# Introduction to Unity3D

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# Game Engines

Game engines are designed for the creation and development of 2D/3D games

## Components

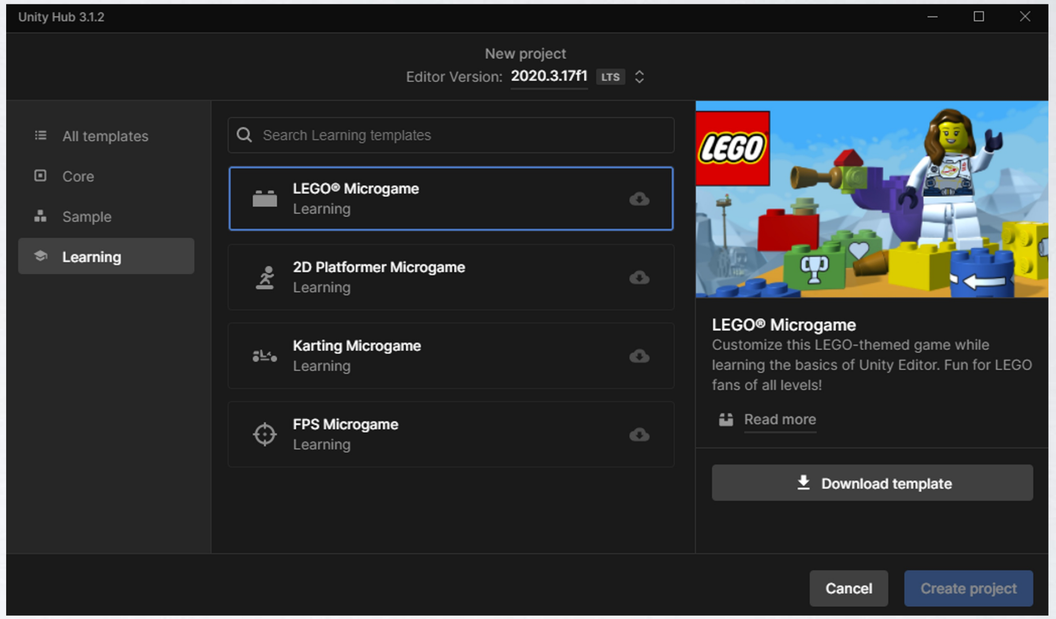
- Renderer
- Physics Engine
- Sound
- Scripting
- Animation
- Artificial Intelligence
- Networking
- Scene Graph

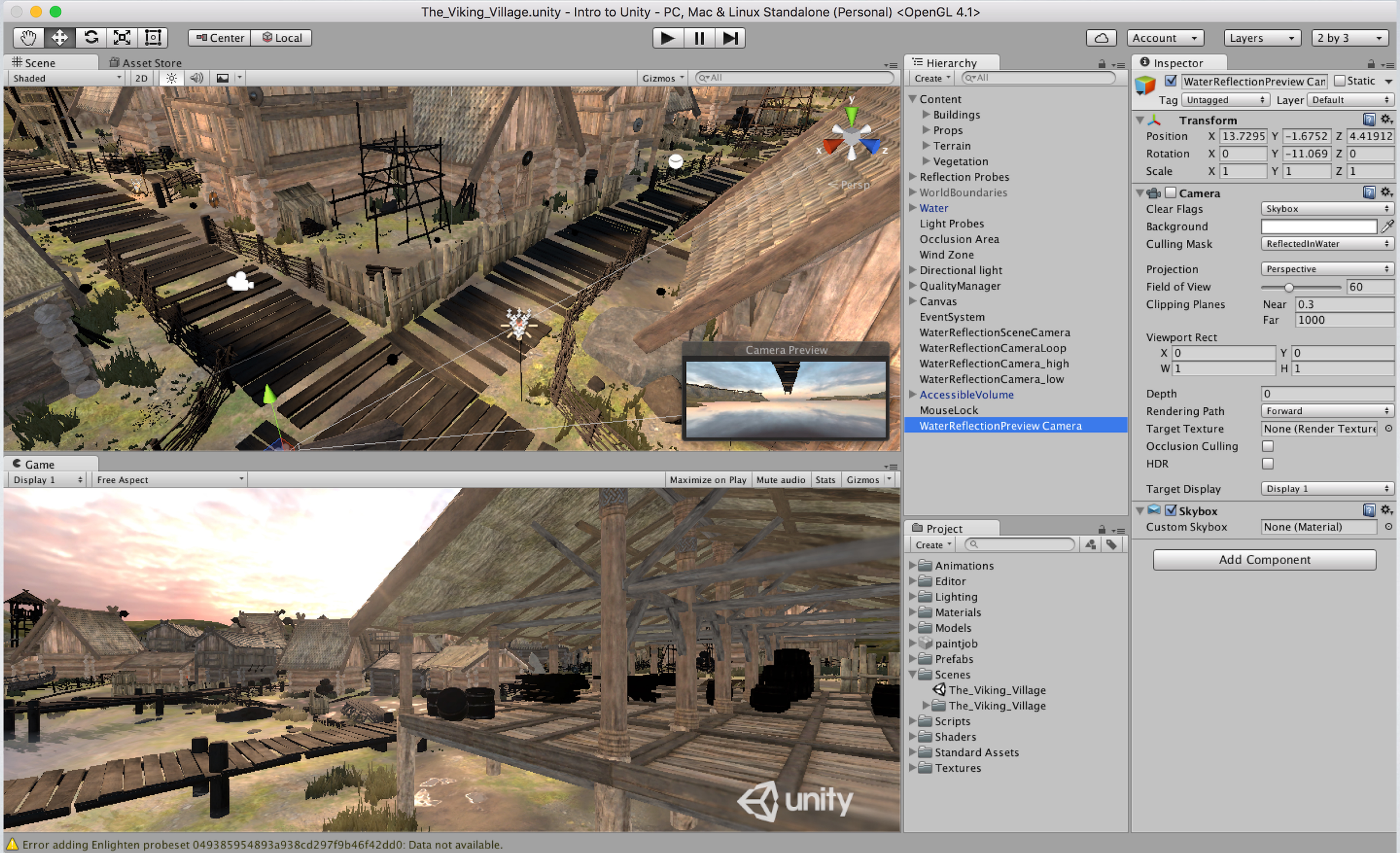
# Unity3D

- Free game engine
- Provides all the components of any modern game engine
- Cross Platform (PC, Xbox, Tablet, Phone, etc.)
- http://unity3d.com

# Activity

- Create a new Unity Project
  - Version: Unity 2021.3.2f1
  - Choose a tutorial template
    - Lego Microgame
    - Karting Microgame
    - FPS Microgame

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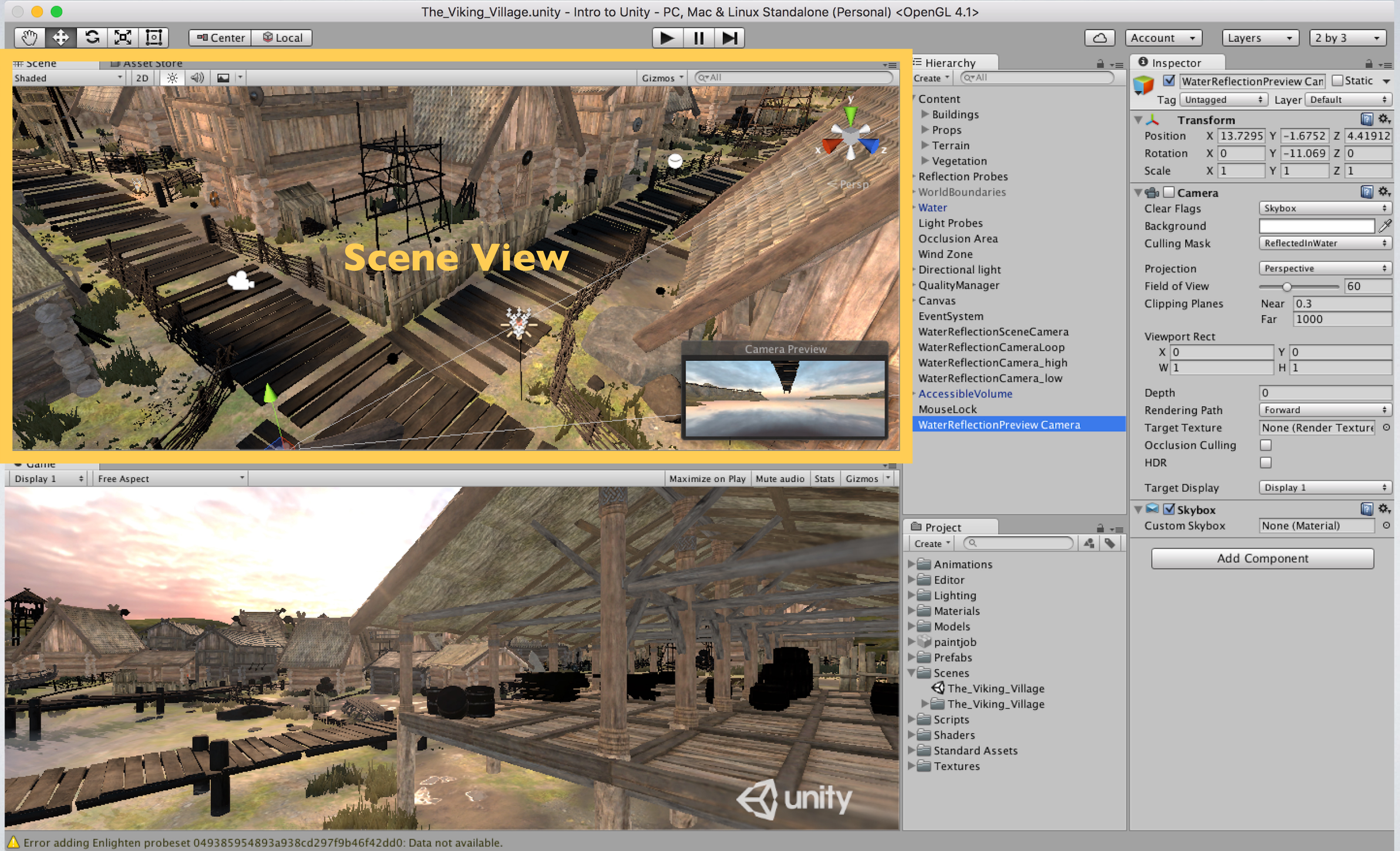
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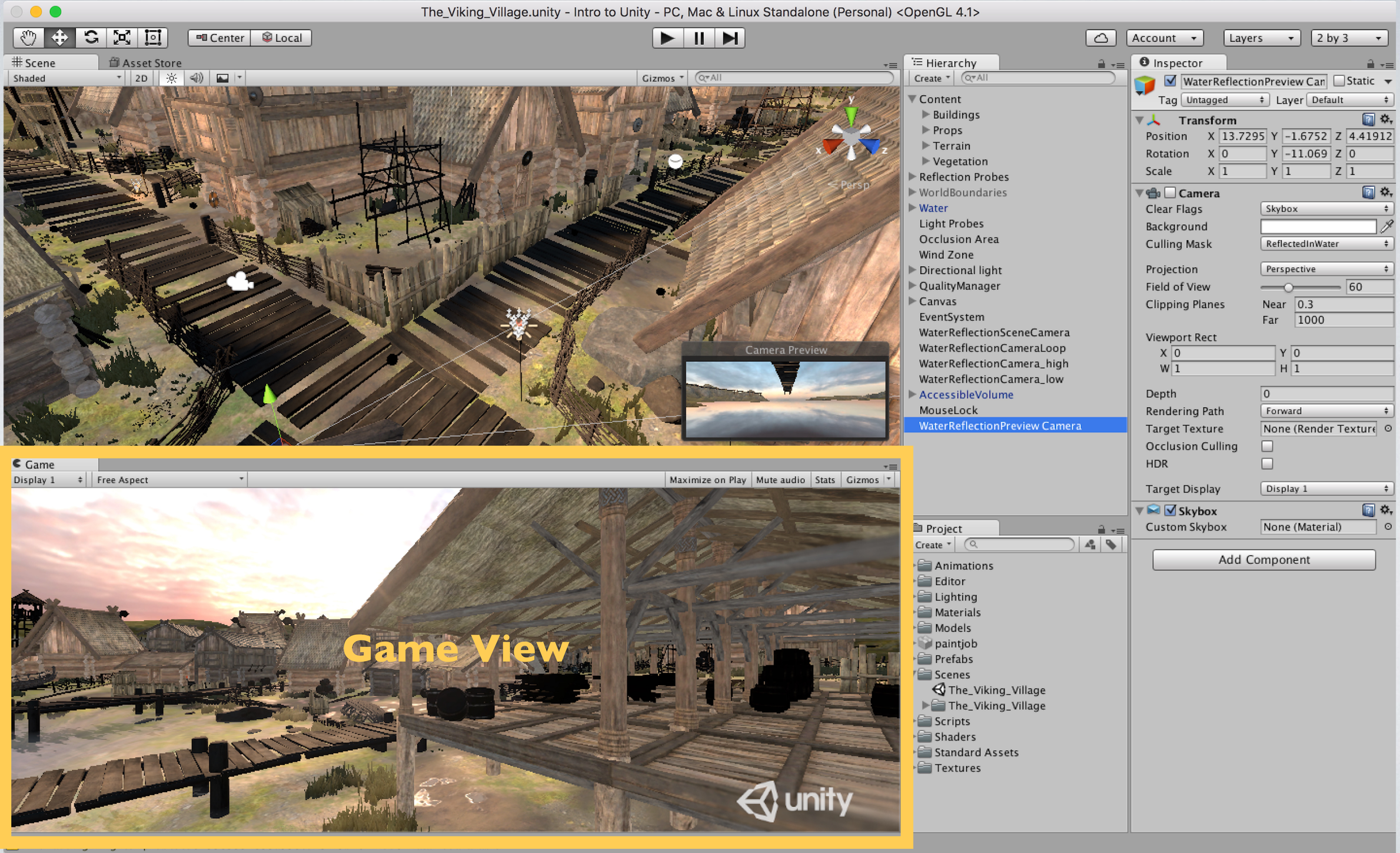
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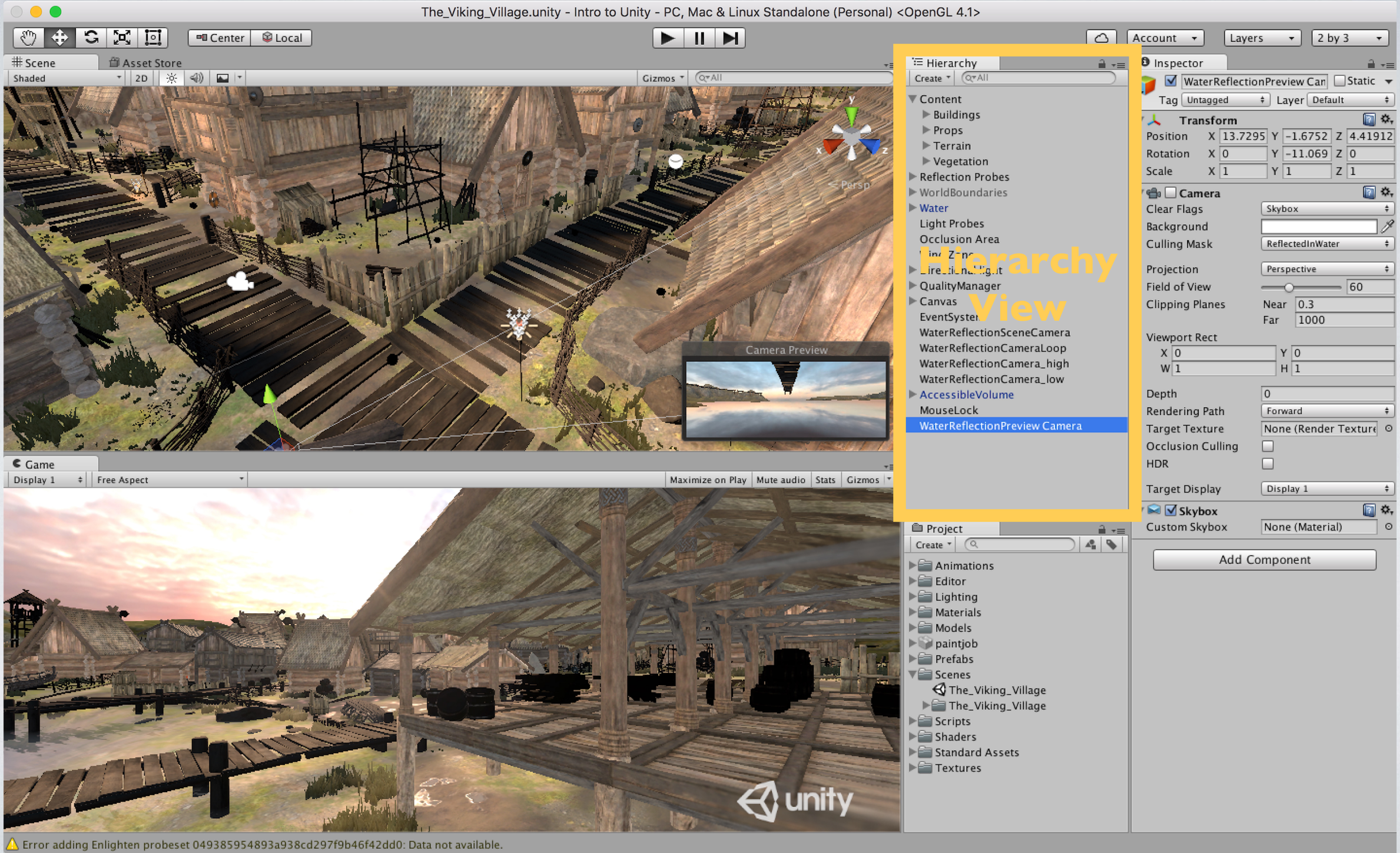
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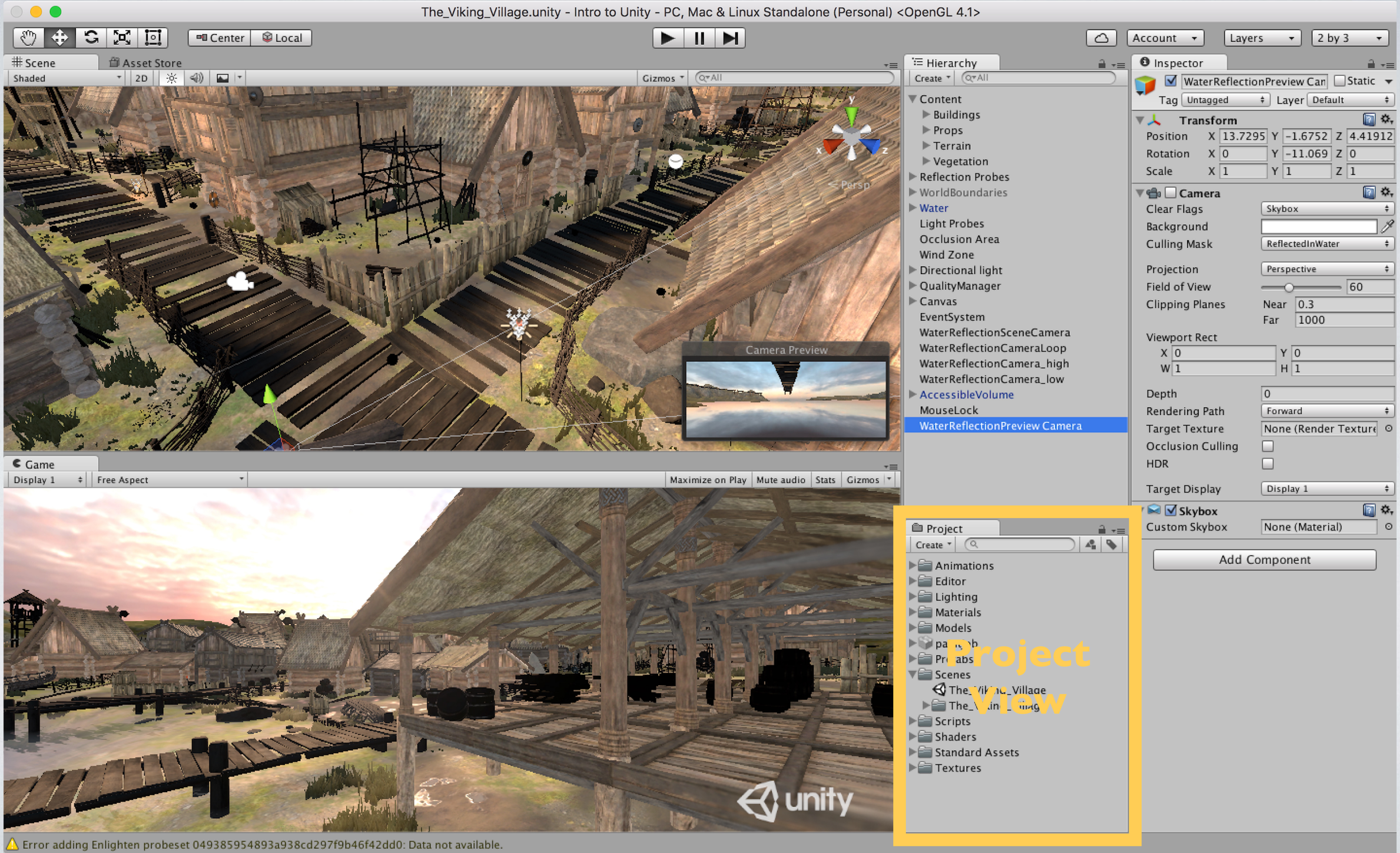
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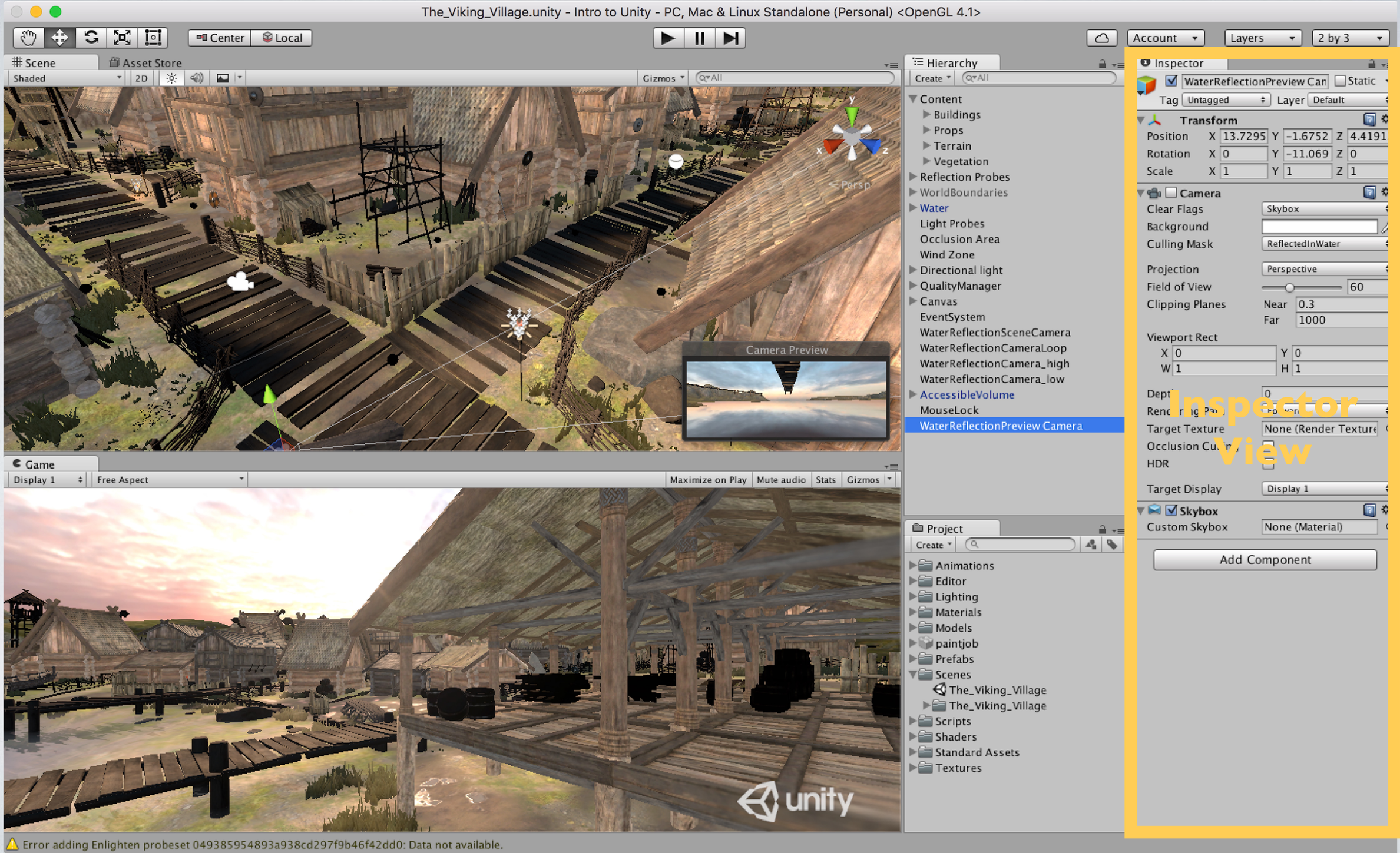
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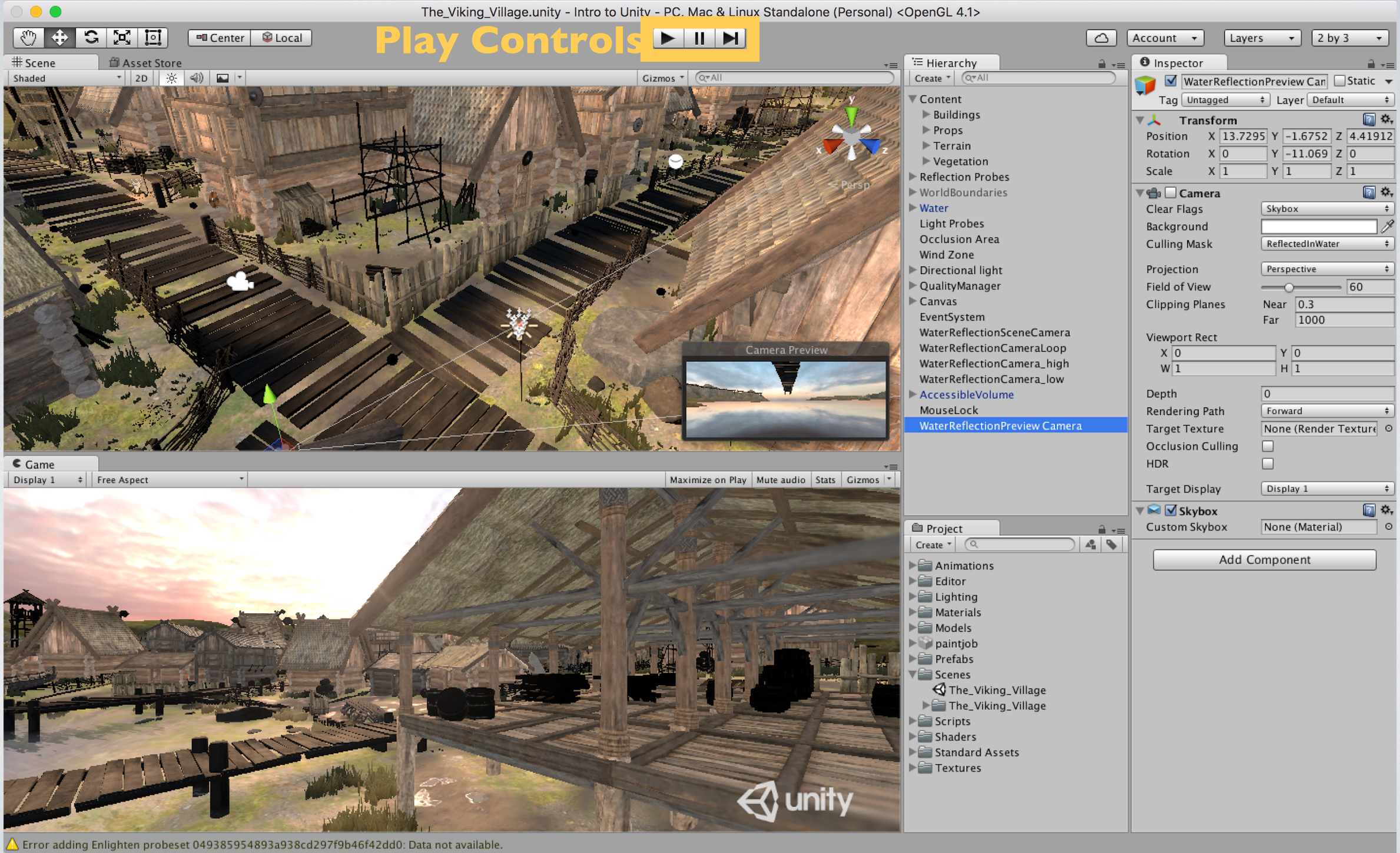
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# Unity Help Pages

Scripting Documentation - http://docs.unity3d.com/Manual/index.html

Tutorials - http://unity3d.com/learn/tutorials

User Forums - http://forum.unity3d.com

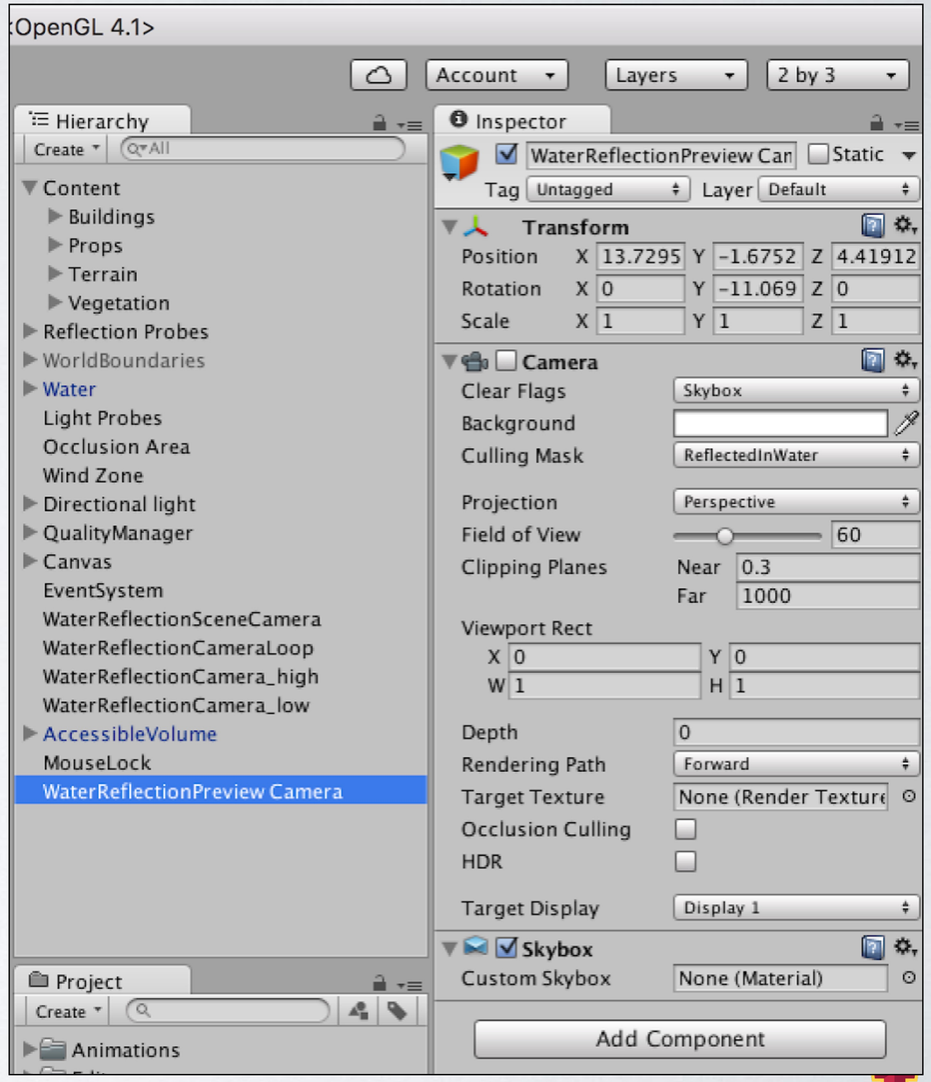
# Basic Unity Concepts

- Game Objects & Components
- Prefabs
- Tags
- Layers

# Game Objects & Components

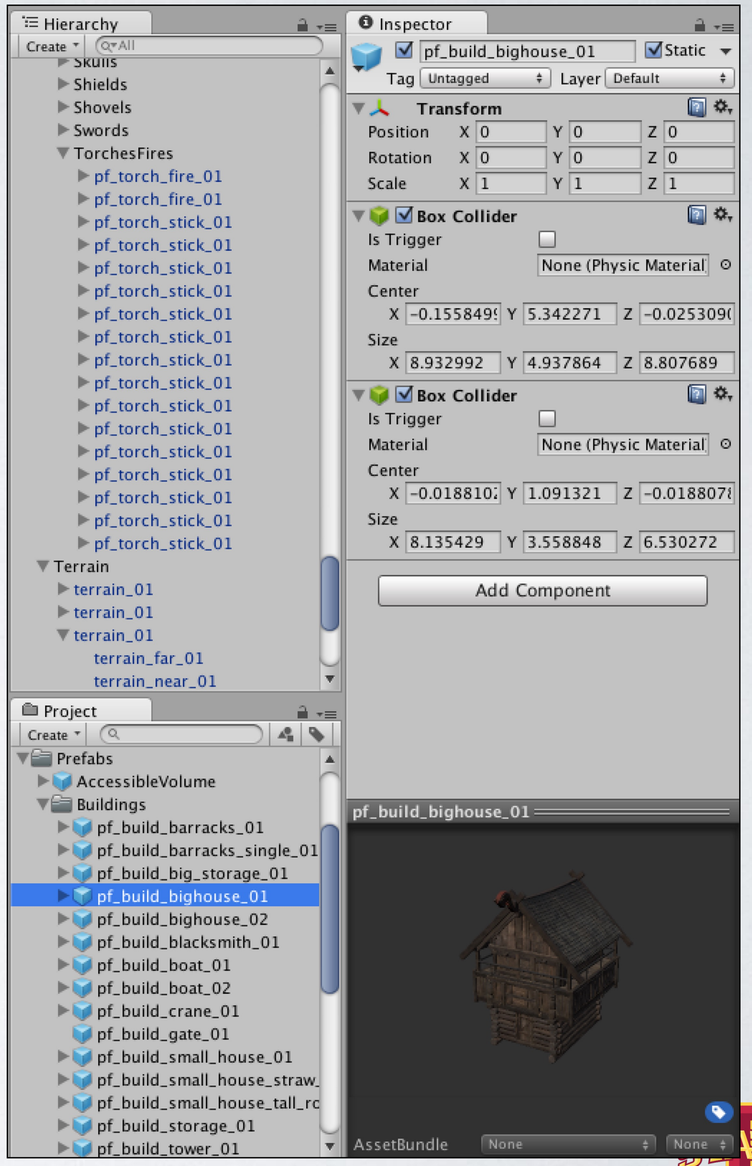
Game Object: Anything within your Unity scene (Hierarchy)

Component: Every Game Object is made up of Components (e.g., Transform)



# Prefabs

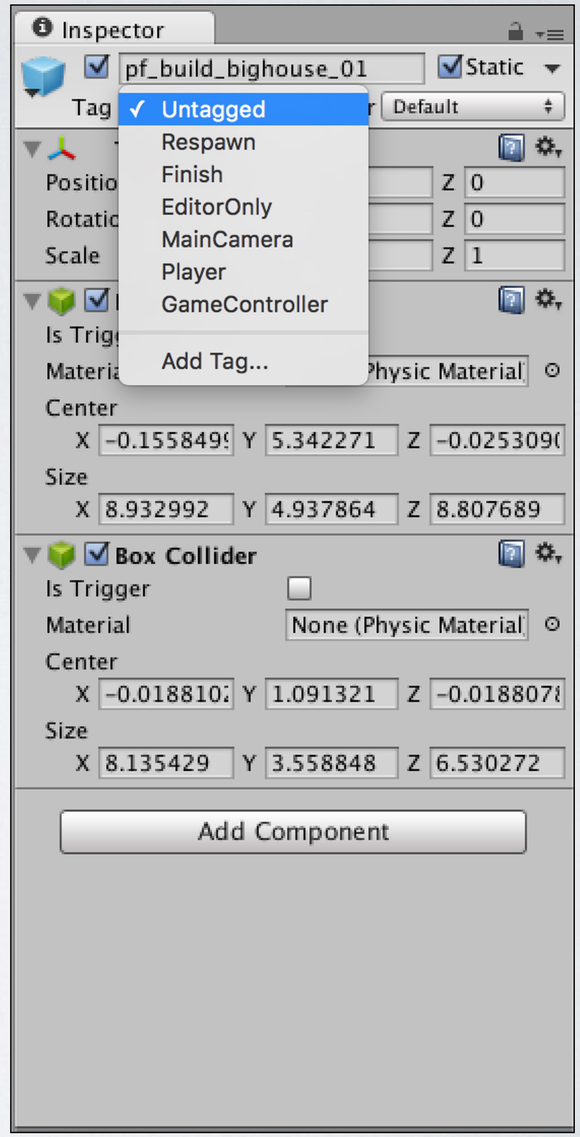
- Prefab = Preconfigured Game Object
- Prefabs are something you wish to use over and over again with minor tweaks, such as buildings, characters, levels, cameras, etc.
- Making changes to a Prefab Game Object allows you to push those changes to all other Game Objects of that type if desired



# Tags

Allows you to group Game Objects together (e.g., enemy)

Allows you to search for objects in code

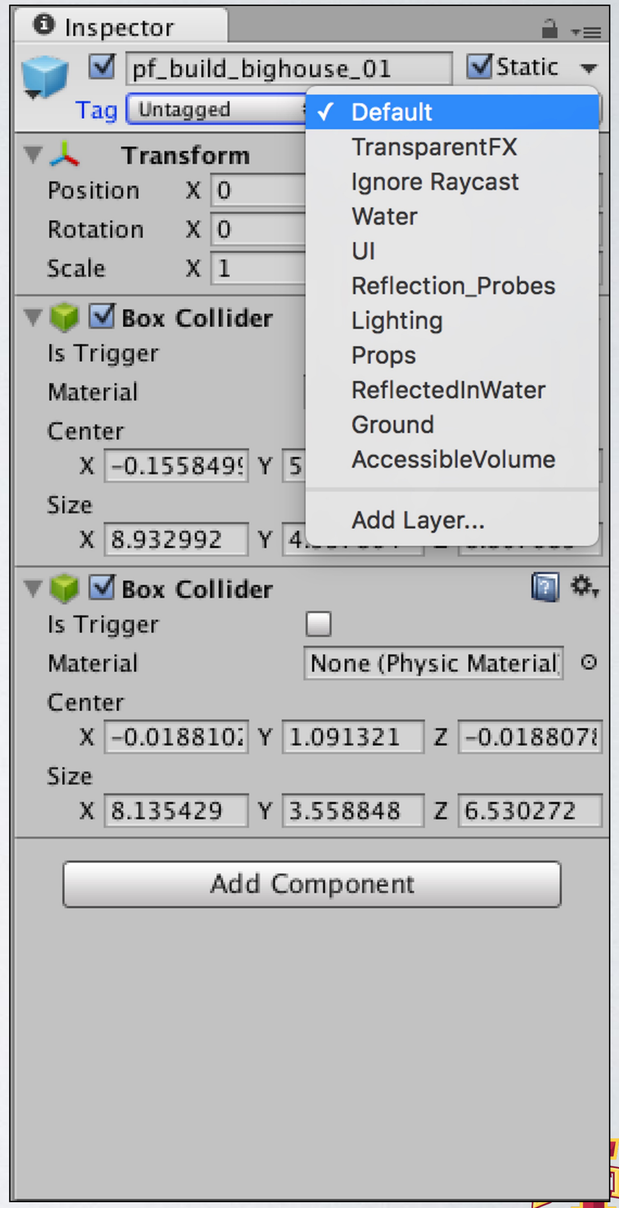


# Layers

Another way of grouping things

You can show or hide layers in the Scene View

Often used to control rendering objects differently



# Navigating Unity

Pan: Left Mouse Button

Zoom: Right Mouse Button + Alt

Rotate: Left Mouse Button + Alt

# Unity Camera

- Used to render the scene
- Must have one camera but can have more
- Every camera has a View Frustum shown by the pyramid
- Orthographic/Perspective Projection

# Unity Lighting

- Unity models how light behaves in the real world
- You can add as many lights as you want
- Directional/Area/Spot
- Realtime/Baked lighting

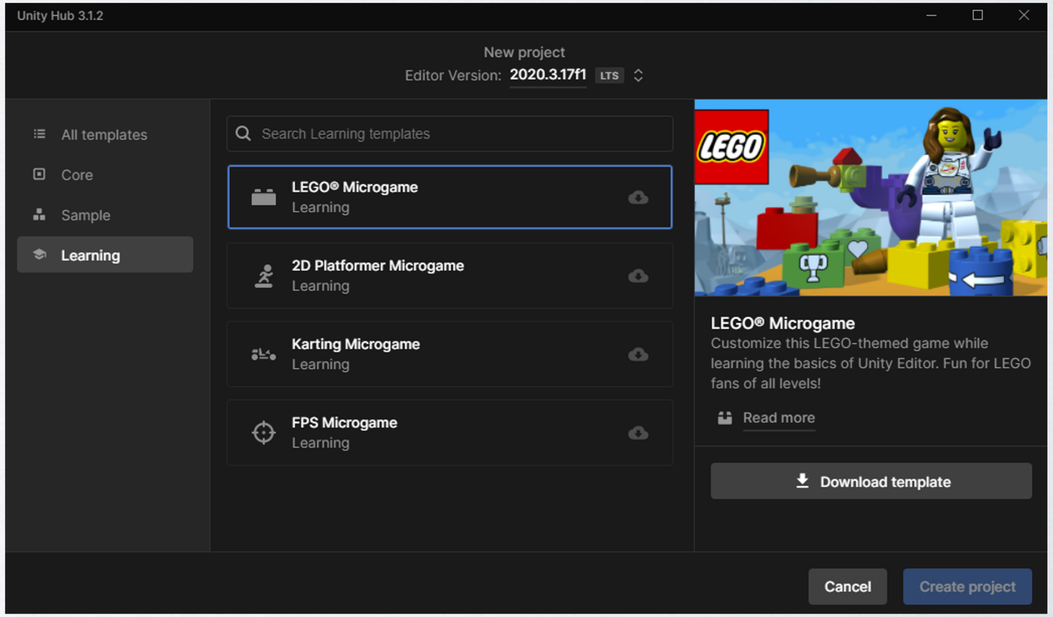
# Activity

- Complete tutorial

  - Go through tutorial if you are unfamiliar

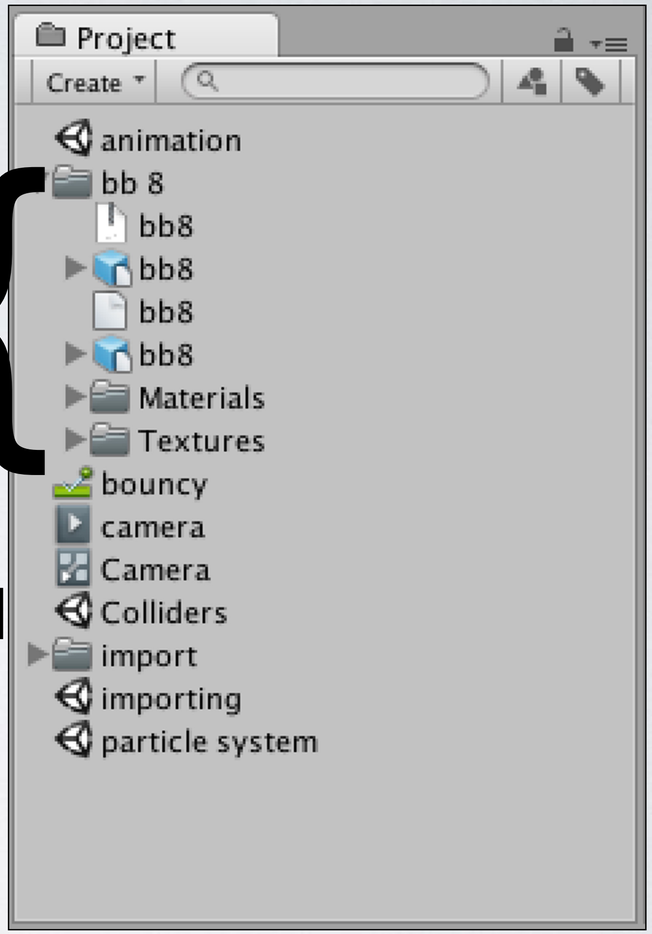
  - Feel free to skip tutorial if you have experience

  - Have fun and try new things!



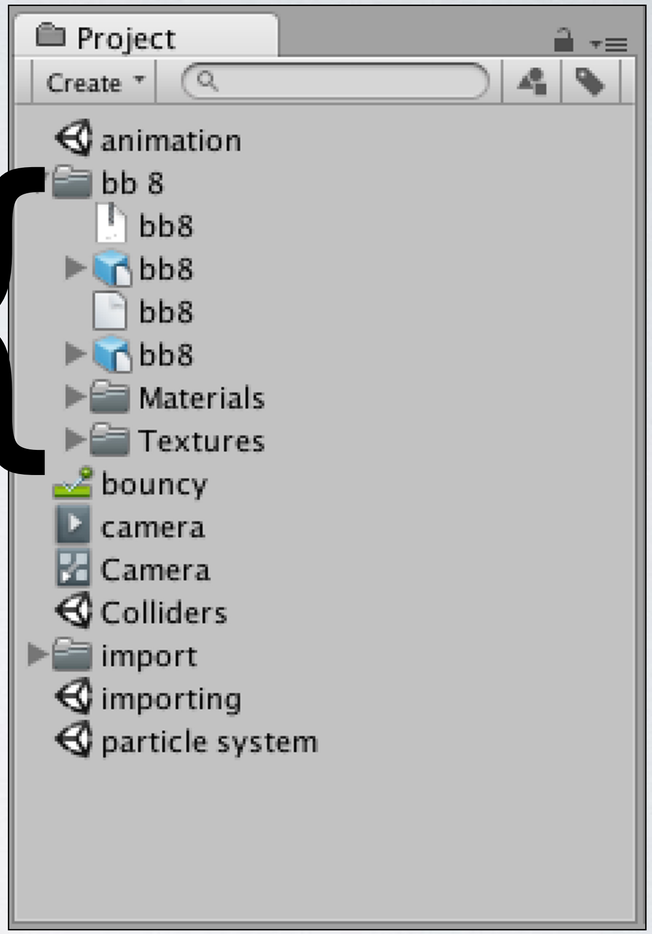
# Importing Models

- Unity can read
  - .fbx, .dae (collada), .dxf, .obj, and .skp files
- Drag and drop model files into Assets folder
- Make sure the geometry, materials, textures are dragged together into Unity project



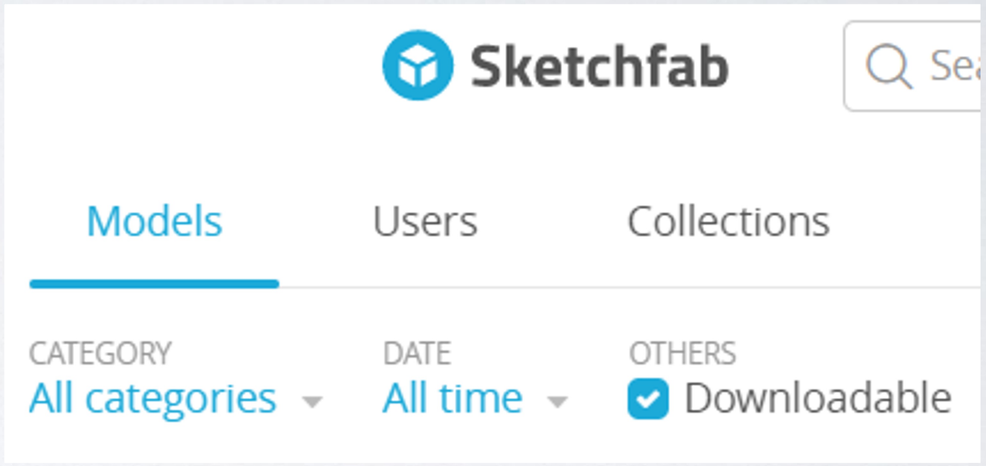
# Importing Models

- Proprietary application support
  - 3D Studio Max, Maya, Blender, Cinema4D, etc
- Unity converts proprietary files into .fbx during import
- User exported .fbx preferred
- https://docs.unity3d.com/Manual/3D-formats.html



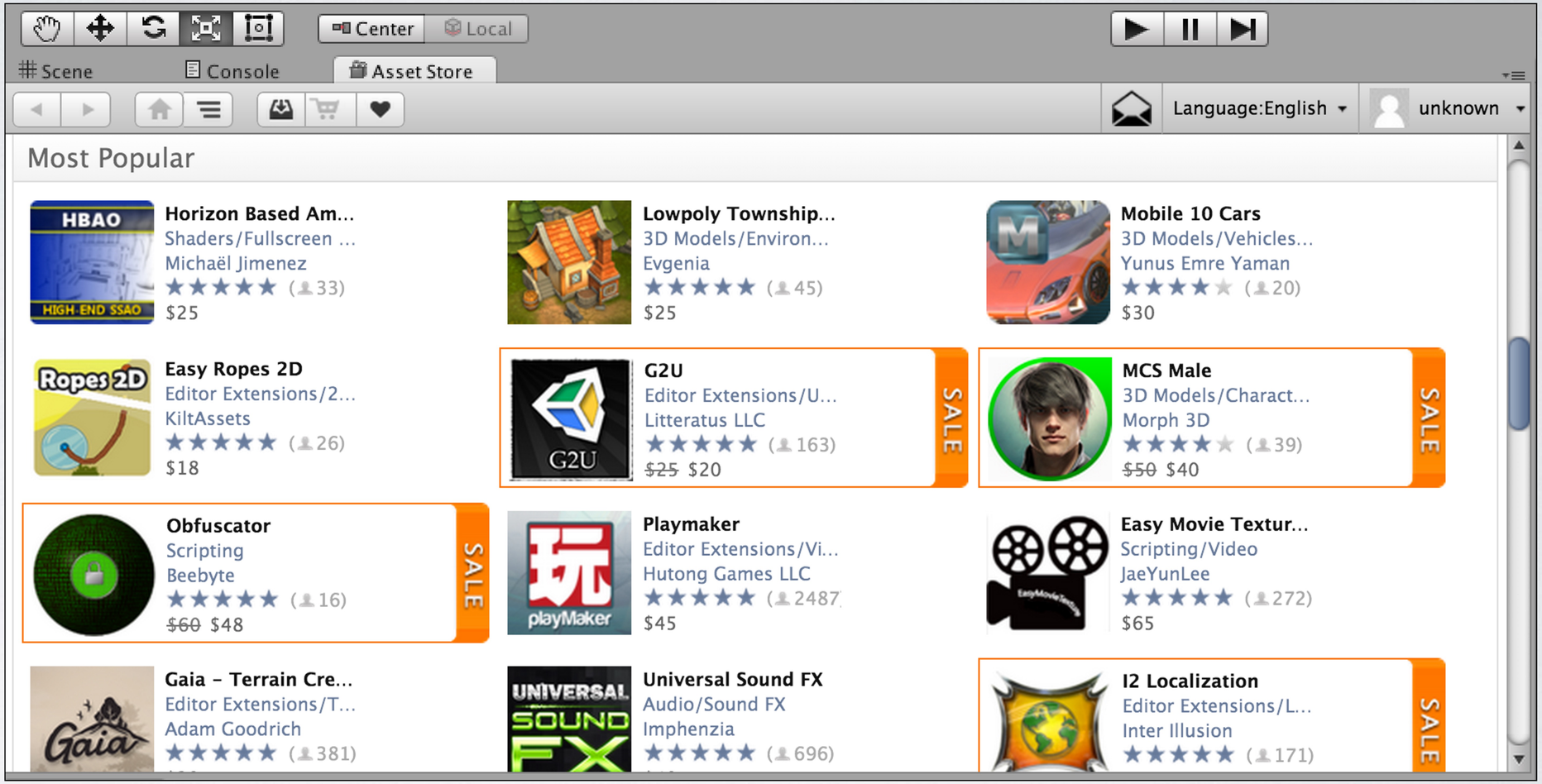
# Places to Find Models

- Sketchfab.com
- turbosquid.com
- www.cgtrader.com
- https://3dwarehouse.sketchup.com
- Dozens of others



# Unity Asset Store

- Models
- Prefabs
- Scripts
- Textures
- Projects



# In-class Assignment

- Add solidworks / blender models to your project
- Have fun and explore!
  - Add new models
  - Add new functionality
  - Break things
  - etc.