

This unit of work was created in collaboration with the teachers from Mentone Girls' Secondary College

Unit Overview

In this unit, students are given the opportunity to plan, create and produce a digital game. Students will commence the project by completing research into different games that are available. They will investigate the different styles of games (from quests to levels). They will look at the graphics, story line, characters and what the definition of winning is in each game. They will use this information and evaluation to help define and shape their own design.

Students will focus on creating a game that is suitable for their stakeholders. They will identify their stakeholders' needs by creating surveys to include qualitative and quantitative data. They will use this data to influence their decisions when designing a game.

Other Curriculum Targeted Areas

Other curriculum areas can be targeted and assessed within this unit.

Other areas of interest may include:

- Arts – Media
- Design and Technologies
- Critical and Creative Thinking
- Persona and Social Capability

Further investigation into these areas is required to ensure they align with the following activities. Activities may need to be modified to ensure content descriptions and achievement standards are met.

Australian Curriculum Alignment

The following sessions have been created using the Victorian Curriculum: Digital Technologies Curriculum. Tasks may need to be modified to ensure state Digital Technologies Curriculum content descriptions and achievement standards are met. ACS has support and documents to help align this unit to other Digital Technology Curricula.

Session

'Session' has been used to define the order of tasks to complete the unit. It does not define a set time required to complete the task. Time allocated to complete a session is the teacher's discretion. This allows for flexibility for the teacher to drive the duration of the task and make modifications if necessary. Sessions can be merged into one set period or sessions may run over multiple periods.

DESIGN A GAME IN UNITY

Levels 9-10



Key Preparation

Programming in Unity

The chosen platform to create their game is Unity. Unity is a platform that can be used to create digital games. To support skill development to create a digital game, Unity is equipped with a selection of self-paced courses for beginners. More information on [Unity Learn can be found here](#). Unity student plan is available and at the time of constructing this unit of work, free for students who are 16 years and older and enrolled in an accredited educational provider. More information on [Unity Student Plan can be found here](#).

Other platforms include: [GODOT](#), [Stencyl](#), [MicroStudio](#). The chosen platform to complete the unit is a decision that needs to be made from a school position.

Key Understandings

Students will:

- Compare and evaluate older and current games to help form the basis of their game design.
- Identify the Australian Privacy Policies and evaluate their validity when creating digital games.
- Create a summary of a 2D game and use wireframes, flowcharts and pseudocode to plan out the game.
- Interview stakeholders to collect and analyse data to validate the suitability of the game design.
- Use the platform Unity to create and code the game.
- Investigate the different file types and use the most appropriate.
- Create and evaluate a 2D game

Key Questions

- Why do we have the Australian Privacy Policies? What privacy policies do we need to consider when we are creating a digital solution?
- How can we best manage a group, online project?
- What are the main features of a game design you need to consider? What are your interests and how can you incorporate them into a game design?
- Who is your target audience and how do you know that your game is suitable for your stakeholders?
- How will data size and compression influence the file formats of the graphics that you will use?
- How will you code your game? What will the code look like – as a flowchart or pseudocode?
- What skills do you need to learn to feel confident using Unity?

Key Vocabulary

Collaboration, iterative collaborative approach, systems, security implications, stakeholders, qualitative data, quantitative data, visual data privacy, functional & non-functional requirements, functionality, accessibility, usability, aesthetics, digital solutions, future risks, innovation, sustainability, data compression, lossy, lossless, programming, sprite, asset, scene, skin, object, layer, mesh, pixel, render, texture, collider, collision,

DESIGN A GAME IN UNITY

Levels 9-10



Session Number	Session Focus	Learning Intention and Success Criteria	Introduction/Teacher Instruction	Whole Class Activity
1.	Evaluating current digital solutions	<p>Learning Intention Students will evaluate a selection of digital games, focusing on the functional and non-functional requirements.</p> <p>Success Criteria I can evaluate a selection of digital games and identify the functional and non-functional requirements of these games.</p>	Discuss with the students the types of digital games they have played in the past. Introduce students to the different the games that students will play with a quick introduction and explanation of how to play the games.	Students will break into small groups and spend time playing the games. Firstly, students will play the game to understand the rules, structure and expectation of the game. After a dedicated time to explore, students are required to fill out an evaluation form and discuss the game and identify areas of the game that could be used to create their own game in Unity.
Session Resources	<p>Student Resources</p> <ul style="list-style-type: none"> • Examples of games made in Unity (located at the end of the document) • Existing Solutions Evaluation (located at the end of the document) 		<p>Teacher Resources</p> <ul style="list-style-type: none"> • AMCI The story of the moving image Videogames • Unity Forum: Made with Unity 	
2.	Managing the project	<p>Learning Intention Students will identify an Australian Privacy Principle to evaluate. They will evaluate this principle into creating a signup page for their game design.</p> <p>Success Criteria I can identify the Australian Privacy Principles and evaluate their importance in relation to game design.</p>	<p>Introduce students to the Australian Privacy Principles. Discuss with students the purpose of these</p> <p>Give students time to read through the summary poster.</p>	<p>Students will break onto their groups that will be used for the group project. Read through the summary of the privacy principals of Australia and as a group pick one to focus on. They will analyse the chapter, in relation to one or more of the games they played in the previous session (if applicable).</p> <p>Prior to starting the game design students will consider what type of data they will collect (when users sign up to their game) and how to ensure how their game adheres to the principles.</p>
Session Resources	<p>Student Resources</p> <ul style="list-style-type: none"> • Australian Privacy Principles Summary poster 		<p>Teacher Resources</p> <ul style="list-style-type: none"> • Australian Privacy Principles 	

DESIGN A GAME IN UNITY

Levels 9-10



Session Number	Session Focus	Learning Intention and Success Criteria	Introduction/Teacher Instruction	Whole Class Activity
3.	Generate an idea	<p>Learning Intention Students will commence mapping out the idea to create a digital game.</p> <p>Success Criteria I can choose a style of game I want to create and complete a plan to organise my ideas.</p>	Provide students with 3 different types of games they could create. Plan out characters and what the first three levels or sections of their game will look like – they follow a criteria and planning sheet	<p>Small groups they read through the 5 different game summaries. They use the ideas as a springboard to create their own game or modify the examples that are provided. Once decided on the style of the game they will create a plan summarising their game.</p> <p>ChatGPT was used to formulate the game ideas and summaries. Included in the summaries are the prompts. An optional task for students to complete is using chatGPT to help formulate game ideas.</p>
Session Resources	<p>Student Resources</p> <ul style="list-style-type: none"> Game ideas summaries (located at the end of the document) Student Game Design Brief (located at the end of the document) 		<p>Teacher Resources</p> <ul style="list-style-type: none"> ACMI: Game builder Level 1 ACMI: Game builder Level 2 Milanote Plan a video game from start to finish DevTeam.Space How to Make a Game Like Pokemon Go? 	
4.	Designing Wireframes	<p>Learning Intention Students will create wireframes to show the first 3 stages or levels of their game.</p> <p>Success Criteria I can create wireframes of the first race or 2 levels of my game.</p>	Students share their ideas for their game design. These ideas will be high level (summary within a couple of sentences and describing characters and scenes. Discuss with the students the importance of creating storyboard to organise and structure the sequence of events.	Students create a storyboard of their game. They include detail such as: Main menu 3 main points that cover that topic Any facts or information that is vital to be included in the main points (stats or quotes). How they will commence and conclude the podcast.
Session Resources	<p>Student Resources</p> <ul style="list-style-type: none"> Gold Rush Wireframe/Storyboard Example 		<p>Teacher Resources</p> <ul style="list-style-type: none"> ACMI: Storyboards You Tube: Toy Story (1995) Storyboard/Final Spilt screen comparison: The Chase Miro: Wireframe Templates Mockit Wondershare How to create a Game Wireframe 	

DESIGN A GAME IN UNITY

Levels 9-10



Session Number	Session Focus	Learning Intention and Success Criteria	Introduction/Teacher Instruction	Whole Class Activity
5.	Acquiring stakeholder data	<p>Learning Intention Students will create a survey to ensure their game design idea is suitable for their stake holders. Structure of the survey will include quantitative and qualitative questions.</p> <p>Success Criteria I can generate a survey that contains qualitative and quantitative questions for my stakeholders.</p>	<p>Generate a discussion about the importance of ensuring the design of games is intended for the right audience.</p> <p>Pose the questions: how will you know your game would be popular with your audience? How do you know you are targeting your stakeholders' needs? How can you find this out?</p>	<p>Students will identify their stakeholders. They will create a simple profile of the stakeholder to get an understating of the needs of the stakeholder.</p> <p>Students create a list of qualitative and quantitative questions to ask their stakeholders. They chose a format that will allow easy collections and collation.</p>
Session Resources	<p>Student Resources</p> <ul style="list-style-type: none"> • Platforms that can generate a survey. Eg: Google Forms, Microsoft Forms, Survey Monkey 		<p>Teacher Resources</p> <ul style="list-style-type: none"> • Stakeholder Question Prompts (located at the end of the document) 	
6.	Privacy Policies	<p>Learning Intention Students will evaluate a selection of privacy policies and evaluate how they adhere to Australian Privacy Principals. They will use this information to create a policy for their game and survey.</p> <p>Success Criteria I can evaluate and explain how the tik tok privacy polices does or does not adhere to the Australian Privacy Principals. I can use this information to help write a policy for our survey and game.</p>	<p>Look at the privacy policy of TikTok and focus a discussion around 'Automatically Collected Information'. Reap on the Australian Privacy Principals by students sharing a summary of the principal they focused on.</p> <p>Discuss with students how the TikTok policy does or does not adhere to the Australian Privacy Principals.</p>	<p>Look at privacy of data that you are collecting and look at where the data is saved and evaluate the privacy and security of the chosen platform.</p> <p>Using a collection of common apps and platforms' privacy policies, students create a privacy policy for the survey and data collected and create a paragraph when collecting data in their game.</p>
Session Resources	<p>Student Resources</p> <ul style="list-style-type: none"> • TikTok Privacy Policy • Snapchat Privacy and Saftey Hub • Instagram Privacy Center • Netflix Privacy Statement 		<p>Teacher Resources</p> <ul style="list-style-type: none"> • Australian Privacy Principles • Australian Privacy Principles Summary poster 	

DESIGN A GAME IN UNITY

Levels 9-10



Session Number	Session Topic Focus	Learning Intention and Success Criteria	Introduction/Teacher Instruction	Whole Class Activity
7.	Interpreting stakeholder data	<p>Learning Intention Students will collate data into meaningful representation and use the representations to evaluate their digital idea.</p> <p>Success Criteria I can visually represent data so it can be interpreted. I can reflect on how this data has influenced my idea and design.</p>	Pose the question – how can you present your data, so it easily represents your stakeholders’ needs? Discuss the importance of data and how to visually represent the data.	Students collate their data. From the data they have collected, students will create a graph that easily visualises results from their data collection. Students will present these findings to their class. They will reflect on how the data has influenced/justified their design.
Session Resources	Student Resources		Teacher Resources	
8.	Introducing algorithms and flowcharts	<p>Learning Intention</p> <p>Success Criteria I can explain the purpose of a flowchart and pseudocode and identify errors in flowcharts and pseudocode.</p>	Introduce students to the importance of planning out code and introduce students to the mechanics of flowcharts and structure of pseudocode.	<p>Provide students with a selection of flowcharts and pseudocode for students to read through</p> <p>They can match the pseudocode to the wireframe, read through the flowcharts to look for mistakes and read through the pseudocode and find mistakes.</p>
Session Resources			<p>Teacher Resources</p> <ul style="list-style-type: none"> • Examples of flowcharts they have created on game they played back in the first session • Information on how to create a flowchart 	

DESIGN A GAME IN UNITY

Levels 9-10



Session Number	Session Topic Focus	Learning Intention and Success Criteria	Introduction/Teacher Instruction	Whole Class Activity
9.	Flowcharts and planning their game	<p>Learning Intention Students create a flowchart or pseudocode that mirrors the wireframes.</p> <p>Success Criteria I can create a flowchart of my wireframe that shows the core functions in my game for level 1 – 3 to predict outcomes and identify potential errors in code.</p>	Go through the flowchart of Gold Rush and demonstrate to students how the wireframe	<p>Create a flowchart/pseudo code of the game –</p> <p>Once the flowchart is complete, swap with another group to test and check for errors.</p>
	Student Resources		Teacher Resources	
			<ul style="list-style-type: none"> Examples of pseudocode 	
10.	Unity skill development	<p>Learning Intention Students complete a selection of Unity courses to help them develop skills in using the platform.</p> <p>Success Criteria I can complete a set of courses in Unity to develop my skills in gaming.</p>	Introduce students to the Unity platform. Demonstrate the basic features of Unity.	As a class, students all complete the Unity Playground, then Platformer Microgame courses. It is intended to use the courses in Unity to help students develop skills in game making. This session will run across a number of weeks to ensure students are confident with using Unity. A selection of courses have been identified below, however it is encouraged that students commence learning in their groups on tasks and skill they need to master.
Session Resources	Student Resources		Teacher Resources	
	<ul style="list-style-type: none"> Unity Playground Platformer Microgame Session 2 Platformer Microgame Video: 2D Game Kit Walkthrough 2D Game Kit Reference Guide Physics Challenges Introduction to Tilemaps Beginner Scripting 		<ul style="list-style-type: none"> Unity Essentials Unity for Educators Unity Curricular Framework Unity Teach Facebook Group Community Unity Playground Unity 2D Forum 	

DESIGN A GAME IN UNITY

Levels 9-10



Session Number	Session Topic Focus	Learning Intention and Success Criteria	Introduction/Teacher Instruction	Whole Class Activity
11.	Programming and designing their game	<p>Learning Intention Students will use Unity to create and code their. They will use the wireframes and flowcharts to keep them on track.</p> <p>Success Criteria I can use my planning documents (wireframes and flowcharts) to create and code my game.</p>	Students are given the opportunity to share their learnings and their design creations in Unity. Students share the different functions and changes they have made and use this time to share skills. It is expected students will use each other to help code and create their games (beyond their small groups)	In their groups, students commence creating and coding their game. It will be encouraged that students continue through the learning courses to upskill in Unity. Students can use the Unity Learn template designed to help them identify the skills they need to learn and how Unity Learn can support them.
Session Resources	<p>Student Resources</p> <ul style="list-style-type: none"> Planning template for using Unity 		<p>Teacher Resources</p> <ul style="list-style-type: none"> Unity Learn 	
12.	Compression of data	<p>Learning Intention Students will investigate file sizes and how the data compression will influence their published game. They will evaluate and choose a file size that will be suitable for their needs.</p> <p>Success Criteria I can investigate files sizes used to produce my game and explain which file type is the most suitable for my game.</p>	Provide students with a list of different file types. Students spend time matching the file end names to the purpose of the file. Discuss with	Create a pros and cons list of the different file types. Use this evaluation to justify the file types they have used to save their images, sounds and graphics.
Session Resources	<p>Student Resources</p> <ul style="list-style-type: none"> Information on lossy and lossless files 		<p>Teacher Resources</p> <ul style="list-style-type: none"> ACS Teacher Resource: Data Compression 	

DESIGN A GAME IN UNITY

Levels 9-10



Session Number	Session Topic Focus	Learning Intention and Success Criteria	Introduction/Teacher Instruction	Whole Class Activity
	Evaluation	<p>Learning Intention Students will evaluate their digital solution by answering a set of questions and prompts.</p> <p>Success Criteria I can evaluate my game design by recording myself playing the game and answering a selection of prompts and questions.</p>	Students present their games to the rest of the class. They present a summary of the game and allow other students to play the game.	Students record themselves playing their game and use the evaluation prompts and questions to evaluate their game.
Session Resources	Student Resources <ul style="list-style-type: none">Evaluation questions and prompts		Teacher Resources	

Games created in Unity

- [Forum in Unity to showcase games](#)
- Crawler Endless Runner: [Android](#), [YouTube Video](#) [Privacy Policy](#)
- Lone Survivor: [Android](#), [iTunes](#), [YouTube Video](#), [Privacy Policy](#)
- Bare Butt Boxing: [YouTube Video](#), [Storyline video](#), [Privacy Policy](#)
- Mystery in the office: [Android](#), [iTunes](#), [YouTube Launch Trailor](#), [Privacy Policy](#)
- Tile Sweeper: [Android](#), [iTunes](#), [YouTube Video](#), [Privacy Policy](#)
- Chicken Family [Android](#), [iTunes](#), [YouTube Video](#), [Privacy Policy](#)
- [Android](#), [iTunes](#), [YouTube Video](#), [Privacy Policy](#)
- [Android](#), [iTunes](#), [YouTube Video](#), [Privacy Policy](#)
- Binary Madness [website link](#)
- Baka Prase: [Android](#), [privacy policy](#)
- Emjoi Switch Lite: [Android](#),

Existing Solution Evaluation			
Basics	What is the name of the game? Who created the game? What is the name of the	Usability and aesthetics	Is your experience using this app a positive one? Are there any errors or glitches in the app? What seemed out of place? Did you like where buttons and links were placed? Any buttons or functions that didn't work properly? Any broken links? Looking at the design, what are 3 things you like about the app? What are 2 things you did not like about the technology and explain your answer.
Summary	Summarise the game in 3 sentences.	Privacy and security requirements	Was their privacy policy accessible? What user information do they collect? What information do they provide to you to keep user data secure? Do you think the privacy policy adheres to Australian Privacy Principles?
Functionality	Briefly explain how the game operates What are the functional requirements (what are the must haves of the app to make it work)?	Nonfunctional requirements	
Storyline	What is the storyline of the game? Who are the characters? What is the plot? What graphics/scene do they use? Rate the story line out of 10 (1 being low and 10 being high and well thought out). Explain your rating	Innovation	How is this innovative? How can the technology develop over time? What improvements could the developers make?

Game Design Ideas - Summaries

Chat GPT prompts:

- Create a digital game like Mario Bros.
- Create another summary but different scene and characters
- Create a summary of a 2D game that is based in an underwater theme and the player has to collect items and go through levels.
- I like it! What about a game that is like candy crush but very different
- I like it! What about another game but this time players have to get through levels and obtain gold coins

Gold Rush

In Gold Rush, players must navigate through various levels and collect gold coins while avoiding obstacles and enemies. The game takes place in a colorful and cartoonish world with different environments, such as jungles, deserts, and underwater caves.

Each level would have its own unique challenges, such as platforms that move, spikes that protrude from the ground, and enemies that chase the player. The player's objective would be to collect as many gold coins as possible while making it to the end of the level without losing all their lives.

To make the game more engaging, players could use the gold coins they collect to purchase upgrades and power-ups, such as extra lives, faster movement, and invincibility. The game could also include boss battles at the end of each level, where players must defeat a large and challenging enemy to progress to the next stage.

Gold Rush could have a single-player campaign mode where players progress through different levels and worlds, or a multiplayer mode where players can compete against each other to collect the most gold coins and reach the end of the level first.

The game could have cute and colorful graphics, fun sound effects, and catchy music to create a playful and enjoyable experience for players of all ages.

Dive into the Depths

"Dive into the Depths" invites players to embark on an immersive underwater adventure in a captivating 2D digital game. Set in a vibrant and enchanting underwater world, players take on the role of a courageous diver on a quest to explore the depths of the ocean, collect valuable items, and conquer challenging levels.

As players navigate through the game's beautifully crafted underwater environments, they encounter a myriad of captivating sea creatures, intricate coral reefs, and hidden caves. The objective is to collect a diverse range of items, such as sparkling pearls, ancient relics, and sunken treasures, scattered throughout each level.

To progress, players must navigate through underwater mazes, solve clever puzzles, and overcome aquatic obstacles while avoiding dangerous predators and treacherous currents. Along the way, they uncover secrets, unlock hidden areas, and discover power-ups that enhance their abilities, enabling them to delve even deeper into the mysterious depths of the ocean.

Lost in the Enchanted Forest

"Lost in the Enchanted Forest" invites players to embark on a magical 2D adventure set in an enchanting forest teeming with mysteries and wonders. In this captivating digital game, players assume the role of a brave explorer who finds themselves in a mystical forest filled with captivating creatures and hidden treasures.

As players venture through the forest's intricately designed levels, they must navigate through dense foliage, overcome challenging platforming obstacles, and solve clever puzzles to collect valuable items scattered throughout the enchanting landscape. From sparkling gems and ancient artifacts to mythical talismans, each item holds its own significance and contributes to the player's progress.

Throughout the journey, players encounter whimsical characters, encounter legendary creatures, and unravel the secrets of the forest's ancient lore. Along the way, they unlock new abilities and power-ups, enabling them to reach hidden areas, discover secret paths, and unveil the forest's well-guarded treasures.

Inventor's Quest: Steampunk Adventure

"Inventor's Quest: Steampunk Adventure" takes players on a thrilling 2D journey through a world infused with steampunk aesthetics and imaginative contraptions. Set in a bustling city of gears, steam, and clockwork wonders, players assume the role of a brilliant inventor on a quest to gather rare components and unlock the secrets of invention.

As players navigate through the game's intricately designed levels, they encounter sprawling industrial districts, ornate clock towers, and hidden underground workshops. The objective is to collect a wide array of unique gears, cogs, and gadgets scattered throughout each level, which are essential for crafting magnificent inventions.

To progress, players must master the art of platforming and overcome ingenious puzzles while avoiding hazardous steam blasts and mechanical adversaries. Along the way, they discover blueprints, unravel hidden passages, and gather inspiration from eccentric characters who populate this steampunk world.

As players gather components, they unlock new tools, gears, and machinery that aid in their journey and enable them to delve deeper into the mysteries of invention. From steam-powered jetpacks to automatons with unique abilities, the possibilities are vast, allowing players to experiment and create their own mechanical marvels.

DESIGN A GAME IN UNITY

Levels 9-10



Student Game Design Brief

Basics	What is the name of the game?	Summary	Summarise the game in 3 sentences.
Storyline	Who are the characters in your game? What is the plot of your game? Where does the story take place? How the characters and scenes connected? What happens at the end of your game? What are the characters aiming for?	Privacy and security requirements	When a user signs up to your game, what data will you collect? Why is that data important for your game? When playing your game, what data will be collected from the user? Why is that data important for your game? What potential issues could arise based on the data you are collecting and storing for your app?
Functionality	What do you want your product to do? What hardware/software do you need?	Nonfunctional requirements	How would you keep data secure? How easy is it for the user to learn to use and manage the interface? What about response times?
Innovation	How is this game different to what is already on the market? What new ideas could you include?		

Wireframe prompt for Gold Rush

ChatGPT prompt:

- Create worded dot points that can be used to create a wireframe
- **Main Game Screen:** Display the central gameplay area where the action takes place, including the game environment, characters, obstacles, and resources.
- **Player Information:** Include a section to showcase important player information such as the player's name, score, level, lives, health, and other relevant stats.
- **Game Controls:** Provide a designated area for game controls, including buttons or icons for actions like moving characters, jumping, attacking, or using special abilities.
- **Menus and Navigation:** Allocate space for menus such as the main menu, pause menu, level selection, and options menu. Include buttons or tabs for easy navigation between different screens.
- **HUD (Heads-Up Display):** Design a HUD element to show real-time information during gameplay, such as a mini-map, timer, score counter, health bar, or resource indicators.
- **Inventory and Upgrades:** Dedicate a section to display the player's inventory, collected items, power-ups, or available upgrades for equipment, abilities, or character customization.
- **Dialogue or Story Panels:** Reserve space for dialogue or story panels to present important narrative elements, character interactions, or mission objectives.
- **Notifications and Feedback:** Create space for displaying in-game notifications, alerts, achievements, or feedback messages to provide information or acknowledge player progress.
- **Additional Screens:** Consider wireframing additional screens like game over screens, victory screens, tutorial screens, or settings screens to cover different aspects of the game experience.

Stakeholder Question Prompts

What age bracket is your stakeholder? What does this mean for the user experience when creating your app?	What about gender, how can it influence your design?
What are some questions you could ask to find out if your stakeholder group would play your game?	What are some questions you could ask your user about to understand who they are?
What type of questions could you ask that will give you worded answers?	What type of questions could you ask that will get you numerical answers?
What type of questions can you ask to understand what they like and dislike?	What type of questions could you ask to get valuable feedback about your game design?
Which wireframes will you include in your survey? What do you want them to tell you about your wireframe?	What questions can you ask to get valuable feedback about the storyline of your game?

DESIGN A GAME IN UNITY

Levels 9-10



Planning Template for Unity Learn				
Skill to learn	Purpose of that skill	Unity Learn Course that can help	Duration	Link
Learn about Unity scenes	To help us learn about the Unity Editor interface and navigate a scene	Explore the Unity Editor	10 minutes	https://learn.unity.com/tutorial/explore-the-unity-editor-1#