SETTING UP UNITY ENVIRONMENT FOR VR PROJECT

In the class, you are provided with a "Starter Project" that is already configured with the packages and settings required to quickly get started working on your Project.

However, if you are interested in understanding more about what goes into setting up a project for VR, this tutorial will teach you step-by-step how to set up a new VR project.

Before you make a project, make sure you have the correct version of Unity installed, which can support stable VR development:

1. From Unity Hub, install Unity 2020.3 LTS (long-term support) or any other LTS version.

2. If developing for mobile VR (e.g. Oculus Quest), make sure to download the Android export module.

You should now have the correct Long-Term Support version of Unity installed with the appropriate export modules.

CREATE A NEW URP PROJECT:

Now that we have the correct version of Unity installed, we need to make a new project on that version configured for VR.

1. Open the Projects tab in Unity Hub.

2. Select New Project.

3. Make sure the Editor Version of your new project is set to the recommended version from the previous step.

3. From the list of templates, select the 3D Sample Scene (URP), then set the Project Name, and the Location to save it.

4. Click Create and wait for your project to open.

You should now have a new empty project with the URP demo scene open.

CREATE A NEW EMPTY SCENE:

Before we get working on our scene, let's clear out any unnecessary assets and create a fresh new empty scene to work in.

1. To make a new Scene:

- **In the Project window, right-click on the Scenes folder and select Create > Scene**
- **Rename the new scene "VR Starter Scene".**

2. To open the new scene:

- **Double-click the new VR Starter Scene scene to open it.**
- **If prompted, select Don't Save to discard changes from the template scene.**

3. To add a simple ground object:

- **In the Hierarchy, right-click to create a 3D Object > Plane.**

- **In the Inspector, reset its XYZ coordinates to 0, 0, 0.**
- **Rename the Plane object “Ground.”**

4. **Save the scene.**

   - **Press Ctrl + S or select File > Save.**

You should now have a new empty scene open with a simple ground object.

INSTALL XR PLUGIN PACKAGES

Before we can begin developing for a particular device, we need to make sure we can interface with different devices.

1. **To enable XR plugins:**

   - **From the top menu select Edit > Project Settings.**
   - **In the XR Plugin Management panel, click the Install XR Plugin Management button.**

2. **To allow the installation of “Preview” packages:**

   - **In the Project Settings window, in the Package Manager panel, select the option to Enable Preview Packages and click “I Understand”.**

3. **To browse preview packages in the Package Manager:**

- From the top menu, select Window > Package Manager.
- To be able to search through all packages, from the drop-down in the top-left, change the scope from “In Project” to “Unity Registry”.

You should now have the appropriate plugins installed for your target device.

INSTALL XR INTERACTION TOOLKIT AND SAMPLES:

It would technically be possible to deploy to a device now if we already had a functioning project, but in order to actually develop the project, we need to install the XR Interaction Toolkit (XRIT).

1. To install the XR Interaction Toolkit package:

- Open the Package Manager window.
- Search for and select the XR Interaction Toolkit package.
- Click Install. This will allow you to quickly develop XR interactions.

During the installation, a warning will likely pop up, asking you to switch to the new input system, which requires restarting the Unity editor. Select Yes to do this, which will restart the Editor.

You may be prompted with a warning about the project containing an obsolete method to validate interactions between XR Interactors and Interactables. Select I Made a Backup, Go Ahead to continue.

2. To install helpful samples for quick development:

- With the XR Interaction toolkit package selected in the Package Manager, a new Samples fold-out appears at the bottom of its description.
- Click to Import the Default Input Actions.

- **This provides presets for mapping specific buttons to actions using the action-based input system**
- **Click to Import the XR Device Simulator**
- **This allows you to test your VR app using keyboard and mouse controls rather than an actual headset.**

You should now have the XR Interaction Toolkit package installed, including helpful samples, and have a new XR option when creating new objects in the Hierarchy.

ADD ACTION BASED XR ORIGIN TO SCENE:

Now that you have all of the packages and samples you need to get started, you can set up your scene for XR Development.

1. **To set up the action-based input system in your scene:**

   - **In the Hierarchy, right-click to create a Empty GameObject, then rename it "XR Input Action Manager"**
   - **Add an Input Action Manager component to the object.**
   - **Expand the Action Assets fold-out and click the + to add a new one.**

Click the circular radio button for Element 0 and assign the XRI Default Input Actions preset.

2. **To apply action presets automatically when you add XR components:**

   - **In the Project window, open Samples > XR Interaction Toolkit > [version] > Default Input Actions.**

- **Select each preset and, at the top of the Inspector, click to Add to [component] Default.**
- **Now, whenever you add a new XR component, these presets will be applied.**

3. **To distinguish between left- and right-hand presets:**

- **From the main menu, select Edit > Project Settings, then select the Preset Manager panel**
- **In the ActionBasedController section, add the filter values, “Right” and “Left”**
- **This allows the appropriate preset to be chosen based on the name of the GameObject.**

4. **To add an action-based XR Rig (Origin) to your scene:**

- **In the Hierarchy, right-click to create an XR > XR Origin (Action-based).**
- **Note: make sure you select “XR Origin (Action-based)” and not just “XR Origin”**
- **This object contains the camera and controllers for the user.**
- **In the Hierarchy, expand XR Origin > Camera Offset, then select one of the controller objects.**
- **Notice how the Action references are already assigned by default.**

You should now have an XR Origin in your scene set up with action-based inputs already configured.

CONFIGURE OTHER PROJECT SETTINGS

Before running your project, you should also make sure the project's quality and rendering settings are appropriate for VR.

1. **To enable more accurate "Linear" color space rendering:**

    - **From the top menu, click Edit > Project Settings, then select the Player settings panel.**
    - **Depending on whether you're building for Desktop (Vive or Rift) or Android (Quest), select the appropriate tab.**
    - **Scroll down and expand the Other Settings fold-out.**
    - **Ensure the Color Space property is set to Linear.**

2. **To make sure your graphics quality settings are appropriate for VR.**

    - **Still in Project Settings, click the Graphics panel on the left.**
    - **For the Scriptable Render Pipeline Settings property, click the radio button to select the MediumQuality settings.**
    - **This will ensure your graphics are not too intensive for mobile VR.**

You should now have critical settings configured properly for running VR projects.