# Dev – Basics 1

Minor Game Design & Development


HOGESCHOOL ROTTERDAM

# Dev Class Intro

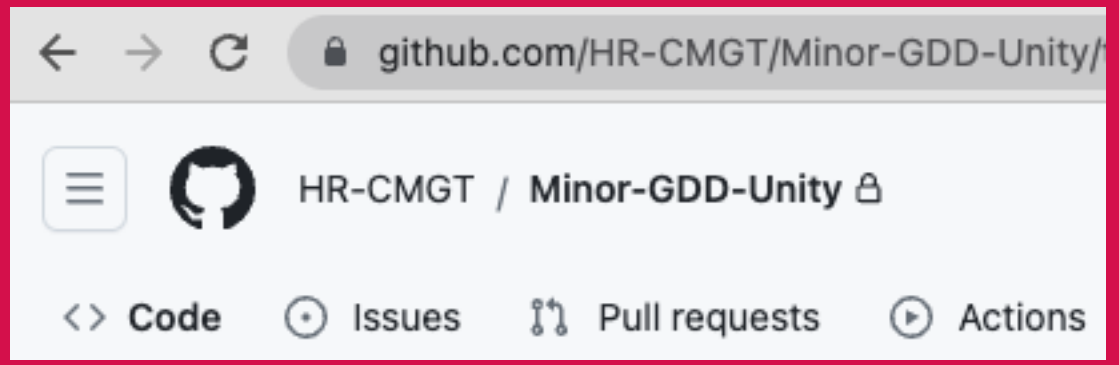
- Unity, C#
- Focus on 2D, then 3D
- Github, Discord

# Part 1

- Github MGDD
- Github Documentation
- Unity Startproject
- Unity Package Manager
- Assignment (StartProject)
- Rigidbody2D - Component
- Rigidbody2D - Scripting
- Unity Documentation
- Unity Learn
- Unity’s Script Lifecycle

# Github MGDD

https://github.com/HR-CMGT/Minor-GDD-Unity/



# Github Documentation

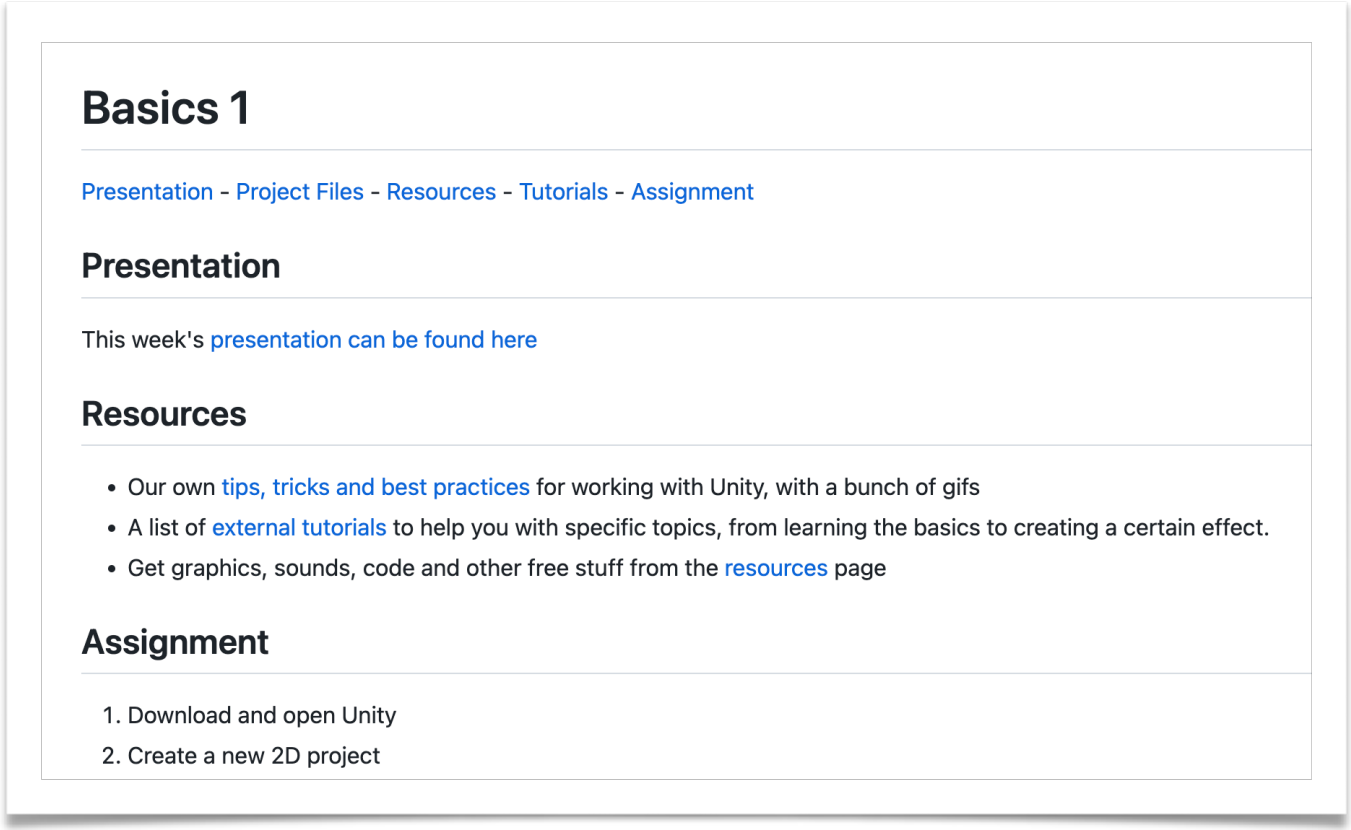
Resources

Tutorials

Project Files

Unity Tips & Best Practices

Code Snippets



## Basics 1

Presentation - Project Files - Resources - Tutorials - Assignment

### Presentation

This week's presentation can be found here

### Resources

- Our own tips, tricks and best practices for working with Unity, with a bunch of gifs
- A list of external tutorials to help you with specific topics, from learning the basics to creating a certain effect.
- Get graphics, sounds, code and other free stuff from the resources page

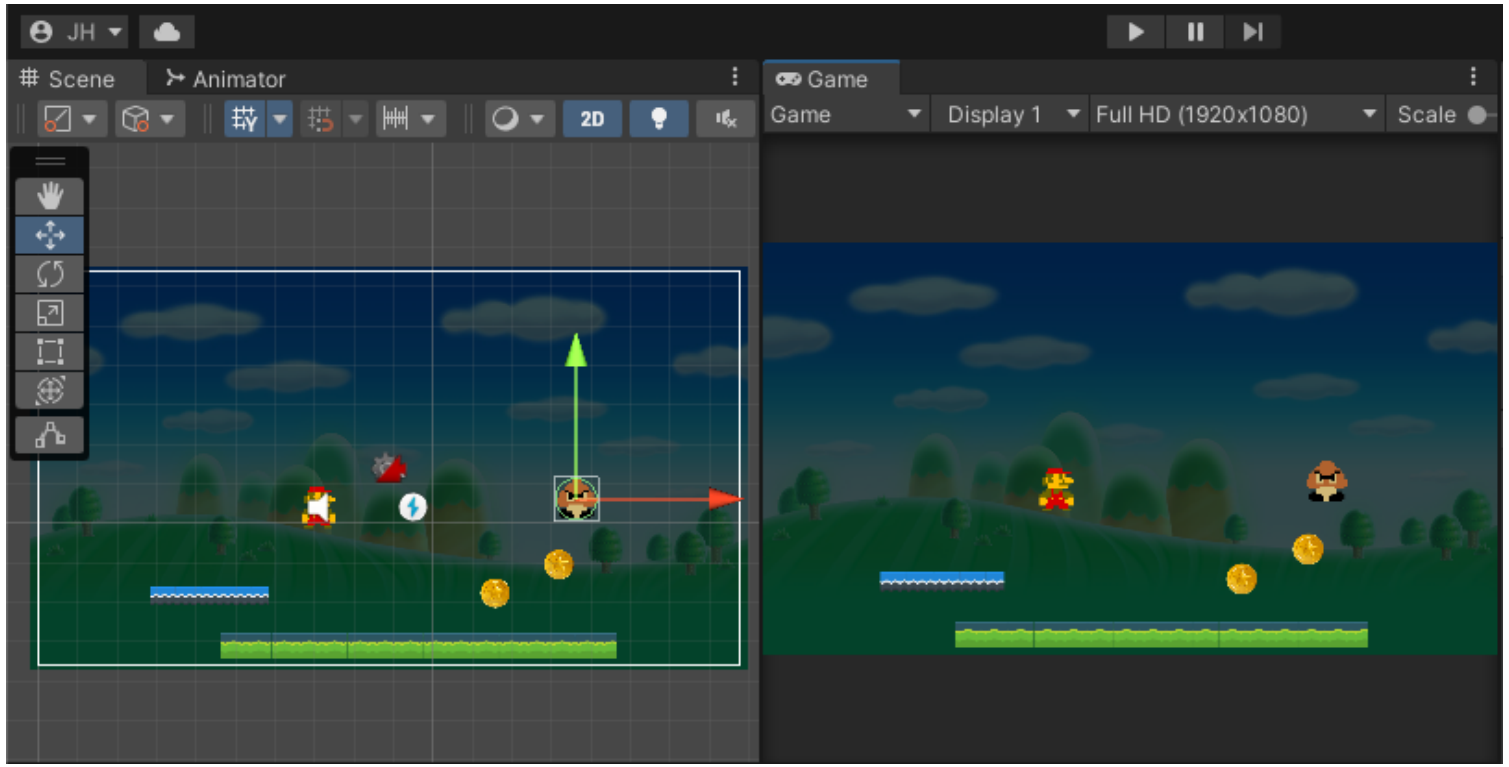
### Assignment

1. Download and open Unity
2. Create a new 2D project

# Unity Startproject

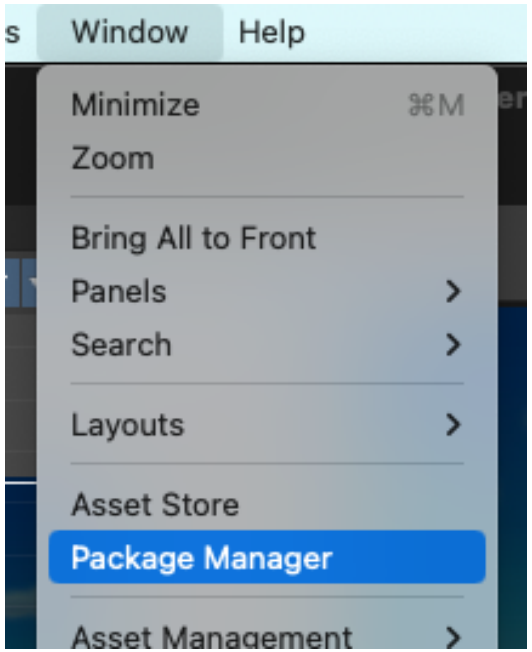
UnityPackage

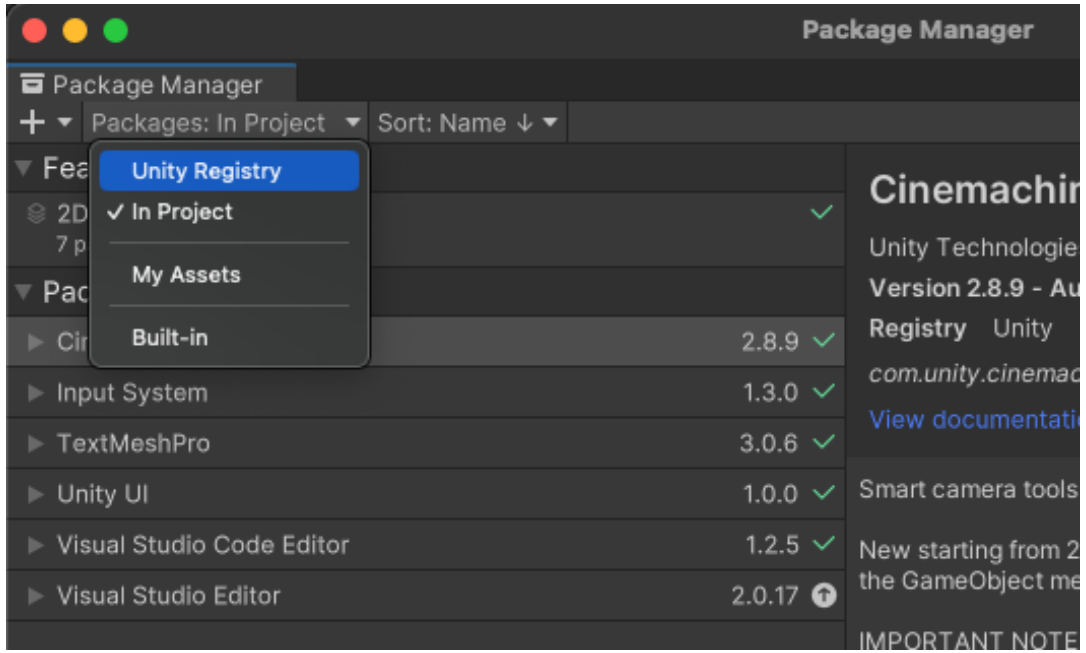
[Github link]

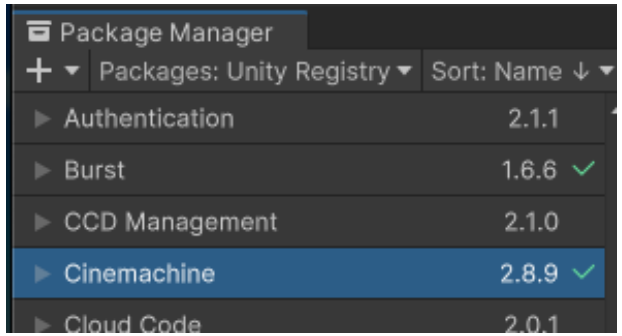


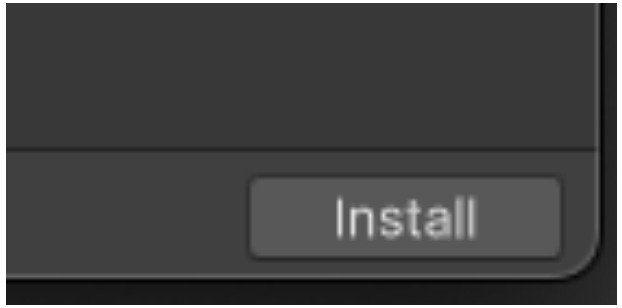
# Unity Package Manager

Open Package Manager, select Unity Registry, install Cinemachine & Input System



# Assignment (StartProject)

- Camera Follow
- Configure the Player
- Programming the Player
  - Jump
  - Move
  - ResetPlayer
  - OnCollisionEnter2D
  - CollectCoin
- Jump Sprite
- Add Coins
- Play Around

# Rigidbody2D - Component

Note: Requires a Collider2D to work!

Body Types:

Dynamic / Kinematic / Static

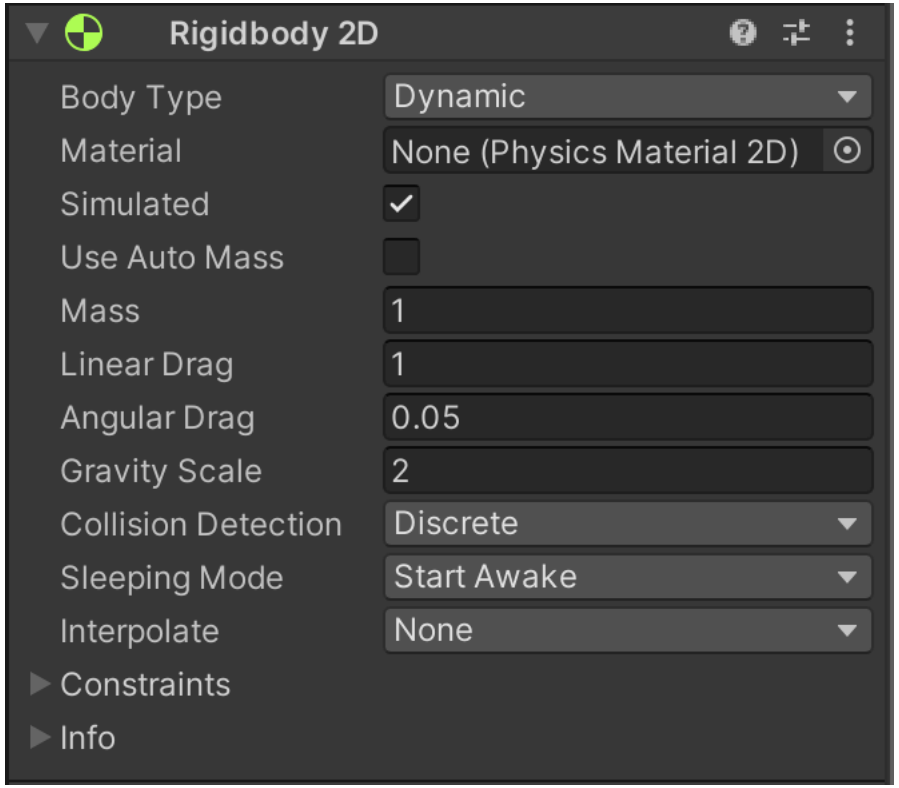
Constraints:

Freeze Position X/Y, Freeze Rotation Z

Material:

PhysicsMaterial2D, friction and bounciness

Mass, Gravity Scale and Linear Drag ('air-friction') settings for "weight"



# Rigidbody2D - Scripting

Frequently used properties and functions of Rigidbody2D

Tip: use AddForce [script ref] for moving a dynamic Rigidbody2D, and use a big

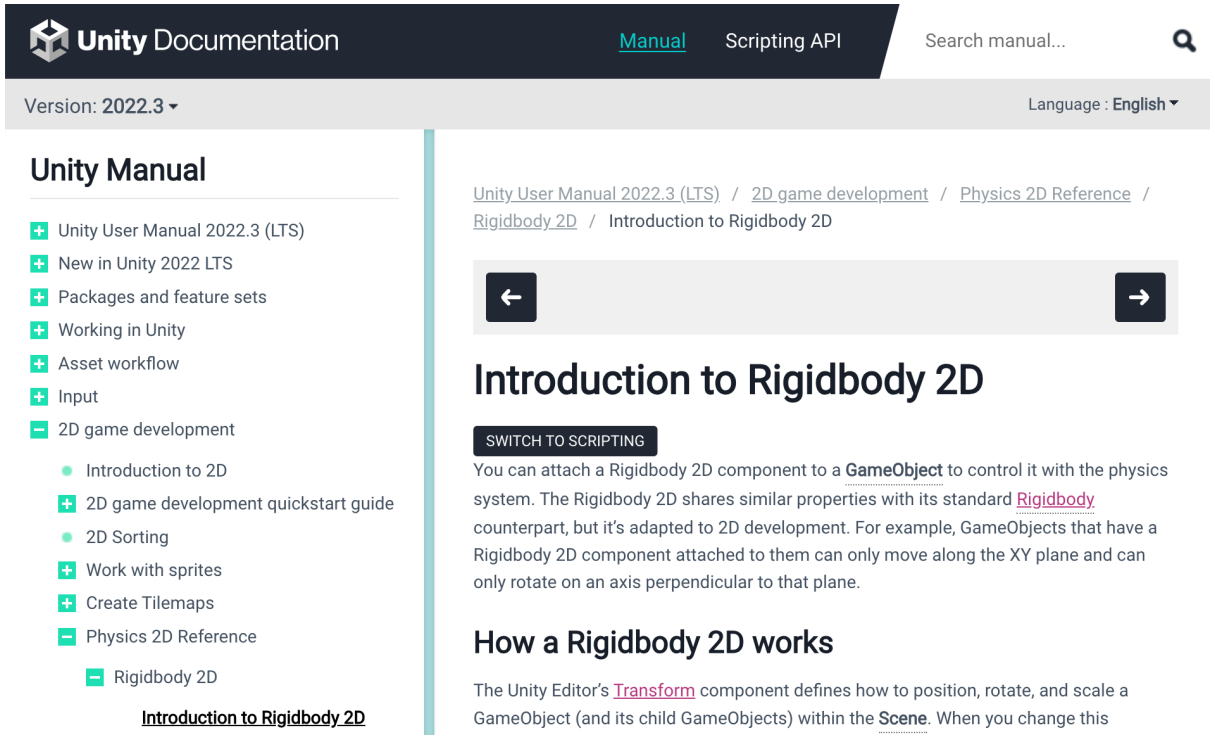
```
rb = GetComponent<Rigidbody2D>();

rb.velocity = Vector2.right; // set the velocity directly, ignore mass
rb.AddForce(Vector2.right); // push the object, include mass
rb.isKinematic = true; // "freeze" the object
rb.MovePosition(new Vector2(0, 0)); // set the world position directly
```

Unity Script Reference - Rigidbody2D

# Unity Documentation

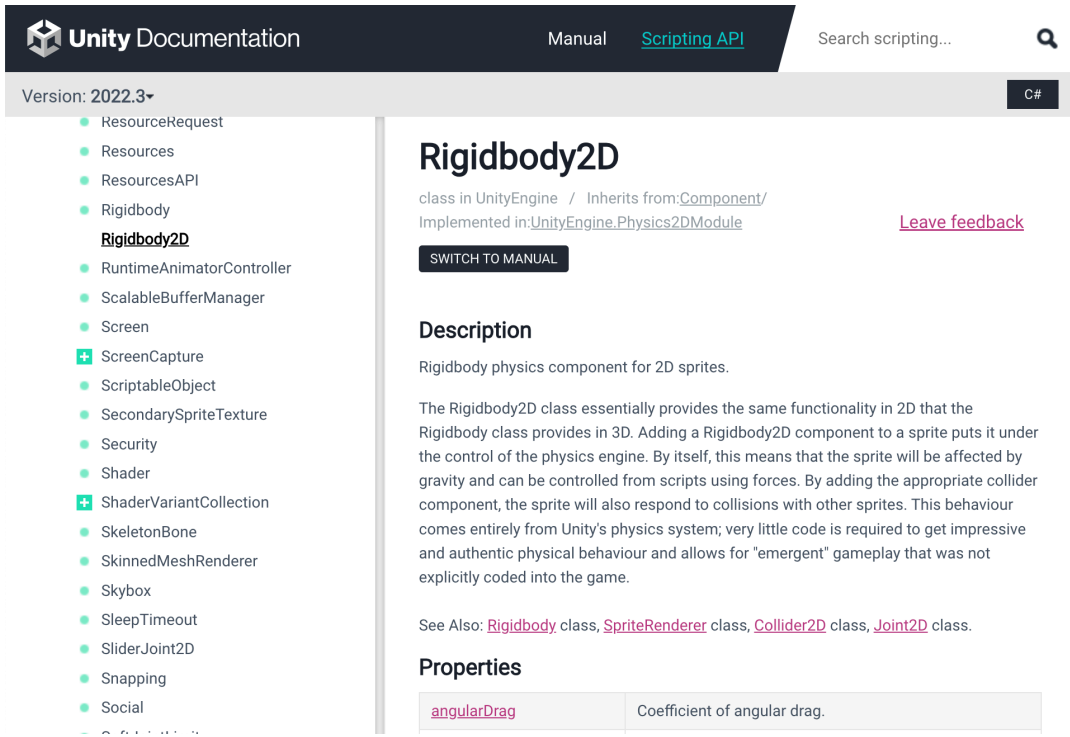
## 1. Unity Manual

"Tutorials" on how Unity's systems work




## 2. Unity Script Reference

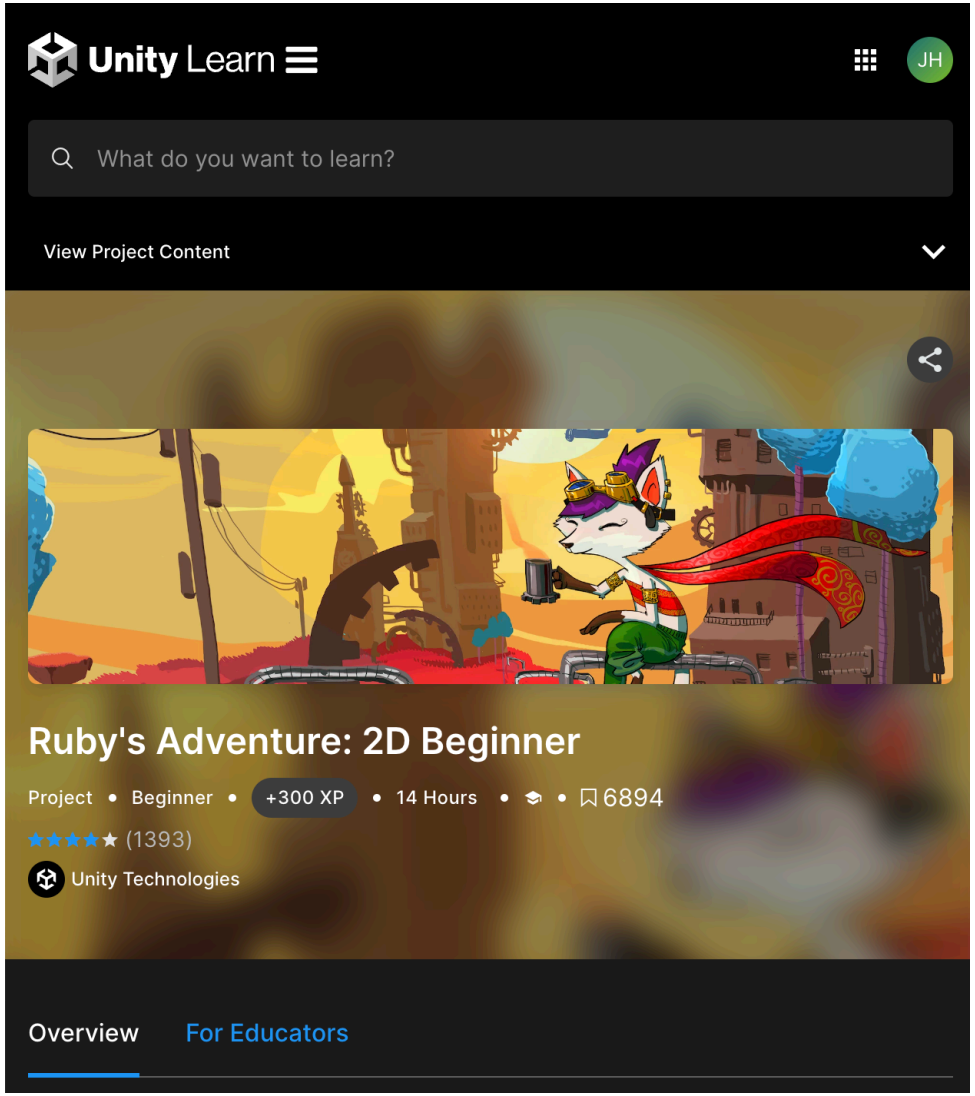
Overview of Scripting API



# Unity Learn

Unity Learn:

- Unity's official tutorials
- All "difficulty" levels
- (New) systems explained
- Up-to-date

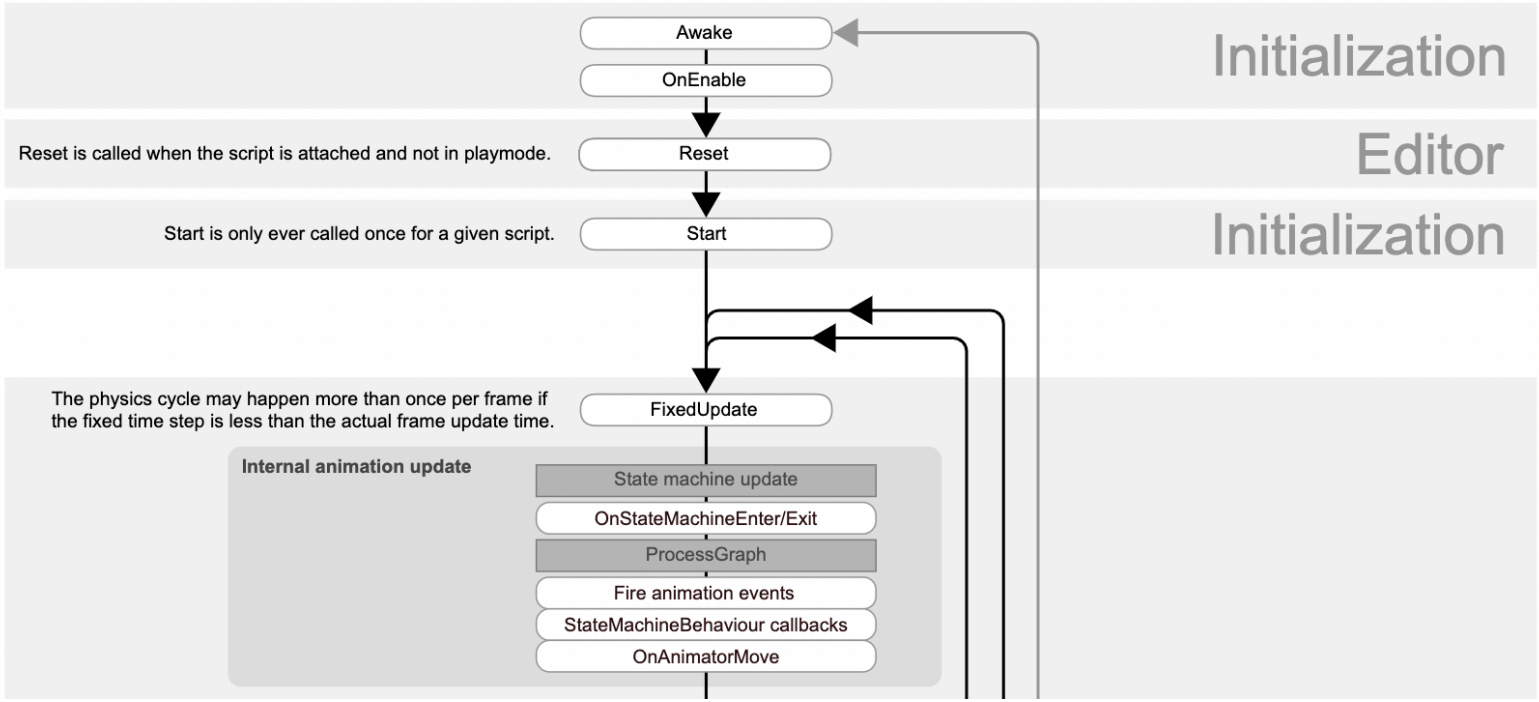



Ruby's Adventure: 2D Beginner
Recommended tutorial for 2D game dev [link] ->

# Unity's Script Lifecycle

Most used, in order of execution:

- Awake
- OnEnable
- Start
- FixedUpdate
- OnCollision (+Enter/Exit/Stay)
- Update
- OnDisable

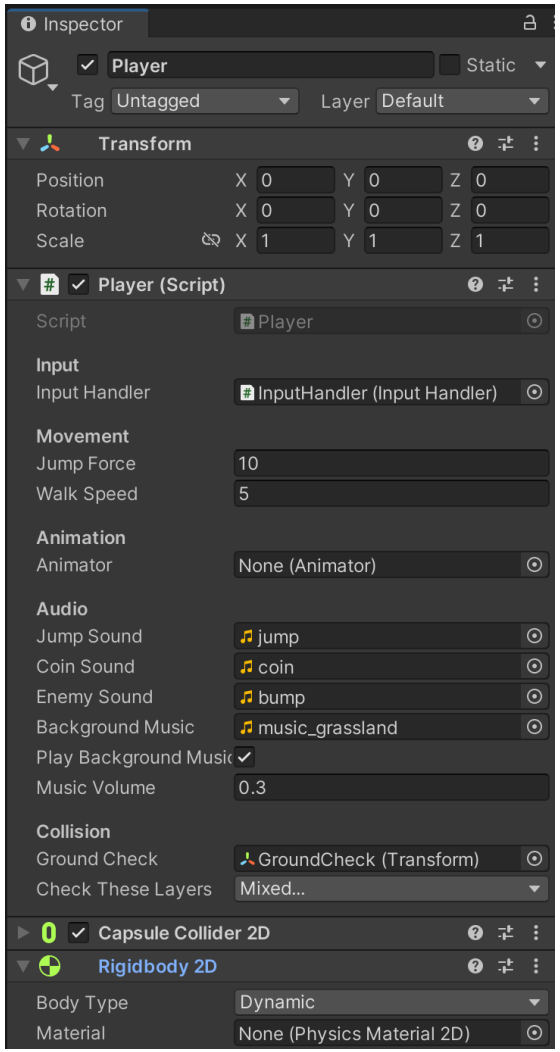



From: [Unity Manual - Order of execution for event functions [link]]

# Part 2

- Unity’s Component-based workflow
- Creating and Destroying GameObjects
- Using Prefabs [TODO]
- Referencing (Game)Objects

# Unity's Component-based workflow




- Inspector shows all components per GameObject
(<- e.g. Transform, Player.cs script, CapsuleCollider2D, Rigidbody2D).

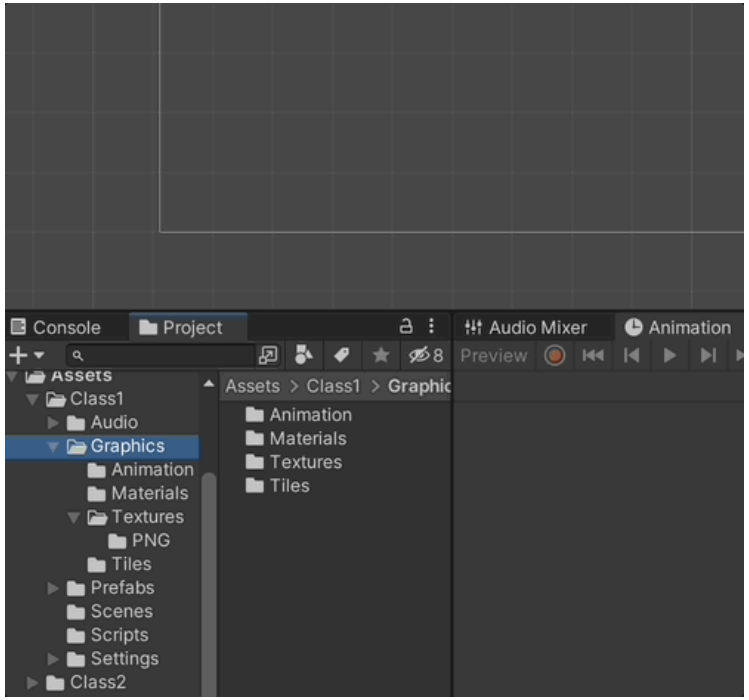
- Every component can be referenced by script

- Every GameObject can be referenced by a component on it

# Creating and Destroying GameObjects

## Method 1: Drag into Scene view

Tip: dragging a Sprite into a scene will create a new game object



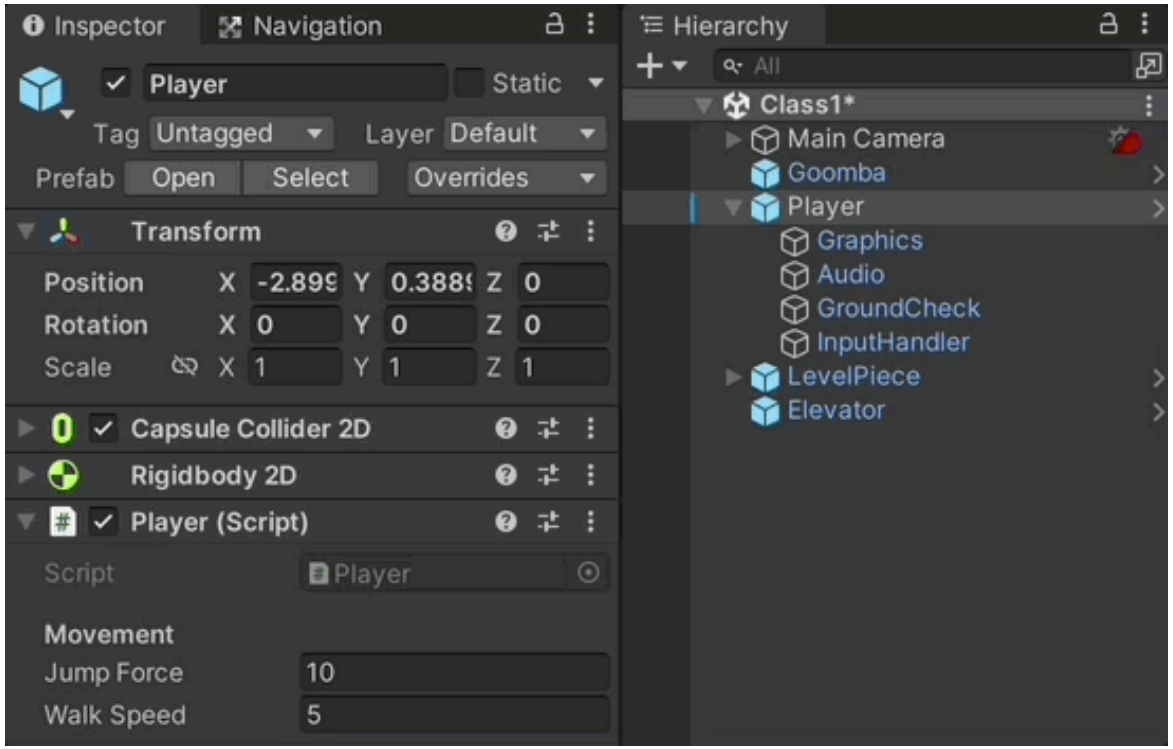

## Method 2: By script

tip: keep lists of things you've spawned

```
public Enemy enemyPrefab;
private List<Enemy> spawnedEnemiesList;

public void SpawnEnemy()
{
    Enemy newEnemy = Instantiate(enemyPrefab);
    spawnedEnemiesList.Add(newEnemy);
}

public void DestroySpecificEnemy(Enemy specificEnemy)
{
    if (spawnedEnemiesList.Contains(specificEnemy)){
        spawnedEnemiesList.Remove(specificEnemy);
        Destroy(specificEnemy);
    }
}
```

# Using Prefabs

- Prefab editing
- Dragging prefabs into a scene

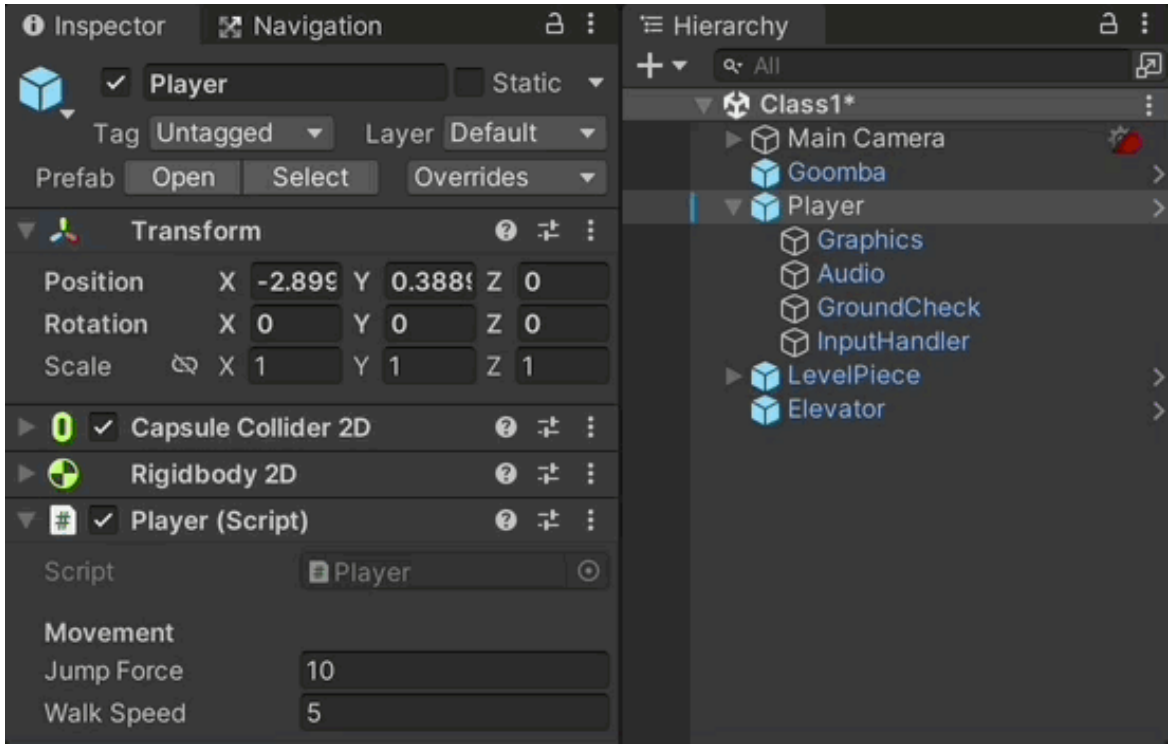


# Referencing (Game)Objects - Public variables

- If you make a variable public, it will show up in the Inspector view

- Use this for referencing other objects

- **Warning**: Don't drag scripts from Project view into the Inspector view!
Always use scripts that are already in the scene.



# Referencing (Game)Objects - by Component

- Player *is* a GameObject

- Player *has* a Player.cs script on it (which is a component)

You can reference a GameObject by the GameObject class,

or by one of the components that the GameObject has.

```
[Header("Same Object Ref")]
public GameObject prefabReference;
public Player playerPrefabReference;
```