

# 1- Easy first Scene

First of a series on Unity 3D introductory tutorials.

You will be amazed to see how easy it is to build from scratch a complete scene including terrain, sky, vegetation and avatar. Unity 3D has, out of the box, all you need to do it and, thanks to its unique WebGL deployer, the 3D scene can be exhibited on the Web without plugins. Neat isn't?



Figure 1 – Our demo scene (in WebGL) running directly on a browser

**Install Unity 3D:** install a stable (long term) release from <https://unity3d.com/unity/qa/lts-releases>. This tutorial was updated to Unity ver. **2018.4**, the version we recommend (There are newer versions of Unity to download but they are not suited for learning until *Unity Standard Assets* package is updated to run with them. this package is crucial for learning Unity3D).

**Important:** during installation put a check on component [WebGL Build Support](#) (see [help image](#)) in order to be able to save scenes in WebGL Format.

## 1. Project, packages, assets, prefabs and scenes

It is important to know some terms (more on this [glossary](#)) and what they mean in Unity 3D.

- **Project folder:** for each new game or virtual world, Unity creates a new **Project** with its own folder in your computer disk containing everything related to that project. That way all assets used and all scenes created for this project will be organized and available in there.
- **Packages:** a group of assets/components. A project is built with components incorporating assets (terrain, objects, cameras, avatars, ...) included in *packages* (paid or free) available on Unity Asset Store. An essential



Figure 2 – Unity packages in Standard Assets ([see image](#))

package used in this tutorial and ideal for beginners is the free [Standard Assets](#) (Figure 2) with the essential you need to create your first scene: *Cameras, Characters/avatars, Effects, Environment, SpeedTrees, Utility, ...* This essential package can be added directly to projects on creation or added later from the [Asset Store](#). To install packages/assets easily use the [asset store tab](#) in Unity's editor ([HowTo here](#)). Remember, [adding assets/packages](#) is a frequent process.

- **Assets** are the individual objects, textures, scripts, videos, etc., you can use for that project. Unity provides a free set of *standard assets*, that can be used to start creating scenes. In the [Asset Store](#) and [elsewhere](#) you can find many more, paid or free.
- **Prefabs** - a "normal" object from assets may need some components or properties to behave properly in the scene, a prefab *already* has what is needed, just drag it from the assets to the scene and it will work as expected (example: *ThirdPersonControler* that is used in this tutorial)
- **Scenes** are what we build using assets. A *game* or *virtual world* can have more than one scene. In games scenes are also known as *levels*.

**Tip:** it is convenient, during the creation process, to save several versions of the scenes as ... [safeguard](#) duplicates!

Now you can start working with Unity3D. The next steps will direct you to selected Unity manual info and some short videos (freely available on the Net) that help on building the scene.

## 2. Creating a "New" Project

Open Unity, click [NEW], choose the [3D template](#) to start a new 3D project and click [Add Asset Package] to [make the Standard Assets available to your project](#). When, the editor opens the **Project** tab shows a folder named *Standard Assets* and the **Hierarchy** tab includes two visible elements, preset in any new scene: A *Main Camera* and a *Directional Light*. A *default skybox* is also configured. With these three elements, *your "world" is ready* to be populated!

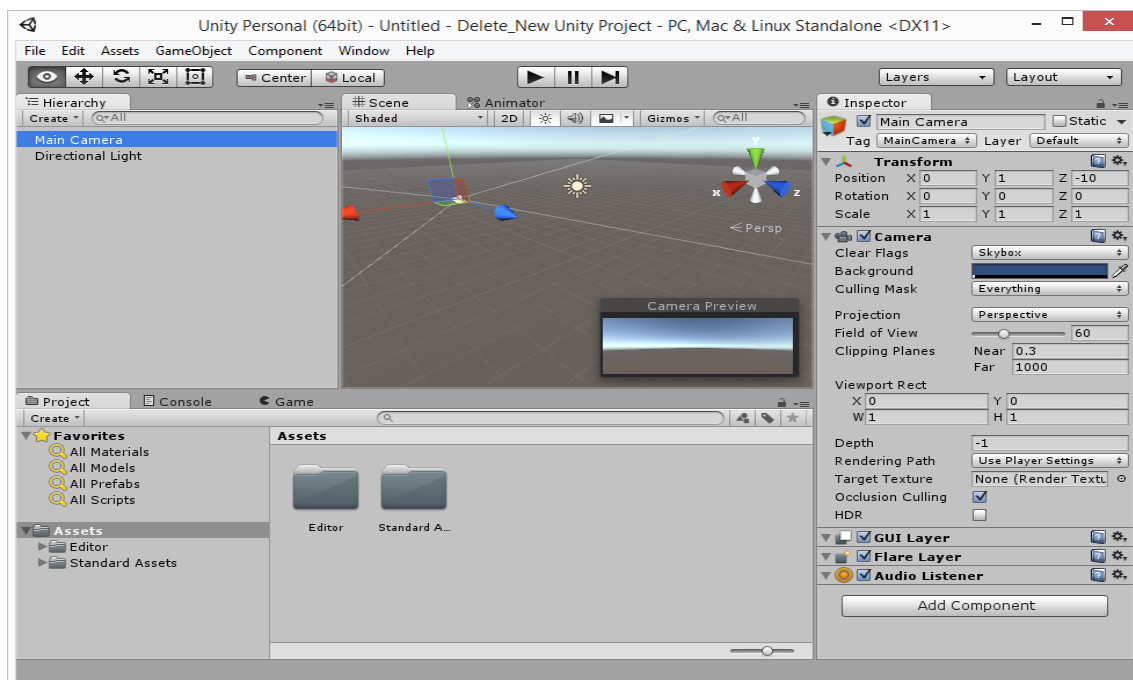


Figure 3

## 2.1. Main Camera

Shows the scene content from a defined position coordinates (viewpoint). The camera position can be changed manually in the **Inspector** tab. More cameras can be added to a scene when needed and we will do that when adding an avatar (point 6).

## 2.2. Directional Light

“Let there be light”. Without the sun, our own “real” world would be dark. The same happens with a virtual world. Light is needed to illuminate the environment, objects and avatars. There are several types of light in 3D scenes. In this scene, we use **directional light**, a powerful source of light that illuminates everything it points to, no matter how distant the object is from the light source. By its characteristics, directional light is often used to simulate the Sun in virtual worlds. Optionally, **shadows** can be set in directional [light inspector](#).

**Tip:** If a *Directional Light* is not in the scene you will see darkness. Correct this adding one.

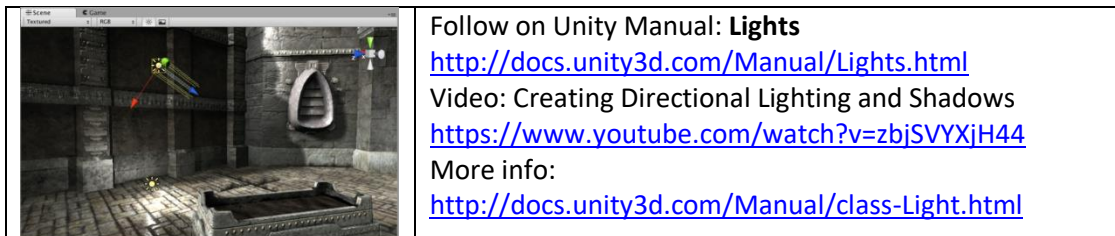


Figure 4

## 3. Sky (skybox)

Skyboxes are a wrapper around your entire scene that displays the vast beyond of your world, the universe around it. To make things easy, Unity already provides your scene with a “Default-Skybox”, that blue sky seen on Figure 8. If you do not like it get another (ex: Classic Skybox) from the online Asset Store and add it to the scene. More info on adding other skybox, below:

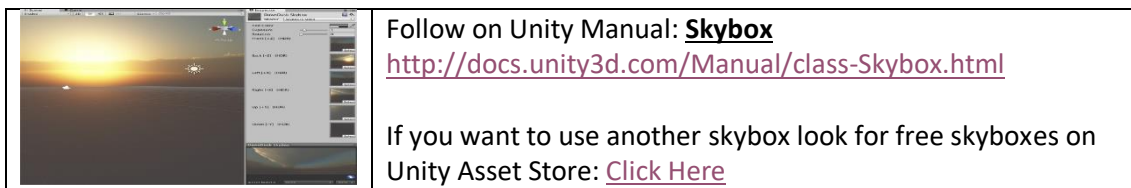


Figure 5

## 4. Navigation: Move, Rotate and Pan

Before start building, you need to know the navigation basics. These videos cover the basic concepts of Rotate, Move, Pan and the hot keys that can assist you with navigating the stage.



-Unity 3D Game Engine - Navigation, Move, Rotate & Pan:

[https://www.youtube.com/watch?v=pRtQ8cK\\_TkU](https://www.youtube.com/watch?v=pRtQ8cK_TkU)

-Unity 5 - From Beginner to Pro #1 – Interface:

<https://www.youtube.com/watch?v=dyoGSUs2aEA&list=PLrswC5B90hKyr9SQk9ldmwOsh-iGePFzB>

More info on Unity Manual: **Learning the Interface**

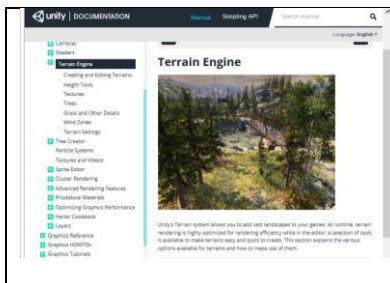
<http://docs.unity3d.com/Manual/LearningtheInterface.html>

Figure 6: Unity 3D Interface

Now, you are ready to start building your first scene.

## 5. Terrain, trees, grass

With Unity's Terrain system, we can quickly add a landscape to the scene with the typical elements: ground, trees, grass ... included in the [Environment package](#) of standard assets.



Follow on Unity Manual: **Terrain Engine**

<http://docs.unity3d.com/Manual/terrain-UsingTerrains.html>

Vids: (1) [Making A Terrain In Unity](#) - Concept;

(2) [Sculpting a Terrain](#) - Learn how to

>>Advanced: (3) [Unity 3D, Creating a Terrain](#) (7 vids);

(4) [Cenários e Texturas no Unity](#) (12 vids, Portuguese)

Figure 7: Terrain Engine

This terrain editor is easy to grasp but quite powerful. Builds simple terrains like the one on Figure 8 or quite complex ones! Learn the basics with videos 1 and 2 on Figure 7 to be able to create a simple terrain. Do not lose yourself in elaborated scenarios, for now :D

**Tip:** If you need images or other components for terrain editor, install the [Standard Assets](#)

**Tip:** If you don't have trees in assets folder, look for "Free SpeedTrees Package" In [Asset Store](#)

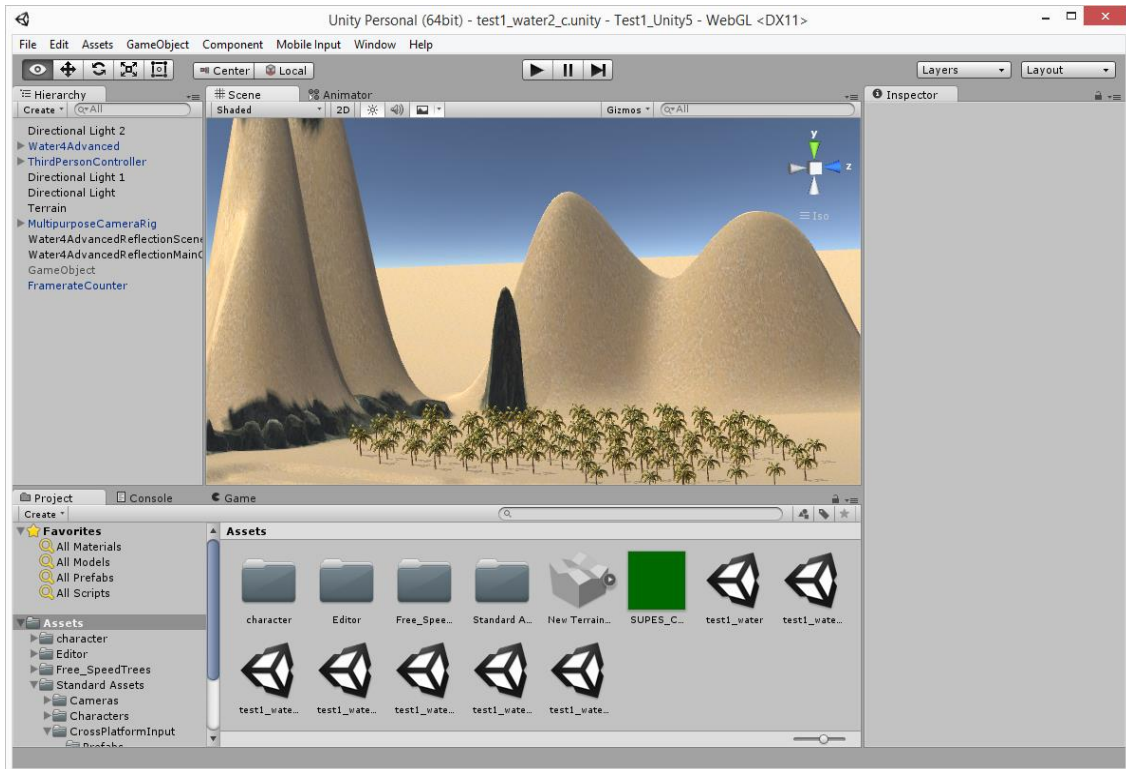


Figure 8: Simple Terrain

## 6. Avatar

The avatar represents us travelling in the world and increases the sense of immersion and realism. [Standard Assets](#) includes one character (*ethan*) already managed has a 3rd Person Controller prefab. Presuming you installed the [Standard Assets](#), look for the characters folder and “drag” the avatar/character from there to the scene as explained below and illustrated on Figure 9:

1. Click on Project label
2. Go to Assets->Standard Assets->Characters>ThirdPersonCaracter>Prefabs
3. In there you find a “ThirdPersonController” prefab
4. Click and drag it to the terrain of your scene and an avatar shape will appear ... *voilà!*

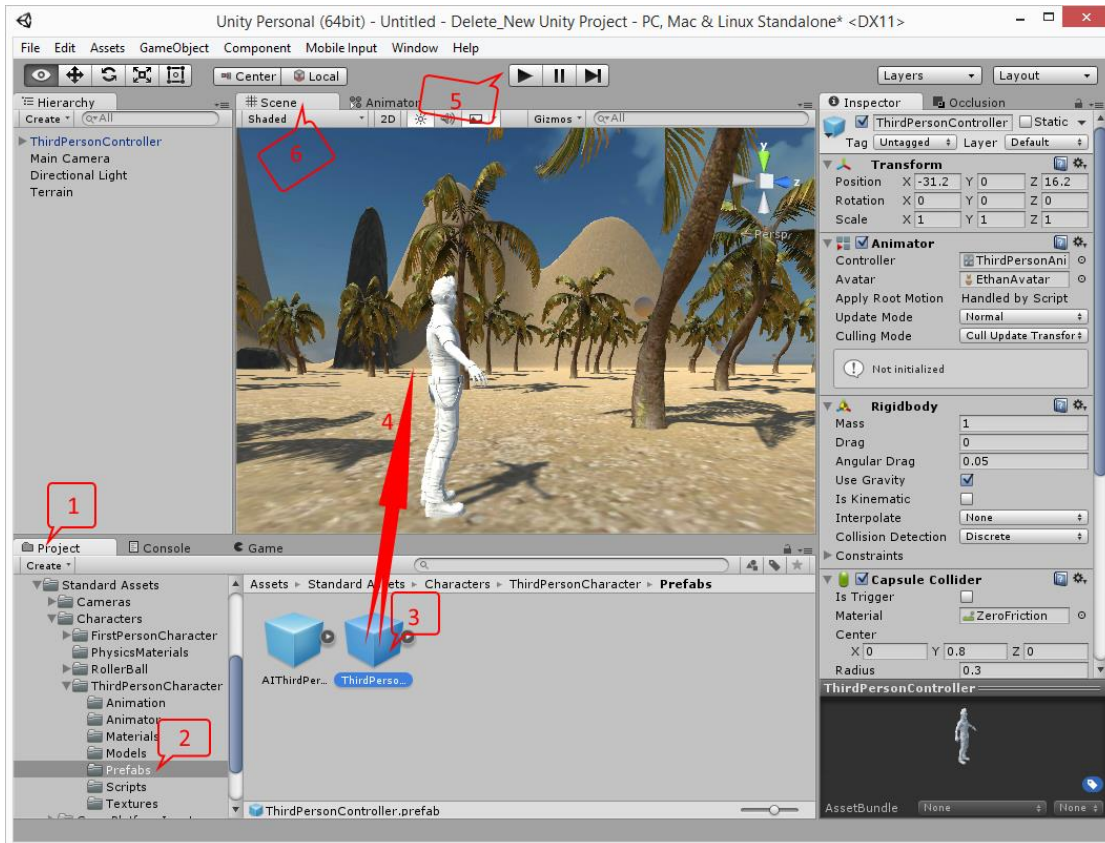


Figure 9 – Steps to insert the standard character (ethan)

5. To see some action, click on **play** and immediately after the avatar starts doing a slight wobbling movement (that corresponds to “idle”; the movement when standing)
6. Now, the character can react to your keyboard arrow keys, <C> key and <Space>, moving, crouching and jumping. Try it!  
Please note that, at this point, you will see the avatar moving (in **Game view**, not in **scene view**) but the camera is fixed, does not go along with the character. A few more steps are needed for that. Continue to the next point.

## 7. Associating the character movement to a Third Person Camera

As seen previously, the character is moving, but we want the camera to follow it from behind so we get what is known as *Third Person View*

This will be done in 4 steps. Figure 10 illustrates the first three steps:

1. Delete the default Main Camera (or just disable it in the inspector). **This is a key point!**
2. Find a new *special* camera. Go to Assets->Standard Assets->Cameras>Prefabs
3. You will find a “MultipurposeCameraRig” prefab. Click and drag it to *scene hierarchy*

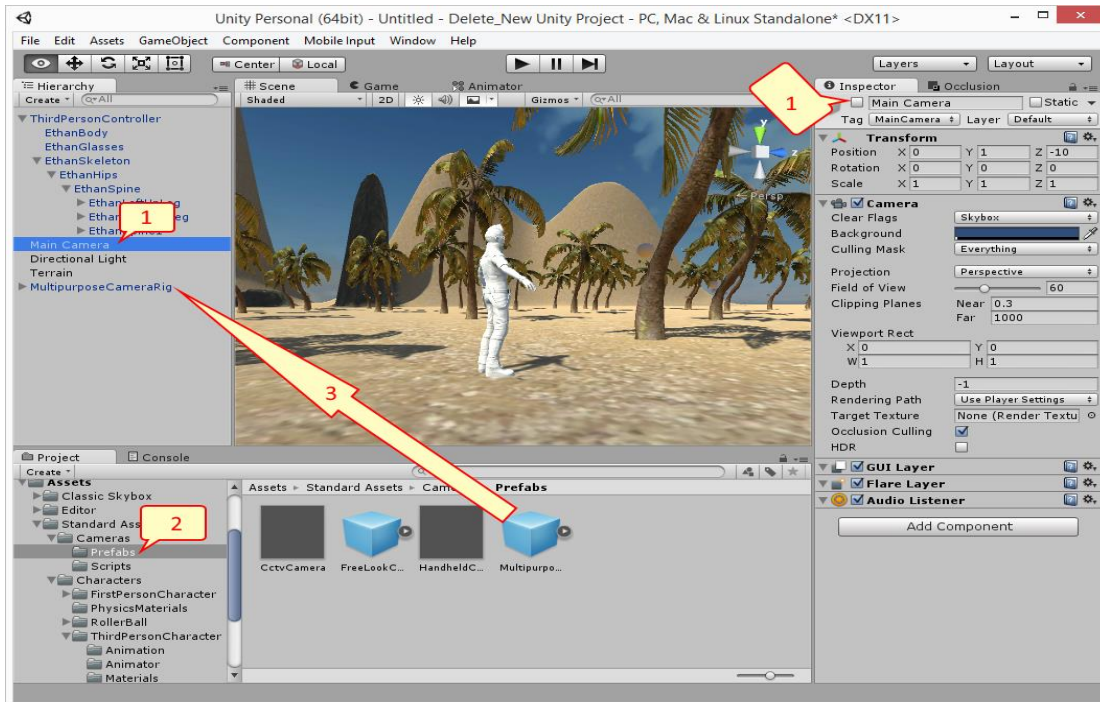


Figure 10 – first 3 Steps to prepare a camera for avatar movement

- An additional configuration step (Figure 11) links the *MultipurposeCameraRig* to *ThirdPersonController*. To link both, on the “Auto cam script” of the *MultipurposeCameraRig* change the “Target” parameter to *ThirdPersonController*  
**Tip:** an alternative, to this step 4, is defining the *ThirdPersonController* tag as *player*

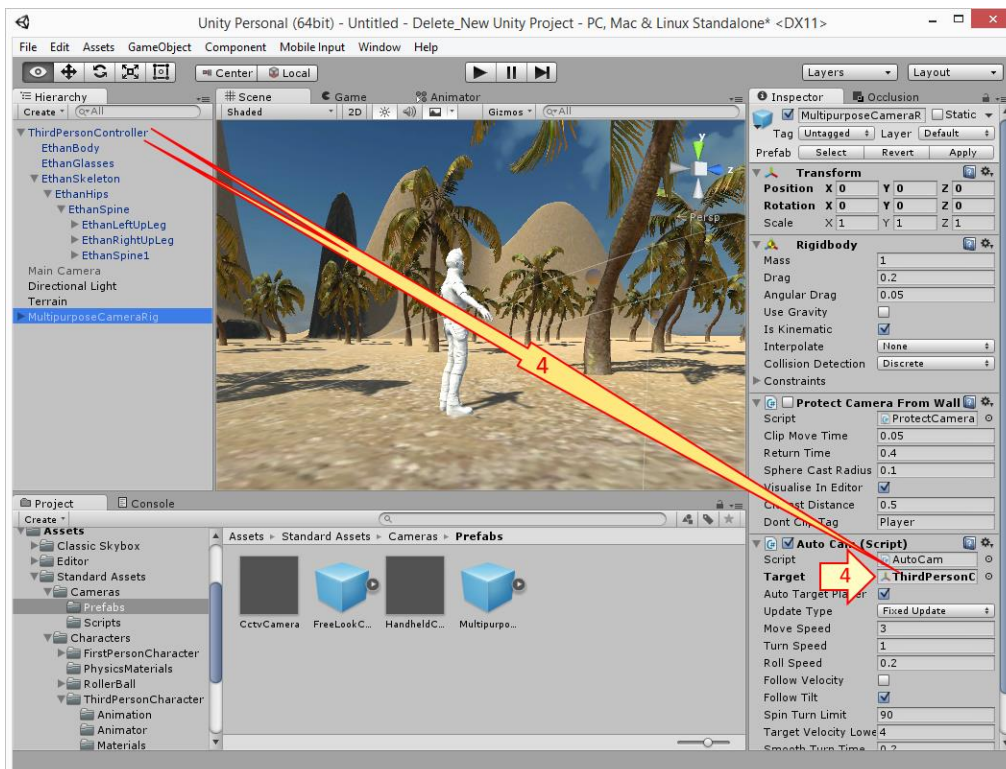


Figure 11 – Step 4, linking the camera to character movement

Finally, we have an avatar and camera properly configured to explore the scene and play around. Click on Play button and enjoy the *game view*<sup>1</sup>.

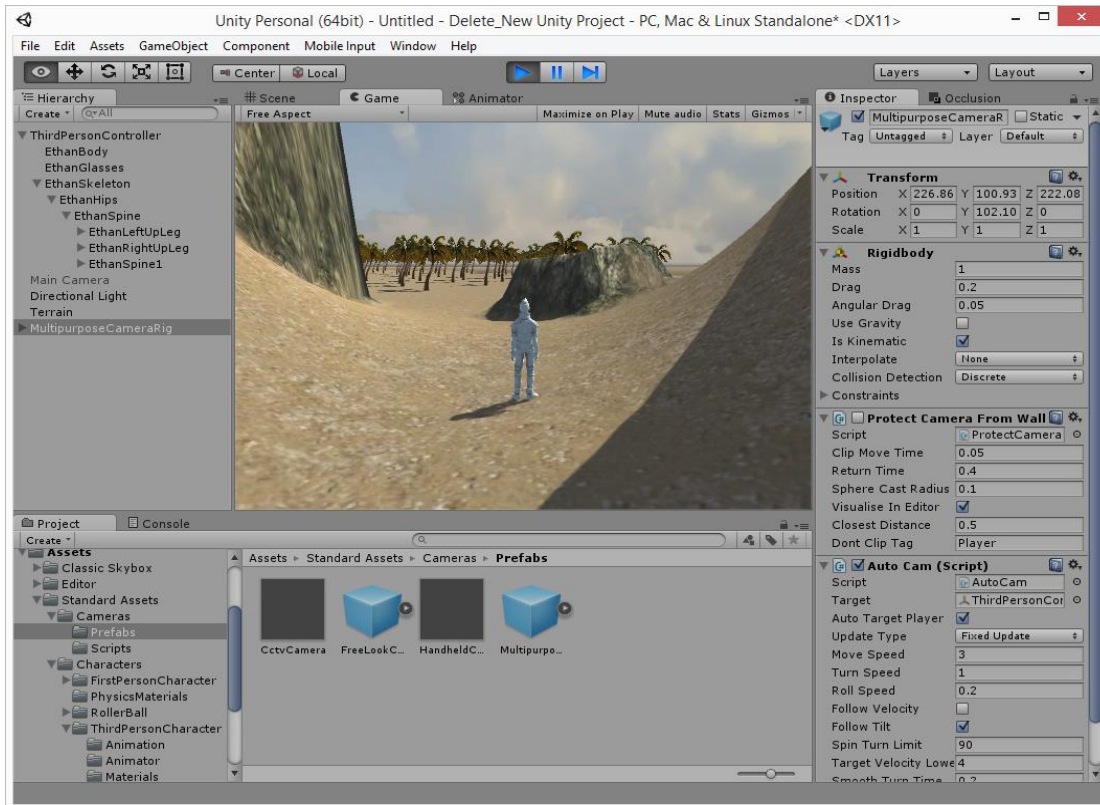


Figure 12 – Exploring the scene in Third Person View

**Common problems:** remember, this will not work if you forget to disable the Main Camera before adding the new one. Also, if Game view is not good ... reposition the camera!

**Tip:** Ethan, out of the box, comes with two [shaders](#) (and their correspondent textures white and grey) but we can dress it in a more colored way with [alternative shaders](#).

You can create your **own characters**; [MakeHuman](#) is an easy and intuitive creator. Remember to add to the character a “Game Engine” Rig on Pose/Animate>>Skeleton and export it as *.fbx* ; More on our “[2 - Using MakeHuman Characters](#)” tutorial

## 8. Publishing the scene (builder)

Unity can publish the scenes to several formats and devices (more than 20), from desktop to mobile, consoles ... and WebGL, the format that runs 3D over the Web without plugins in desktop browsers Firefox, Chrome, Edge, Safari, ... On mobile browsers you may (or not) find issues with Unity’s WebGL scenes but it’s evolving every day (more [info here](#)).

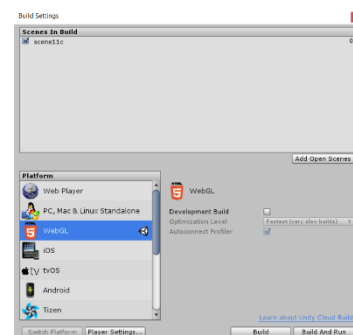


Figure 13

<sup>1</sup> The game view tab is a preview. It shows the scene as will be seen by the end user in a browser or app.



- To open the Builder go to File->Build Settings (Figure 13)  
*Caution:* check the window “Scenes in Build” to be sure you’re building the correct scene
- Then choose **WebGL** and click Build.

The build ends and unity opens a folder with your scene in WebGL format. Click the index.html file to open the scene in a browser. It should work since all major browsers are WebGL ready. More info on Unity’s [builder](#) and [WebGL browser/player settings](#) to solve problems.

Tips: (1) If WebGL build feature is not in builder, reinstall Unity and while installing check option [WebGL Build Support](#) (see [help image](#)). (2) If a WebGL scene won’t run on the browser because of **memory** try increasing it in WebGL browser/player settings in Unity; alternatively try with another browser. (3) If a local WebGL file won’t run on the browser because of security reasons you need to configure browser’s own settings and look for info [here](#); alternatively try with another browser. (4) If the avatar falls from scene boundaries create [physical barriers](#).

## 9. Demo scene (WebGL)

A basic WebGL demo is available online at:

<http://odisseia.babelx3d.net/unity3d/tuteasyscene1webGL3/index.html>

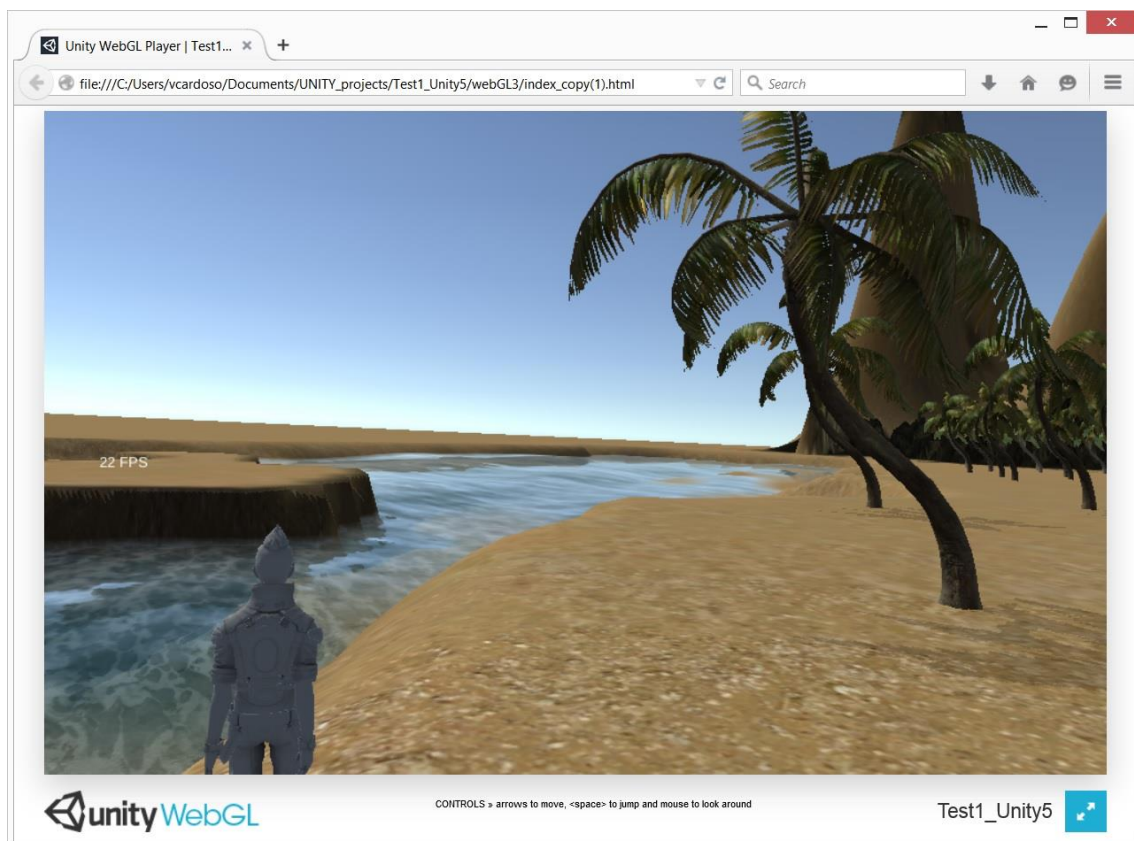


Figure 14 - Demo scene in WebGL - 3D without plugins!

## 10. Defy

Using the tutorial info, create your own virtual scene and answer to this post on [babelx3d forum’s defy](#) with images and links to your scenes and projects:

<https://portal.babelx3d.net/content/unity3d-5-webgl-scene>

## 11. References

Tutorials are simple texts aiming to motivate. To go beyond look for reference documents:

- Unity Documentation, is the fundamental reference text to learn from  
<http://docs.unity3d.com/Manual/index.html>
- Unity Learn –Tutorials, videos and training on Unity site.  
<http://unity3d.com/learn>
- Other easy to follow introductory videos (for different versions of Unity) on:
  - Unity 3D Game Engine  
[https://www.youtube.com/playlist?list=PLhJJbQW8pm\\_xQbMJ37zNK1xUwNm\\_dW\\_CuH](https://www.youtube.com/playlist?list=PLhJJbQW8pm_xQbMJ37zNK1xUwNm_dW_CuH)
  - Xenosmash Games  
<https://www.youtube.com/channel/UCKkQs1aEpGoboaTjoxyvGnA>
  - Tutorials Unity 3D ITA  
<https://www.youtube.com/playlist?list=PLI4fxixGrqWt18glvZ6DofAJfw6JyKu6K>
  - Unity3D: LearnQuick Series 01  
[https://www.youtube.com/playlist?list=PLov67ubKcn3Eh\\_U\\_kKvNU15Ch\\_uyTt2H](https://www.youtube.com/playlist?list=PLov67ubKcn3Eh_U_kKvNU15Ch_uyTt2H)
- Assets  
We can get Unity assets in many places and even use assets (images, objects, ..) made for other 3D programs (check [babelx3d list](#)) but one fundamental reference is Unity's [Asset Store](#) where we can find hundreds/thousands of paid and free assets accessible directly from [Unity's interface](#) editor: <https://www.assetstore.unity3d.com>

**Tip** to easily find **free assets** in Unity's Asset Store: set the "price range" to zero. This works for categories and subcategories of assets that are displayed in the asset store window. Example: you click on "3D models" link, all 3D Models (paid and free) are displayed; then if you set the "price range" to zero the window will display only the free models of that category.

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Unity3D Easy first Scene

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Current version: 3.35 - revised 9.November.2020

(Original version: 15.Jan.2015 for unity 3D and WebGL)

Important: this tutorial is updated from time to time so, preferably, [read it online](#) or get the latest version from [https://1drv.ms/f/s!AiVFncpESHaShZNdH\\_DaKhqFHCeTWQ](https://1drv.ms/f/s!AiVFncpESHaShZNdH_DaKhqFHCeTWQ)

More tutorials are available at <https://1drv.ms/f/s!AiVFncpESHaSrUR3FA2O03Z138HJ>