM-01****CT5-COM-01**A student:* applies iterative processes to define problems and plan, design, develop and evaluate computing solutions
* communicates ideas, processes and solutions using appropriate media.
 | **Learning intentions**Examine the principles of design and design theory and the impact on user interface (UI) and interactive systems.Investigate techniques to evaluate a UI.**Success criteria*** I can describe how design principles and issues affect UIs or interactive media.
* I can investigate and evaluate a UI and interactive media.

**Teaching and learning activity**Teacher-led discussion on design theory and principles.Students [Think Pair Share](https://app.education.nsw.gov.au/digital-learning-selector/LearningActivity/Card/645) on what they believe good design is.As a class, students watch [Understanding the principles of design (9:55)](https://www.youtube.com/watch?v=UmHMVU6dceA).Students create a digital poster incorporating design principles on [Canva](https://www.canva.com/en_au/).Class discussion on the unique design requirements of digital design including:* static versus dynamic
* data types, for example, .jpeg versus .gif, Vector versus Bitmap
* scalability
* accessibility
* typography.
 | Student responses demonstrate an understanding of design theory.Students check their understanding with a Think-Pair-Share activity to compare their knowledge and understanding of the principles of design. | This section is also for use in school when making adjustments to support all students to achieve in their learning.Prompt student discussion with real-world scenarios and examples. |  |
| **CT5-DPM-01**A student:* applies iterative processes to define problems and plan, design, develop and evaluate computing solutions.
 | **Learning intention**Explore design principles and issues relevant to UIs or interactive media.**Success criteria*** I can investigate techniques to evaluate a UI.
* I can evaluate existing UIs and assess their suitability and whether they could be modified or used in other products.

**Teaching and learning activity**Teacher-led discussion on evaluating UI and interactive media including:* [heuristic evaluation](https://www.nngroup.com/articles/ten-usability-heuristics/)
* think aloud evaluation
* pluralistic walkthrough evaluation.

Students explore heuristic evaluation through the [Nielsen Norman Group (NNGroup) website](https://www.nngroup.com/articles/ten-usability-heuristics/) and as a class watch the videos.[Heuristic Evaluation playlist](https://www.youtube.com/playlist?list=PLJOFJ3Ok_idtb2YeifXlG1-TYoMBLoG6I) [10 videos – YouTube)* [Usability Heuristic 1: Visibility of System Status (2:36)](https://www.youtube.com/watch?v=cTtc90jCULU&list=PLJOFJ3Ok_idtb2YeifXlG1-TYoMBLoG6I)
* [Usability Heuristic 2: Match Between the System and the Real World (3:08)](https://www.youtube.com/watch?v=0TAt9Pln51g&list=PLJOFJ3Ok_idtb2YeifXlG1-TYoMBLoG6I&index=2)
* [Usability Heuristic 3: User Control & Freedom (2:15)](https://www.youtube.com/watch?v=MXuk-fdbr0A&list=PLJOFJ3Ok_idtb2YeifXlG1-TYoMBLoG6I&index=3)
* [Usability Heuristic 4: Consistency and Standards (2:37)](https://www.youtube.com/watch?v=Ibndy9KLOSQ&list=PLJOFJ3Ok_idtb2YeifXlG1-TYoMBLoG6I&index=4)
* [Usability Heuristic 5: Error Prevention (2:52)](https://www.youtube.com/watch?v=imS9s1DUY-I&list=PLJOFJ3Ok_idtb2YeifXlG1-TYoMBLoG6I&index=5)
* [Usability Heuristic 6: Recognition vs. Recall in User Interfaces (2:48)](https://www.youtube.com/watch?v=6glQPp6q4Jc&list=PLJOFJ3Ok_idtb2YeifXlG1-TYoMBLoG6I&index=6)
* [Usability Heuristic 7: Flexibility and Efficiency of Use (2:54)](https://www.youtube.com/watch?v=LoTdRTBB8BQ&list=PLJOFJ3Ok_idtb2YeifXlG1-TYoMBLoG6I&index=7)
* [Usability Heuristic 8: Aesthetic and Minimalist Design (1:57)](https://www.youtube.com/watch?v=ZgbRmeWDgd0&list=PLJOFJ3Ok_idtb2YeifXlG1-TYoMBLoG6I&index=8)
* [Usability Heuristic 9: Help Users Recognize, Diagnose and Recover from Errors (2:19)](https://www.youtube.com/watch?v=cCun-ReLTFI&list=PLJOFJ3Ok_idtb2YeifXlG1-TYoMBLoG6I&index=9)
* [Usability Heuristic 10: Help & Documentation (2:46)](https://www.youtube.com/watch?v=iIQVRzatb50&list=PLJOFJ3Ok_idtb2YeifXlG1-TYoMBLoG6I&index=10).

Students utilise the usability heuristics to evaluate in a table one of the following websites:* [Amazon](https://www.amazon.com.au/)
* [WWF](https://www.wwf.org.au/)
* [Ticketek](https://premier.ticketek.com.au/)
* [Ambulance NSW](https://www.ambulance.nsw.gov.au/).

Evaluation will include:* list each of the 10 heuristics
* outline suitability for the users
* examine areas of modification/improvement
* evaluate how could it be used for other purposes/applications.
 | Student responses demonstrate an understanding of the concepts addressed.Students demonstrate how they have evaluated a user interface.Students can identify suitability and modification required in existing user interfaces when evaluating their functionality. | This section is also for use in school when making adjustments to support all students to achieve in their learning.Provide visual and/or multimedia examples and check understanding of concepts.Prompt student discussion with real-world scenarios and examples. |  |

## Week 5

Table 5 – Week 5 – identifying and defining lesson sequence and details

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Outcomes and content | Teaching and learning activities | Evidence of learning | Differentiation/ adjustments | Registration and evaluation notes |
| **CT5-DAT-01**A student:* explains how data is stored, transmitted and secured in digital systems and how information is communicated in a range of contexts.
 | **Learning intention**Examine how UIs or interactive media have evolved in response to people's needs and opportunities.**Success criteria*** I can explain the history of user interfaces, such as punch cards, text, graphical user interfaces (GUI), to gestures and speech.

**Teaching and learning activity**Teacher-led discussion on the history of user interfaces, including the movement from text to graphical user interfaces:* Punch cards
* Watch [The Rise and Fall of The Punched Card (10:58)](https://www.youtube.com/watch?v=spL_pJOIqKA).
* Text-based user interface (TUI)
* Students investigate and compare the first text-based user interfaces with today's command line programming user interfaces, including [DOS](https://en.wikipedia.org/wiki/DOS) and [Command-line interface (CLI)](https://en.wikipedia.org/wiki/Command-line_interface).
* Graphical user interface (GUI)
* Watch the [evolution of the GUI video (12:58)](https://www.youtube.com/watch?v=XIGSJshYb90).

Students research and describe one of the following early GUI devices covering its production, development and uses:* Xerox PARC
* Apple Lisa
* SGI 1000 Series A
* Microsoft Windows (16-bit versions).

Class introductory discussion on modern interfaces such as:* controllers with haptic feedback
* gesture and speech control
* VR headsets
* simulation hardware.
 | Students will be able to record their key learning events when examining the history of user interfaces.Students will be able to recall examples of a variety of graphical user interfaces, gestures and speech used in user interfaces. | This section is also for use in school when making adjustments to support all students to achieve in their learning.Provide visual and/or multimedia examples and check understanding of concepts.Prompt student discussion with real-world scenarios and examples. |  |
| **CT5-DAT-01**A student:* explains how data is stored, transmitted and secured in digital systems and how information is communicated in a range of contexts.
 | **Learning intention**Examine how UIs or interactive media have evolved in response to people's needs and opportunities.**Success criteria*** I can describe the development of input and output technology.
* I can describe intelligent interfaces and virtual assistants.
* I can describe augmentative and alternative communication (ACC) technology.

**Teaching and learning activity**Teacher-led discussion and reflection on the previous lesson’s exploration of modern interfaces.Explain the terms ‘input’ and ‘output’ and discuss intelligent interfaces and virtual assistants.Students create a table with the headings ‘Input’ and ‘Output’ and [brainstorm](https://app.education.nsw.gov.au/digital-learning-selector/LearningActivity/Card/542) different hardware, software and technologies that apply to those terms.Class discussion on communication without speaking (augmentative and alternative communication) covering:* text messages
* social media
* gestures
* speech generation
* drawing
* miming.

Students attempt to have a short conversation with a peer using no tech or low tech.Students answer the following questions:* Explain the impact Alexa, Siri and Google Smart interfaces have on people’s lives.
* What do the terms ‘home automation’ and ‘routines’ mean?
* How does augmentative and alternative communication assist those who can’t speak or have trouble speaking?

Teacher-led discussion and modelling on IPO (Input Process Output) diagrams: teacher outlines the IPO for online shopping and students complete the diagram individually:* Input
* User search criteria
* Select product
* Add to cart
* Checkout
* Payment method
* Process
* Run query on search criteria
* Retrieve product results
* Filter and sort based on user preferences
* Add product to cart
* Calculate total cost
* Process transaction
* Generate invoice/receipt
* Output
* Search results
* Product information page
* Updated shopping cart
* Total cost
* Printed receipt/invoice.
 | Students will be able to recall different components of user interface and interactive media.Students can describe basic concepts of inputs, outputs, intelligent interfaces and virtual assistants.Students can develop a table in their documentation that shows their understanding of inputs and outputs.Student responses demonstrate an understanding of the concepts addressed. | This section is also for use in school when making adjustments to support all students to achieve in their learning.Provide visual and/or multimedia examples and check understanding of concepts.Prompt student discussion with real-world scenarios and examples. |  |
| **CT5-DAT-01**A student:* explains how data is stored, transmitted and secured in digital systems and how information is communicated in a range of contexts.
 | **Learning intention**Examine how UIs or interactive media have evolved in response to people's needs and opportunities.**Success criteria*** I can describe accessibility features.
* I can describe cyber safety and security, such as biometric authentication.

**Teaching and learning activity**Teacher-led discussion on ‘data for everyone’.Class investigates the [W3 organisation](https://www.w3.org/WAI/fundamentals/accessibility-intro/) website and answers the following questions:* Explain what disabilities should be considered when designing for accessibility?
* Describe other groups of people who are assisted by designing with high accessibility design.
* Describe ways to evaluate web accessibility.

As a class, watch [Evaluating Web Accessibility (2:06)](https://www.youtube.com/watch?v=C4GIqWeywiI&t=1s).Students [Think Pair Share](https://app.education.nsw.gov.au/digital-learning-selector/LearningActivity/Card/645) what they believe cyber safety is.Teacher-led discussion on security of data and cyber safety.As a class watch [Safe Web Surfing (5:01)](https://www.youtube.com/watch?v=yrln8nyVBLU).Students investigate the following cyber safety pages:* [Avoiding scams](https://www.digitalcitizenship.nsw.edu.au/articles/avoiding-scams)
* [Controlling your privacy settings in social media](https://www.digitalcitizenship.nsw.edu.au/articles/controlling-your-privacy-settings-in-social-media)
* [Leaving a digital footprint](https://www.digitalcitizenship.nsw.edu.au/articles/leaving-a-digital-footprint).

Students research and answer the following questions:* Describe the privacy risks that new technologies present, and how do you decide if they're worth it?
* Describe how can you protect your privacy when you're online?
* Discuss what age should people be allowed to use social media? Why?
 | Student responses demonstrate an understanding of the concepts addressed.Students research and investigate questions on accessibility.Students demonstrate and improve their understanding of cyber security through a [Think Pair Share](https://app.education.nsw.gov.au/digital-learning-selector/LearningActivity/Card/645) activity.Student responses demonstrate an understanding of the concepts addressed.Students complete an informal research task on privacy and privacy protection. | This section is also for use in school when making adjustments to support all students to achieve in their learning.Prompt student discussion with real-world scenarios and examples.Complete the first question of the activity as a class with a prepared response or students can complete in pairs or small groups.Provide visual and/or multimedia examples and check understanding of concepts. |  |

## Weeks 6–7

Table 6 – Weeks 6–7 – identifying and defining lesson sequence and details

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Outcomes and content | Teaching and learning activities | Evidence of learning | Differentiation/ adjustments | Registration and evaluation notes |
| **CT5-SAF-01****CT5-DAT-02**A student:* selects and applies safe, secure and responsible practices in the ethical use of data and computing technology
* acquires, represents, analyses and visualises simple and structured data.
 | **Learning intention**Design and author a data dashboard with visualised data.**Success criteria*** I can model entities, events and their attributes using structured data.
* I can access datasets and collect data from users or the environment, considering privacy and personally identifying information (PII).
* I can summarise data using a spreadsheet, including complex formulas, aggregate functions and lookup functions.
* I can validate data is correct and investigate the impact of invalid data.
* I can filter, group and sort data using a spreadsheet.
* I can present data and make predictions and decisions using a spreadsheet, including creating a data dashboard.
* I can visualise data to identify trends and outliers using a range of tools.

**Teaching and learning activity**Teacher overview of Microsoft Excel and its main purposes for personal and business use:* data entry and storage
* accounting and budgeting
* data analysis
* reporting and visualisation of data
* forecasting.

Class discussion on prior knowledge of Microsoft Excel attributes and features and basic functions.Students review the [Microsoft Excel tutorial page](https://support.microsoft.com/en-us/office/basic-tasks-in-excel-dc775dd1-fa52-430f-9c3c-d998d1735fca) and check for prior understanding.Teacher-led discussion on quality data, data collection tools, and social and ethical considerations including:* As a class, students watch [What is Good Data? (2:58)](https://www.youtube.com/watch?v=Qgwh9FNualc).
* As a class, students watch [Choosing your Data Collection Methods (5:16)](https://www.youtube.com/watch?v=q17s84ADGfA).

Students work in small groups to plan and create a data collection tool utilising closed questions.Students evaluate their collection tools, answering the following questions.* Is my collection tool easy to navigate?
* Are the questions simple to understand?
* Are my questions neutral or do they prompt a specific answer?
* Are the questions clear and do they ask just one thing?
* Are all my questions different or am I getting redundant/conflicting data?
* Are my set answers appropriate to all or should I be adding an ‘Other’ or ‘Prefer not to say’ option?
* What privacy and cyber security issues should I consider?

Teacher-led discussion on validation of data.Teacher demonstration and modelling of Microsoft Excel functions.Students [download a sample data set](https://www.contextures.com/xlsampledata01.html#data).Teacher leads students through importing, filtering and sorting data as well as the use of formulas, [aggregate](https://support.microsoft.com/en-us/office/aggregate-function-43b9278e-6aa7-4f17-92b6-e19993fa26df) and [lookup](https://support.microsoft.com/en-us/office/video-vlookup-when-and-how-to-use-it-9a86157a-5542-4148-a536-724823014785) functions.Class discusses why and how data can be sorted and filtered to create useful information.Teacher leads students in the manipulation and presentation of cells and data to create a pivot table, data dashboard, reports and the modelling of entities and events using structured data over several lessons.Students can follow directly from the teacher or self direct through watching the [Secrets to Building Excel Dashboards video (13:19)](https://www.youtube.com/watch?v=9p6tWCHbtPQ).Further instructions and activities can be completed on [Excel Tutorial | W3schools](https://www.w3schools.com/EXCEL/index.php).Class discussion on how the visualisation of data can be used to identify trends.Teacher leads students through the building and manipulating of the lookup table. | Student responses demonstrate an understanding of the concepts addressed.Students research and produce a data collection device using closed questions.Students evaluate their own and peer mark each other’s collection tools.Students manipulate Microsoft Excel to create a pivot table, data dashboard, reports, and the modelling of entities and events using structured data over several lessons. | This section is also for use in school when making adjustments to support all students to achieve in their learning.Provide visual and/or multimedia examples and check understanding of concepts.Prompt student discussion with real-world scenarios and examples.Prompt students to utilise the three before me strategy to build their problem-solving skills and engage positively in discussion with peers.Complete the first question of the activity as a class with a prepared response or students can complete in pairs or small groups. |  |

## Weeks 8–10

Table 7 – Weeks 8–10 – identifying and defining lesson sequence and details

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Outcomes and content | Teaching and learning activities | Evidence of learning | Differentiation/ adjustments | Registration and evaluation notes |
| **CT5-DPM-01****CT5-COL-01****CT5-DES-01**A student:* applies iterative processes to define problems and plan, design, develop and evaluate computing solutions
* communicates ideas, processes and solutions using appropriate media
* designs and creates user interfaces and the user experience.
 | **Learning intentions**We will work to design an interactive media product.We will break a real-world problem or need down into manageable parts and describe the users of the system.**Success criteria*** I can design and implement a UI, UX or interactive media product, allowing for functionality, accessibility, usability and aesthetics.
* I can plan and manage a project using an iterative approach.

**Teaching and learning activity**Teacher models and evaluates wireframes and their use as a planning tool.As a class, watch the [Wireframing basics video (3:10)](https://www.youtube.com/watch?v=aqdn7vVKygA).Students choose a website or app and create a wireframe to demonstrate their understanding.Teacher-led overview and discussion on Assessment task 3– designing for users and students have approximately 3 weeks to complete this task.Students complete assessment task utilising prior knowledge and research. | Students create a report for Assessment task 3, covering software specification, functional requirements and non-functional requirements.Students create an accurate dataflow diagram illustrating all stages of data handling.Students demonstrate their ability to use graphical planning tools with the creation of wireframes.Summative Assessment task 3 is due and feedback is given. | This section is also for use in school when making adjustments to support all students to achieve in their learning.Prompt student discussion with real-world scenarios and examples.Provide visual and/or multimedia examples and check understanding of concepts.Prompt students to utilise the three before me strategy to build their problem-solving skills and engage positively in discussion with peers. |  |

## Weeks 11–12

Table 8 – Weeks 11–12 – identifying and defining lesson sequence and details

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Outcomes and content | Teaching and learning activities | Evidence of learning | Differentiation/ adjustments | Registration and evaluation notes |
| **CT5-DPM-01****CT5-COM-01**Students:* explore how augmented reality (AR), mixed reality (MR) and virtual reality (VR) create immersive experiences
* generate alternative designs and evaluate them against the requirements to select a preferred design.
 | **Learning intention**We will explore how augmented reality (AR), mixed reality (MR) and virtual reality (VR) create immersive experiences.**Success criteria*** I can define and explain augmented reality (AR), mixed reality (MR) and virtual reality (VR).

**Teaching and learning activity**Teacher leads a class discussion on the immersion of augmented reality over the last decade and its [growth](https://finance.yahoo.com/news/augmented-reality-market-hit-597-101500121.html?guccounter=1&guce_referrer=aHR0cHM6Ly93d3cuZ29vZ2xlLmNvbS8&guce_referrer_sig=AQAAAJYxctRePzrhC-Ejjg45JsKRrq2OEonGRs5O_tfV02ZCEVnid-Sboxz2-sgpb3SObqXOqZXIiuuW8iKK8VKEYOIv6Yk27Q5DZV-H_SZrtNCq5V4yJlIyRITBNdSr2NNy7nKxrXeXltY2MzL8YZH6QzOqvOv-x8rBIZacqdsbLT5g), and highlights the areas of use beyond gaming and entertainment.As a class, watch [The Rise of Technology video on immersive technology (8:39)](https://www.youtube.com/watch?v=XLP4YTpUpBI).Students explore and research the hardware needed to make augmented reality possible including:* head-mounted display (HMD)
* head-up display
* handheld devices
* smart glass.

In their research, students should answer the following questions:* What are the key hardware components necessary for creating an augmented reality (AR) experience?
* How does the processing power of different hardware devices impact the performance and capabilities of AR applications?
* What advancements in hardware technology are needed to enable seamless integration of virtual content into the physical environment for AR applications?
* How does the size, weight, and comfort of AR devices impact user acceptance and adoption, and what design improvements can be made to address these factors?

Teacher outlines the use of Adobe Aero to create an interactive AR experience.As a class, watch the video on [Adobe Aero (2:46)](https://www.youtube.com/watch?v=jAfR_JY3P5g).Teacher demonstrates how to create assets in either Adobe Photoshop or Adobe Illustrator and then transfer them into Adobe Aero.As a class, watch the video on [Adobe Photoshop (16:16)](https://www.youtube.com/watch?v=fo8aG0vCY7k) and [Adobe Illustrator (15:06)](https://www.youtube.com/watch?v=12oCyiBYqKY).Students complete a small project over several lessons where they create assets and familiarise themselves with their chosen software and Adobe Aero. | Students complete an informal research task on the hardware associated with AR.Students progressively improve their skills and ability in the manipulation of graphics and digital assets, receiving ongoing feedback and assistance from the teacher, and completing a project for Assessment task 4. | This section is also for use in school when making adjustments to support all students to achieve in their learning.Provide visual and/or multimedia examples and check understanding of concepts.Complete the first question of the activity as a class with a prepared response or students can complete in pairs or small groups.Prompt students to utilise the three before me strategy to build their problem-solving skills and engage positively in discussion with peers. |  |

## Weeks 13–18

Table 9 – Weeks 13–18 – identifying and defining lesson sequence and details

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Outcomes and content | Teaching and learning activities | Evidence of learning | Differentiation/ adjustments | Registration and evaluation notes |
| **CT5-SAF-01 CT5-DPM-01****CT5-COL-01****CT5-THI-01****CT5-COM-01****CT5-DES-01**A student:* selects and applies safe, secure and responsible practices in the ethical use of data and computing technology
* applies iterative processes to define problems and plan, design, develop and evaluate computing solutions
* manages, documents and explains individual and collaborative work practices
* communicates ideas, processes and solutions using appropriate media
* applies computational, design and systems thinking to the development of computing solutions
* designs and creates user interfaces and the user experience.
 | **Learning intentions**We will plan and manage a project using an iterative approach.We will manage, document and explain work practices during development of the project.We can apply computational, design and systems thinking to the solution.**Success criteria*** I can generate alternative designs and evaluate them against the requirements to select a preferred design.
* I can identify and apply iterative processes to UIs or interactive media.
* I can create an immersive experience.
* I can design and author an interactive media product using the preferred design.
* I can design and implement a UI, UX or interactive media product allowing for functionality, accessibility, usability and aesthetics.
* I can apply information architecture elements in the development of a product, including
* fishbone diagrams: fault-finding in projects
* stories: plan user journeys through a website
* storyboards: test the fluency of an animation
* prototypes: input interfaces.
* I can select and use specialist terminology in context.
* I have the skills to create a record of project development and manage a project using an iterative approach.

**Teaching and learning activity**Teacher provides students with an overview of the project and the timeline of skills and milestones.For the design and development of the Adobe XD app and Adobe Aero Interactive media element, follow the envisioned timeline:Week 13: overview of the assessment, group formation and a review of any prior knowledge required for the task.Students watch the following tutorials to understand how to use Adobe Aero:1. [Introduction with James Zachary (1:15)](https://www.youtube.com/watch?v=m188uKa373Y&list=PLD8AMy73ZVxXyf4x9cM16yiN5ZUXz5w_N&index=1)
2. [Installing Adobe Aero (1:46)](https://www.youtube.com/watch?v=jE41jZvguJ4&list=PLD8AMy73ZVxXyf4x9cM16yiN5ZUXz5w_N&index=2)
3. [Getting started with AR (5:52)](https://www.youtube.com/watch?v=PtuYBpvjJKE&list=PLD8AMy73ZVxXyf4x9cM16yiN5ZUXz5w_N&index=3)
4. [Setting the Stage (4:31)](https://www.youtube.com/watch?v=0LCSAfx7X-s&list=PLD8AMy73ZVxXyf4x9cM16yiN5ZUXz5w_N&index=4)
5. [Crafting A Scene Around the Stage (7:23)](https://www.youtube.com/watch?v=XORBN2k0U6c&list=PLD8AMy73ZVxXyf4x9cM16yiN5ZUXz5w_N&index=5)
6. [Mastering Hide and Show Technique (7:02)](https://www.youtube.com/watch?v=t-_0cyluHhs&list=PLD8AMy73ZVxXyf4x9cM16yiN5ZUXz5w_N&index=6)
7. [Proximity Triggers (6:01)](https://www.youtube.com/watch?v=Fra8KEfVwWY&list=PLD8AMy73ZVxXyf4x9cM16yiN5ZUXz5w_N&index=7)
8. [Adding 3D Audio and GIFS in Aero (9:32)](https://www.youtube.com/watch?v=ih5O5Iy6KRY&list=PLD8AMy73ZVxXyf4x9cM16yiN5ZUXz5w_N&index=8)
9. [Sharing Your Work (2:25)](https://www.youtube.com/watch?v=j1yF3ssgv3E&list=PLD8AMy73ZVxXyf4x9cM16yiN5ZUXz5w_N&index=9)
10. [Image Anchors (9:06)](https://www.youtube.com/watch?v=OwCIY_j9Pds&list=PLD8AMy73ZVxXyf4x9cM16yiN5ZUXz5w_N&index=10)

Weeks 13–14: storyboarding and planning, including decision making on app theme.Weeks 14–16: asset creation in chosen software for interactive multimedia element, including Adobe Aero compilation and asset behaviour creation.As a class, students read [Prepare illustrator assets for Aero](https://helpx.adobe.com/au/aero/using/work-with-illustrator-assets-in-aero.html).Illustrator tutorials to support student skill development:* [Create and edit shapes](https://helpx.adobe.com/au/illustrator/how-to/shapes-basics.html?playlist=/services/playlist.helpx/products:SG_ILLUSTRATOR_1_1/learn-path:get-started/set-header:ccx-designer/playlist:ccl-get-started-1/en_AU.json&ref=helpx.adobe.com)
* [Add text to your designs](https://helpx.adobe.com/au/illustrator/how-to/text-basics.html?playlist=/services/playlist.helpx/products:SG_ILLUSTRATOR_1_1/learn-path:get-started/set-header:ccx-designer/playlist:ccl-get-started-1/en_AU.json&ref=helpx.adobe.com)
* [Drawing in Illustrator](https://helpx.adobe.com/au/illustrator/how-to/draw-vector-paths-with-pen-pencil-tools.html?playlist=/services/playlist.helpx/products:SG_ILLUSTRATOR_1_1/learn-path:key-techniques/playlist:topic/set-header:design/en_AU.json&ref=helpx.adobe.com)
* [Design a logo](https://helpx.adobe.com/au/illustrator/how-to/logo-design.html?playlist=/services/playlist.helpx/products:SG_ILLUSTRATOR_1_1/set-header:illustrator-projects/playlist:topic/learn-path:key-techniques/en_AU.json&ref=helpx.adobe.com)
* [Create an icon](https://helpx.adobe.com/au/illustrator/how-to/create-an-icon.html?playlist=/services/playlist.helpx/products:SG_ILLUSTRATOR_1_1/set-header:illustrator-projects/playlist:topic/learn-path:key-techniques/en_AU.json&ref=helpx.adobe.com).

As a class, students read [Prepare Photoshop assets for Aero.](https://helpx.adobe.com/au/aero/using/work-with-photoshop-assets-in-aero.html)Photoshop tutorials to support student skill development.* [Create your first design](https://helpx.adobe.com/au/photoshop/how-to/graphic-design-basics.html?playlist=/services/playlist.helpx/products:SG_PHOTOSHOP_1_1/learn-path:key-techniques/playlist:topic/set-header:quick-starts/en_AU.json&ref=helpx.adobe.com)
* [Create a web banner](https://helpx.adobe.com/au/photoshop/how-to/make-banner.html?playlistPath=/services/playlist.helpx/products:SG_PHOTOSHOP_1_1/learn-path:get-started/set-header:ccx-designer/playlist:orientation/en_AU.json)
* [Create a poster](https://helpx.adobe.com/au/photoshop/how-to/make-poster.html?playlistPath=/services/playlist.helpx/products:SG_PHOTOSHOP_1_1/learn-path:get-started/set-header:ccx-designer/playlist:orientation/en_AU.json)
* [Create an image for social media](https://helpx.adobe.com/au/photoshop/how-to/add-text-pictures.html?playlistPath=/services/playlist.helpx/products:SG_PHOTOSHOP_1_1/learn-path:get-started/set-header:ccx-designer/playlist:orientation/en_AU.json)

Weeks 16–18: app development on Adobe Aero, including the embedding of a link or QR code with interactive element.Week 18: app evaluation.Teacher completes staged demonstrations at each milestone of the task to complement prior knowledge and set expectations for each component of the task.Students follow and complete each segment of the task, completing a record of project development as they go.Students utilise an iterative process in the designing and development of a final solution on their chosen theme. This may require students to complete tutorials or research to improve skills and knowledge to better complete the task.Students adapt and change their design, refining to create an interactive multimedia element that engages users and that contributes to an app that has the user experience at the core if its design. | Students have documented their design process and resulting product.Students work collaboratively on Assessment task 4 under the guidance of their teacher to create an app and documentation.Students can describe the processes they undertook and the skills required for using the software and provide reasoning for the choices they made.Students evaluate their use of the design processes.Students may have worked successfully as individuals or as a group.Students receive ongoing formative feedback and summative feedback through Assessment task 4. | This section is also for use in school when making adjustments to support all students to achieve in their learning.Provide visual and/or multimedia examples and check understanding of concepts.Prompt students to utilise the three before me strategy to build their problem-solving skills and engage positively in discussion with peers.Provide students with multimodal information and demonstrations to assist in building their skills and knowledge to complete the task outcomes.Include multiple opportunities to respond, for example:* verbally
* individually
* partner turn and talk
* non-verbally
* gesture
* response cards.
 |  |

## Weeks 19–20

Table 10 – Weeks 19–20 – identifying and defining lesson sequence and details

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Outcomes and content | Teaching and learning activities | Evidence of learning | Differentiation/ adjustments | Registration and evaluation notes |
| **CT5-DPM-01****CT5-COL-01****CT5-THI-01**A student:* applies iterative processes to define problems and plan, design, develop and evaluate computing solutions
* manages, documents and explains individual and collaborative work practices
* applies computational, design and systems thinking to the development of computing solutions.
 | **Learning intentions**We will learn how to evaluate your own project and that of your peers.We will learn about careers in the field of UI design or interactive media.**Success criteria*** I can examine functional and non-functional requirements and evaluate these in multiple projects.
* I can evaluate whether solutions meet social, ethical and legal responsibilities and cybersecurity principles.
* I can test and evaluate a UI to improve usability of an interactive media product.
* I can test and evaluate a UI to improve overall efficiency.
* I can research and explore careers in UI design or interactive media.

**Teaching and learning activity**Teacher-led discussion on the importance and types of evaluation, specifically an outcome evaluation (prior knowledge check with [KWLH charts](https://app.education.nsw.gov.au/digital-learning-selector/LearningActivity/Card/562)).Teacher explains to the class that students will showcase their final project and go through self and [peer feedback](https://app.education.nsw.gov.au/digital-learning-selector/LearningActivity/Card/549).Students participate in self and peer review through a showcase of student projects, looking at the functional and non-functional requirements of the project.Students collaborate to develop a presentation for the project evaluation, where each member presents the key information as part of their role in the team. The presentation can also include their video journal of their system completing challenges or testing data.Teams of students present their project evaluation to the class and receive feedback.Teacher leads discussion about careers in the field of UI design or interactive media.Careers can include:* social media specialist
* animator
* video editor
* web designer
* digital advertising specialist
* digital marketer
* multimedia graphic designer
* video game designer.

Students research one of the above industry careers and complete the questions below:* Who is considered a pioneer in the field of interactive media or UI design, and what significant contributions have they made?
* How has the evolution of interactive media and UI design influenced the way we interact with technology today?
* What are some key skills and qualities required to succeed in the field of interactive media or UI design?
* What are the current trends and emerging technologies in interactive media and UI design, and how are they reshaping the industry?
* What ethical considerations should designers keep in mind when creating interactive media or UI interfaces?

Students investigate various job search websites and create a table of research, showing job description, pay and education requirements. | Student responses demonstrate an understanding of the concepts addressed.Students' participation and evaluation of their own project and their peers against functional and non-functional requirements.Students complete a research task, demonstrating their understanding of key careers in the interactive media and UI fields and can identify skills and responsibilities of the roles.Students are able to investigate real-world jobs in the key area of interactive media and UI. | This section is also for use in school when making adjustments to support all students to achieve in their learning.Include multiple opportunities to respond, for example:* verbally
* individually
* partner turn and talk
* non-verbally
* gesture
* response cards.
 |  |

# Additional information

For additional support or advice, contact the Technological and applied studies (TAS) curriculum team by emailing 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 is one of the most powerful influences on student achievement. 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/teaching-and-learning#Differentiation2) 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).

## 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.

**Alignment to system priorities and/or needs**: [School Excellence Policy](https://education.nsw.gov.au/policy-library/policies/pd-2016-0468), [School Success Model](https://education.nsw.gov.au/public-schools/school-success-model/school-success-model-explained).

**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 Teaching Standards**: 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) 3.2.2, 3.3.2.

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

**NSW syllabus**: Computing Technology 7–10

**Syllabus outcomes**: CT5-SAF-01, CT5-DPM-01, CT5-COL-01, CT5-DAT-01, CT5-COM-01, CT5-THI-01, CT5-DAT-02, CT5-DES-01.

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

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

**Resource**: Program of learning

**Related resources**: further resources to support Computing Technology 7–10 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 the TAS statewide staffroom.

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# Evidence base

[Computing Technology 7–10 Syllabus](https://curriculum.nsw.edu.au/syllabuses/computing-technology-7-10-2022) © 2022 NSW Education Standards Authority (NESA) for and on behalf of the Crown in right of the State of New South Wales.

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