**Game Design**

Performance Task

# **Create — Basic Gameplay**

## **Overview**

In this performance Task, you will program a top-down game with the objective of throwing food to hungry animals - who are stampeding towards you - before they can run past you. In order to do this, you will become much more familiar with some of the most important programming and Unity concepts, including if-then statements, random value generation, arrays, collision detection, prefabs, and instantiation. In completing this Unit, you will learn how to program a basic game with the ability to launch projectiles and maneuver the player to keep the game alive.

## **Assessment**

You will be provided with 16 hours of class time to complete and submit the following:

* A video of your game being planned or a trailer for the game
* Written responses about your game and design process
* Digital Game Prototype

Your teacher will share submission guidelines that include suggestions for creating video and PDF files.

## **General Requirements**

You are required to:

* Define control structures and boolean expressions
* Decompose (break down) the steps needed to solve a problem into a precise sequence of instructions.
* Identify data types and memory models
* Define events, event handler and validation in terms of algorithms.
* Identify the cause of an incorrect behaviour (i.e., bug) in a program.
* Identify the rationale or purpose behind programs and digital tools commonly used. Explain how programs are built for a purpose.
* Identify the basic principles of design thinking (i.e., empathy, brainstorming, prototyping, testing, iterating).
* Write responses to questions about your game.
* Include your entire prototype.

## **Submission Requirements**

### 1. **Video**

Submit one video in .mp4, .wmv, .avi, or .mov format that demonstrates the running of your game. Your video must not exceed 1 minute in length and must not exceed 30MB in size.

### 2**. Written Responses**

Submit one PDF document in which you respond directly to each prompt. Clearly label your responses. Your response to all prompts combined must not exceed 750 words.

You may use images to show off or to explain things in your written responses.

## **Purpose and Development**

1. Provide a written response or audio narration in your video that:

Identifies the changes you made to your prototype. Identifies the changes.

* Explains what the video illustrates.

(Approximately 150 words)

1. Identify the cause of an incorrect behaviour (i.e., bug) in a program. Identify the rationale or purpose behind programs and digital tools commonly used. Explain how programs are built for a purpose. Decompose (break down) the steps needed to solve a problem into a precise sequence of instructions.

(Approximately 200 words)

1. Identify the basic principles of design thinking (i.e., empathy, brainstorming, prototyping, testing, iterating).

(Approximately 200 words)

1. Define control structures and boolean expressions. Identify data types and memory models. Define events, event handler and validation in terms of algorithms. (Approximately 200 words)

## Tasks

### **Activity 1 - Explore**

**Description**

Students learn about prefabs and use them to create and enhance a scene. Students complete a prefab tutorial in Unity to learn the basics of modifying prefab GameObjects and component parameters to change the scene’s output in game view.

* Using Prefabs

Time To Complete: 1-3 Hours

### **Activity 2 - Research**

**Description**

How to use IF statements to set conditions in your code. Understanding variable & function scope and accessibility. Learn the important differences between Value and Reference data types, in order to better understand how variables work.

* Introduction to Programming Part 2

Time To Complete: 1-2 Hours

### **Activity 3 - Ideate**

**Description**

Students learn about their final project and spend time brainstorming and refining their ideas. Up to this point, you’ve learned a little about the video game industry and some fundamental Unity skills. Now it’s time to put your knowledge to use in your very own game.

* Planning Your Game Part 1

Time To Complete: 1-2 Hours

### **Activity 4 - Evaluate**

**Description**

Students will self evaluate their game idea, and then peer review the idea looking for input and helpful feedback to finalize the idea before building the prototype.

Time To Complete: 1-2 Hours

### **Activity 5 - Construct a Prototype**

**Description**

Students will begin this unit by creating a new project for your second Prototype and getting basic player movement working. You will first choose which character you would like, which types of animals you would like to interact with, and which food you would like to feed those animals. You will give the player basic side-to-side movement just like you did in Prototype 1, but then you will use if-then statements to keep the Player in bounds.

Students will allow the player to launch the projectile through the scene. First you will write a new script to send the projectile forwards. Next you will store the projectile along with all of its scripts and properties using an important new concept in Unity called Prefabs. The player will be able to launch the projectile prefab with a tap of the spacebar. Finally, you will add boundaries to the scene, removing any objects that leave the screen.

Our animal prefabs walk across the screen and get destroyed out of bounds, but they don’t actually appear in the game unless we drag them in! In this lesson we will allow the animals to spawn on their own, in a random location at the top of the screen. In order to do so, we will create a new object and a new script to manage the entire spawning process.

Our game is coming along nicely, but there are some critical things we must add before it’s finished. First off, instead of pressing S to spawn the animals, we will spawn them on a timer so that they appear every few seconds. Next we will add colliders to all of our prefabs and make it so launching a projectile into an animal will destroy it. Finally, we will display a “Game Over” message if any animals make it past the player.

* Player positioning
* Food fight
* Random animal
* Collision detection
* Challenge 2

Time To Complete: 6-8 Hours

### **Activity 6 - Improve the Design**

**Description**

Once the prototype is built the students will now test the games. Students should play 2-3 games and provide useful feedback to the creator. Students will then take their feedback and plan how to improve their game, play test it once more and get some final feedback.

* Extras

Time To Complete: 2-3 Hours

### **Activity 7 - Share**

**Description**

Students will share their feedback, prototype and whole design process with the class in a formal presentation, or gallery walk.

Time To Complete: 1-2 Hours

### **Activity 8 - Reflect**

**Description**

Students will reflect on their design process and how they went about creating their game, what struggles they encounter and how what worked and didn’t work for them. They will submit a video of game play, along with their written reflection.

Time To Complete: 1 Hour