Introduction to Unity3D

Jack Miller and Mieszko Muskala

Game Engines

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

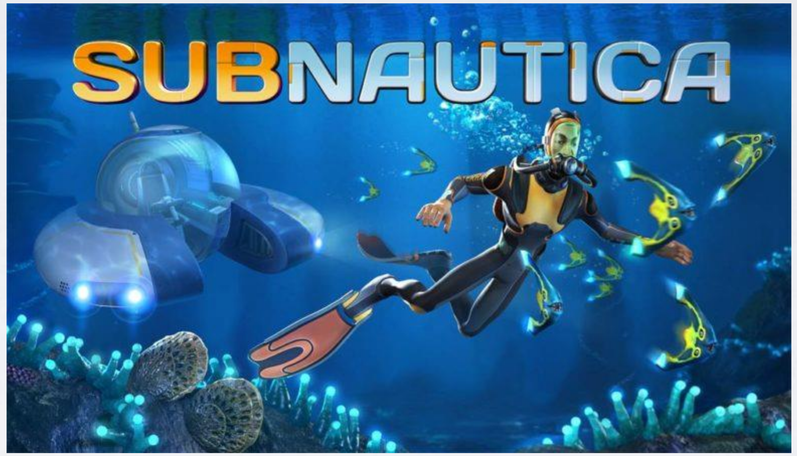
Components

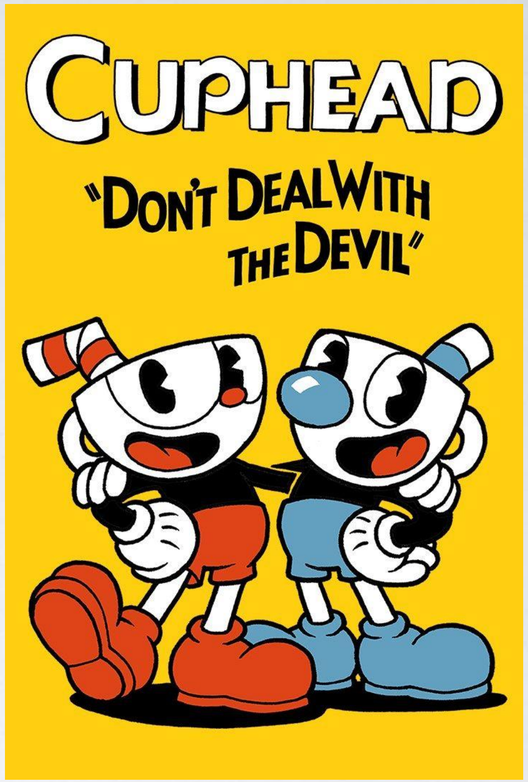
- Renderer
- Physics Engine
- Sound
- Scripting
- Animation
- Artificial Intelligence
- Networking
- Scene Graph

Unity3D

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


BEAT
SABER


SUBNAUTICA

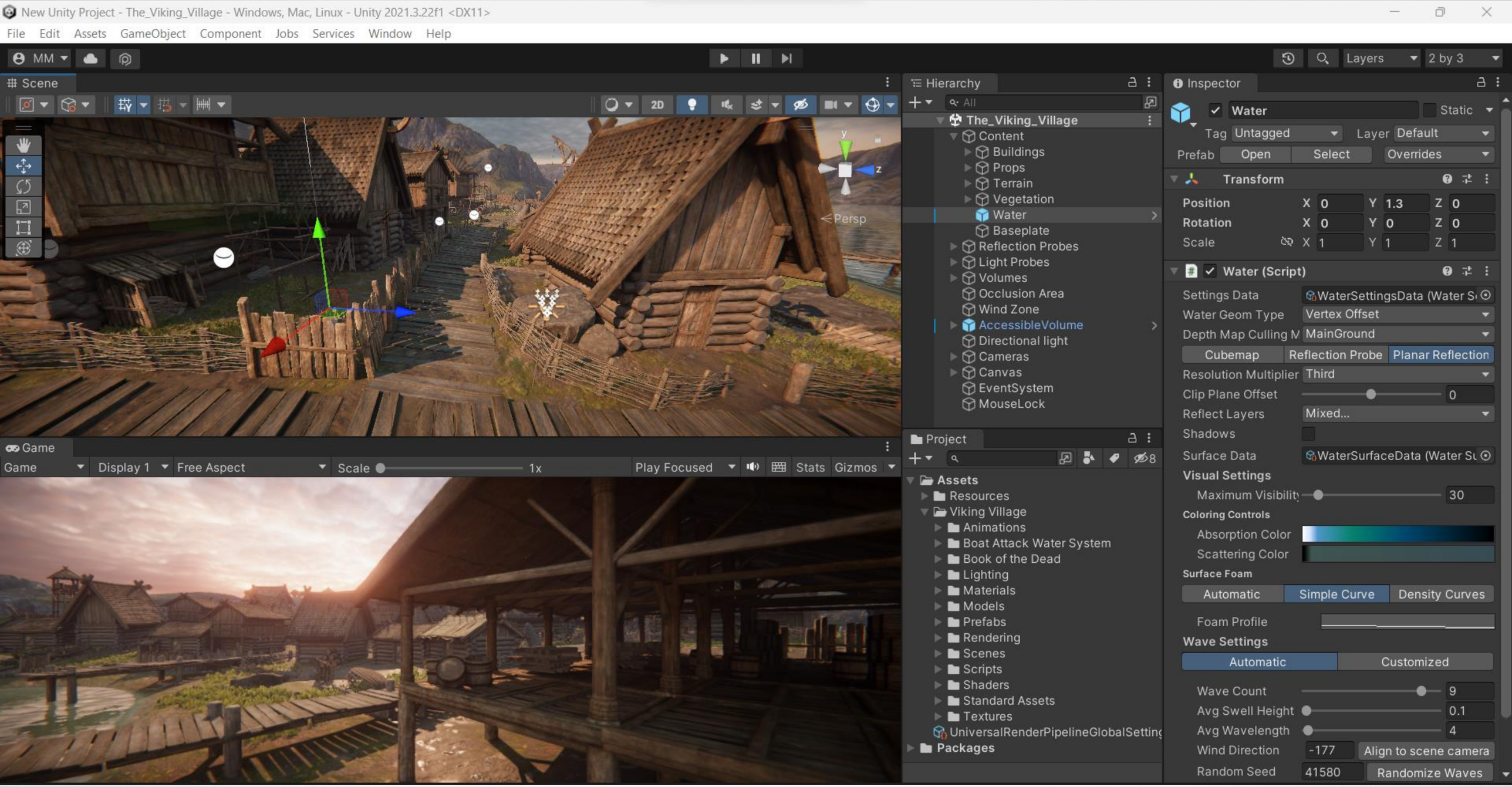

CUPHEAD
"DON'T DEAL WITH THE DEVIL"


POKÉMON
GO


KERBAL
SPACE PROGRAM
2

Activity

- Create a new Unity Project
  - Version: Unity 2021.3.2f1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Layers
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Wave Settings
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Wave Count 9
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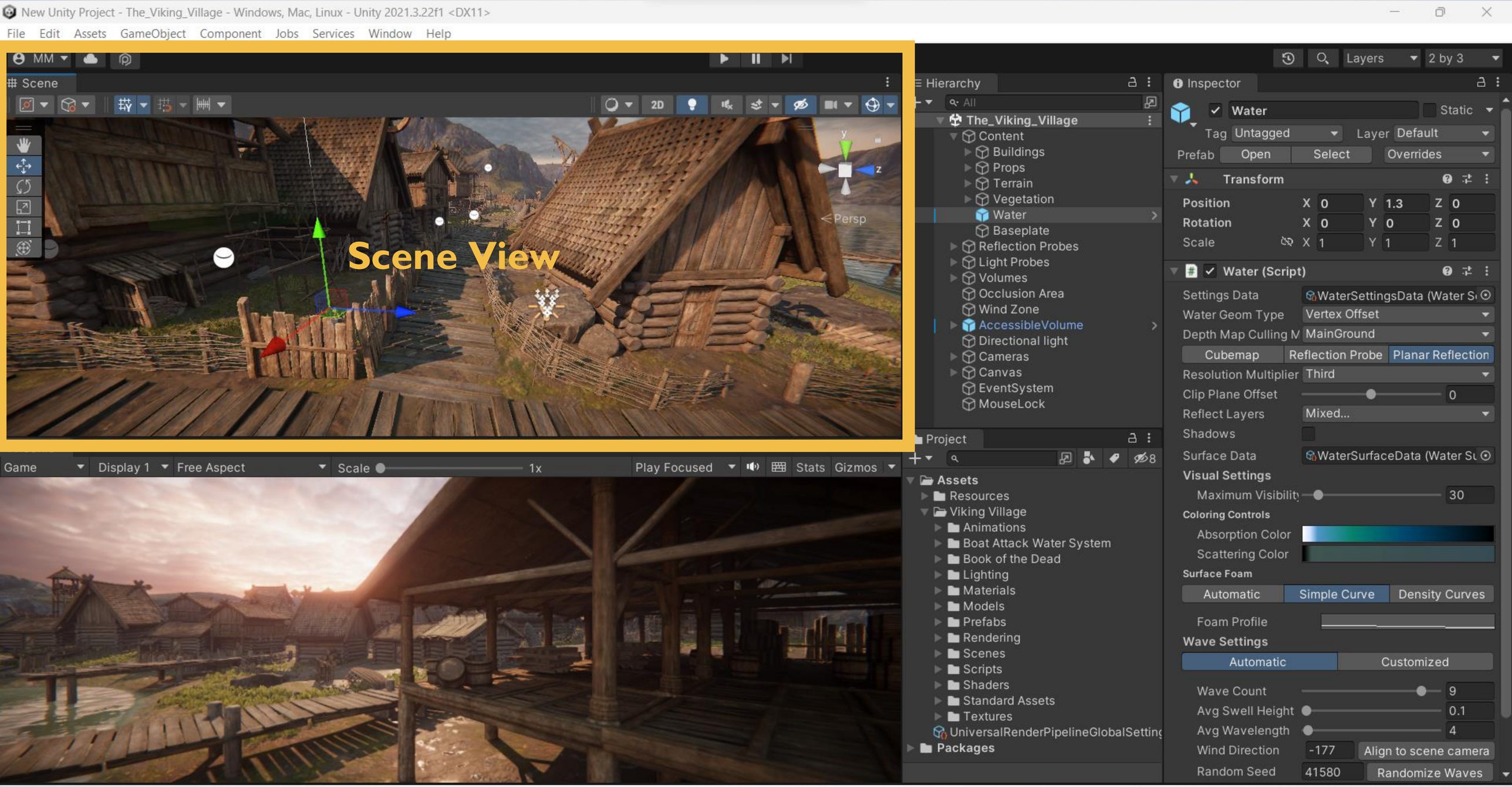
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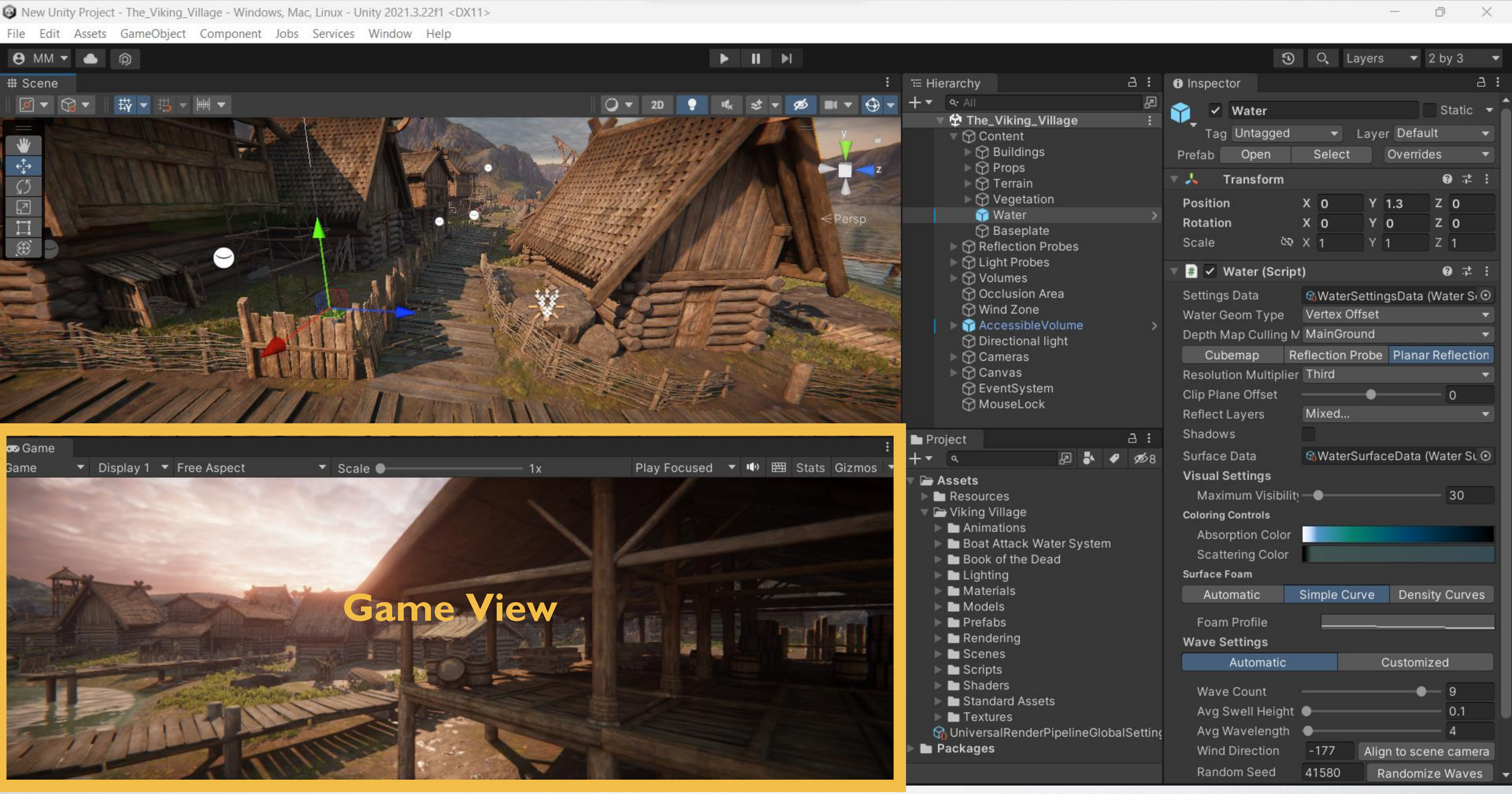
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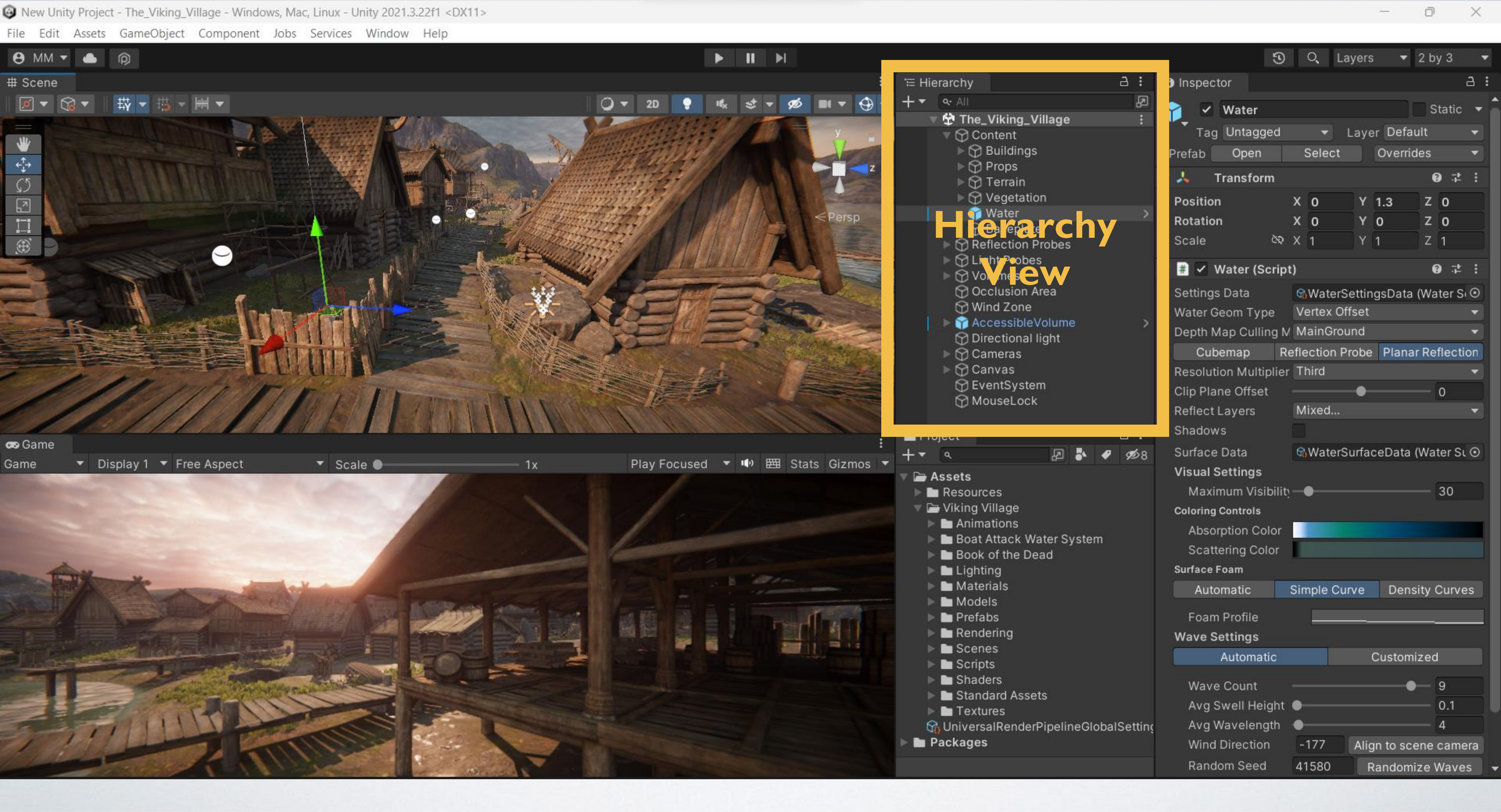
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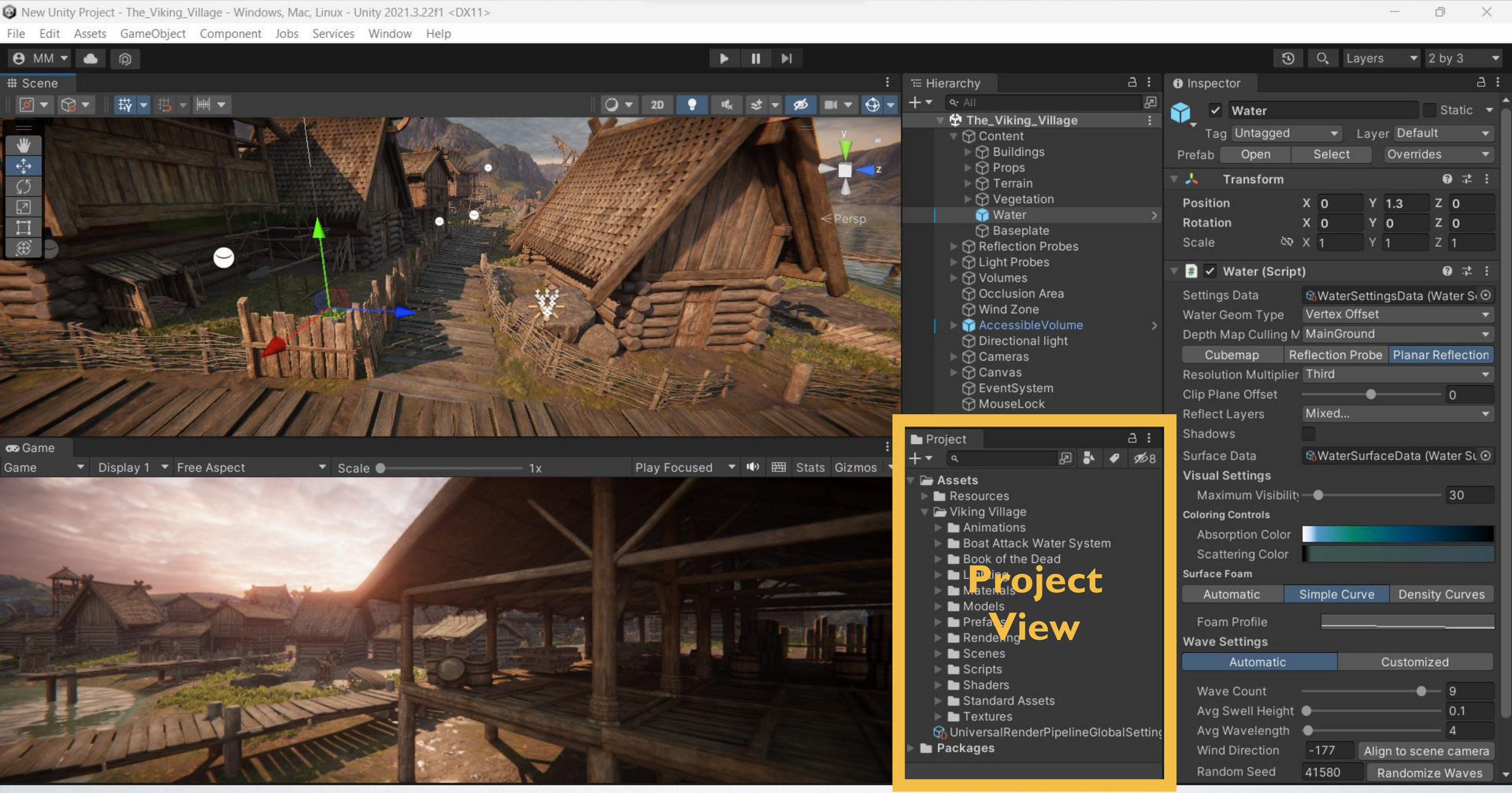
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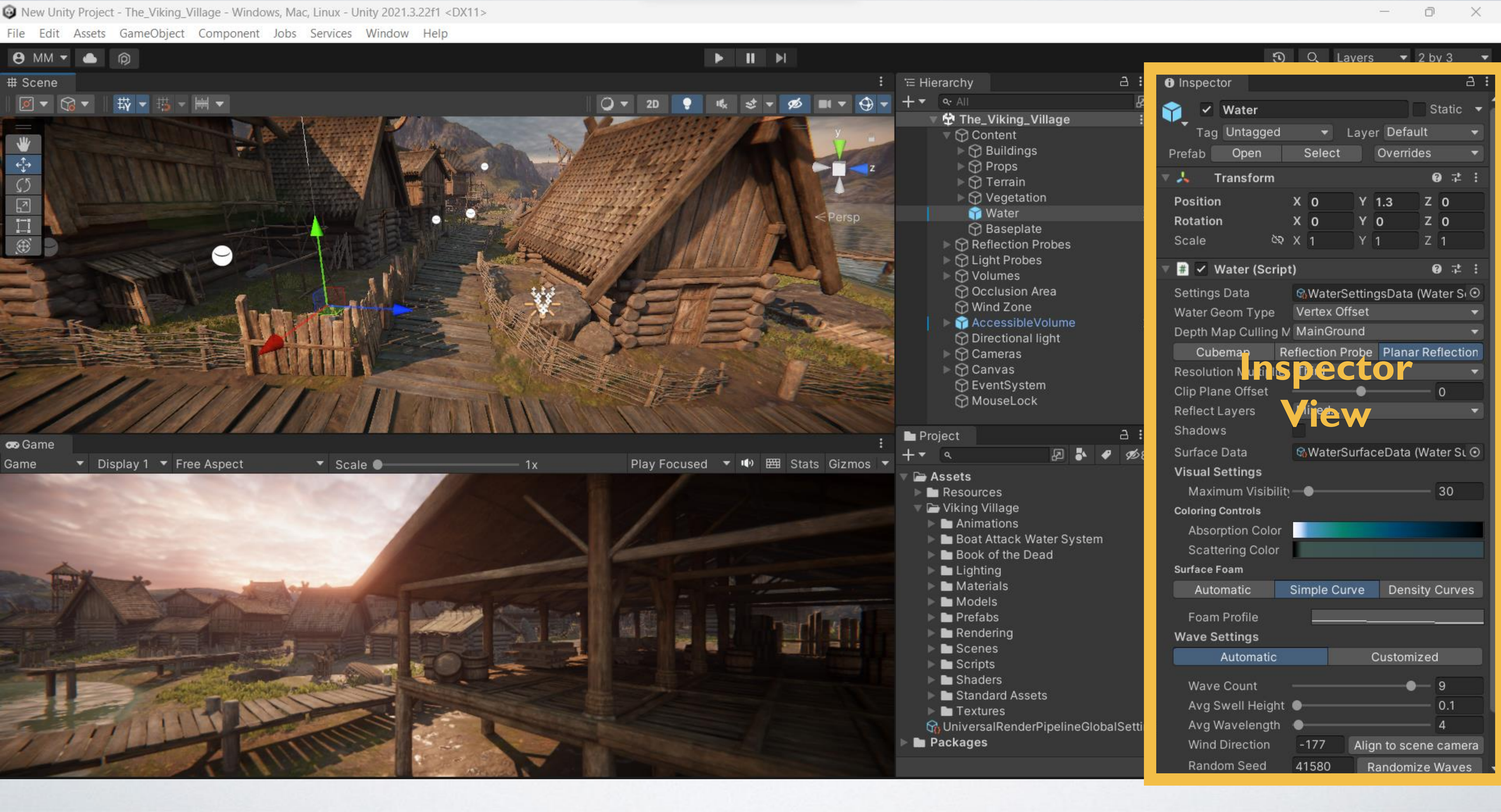
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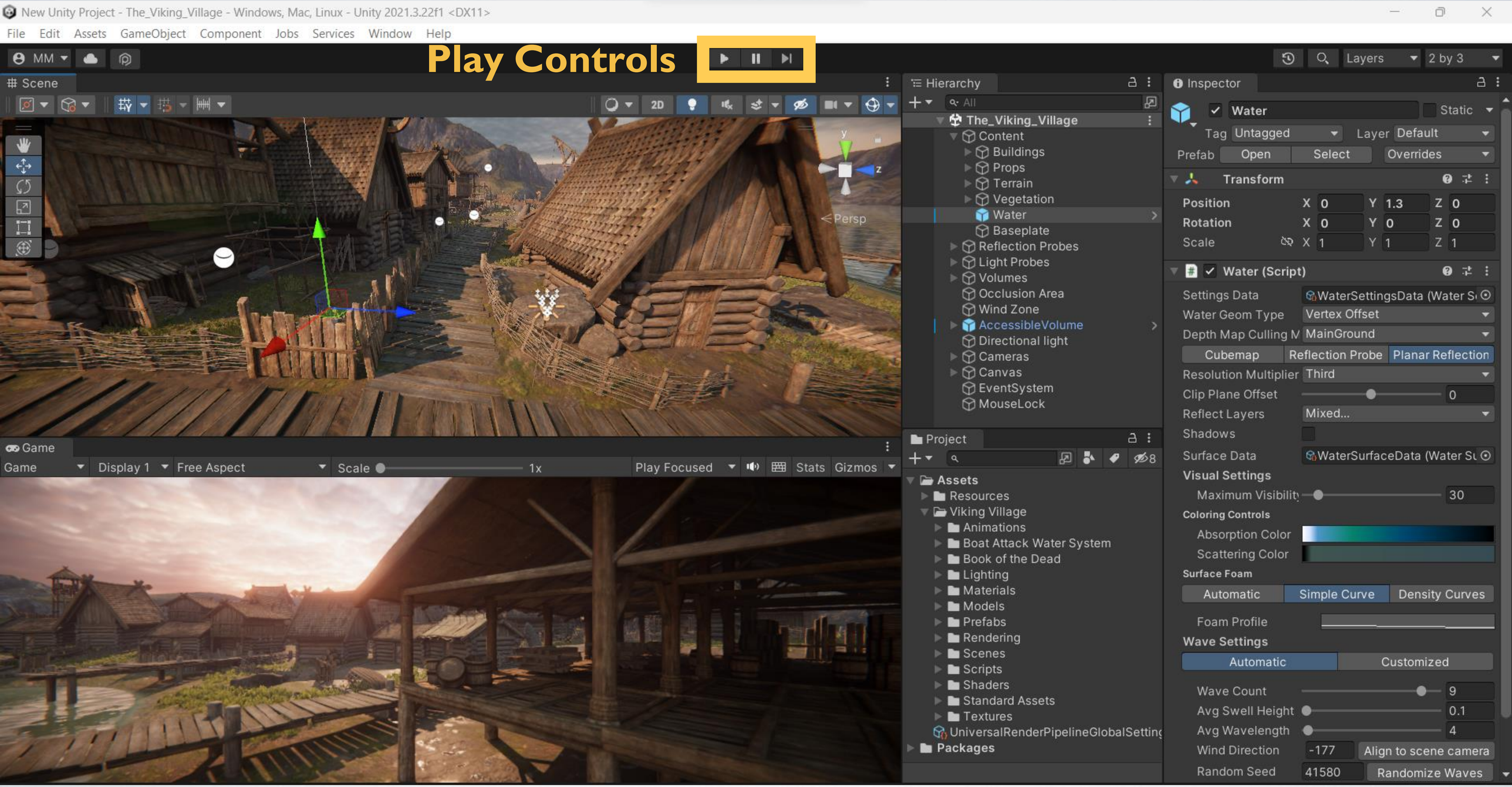
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Unity Help Pages

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

Tutorials - https://learn.unity.com/

User Forums - https://forum.unity.com/

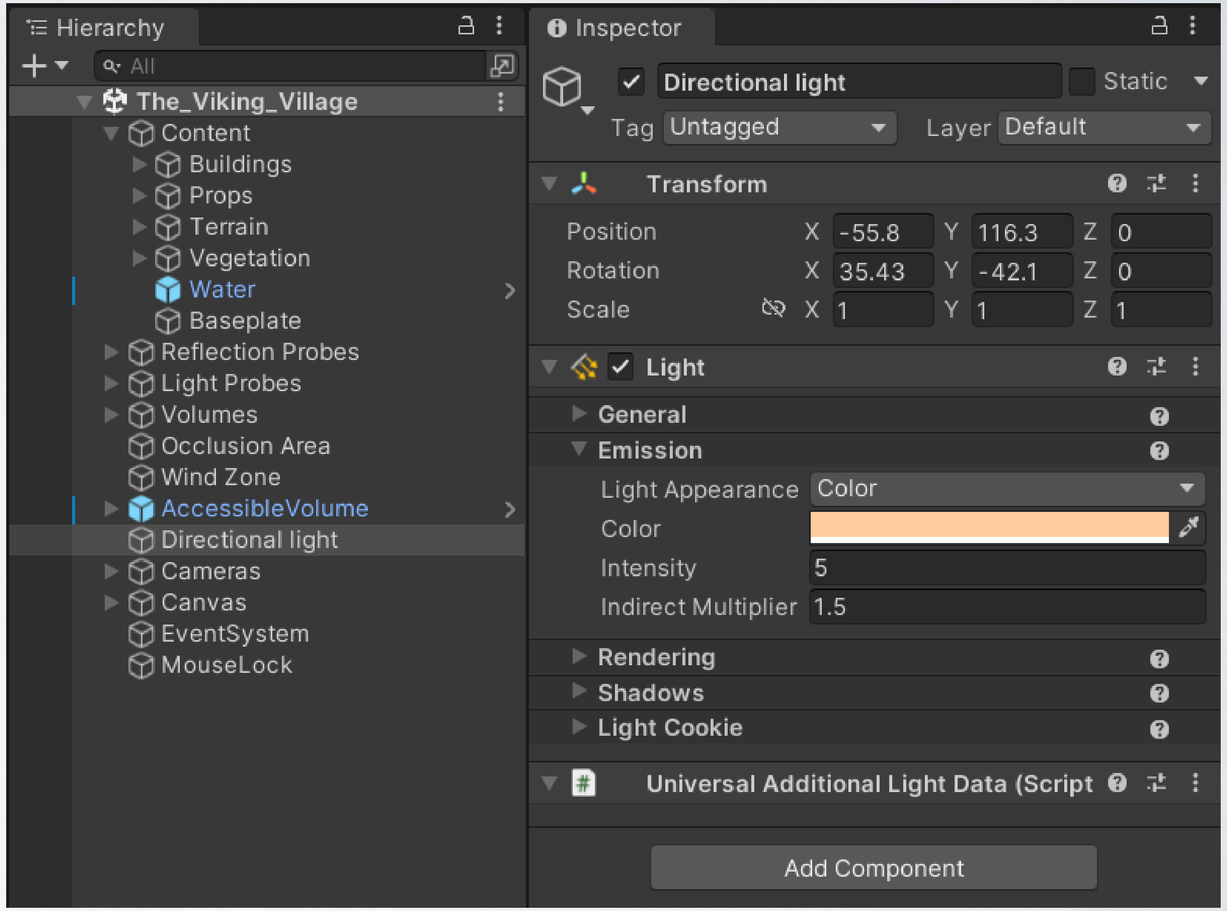
Basic Unity Concepts

- Game Objects & Components
- Prefabs
- Tags
- Layers

Game Objects & Components

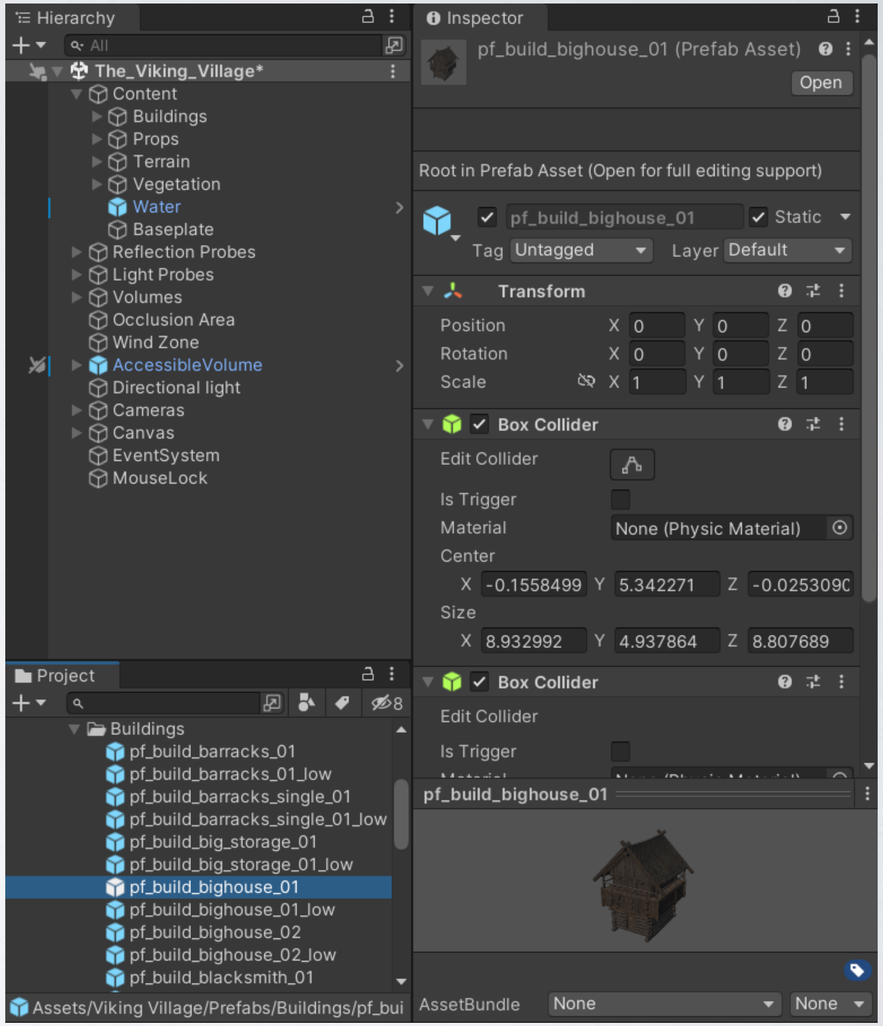
Game Object: Anything within your Unity scene (Hierarchy)

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



Prefabs

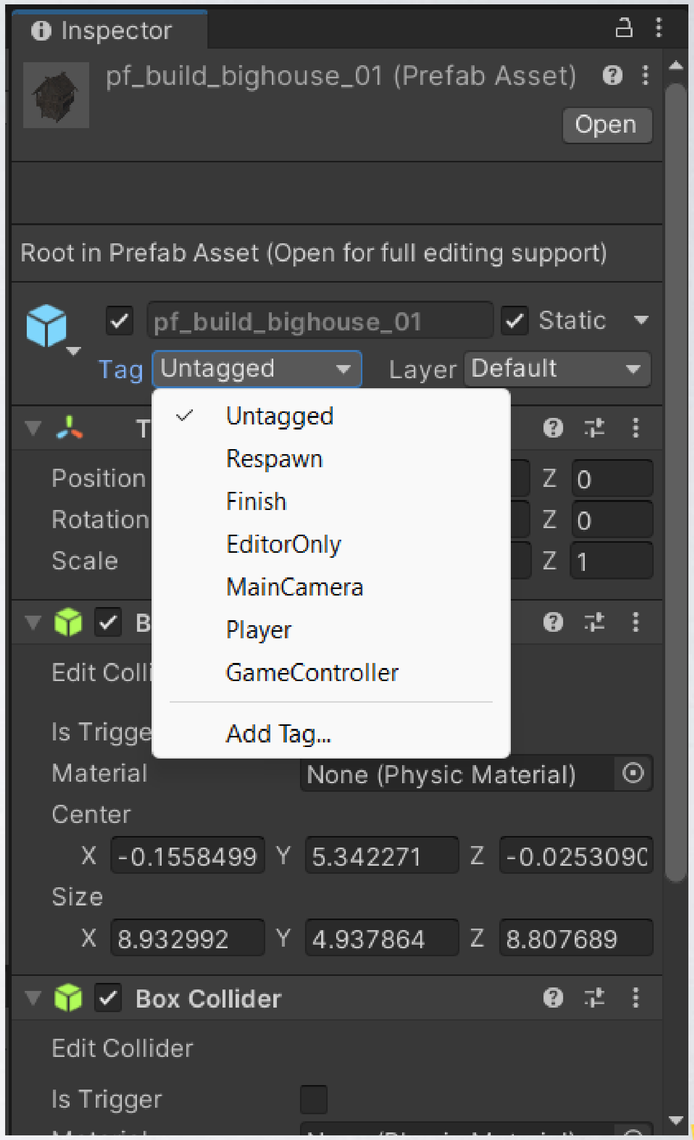
- Prefab = Preconfigured Game Object
- Prefabs are something you wish to use over and over again with minor tweaks, such as buildings, characters, levels, cameras, etc.
- Making changes to a Prefab Game Object allows you to push those changes to all other Game Objects of that type if desired



Tags

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

Allows you to search for objects in code

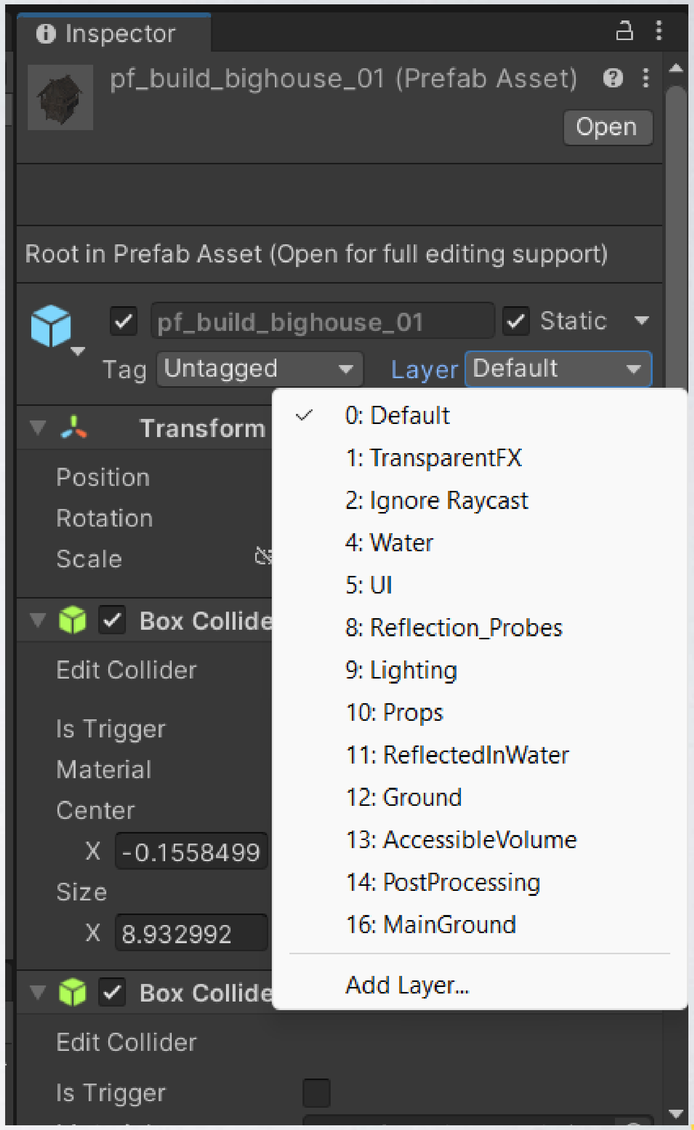


Layers

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

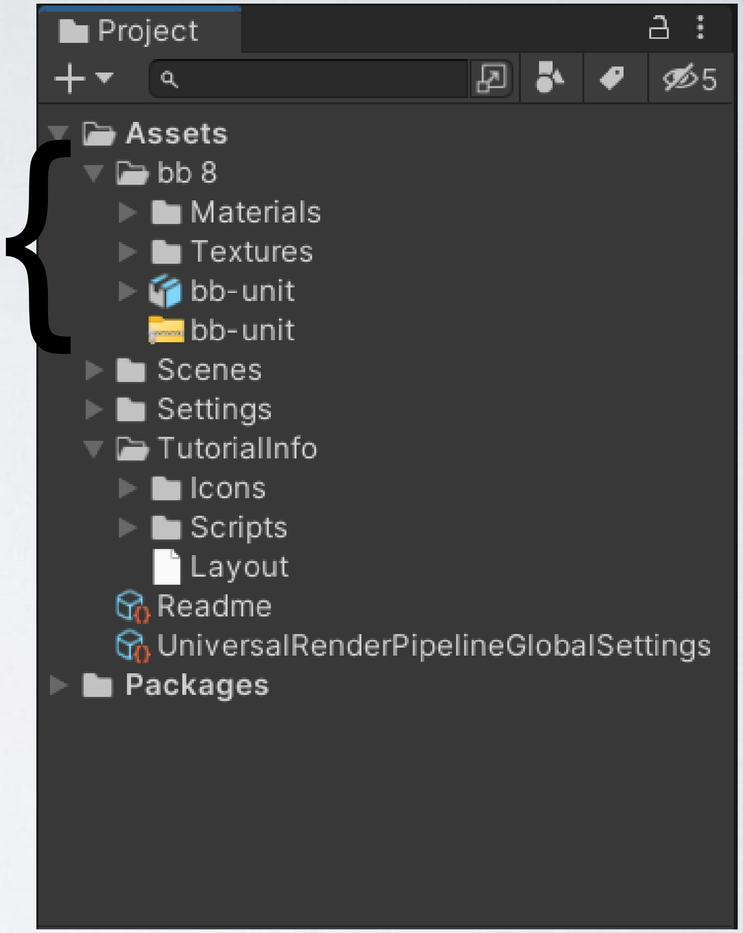
- Unity models how light behaves in the real world
- You can add as many lights as you want
- Directional/Area/Spot
- Realtime/Baked lighting

Activity

- TBD

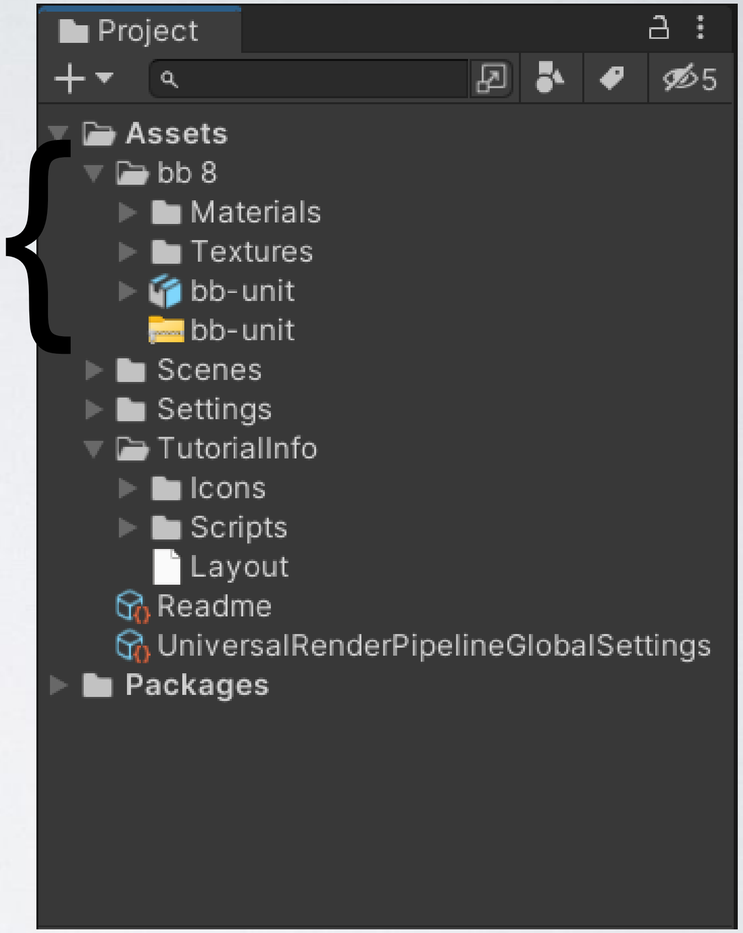
Importing Models

- 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 and dropped together into Unity project



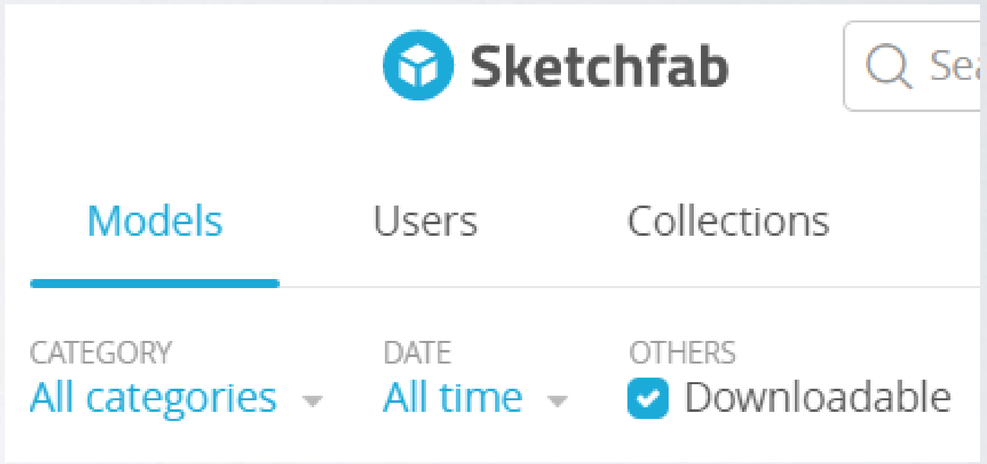
Importing Models

- 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

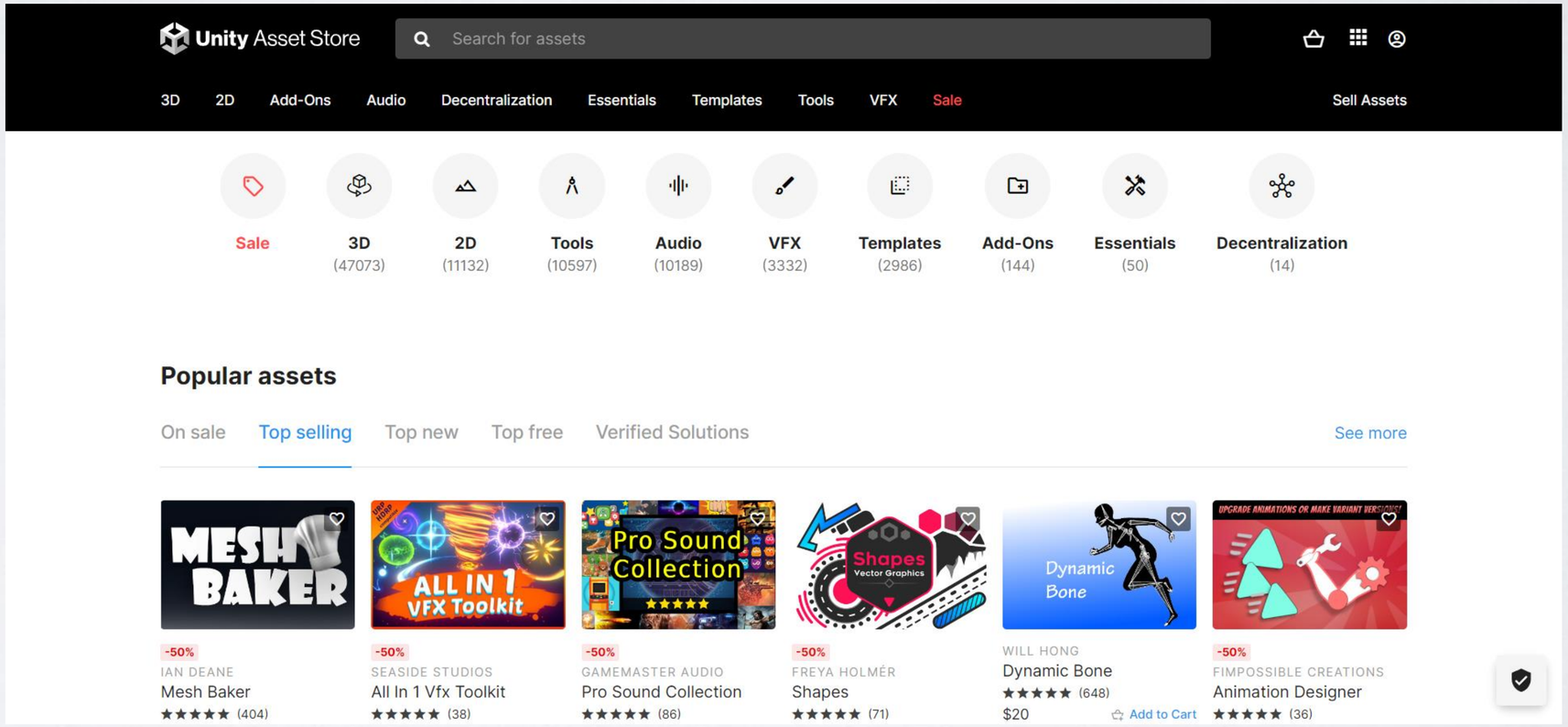
- Sketchfab.com
- turbosquid.com
- www.cgtrader.com
- https://3dwarehouse.sketchup.com
- Dozens of others



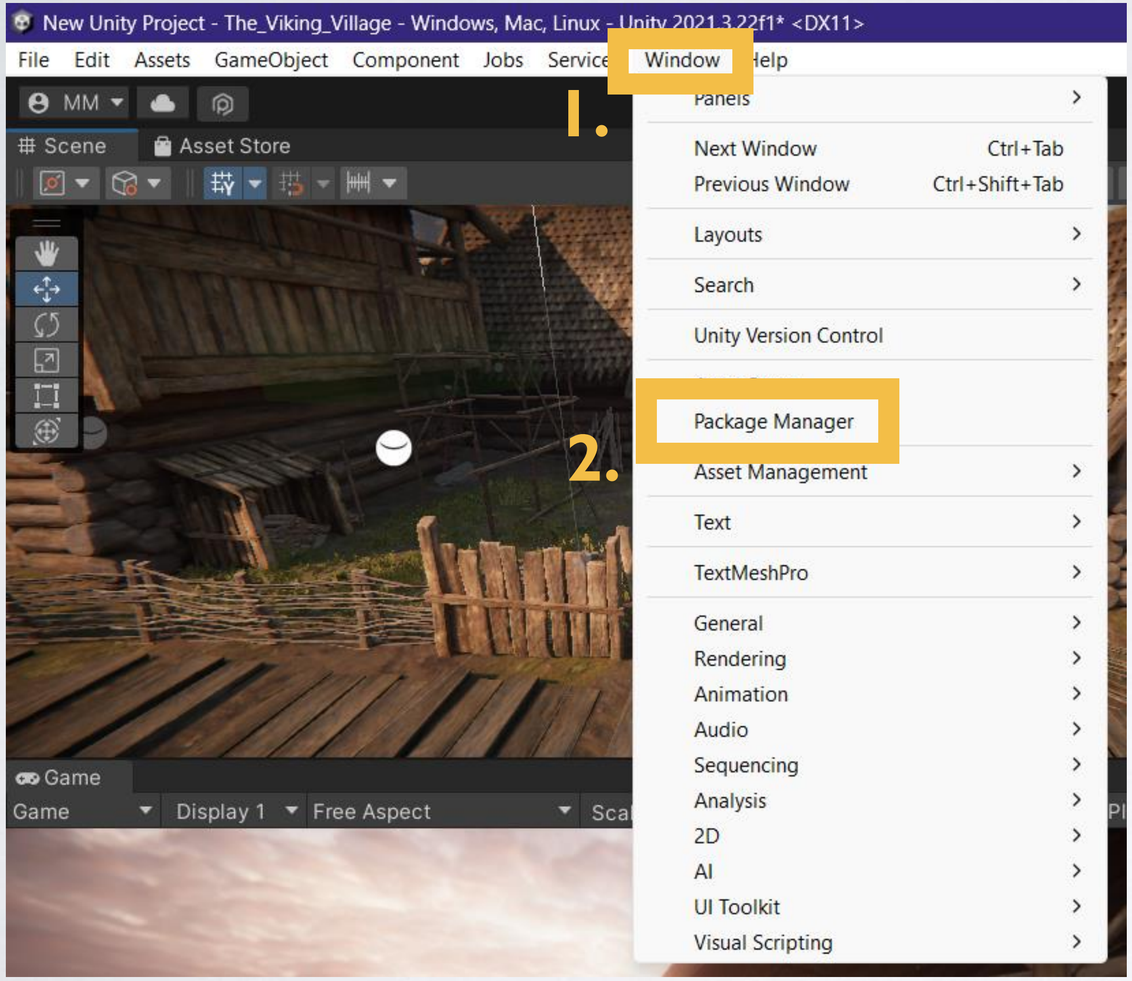
Unity Asset Store

- Models
- Prefabs
- Scripts
- Textures
- Projects

https://assetstore.unity.com/



View Unity Store Assets



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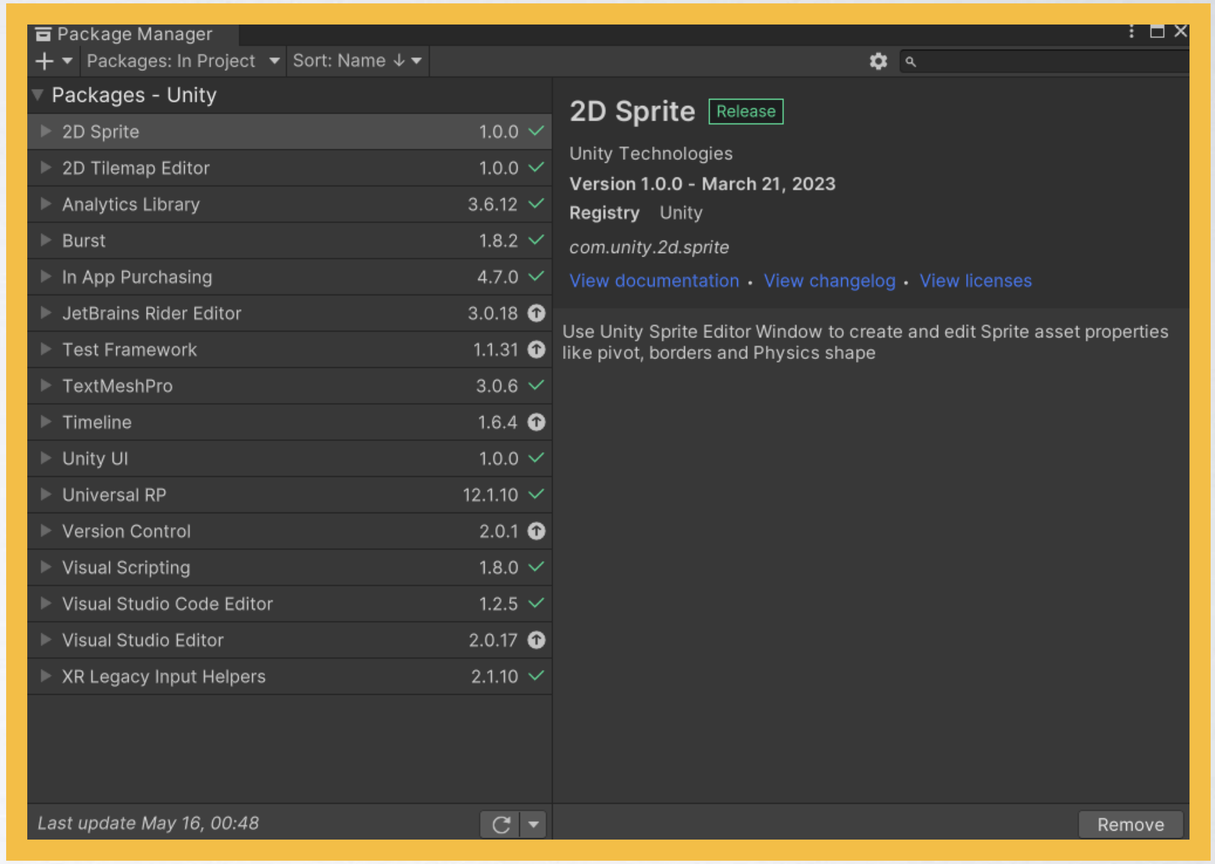

In-class Assignment

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