

2.5D Medieval Fantasy Environment documentation



Summary

1 Introduction (page 2)

2 Settings (page 3) *Settings needed to use this asset.*

3 Demo (page 8)

4 Create your level : Tutorial (page 9)

5 Lighting and framerate optimization :Tutorial (page 13) *Important concepts.*

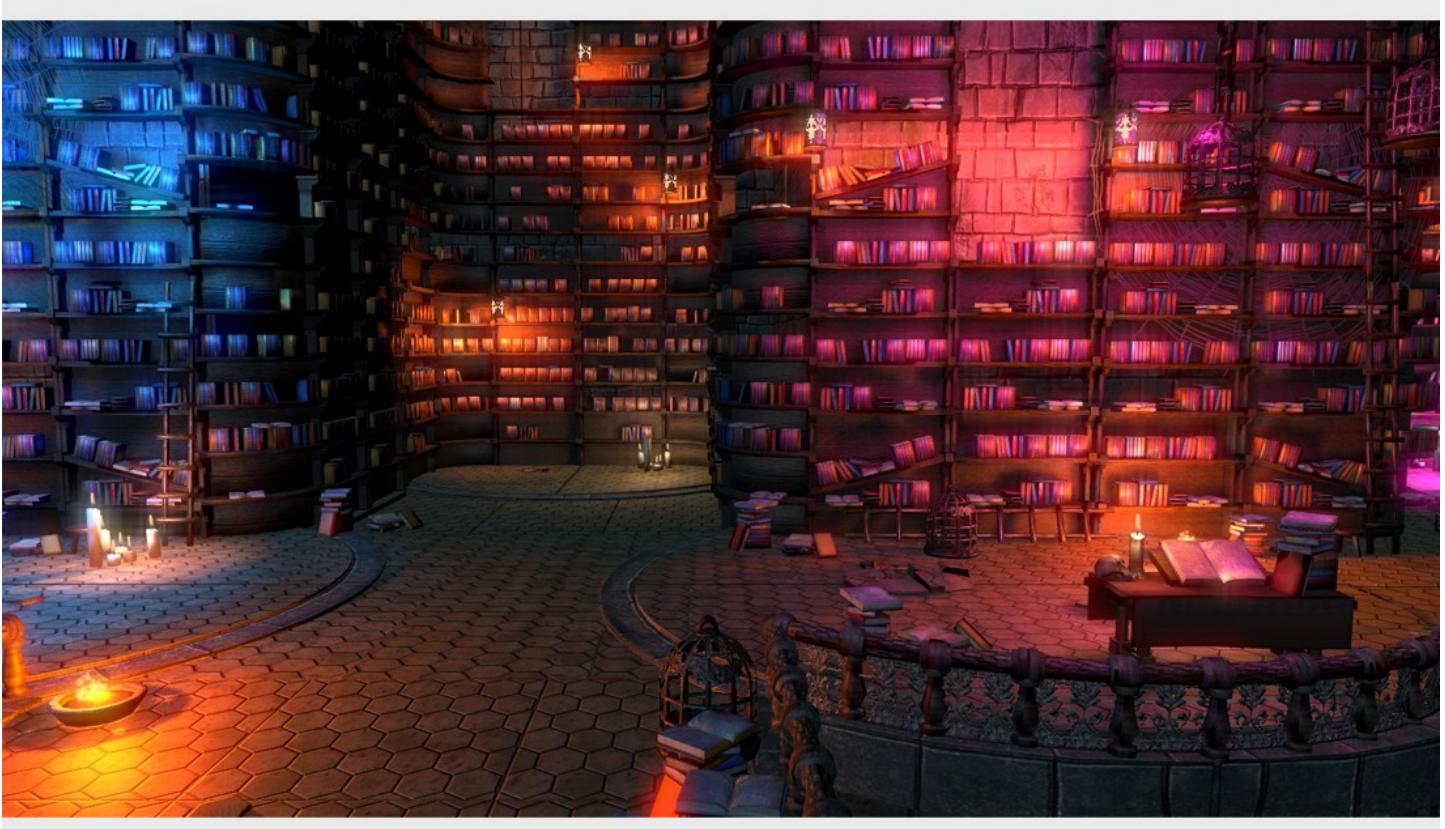
6 Realtime light optimization : Tutorial (page 24) *Framerate optimization.*

7 Specials effects : Scripts (page 28)

8 Art Tips (page 31)

9 Tricks and tips (page 34)

10 Appendices : Lighting panel presets (page 36)



Thank you for purchasing 2.5D Medieval Fantasy Environment.

2.5D Medieval Fantasy Environment documentation contains everything you need to get started.
If you have any questions, please contact us at tropicalstudio3d@gmail.com

You could join the forum here :

<http://forum.unity3d.com/threads/wip-2-5d-medieval-fantasy-environment.408098/>

How to use 2.5D Medieval Fantasy Environment :

1 Read chapter 2 (Settings needed to use this asset)

2 Open demo scene (**TS_Medieval_Fantasy / Demo / DEMO_scene**) to see example scene

3 Open Showroom scene (**TS_Medieval_Fantasy / Demo / Showroom**) to see all prefabs available in this asset.

4 For new scene preferably using the scene : **Starter_Kit (Assets / Scenes / Starter_Kit)**

All you need to start scene is set (lighting panel presets, ambient light, camera + character + collider)

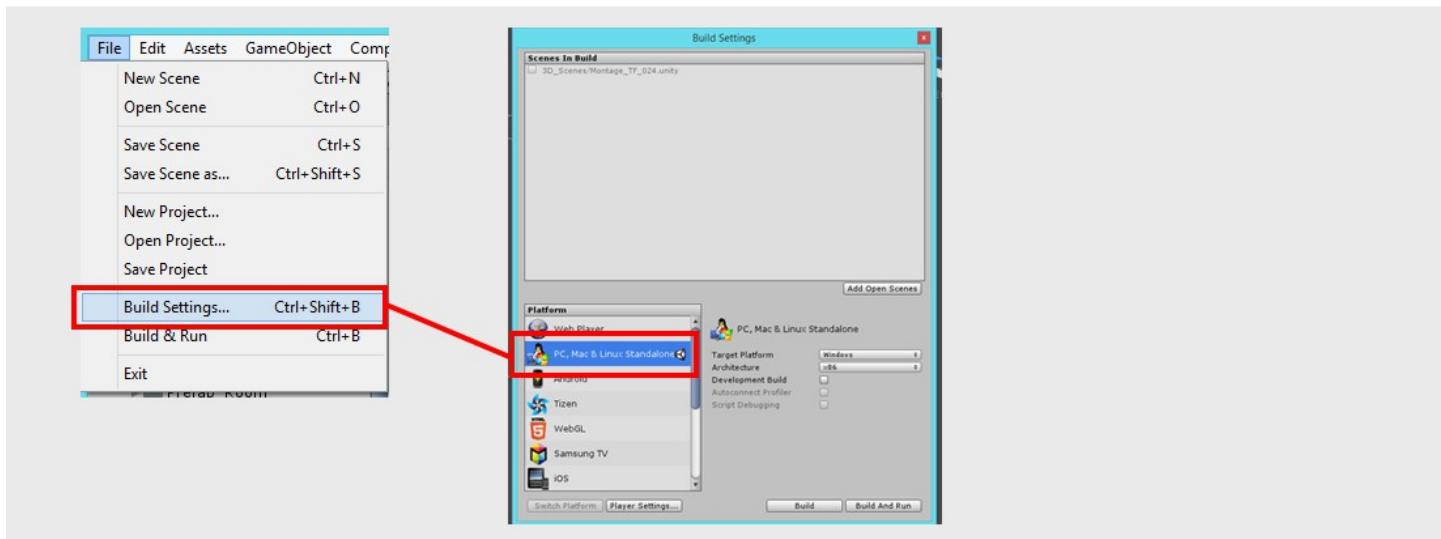
*If you prefer starting with a new scene or if you want to import elements in your own scene
see Chapter 10 (Appendices : Lighting panel presets).*

5 If you are unfamiliar with lighting in Unity we recommend that you read chapter 5 carefully (Lighting and framerate optimisation).

5 Realtime lights uses a lot of CPU : to optimize framerate read Chapter 6 (Realtime light optimization)

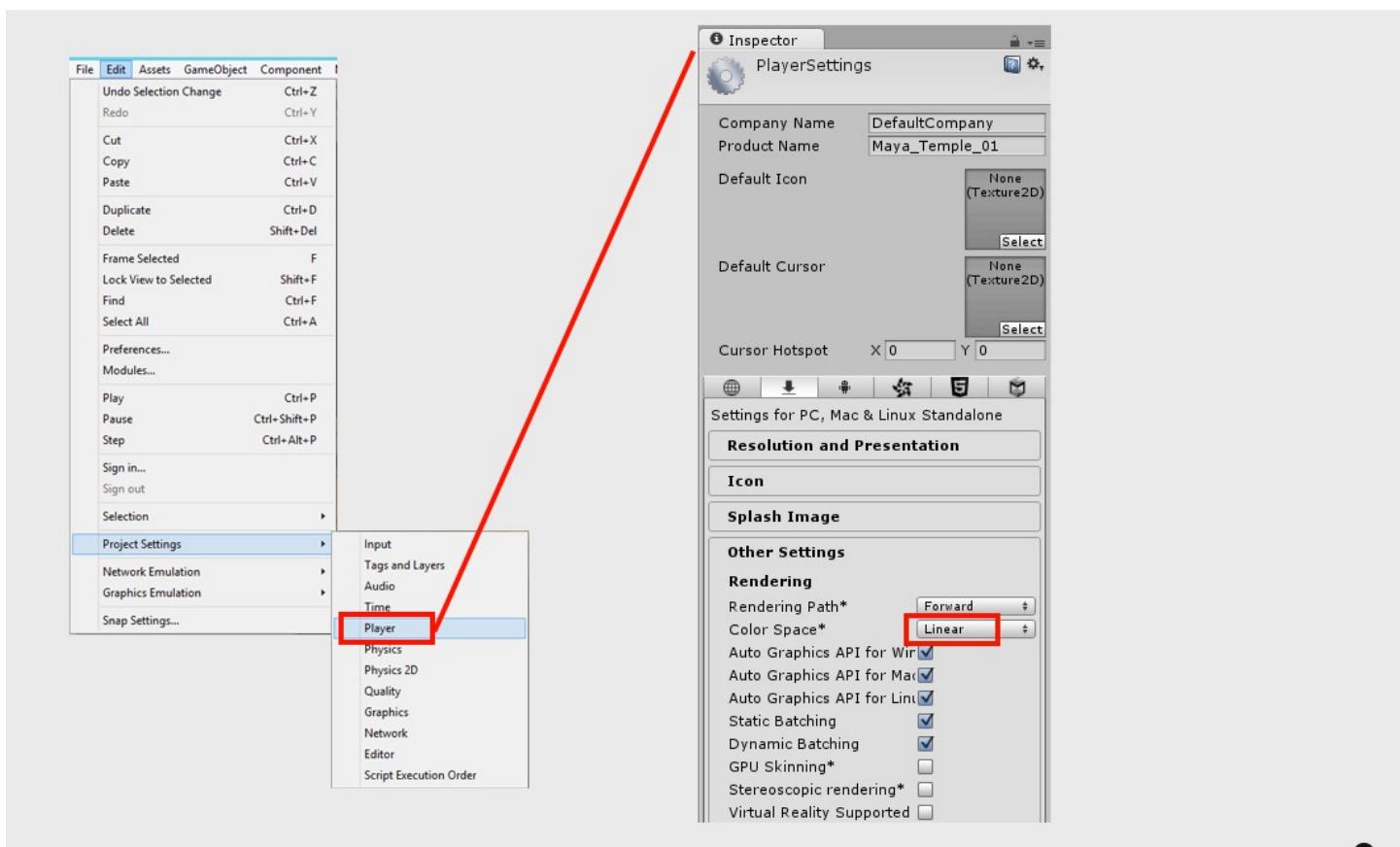
2 Settings (Settings needed to use this project);

1 Verify that you are in the PC, Mac & Linux Standalone mode.
Go to File > Build_Settings.

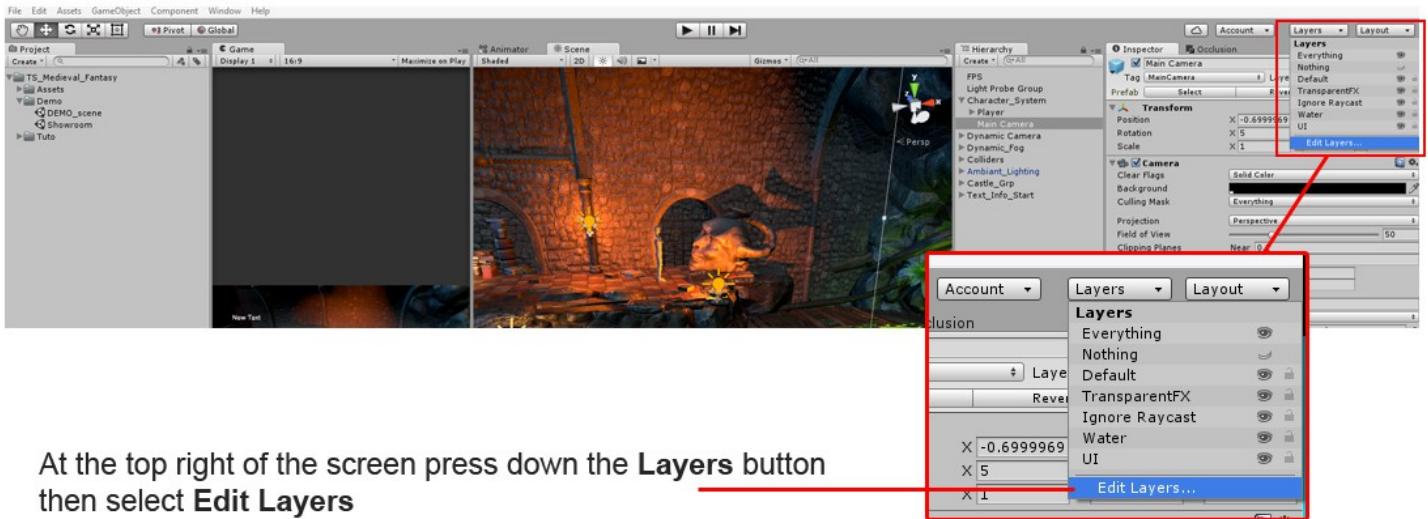


2 Color Space

Open Edit > Project Settings > Player.
In Inspector window change Color Space to Linear



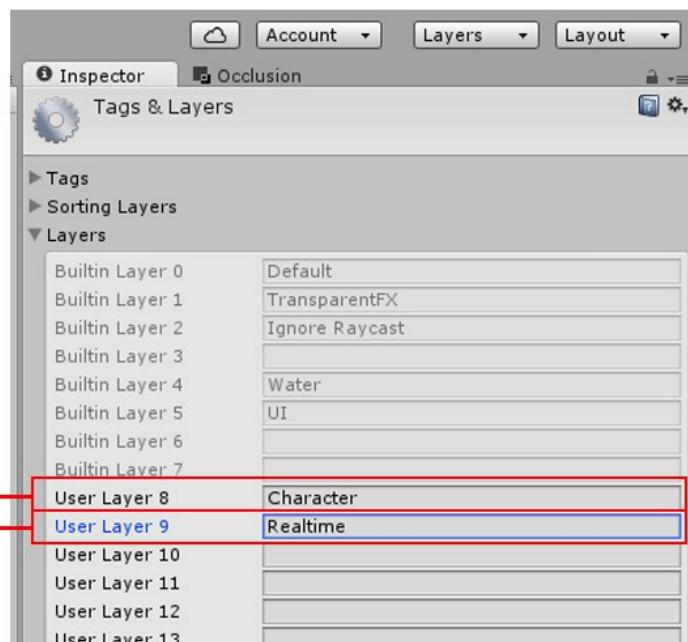
3 Layers (Use for realtime light optimizaton see chapter 6 for more informations)



Write using the correct lowercase and uppercase letters:

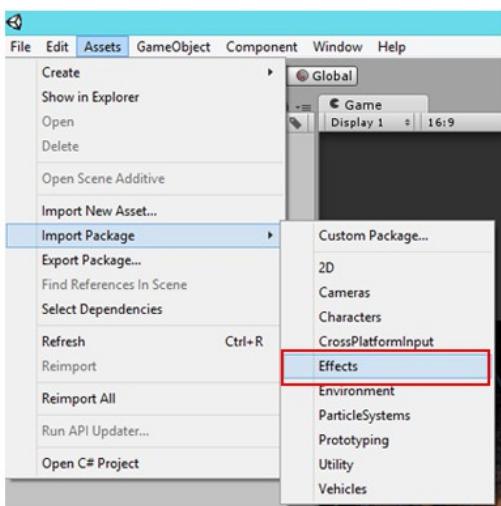
In layer 8 box write “Character”

In layer 9 box write “Realtime”

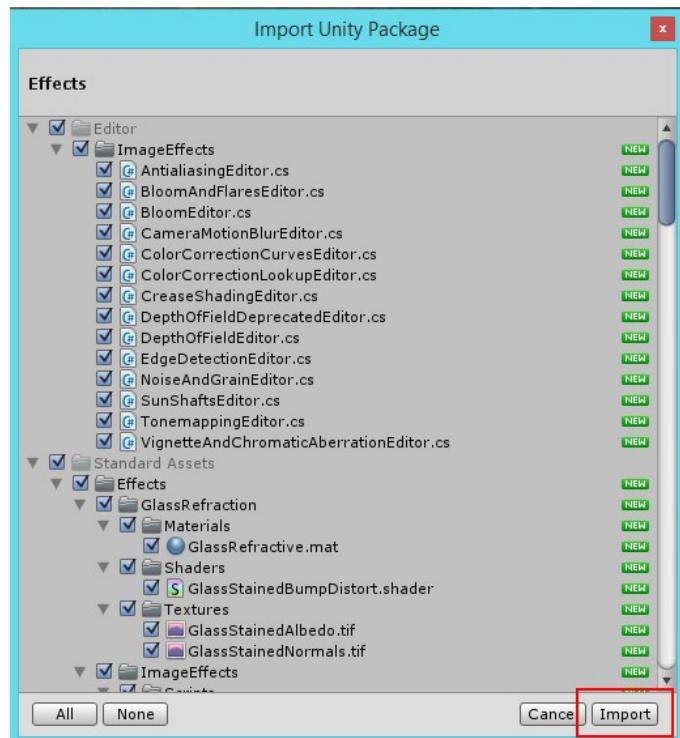


4 Standard asset : Effects

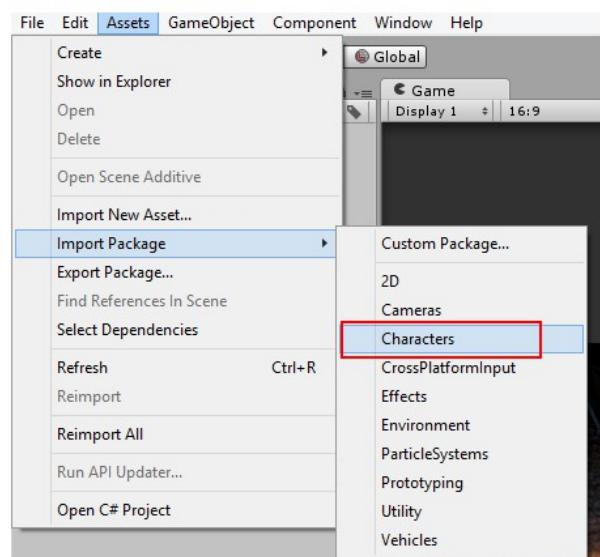
Open Assets > Import Package > Effects



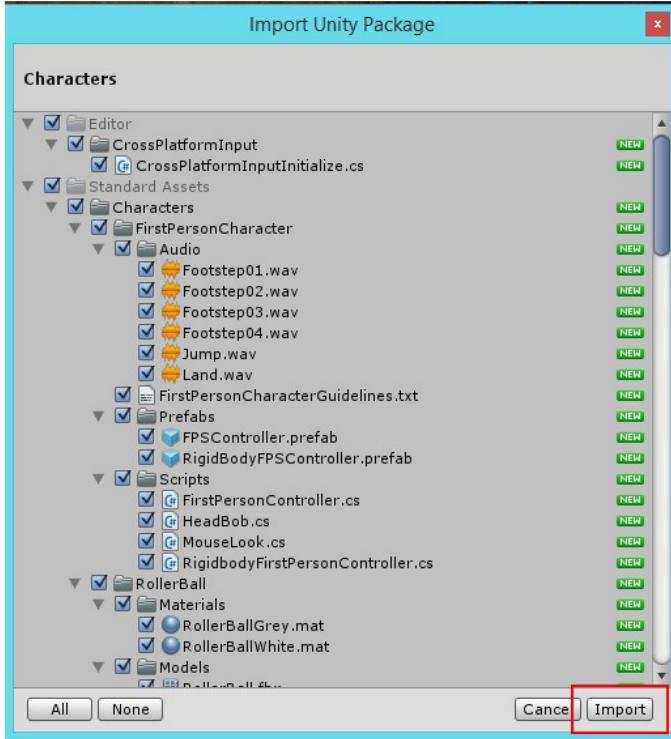
Press down the Import button



5 Standard asset : Character
Open Assets > Import Package > Character

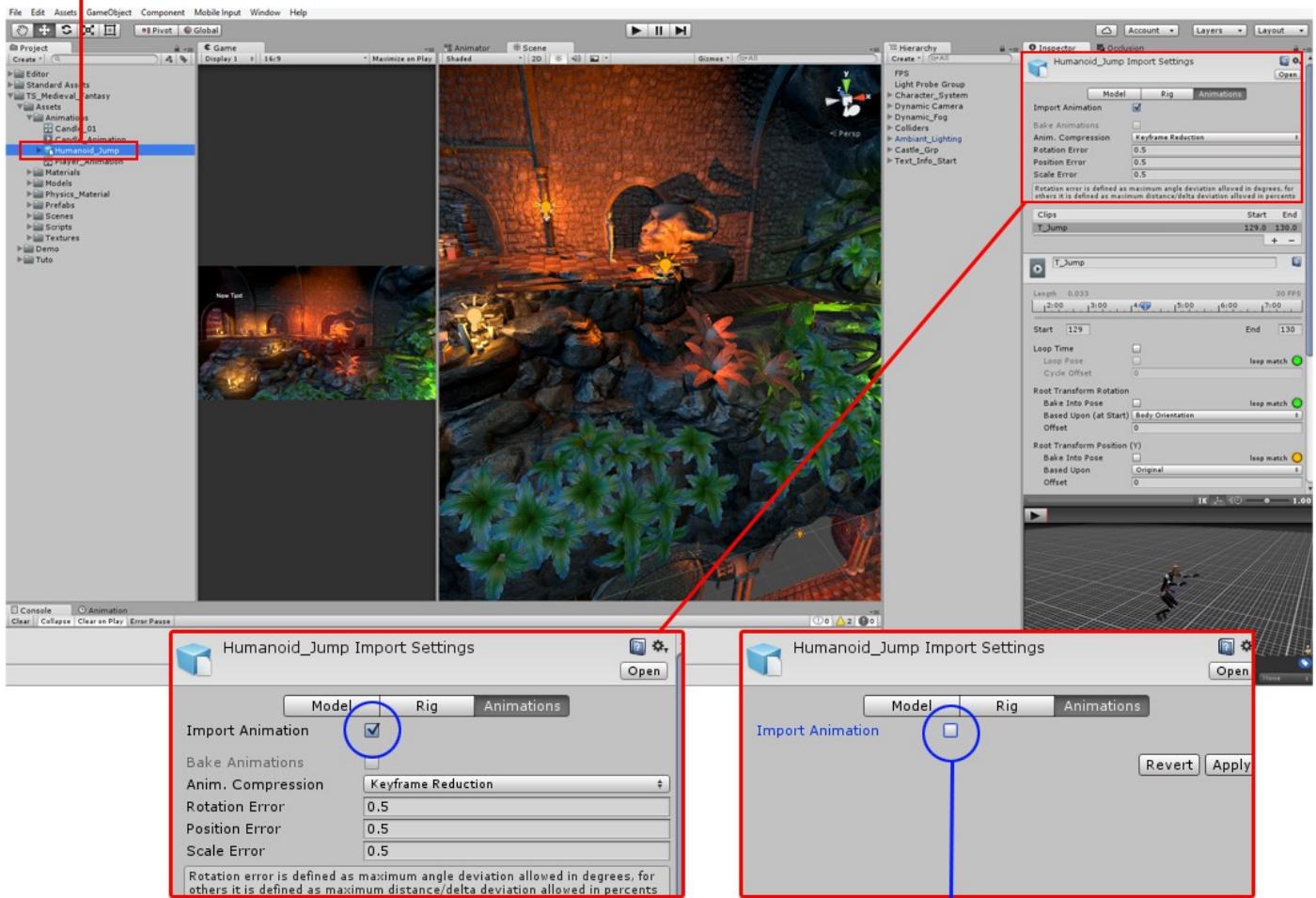


Press down the Import button

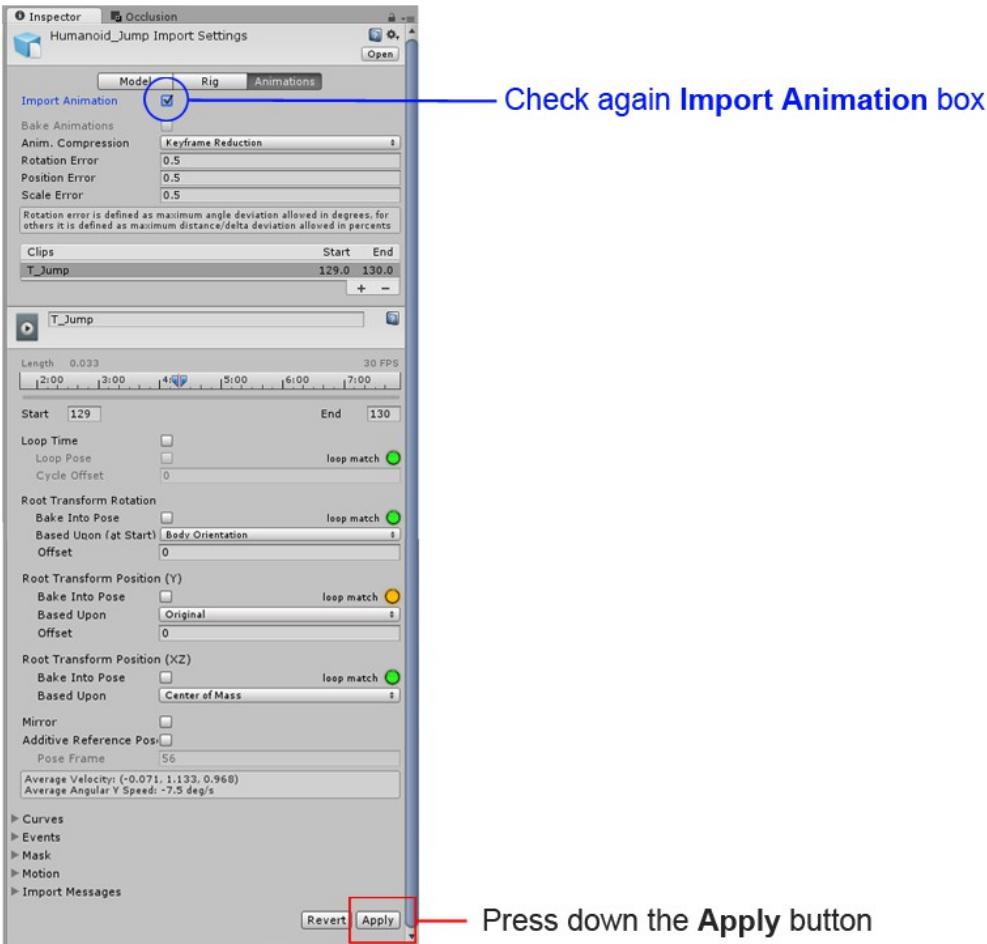


6 Refresh Character animation :

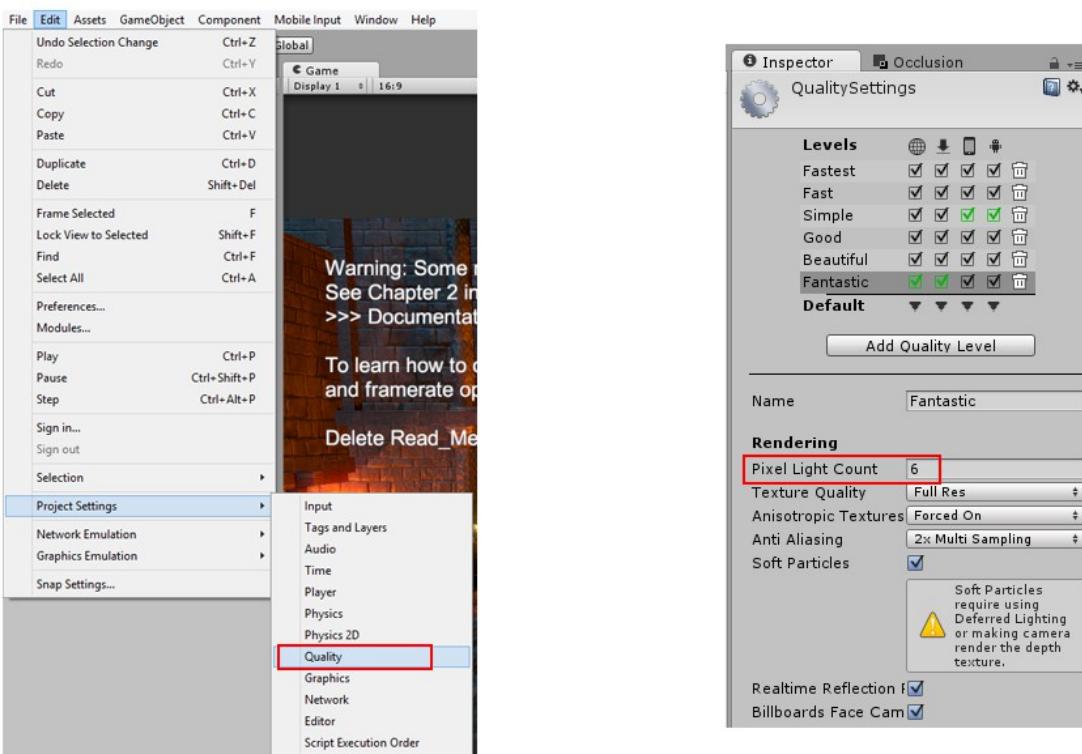
Select Assets > Animations > Humanoid_Jump prefab in Project tab



Uncheck Import Animation
box



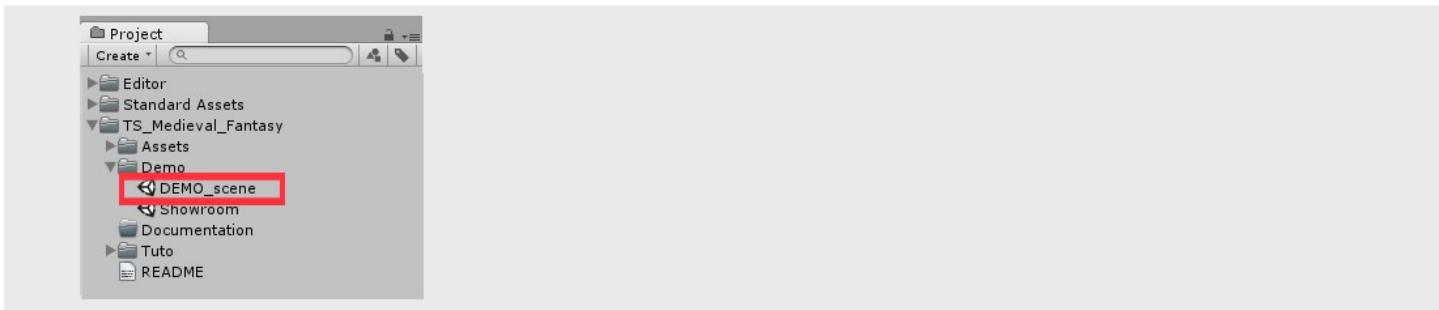
7 Open Edit > Project Settings > Quality.
In Inspector window change Pixel Light Count to 6
To learn more about pixel light count read page 19 20 and 21



Settings needed for this asset are ready!

3 Demo

In folder Demo open DEMO_scene



Tips: if you want to speed up your scene uncheck this icon.



Demo scene contains one **character** and **camera follow**.

Use the **arrow keys** on your keyboard to move your character.

Use the **spacebar keys** on your keyboard to jump.



If your character does not move correctly when you use the arrow keys please read chapter 2 **Settings**.

To learn how to optimize framerate read **chapter 5 Lighting and framerate optimization** and **chapter 6 Realtime light optimization**

To discover all prefabs contained in this asset:

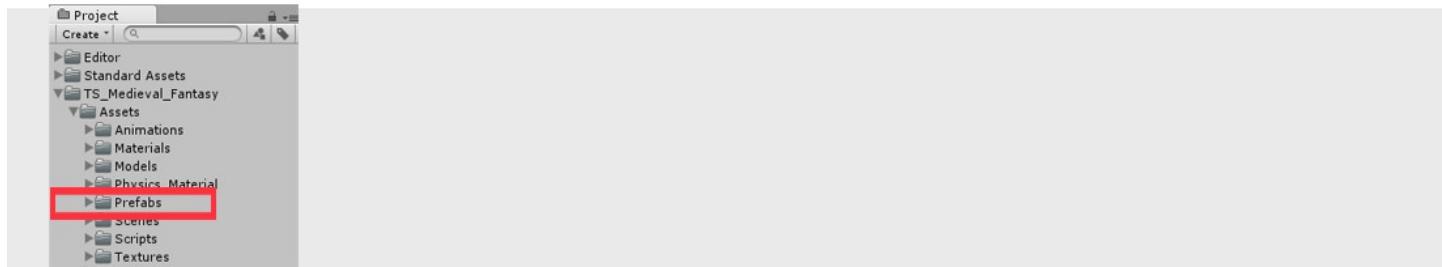
In folder Demo open **Showroom** scene



4 Create your level: Tutorial

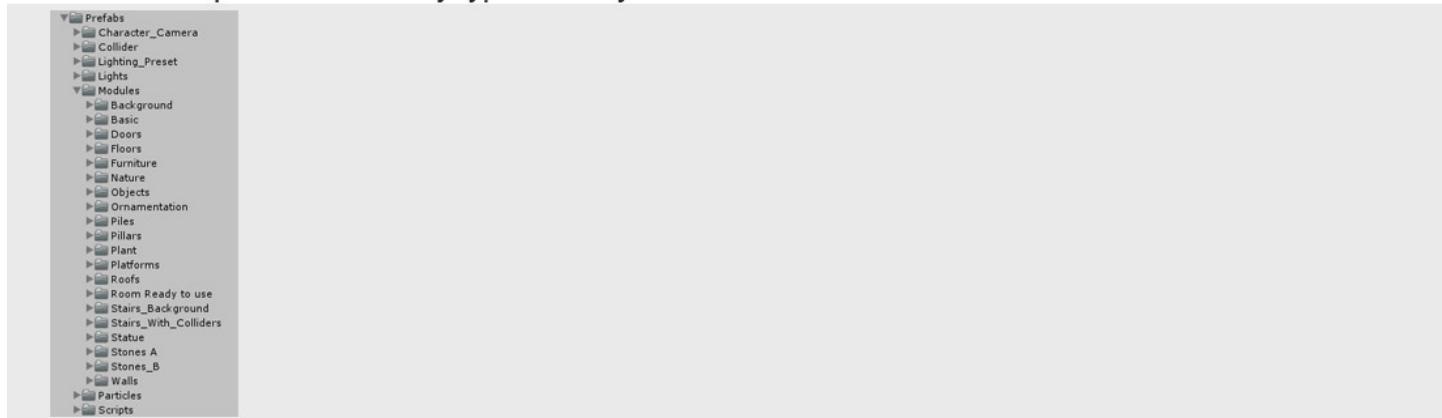
This tutorial explains how to build your own level.

Use prefab from the folder **Assets / Prefabs**.

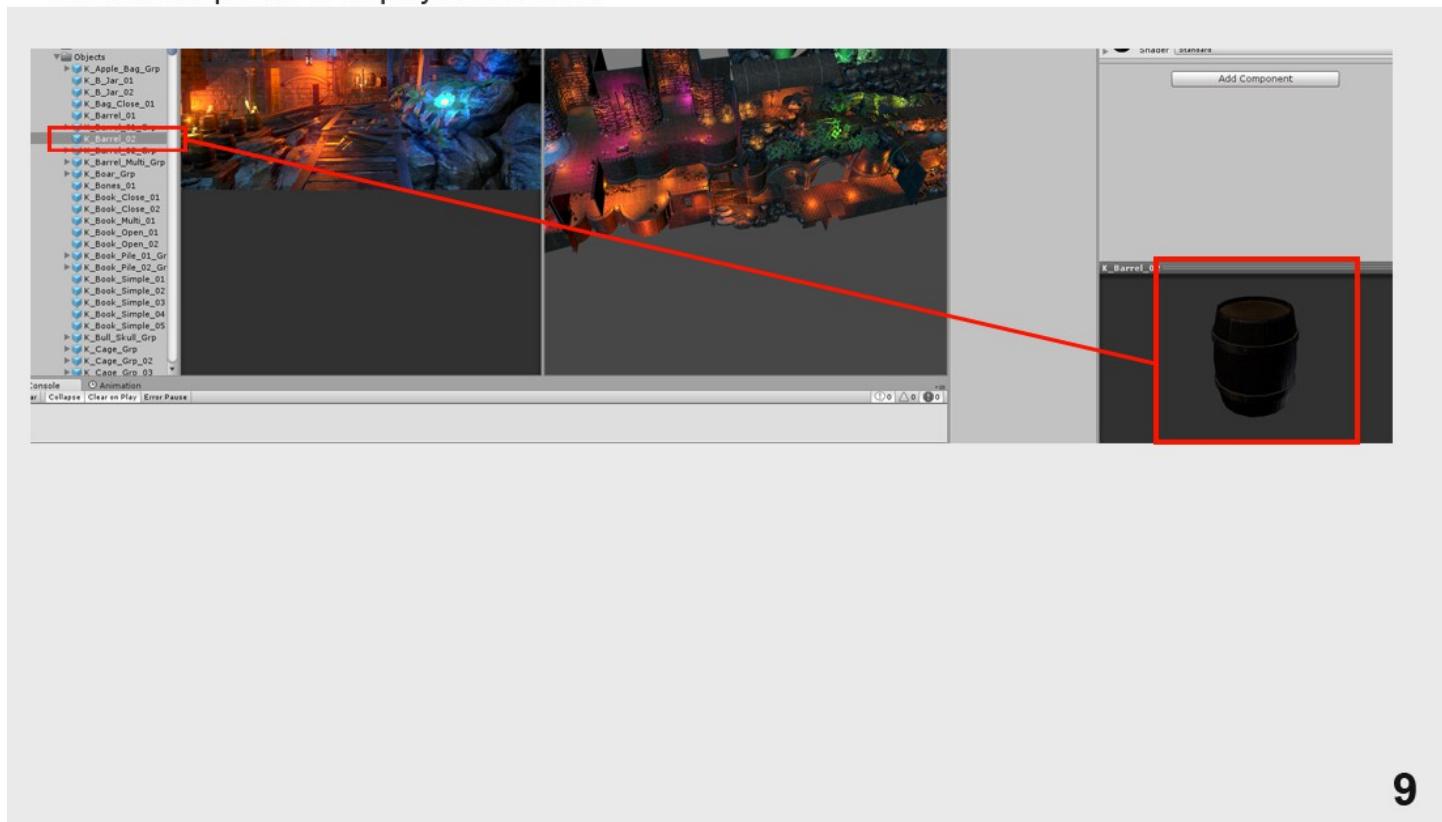


All prefabs are lightmap ready.

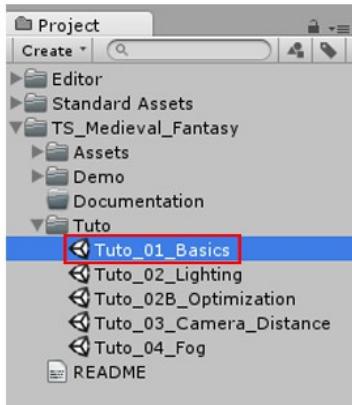
Prefabs are put into folders by type for easy use.



Click on the prefab to display its contents.

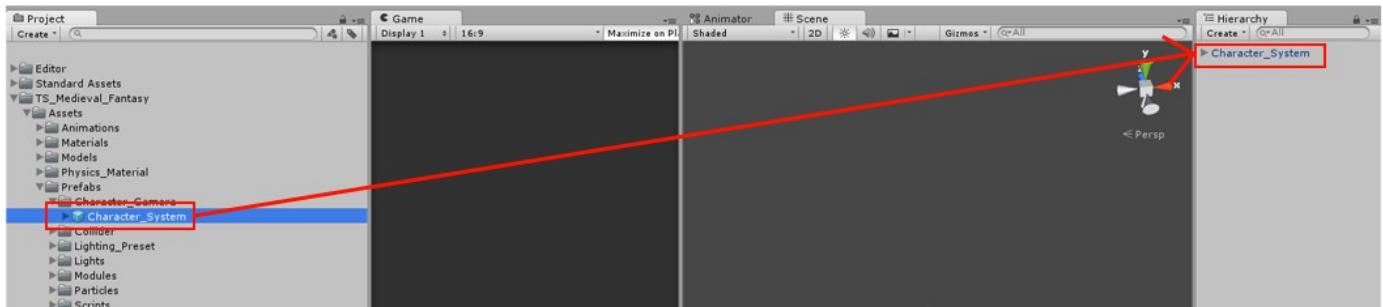


1 Open scene : Tuto / Tuto_01_Basics.



2 From project window drag and drop character and camera follow in hierarchy tab: **Assets / Prefabs / Character_Camera / Character_System**

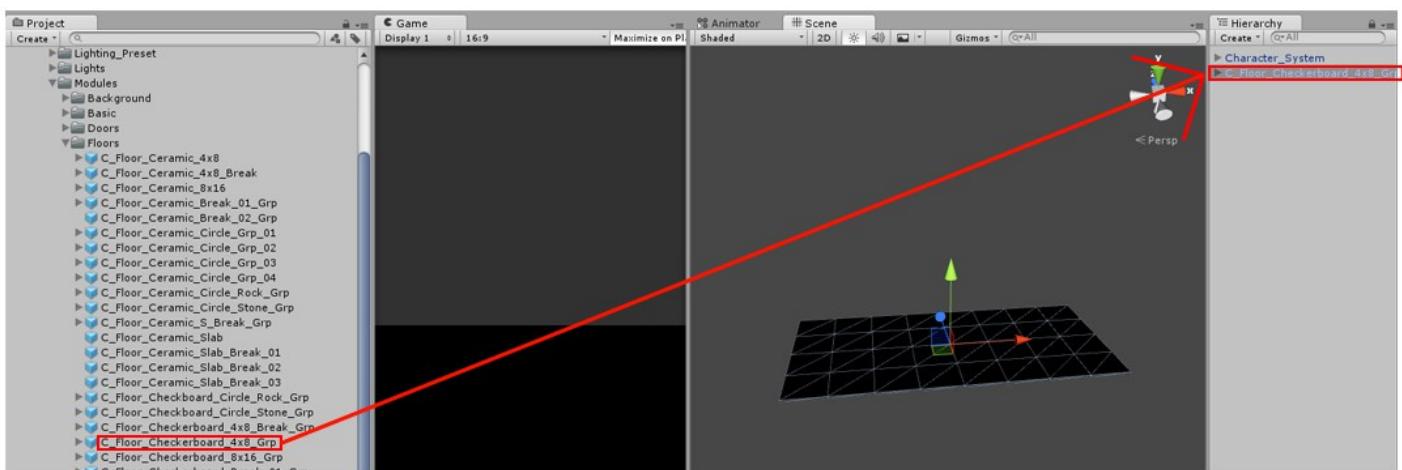
In hierarchy select **Character_System** and change the X,Y,Z coordinates : X:0 Y: -0.9 Z: -1.1



Dont't Forget : to move character always move the entire group : **Character_System**

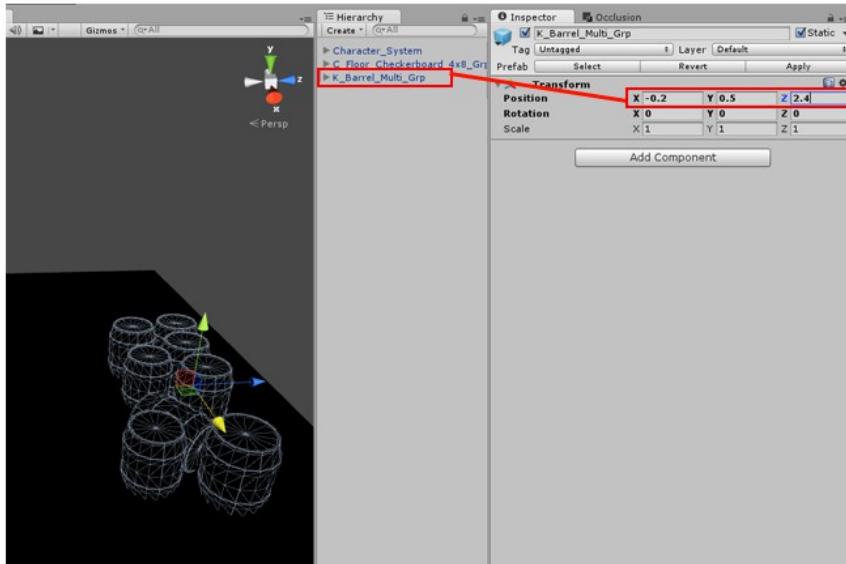
To learn how to modify camera distance read page 29

3 From project window drag and drop **Assets / Prefabs / Modules / Floors / C_Floor_Checkerboard_4x8_Grp**

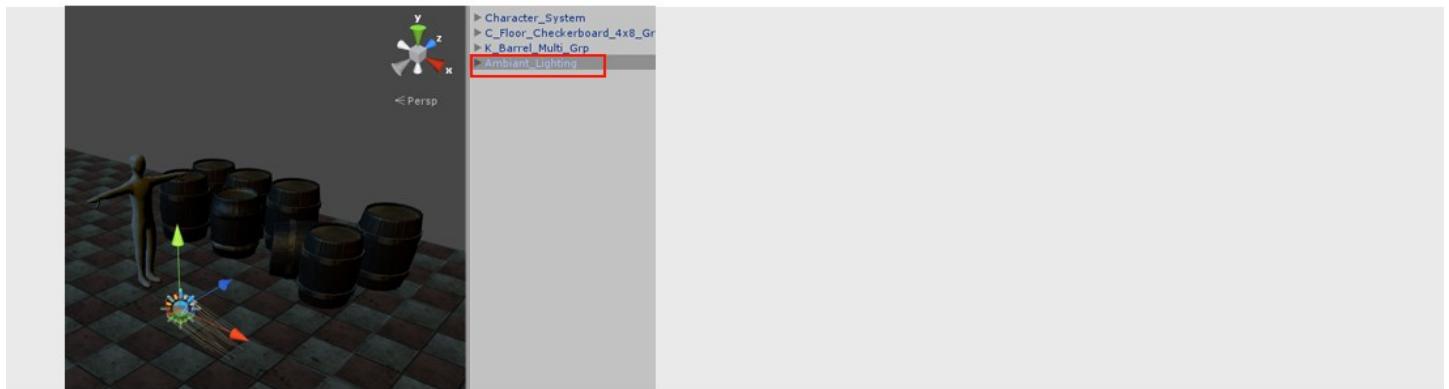


4 From project window drag and drop in hierarchy tab:
Assets / Prefabs / Modules / Objects / K_Barrel_Multi_Grp

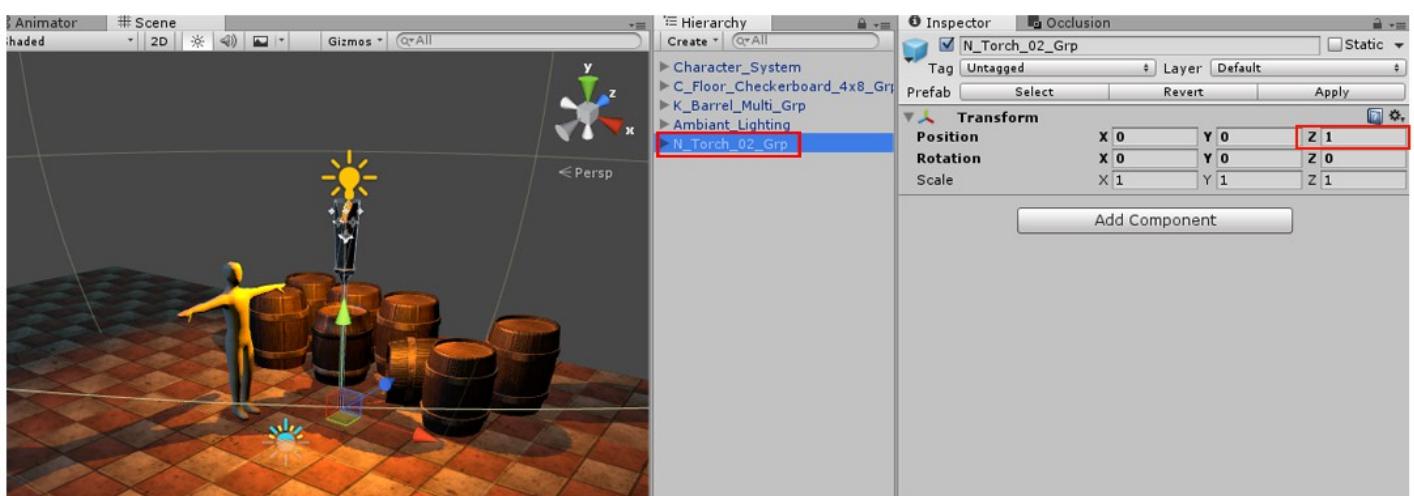
In hierarchy select **K_Barrel_Multi_Grp** and change the X,Y,Z coordinates : **X:-0.2 Y: 0.5 Z: 2.4**



5 From project window drag and drop **Assets / Prefabs / Lighting_Preset / Ambiant_Lighting**

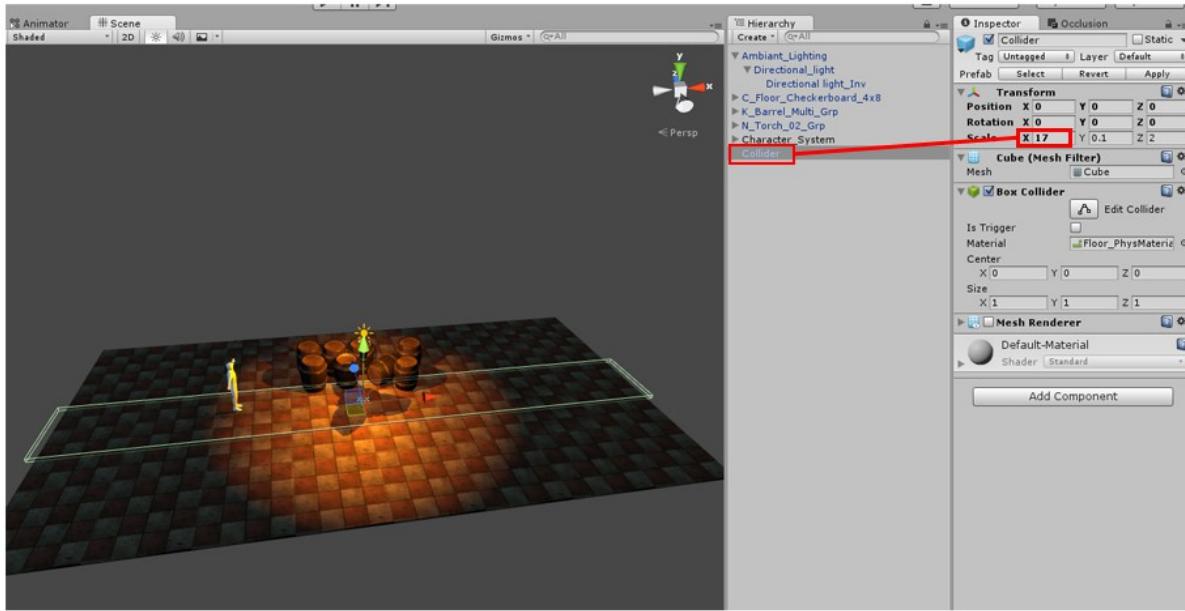


6 Import in hierarchy tab:
Assets / Prefabs / Lights / N_Torch_02_Grp
In hierarchy select **N_Torch_02_Grp** and change the **Z** coordinates : **Z: 1**



**7 Drag and drop Collider in hierarchy tab:
Assets / Prefabs / Collider / Collider**

In hierarchy select **Collider** and change the **scale X : 17**



3 Run your scene.



Use the **Up and Down arrow keys** and **Spacebar** on your keyboard to move your game character.

TIPS: For new scene preferably using the scene : **Starter_Kit**
All you need to start scene is set (lighting panel presets, ambient light, camera + character + collider)

In the next chapter we learn how use lightmap to optimize framerate

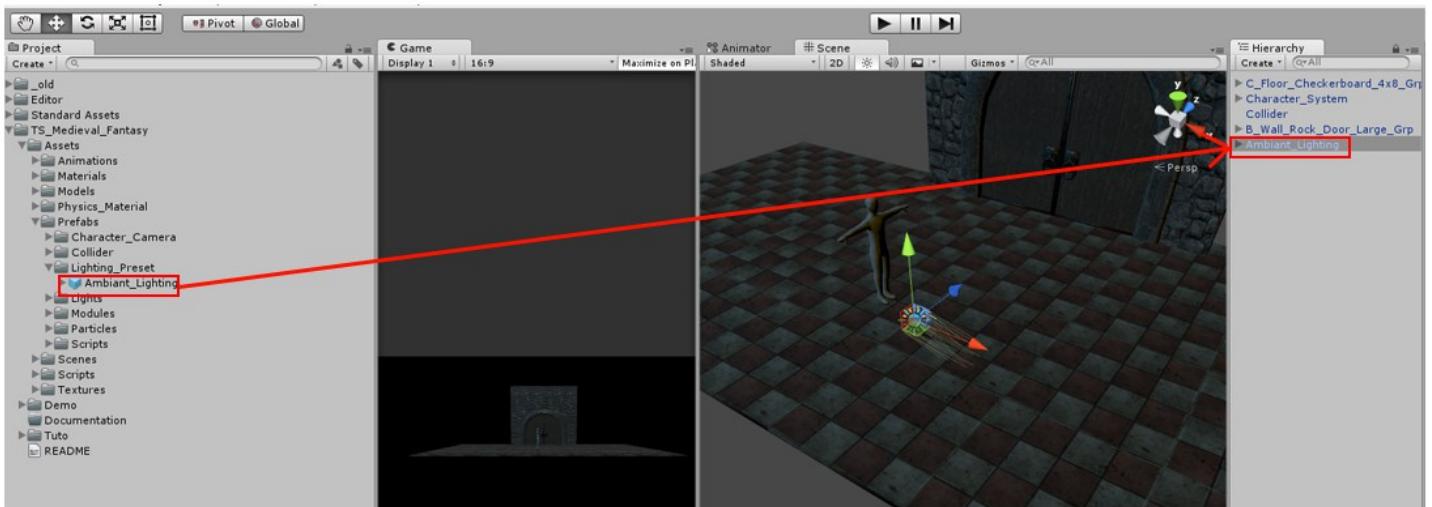
5 Lighting and framerate optimisation :Tutorial

Warning: This section covers important subject : lighting et framerate optimisation.
If you are unfamiliar with lighting in Unity we recommend that you read this section carefully.

1 Open scene : Tuto / Tuto_02_Lighting

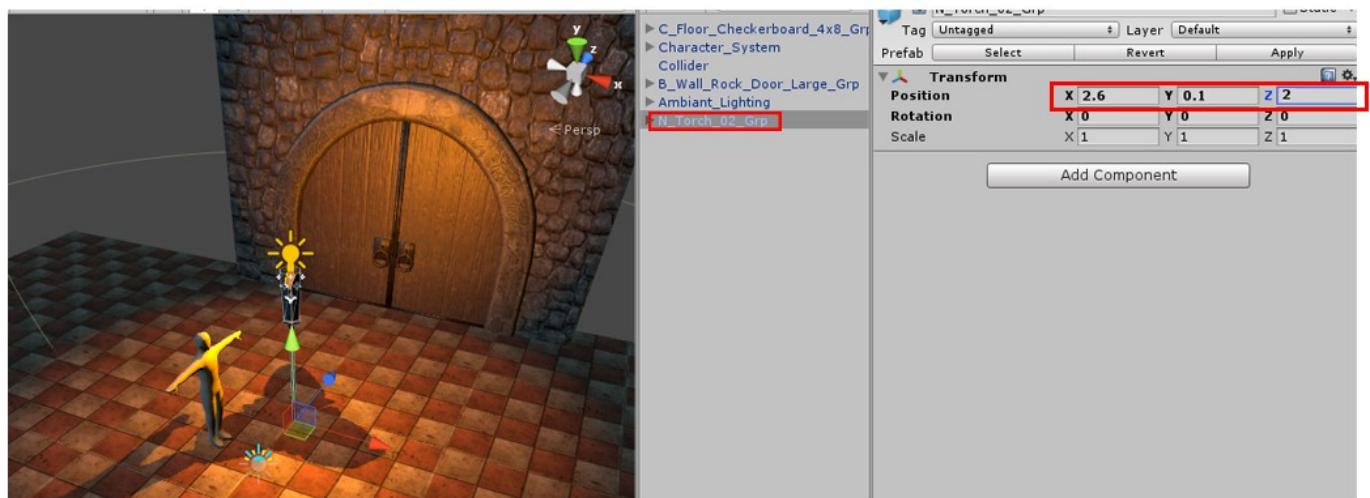
2 In order to add ambient light to the scene :

From project window drag and drop Assets / Prefabs / Lighting_Preset / Ambiant_Lighting



3 Add one light to the scene :

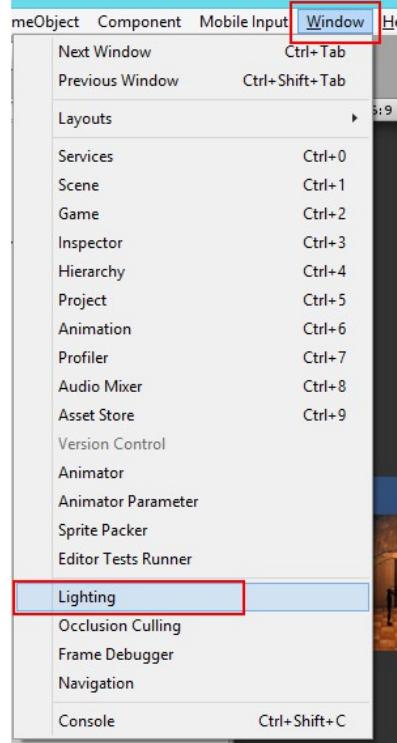
From project window drag and drop in hierachy tab: Assets / Prefabs / Lights / N_Torch_02_Grp
In hierarchy select N_Torch_02_Grp and change the X,Y,Z coordinates : X: 2.6 Y: 0.1 Z: 2



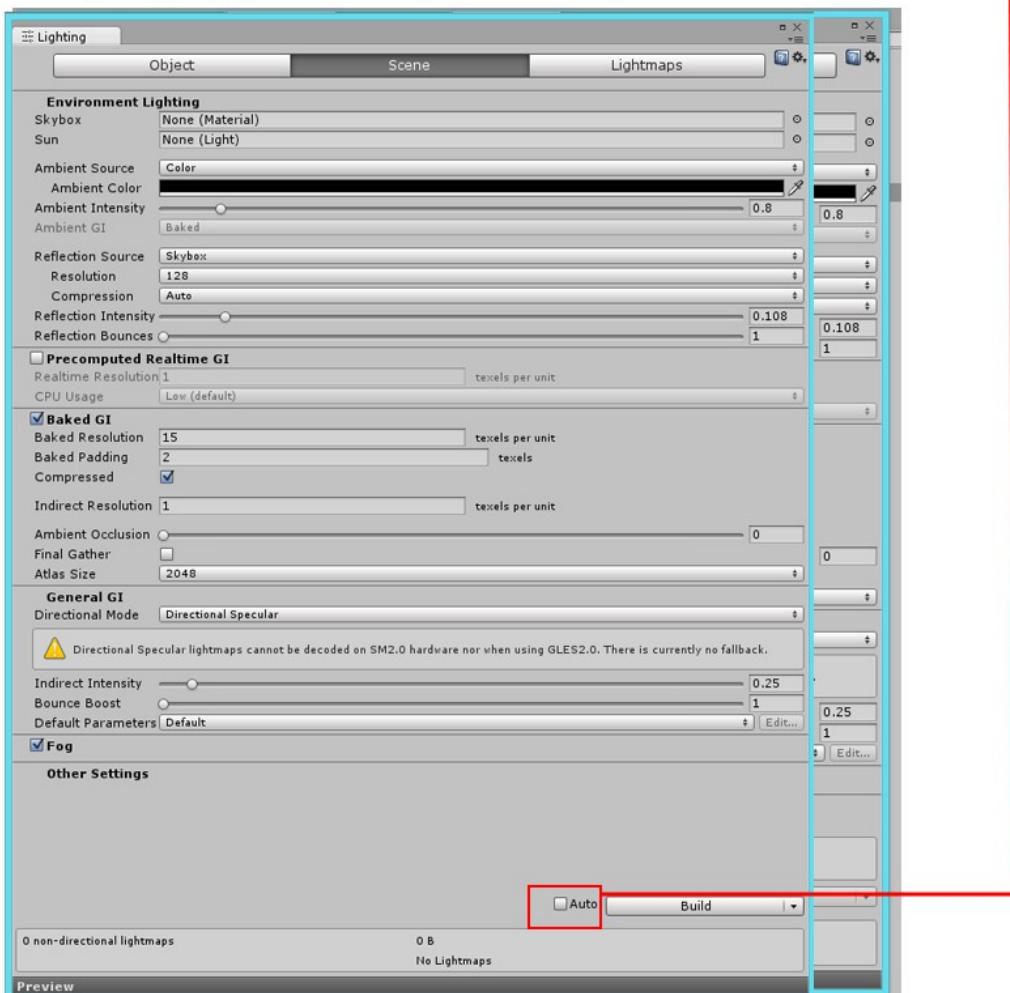
All lights in folder Assets / Prefabs / Lights / are baked light.

Then we have to enabled precompute lightmap process in lighting panel.

4 Select Window > Lighting.

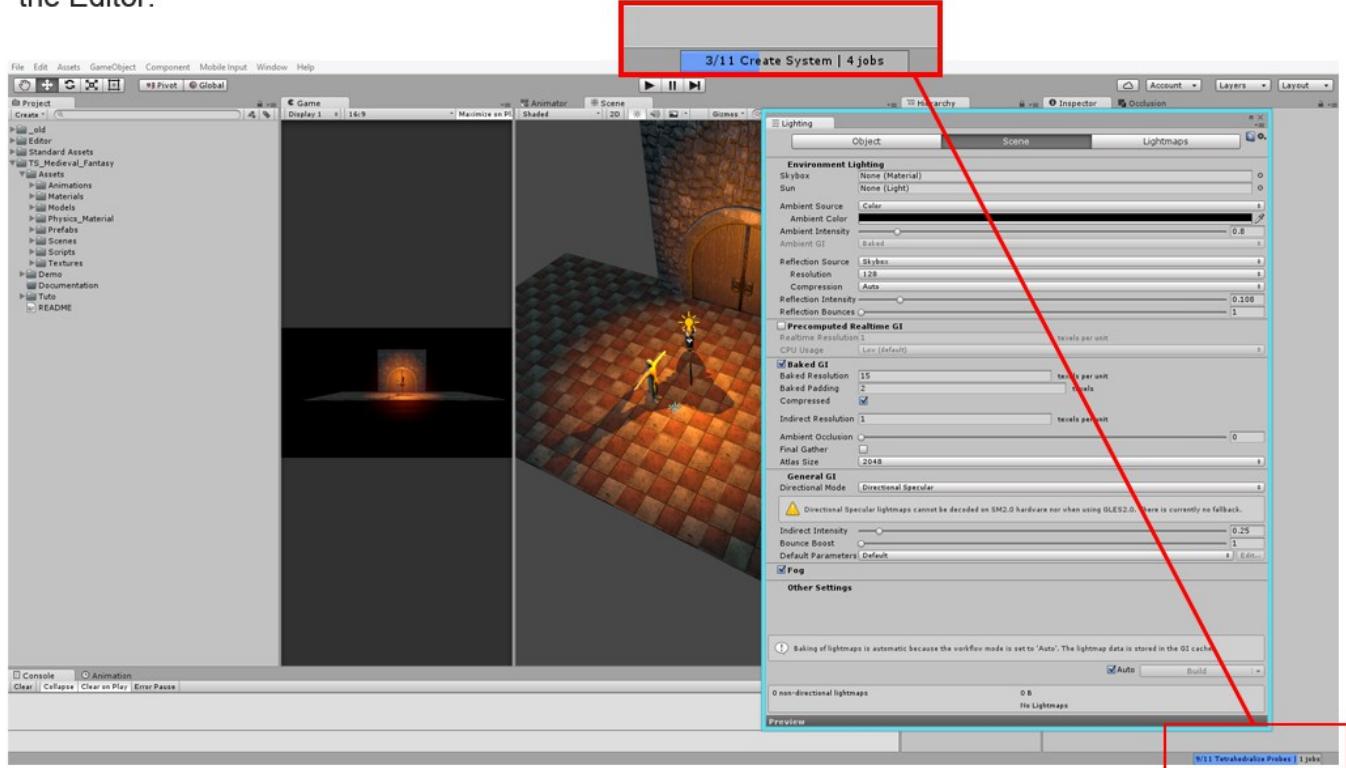


5 In lighting panel check Auto box.

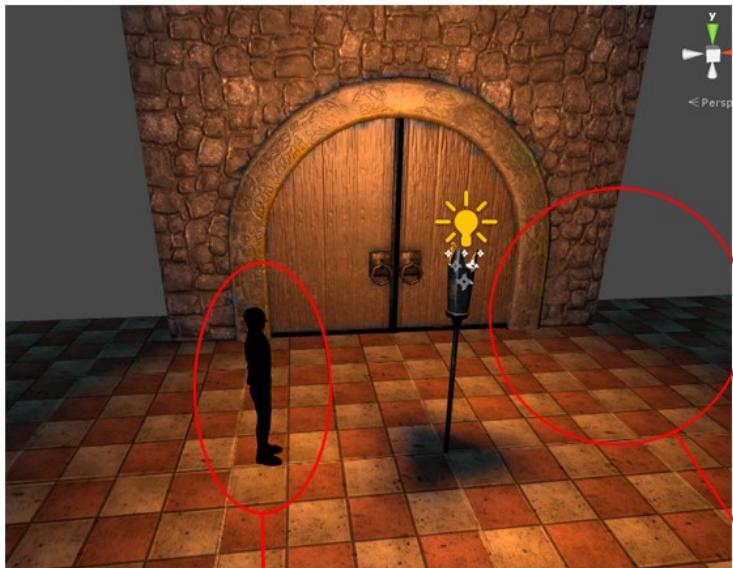


Precompute lightmap process is starting.

When the precompute process is running, a blue progress bar will appear in the bottom right of the Editor.



6 When precompute process is finish:

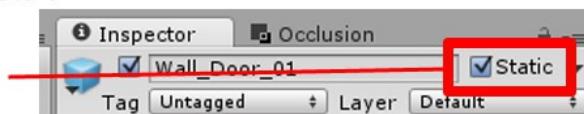


Character is black and have no shadow

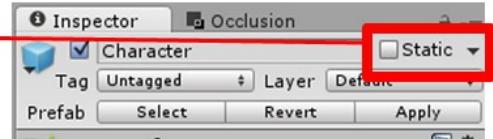
Lighting on wall and floor is OK

Why the character is black and have no shadow ?

Walls and floors are in static mode
(check box at the top right of the Inspector tab)



Character are **not** in static mode.
(Static object can't move)

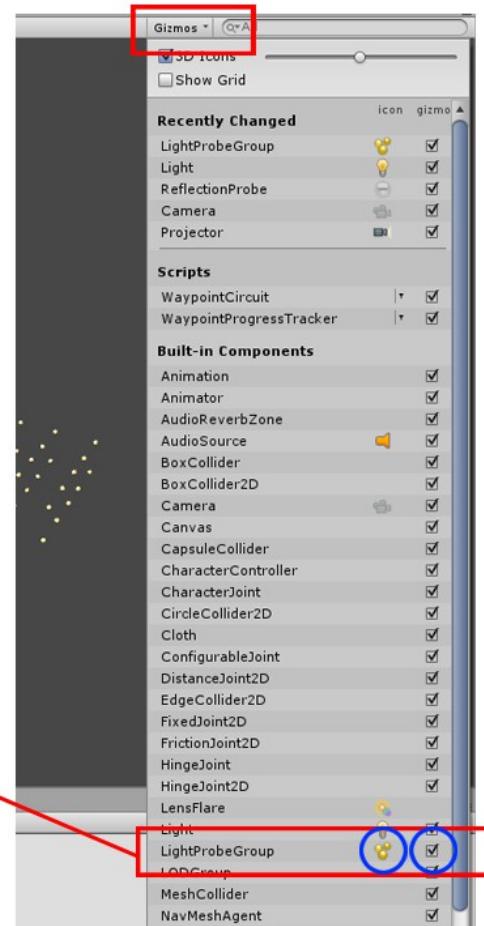
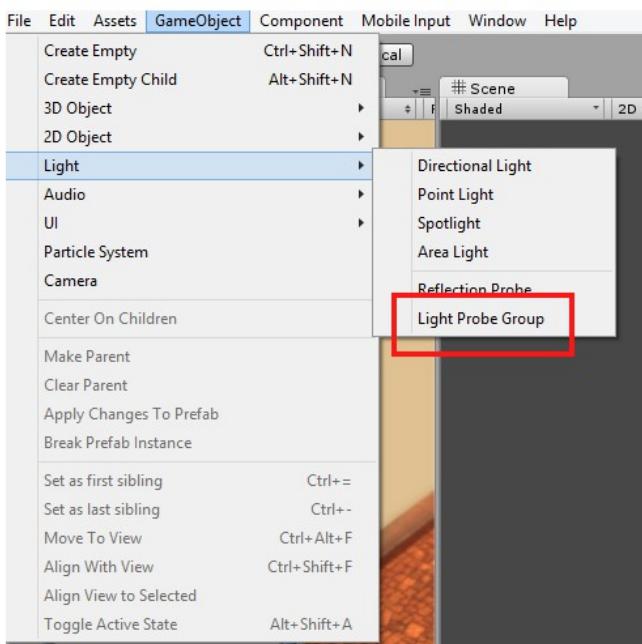


Baked light don't light **non static** object.

We will solve the problem by using lightprob to light the character.

Lightprob use lightmap (generated by baked light) to light non static object.

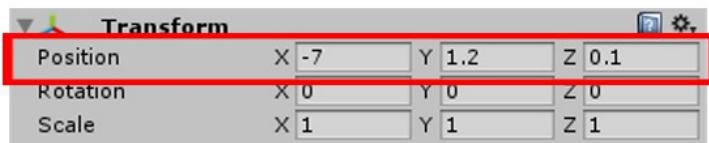
7 Go to GameObject > Light > Light Prob Group.



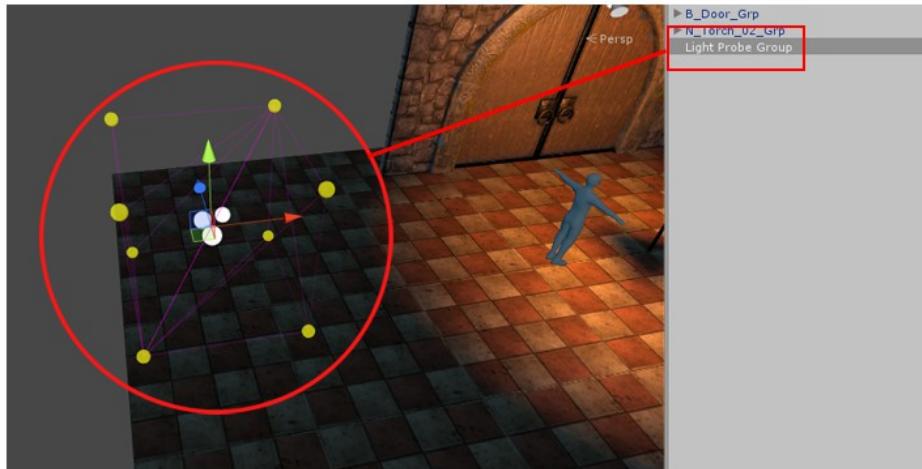
If the light prob doesn't appear check
that the **lightprobGroup** option is selected in
Gizmos window.

8 In Inspector window of the LightProbe, change the **X,Y, and Z** coordinates:

Pos X -7 Pos Y: 1.2 Pos Z 0.1



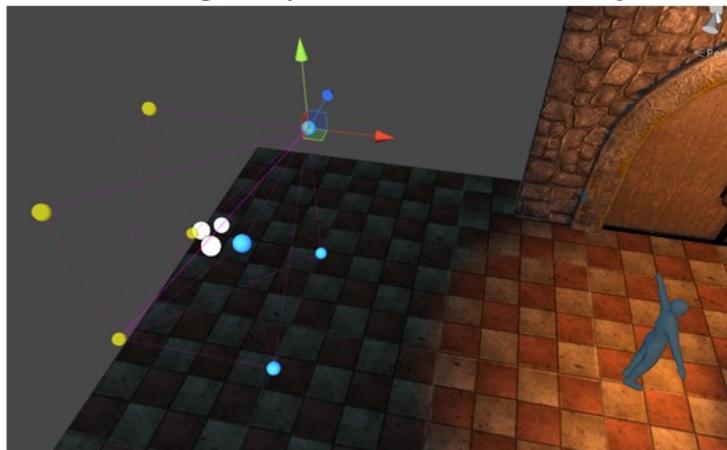
Light prob is in the form of a cube formed by 8 yellow balls.



9 Select Light Probe Group in hierarchy tab.

In Scene tab Select 4 balls (yellow balls become blue).

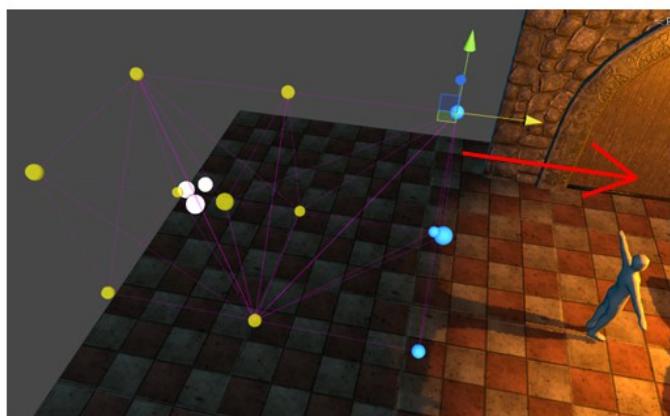
When selecting multiple balls use the **MAJ** keys.



10 Press the **W** key to switch to the move mode.

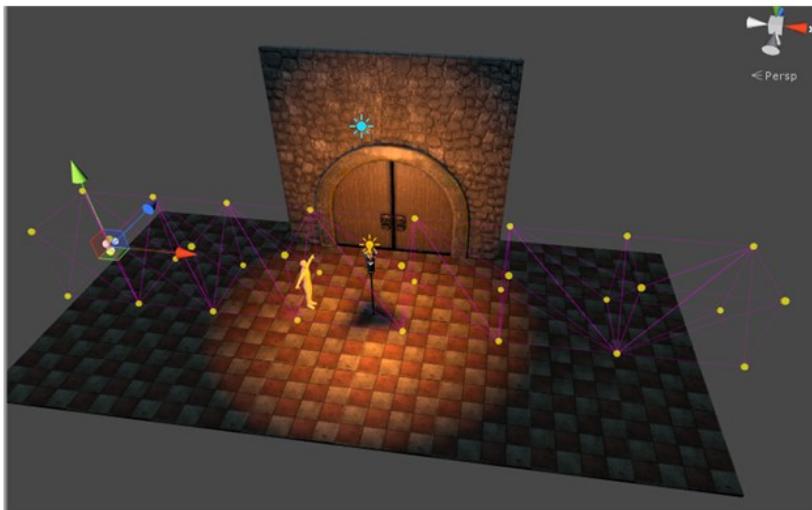
11 Duplicate object by pressing **CTRL + D**.

12 Move the blue balls on the **X-axis** for creating a new cube.



13 Repeat the process until the entire area covered by the character is filled.

Each cube (represented by 8 blue balls) corresponds to a specific lighting area. The tighter the mesh on the ball, the more light on the character there will be.



14 In hierarchy unselect Light Probe Group then wait for precompute lightmap process.



The color of each ball indicates the brightness of light to be projected on the moving parts

Tips :If a ball is into an object (or anything else) move ball outside to avoid strange result.

15 Run your scene.



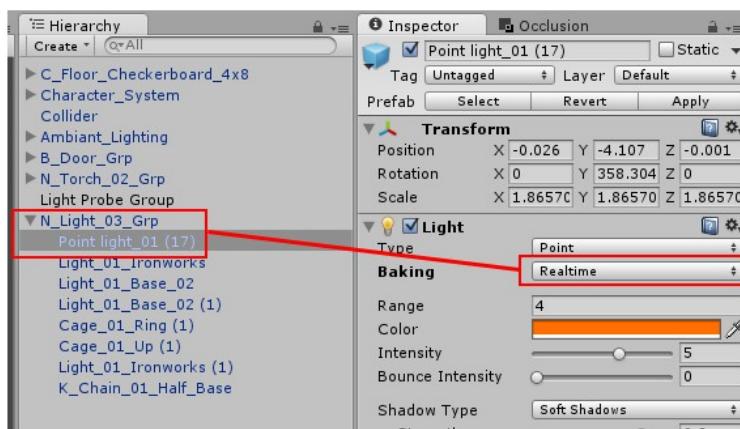
Now the lighting of the character is the same as the lighting of the scene.

16 Now we wil add shadow to the character:

From project window drag and drop in hierachy tab: **Assets / Prefabs / Lights / N_Light_03_Grp**
Select in hierachy tab **N_Light_03_Grp** then Change the Y coordinates: **Y: 6**

17 Open **N_Light_03_Grp** then select **Point light_01**

Choose **Realtime** in Baking menu



Wait for precompute lightmap process.

Run your scene.



Now the character have a dynamic shadow

Just a few words about Realtime light / Baked lights:

Baked light:

PROS: Lightmap have been precomputed before running the game. Use less CPU.

CONS: Lights color and shadows are baked : they can't change or move during the game.

Realtime Light:

PROS: Lights color and shadows can change or move during the game.

CONS: Use more CPU.

Conclusion:

We will use:

- Realtime light to generate shadows on character at some locations or to create specials effects.
- As many Baked light as needed to light the whole scene (Not Cpu Intensive).

Tips: Avoid very large realtime light which may particularly Cpu Intensive.
See chapter 6 to learn how to optimize realtime light.

Tips: work quickly and effectively

- When Auto box is check in Lighting panel (see n°5 page 14) Unity start precomputed lightmap process each time you move an object spending huge amounts of time.

Uncheck Auto box when working.

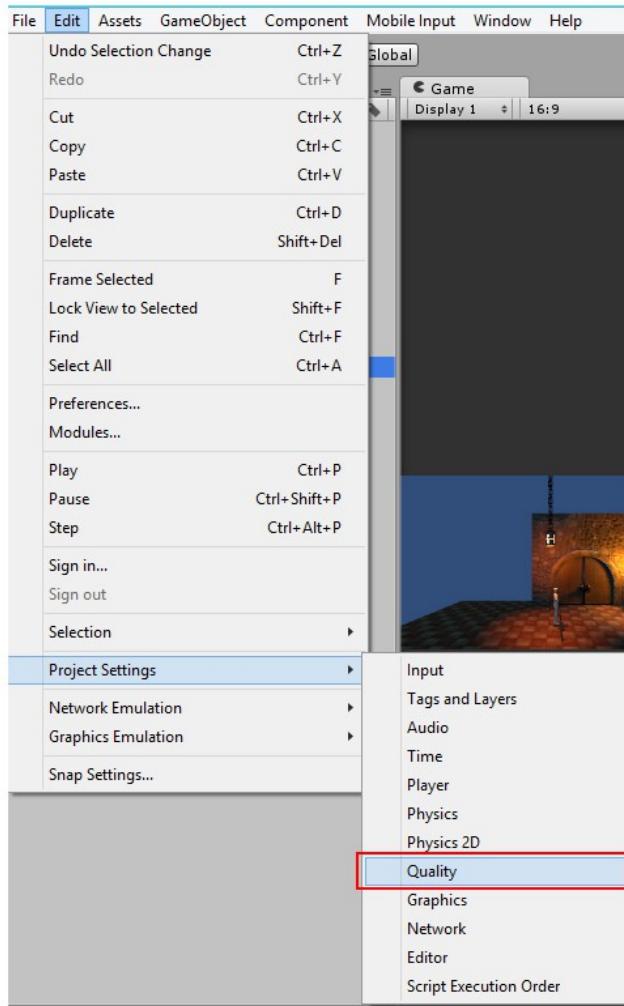
When you want to see final result check Auto box.

- When Auto Box is uncheck all lights are considered to be Realtime.

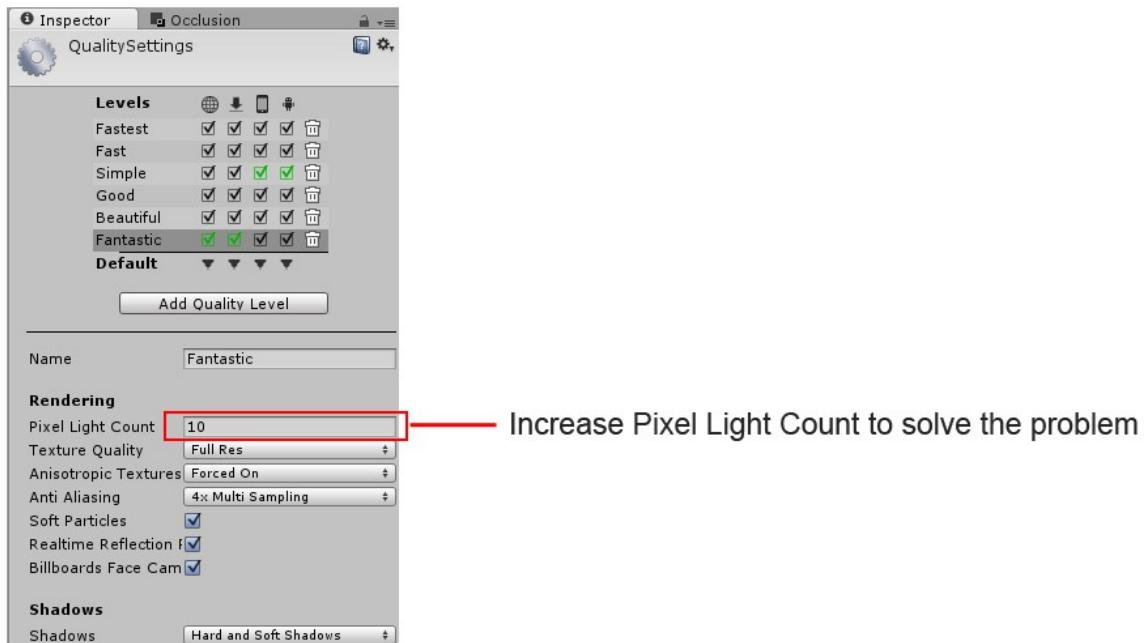
If there is a lot of lights in a small area some light appear to flash or make strange result.

Follow these instructions to solve the problem:

Open Edit > Project Settings > Quality

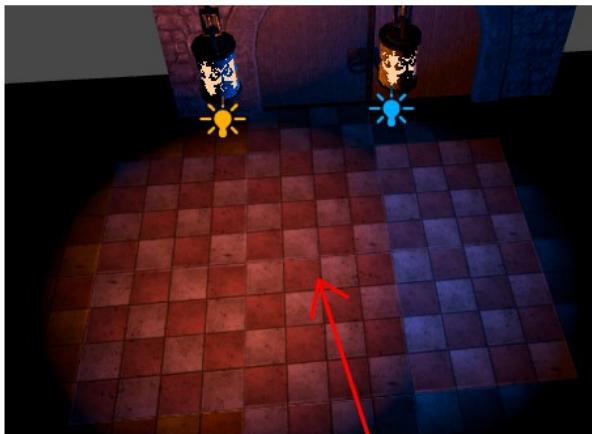


Open Edit > Project Settings > Quality

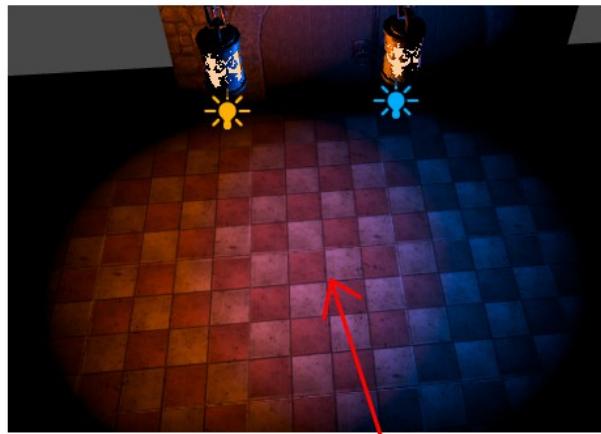


Exemple :

2 lights (1 yellow / 1 blue)



Pixel count: 1
Yellow and blue doesn't blend in the middle

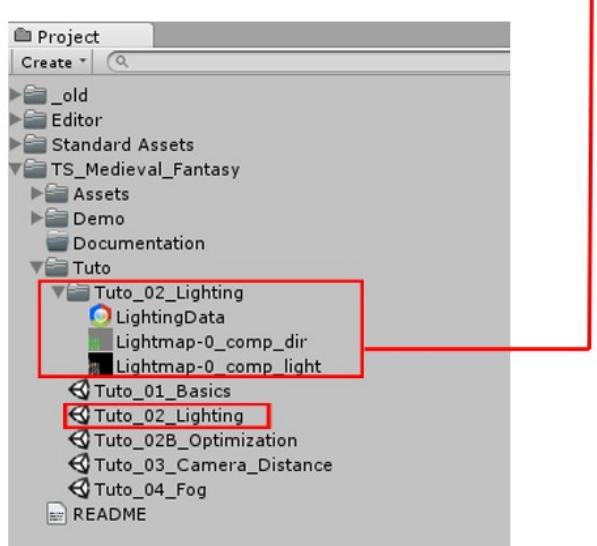


Pixel count: 2
Yellow and blue blend in the middle

- When the scene is very large (with a lot of objects) precomputed lightmap process may be very long. In this case click on build button (just near Auto box in the lighting panel) instead of check **Auto** box

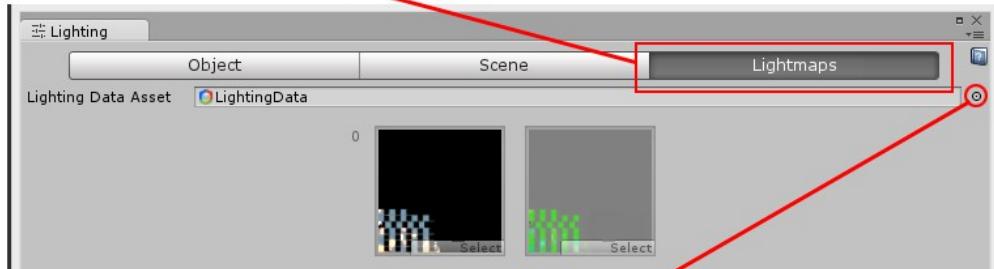


Unity calculate lightmap and store it in folder with a name that matches the name of your scene.



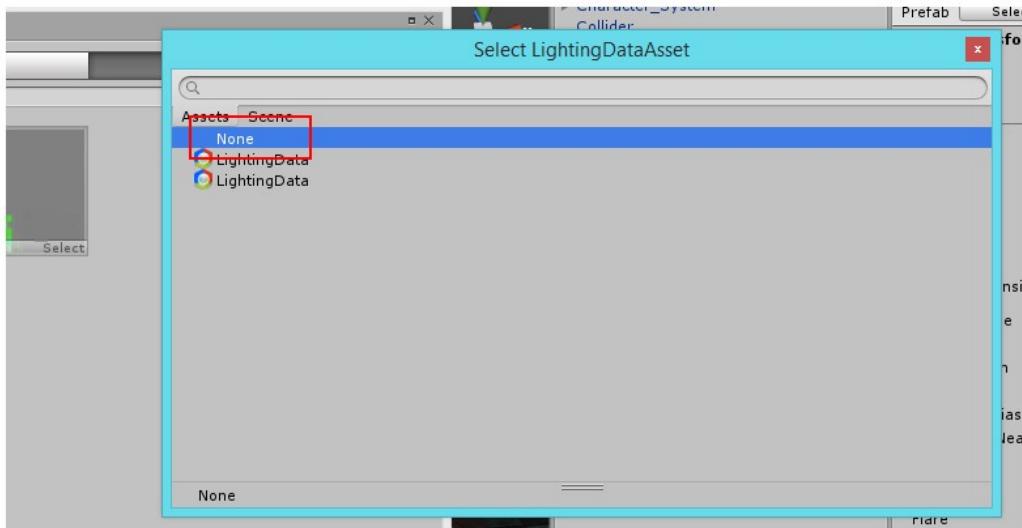
This lightmap is now use permanently in your scene.(No more need to recalculate when you build your project).

If you want to remove it open **Lighting Panel**
Go to **Lightmap tab**



Click on circle at the top right of the panel

In **Select LightingDataAsset** popup panel select **None**.



Tips: If lightmap doesn't disappear follow this instructions:

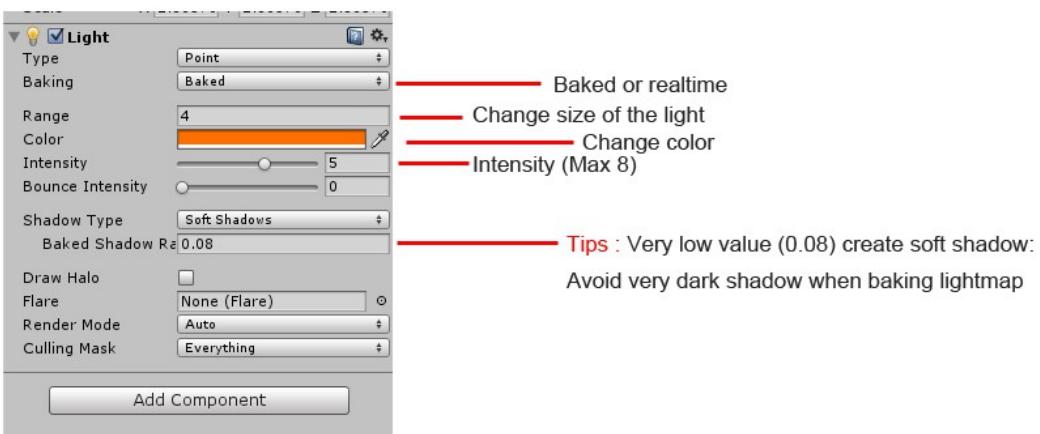
- Run your scene 
- Stop your scene

Warning: If scene is very large with a lot of baked lights and objects, lightmap computed process might be very long.

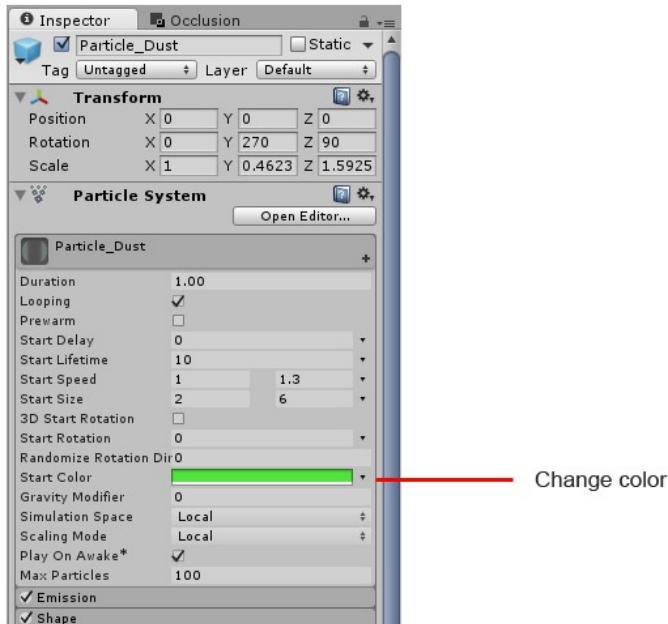
Exemple:

Demo scene 5 hours (tested on Intel(R) Core(TM) i5-4440 CPU @ 3.10Ghz 8Go Ram NVIDIA GeForce GTX 650.)

In Assets / Prefabs / Lights folder a lot of pre-made lights are available. They are all composed of : Object + particles + light



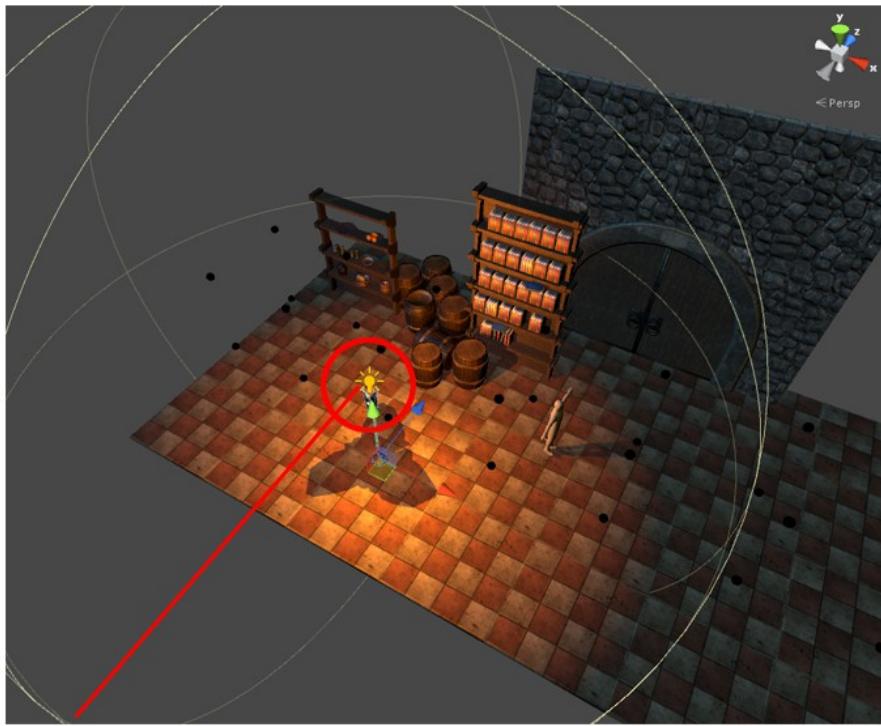
In Assets / Prefabs / Particles folder 2 pre-made special particles are available : Dust and firefly



6 Realtime light optimization: Tutorial

Realtime lights uses a lot of CPU.

To avoid low framerate during the game we have to optimize realtime light.



This torch (realtime) lights a lot of objects : book, furniture and barrels.
We want to limit the number of objects light by the torch.

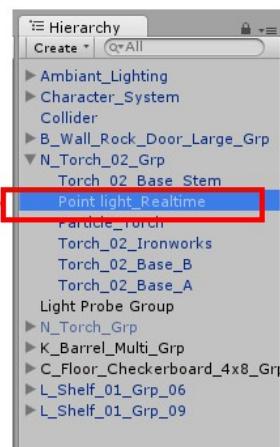
Follow this tutorial to understand how to reduce number of shadows cast by realtime light.

[Open Tuto / Tuto_03_Optimization](#)

1 In hierarchy tab open N_Torch_02_Grp
then select Point_light_01



2 Rename it : Point_light_Realtime

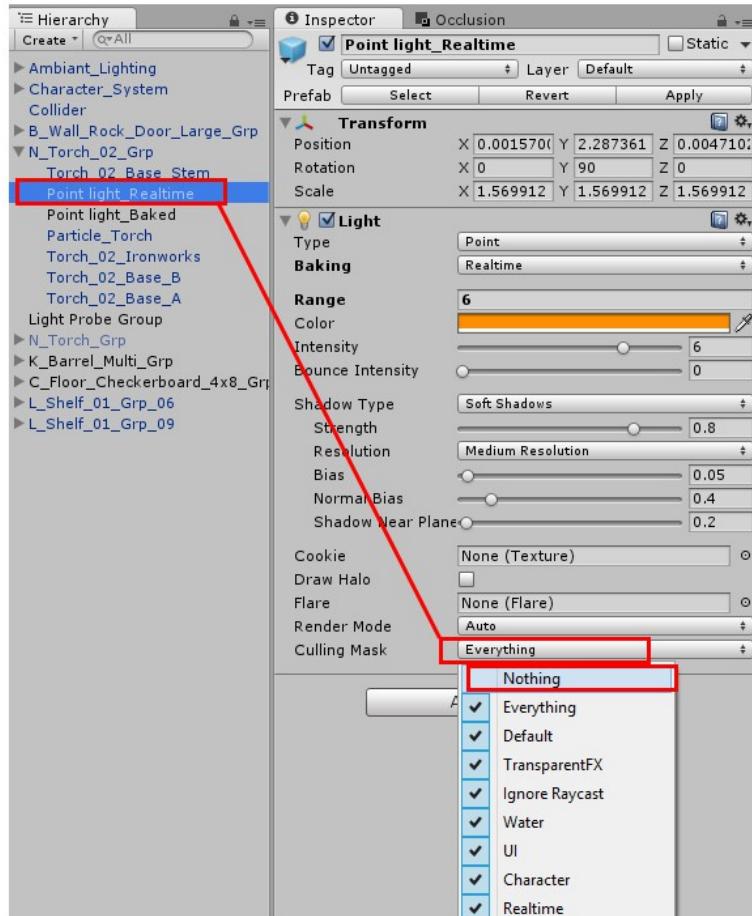
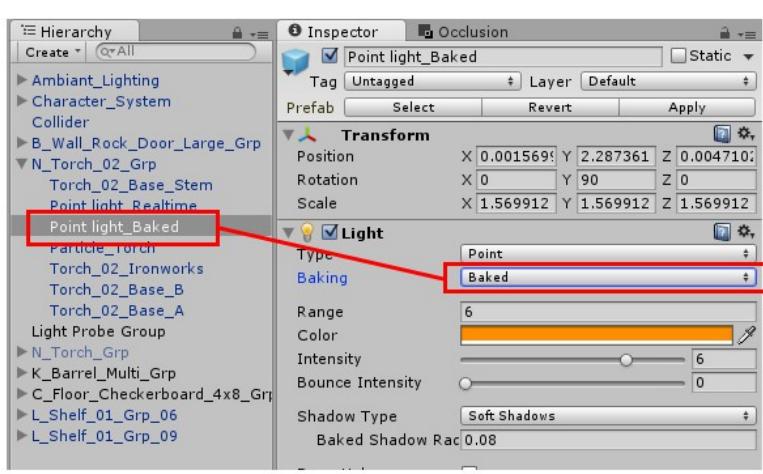


3 Duplicate Point_Light_Realtime

4 Rename new light :
Point_light_Baked

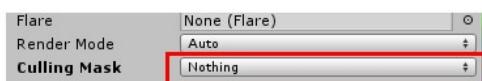


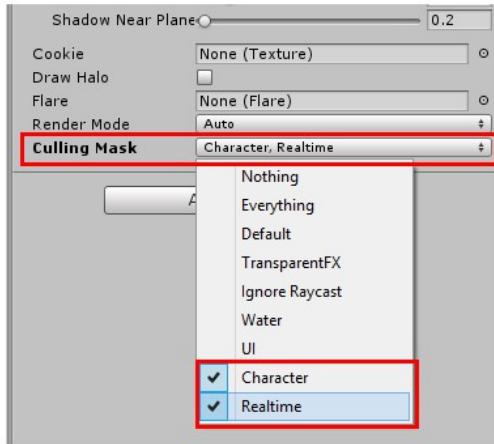
5 Set Point_light_Baked to Baked



6 Select Point_Light_Realtime
In Inspector tab in front of Culling Mask
press down **Everything**
then press down **Nothing**

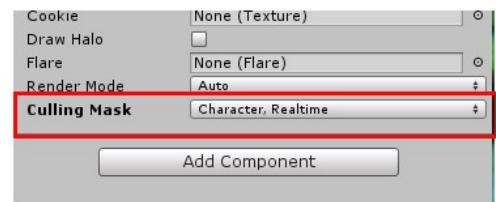
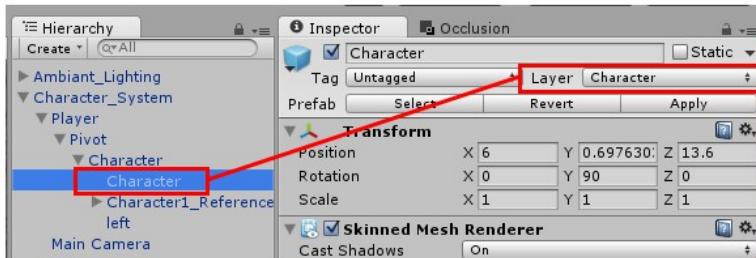
7 At the same place press down **Nothing**





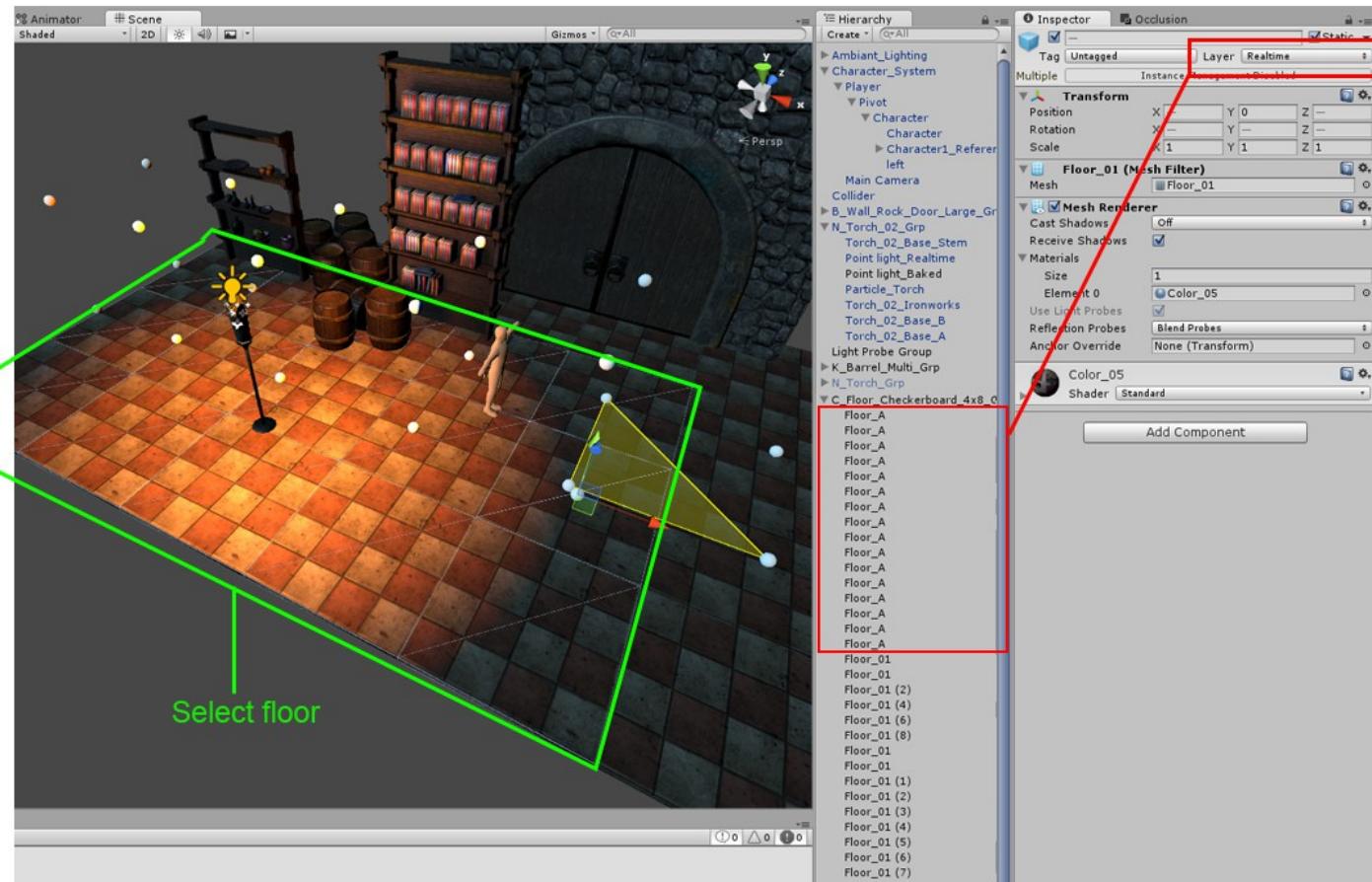
8 As explained in section 6 press down **Character** then press down **Realtime**

Now **Point_Light_Realtime** light only object with layer set to “Realtime” or “Character”. “Character” layer are only use for character prefabs



9 Select floor model as shown in the illustration below (Named Floor A)

10 Set Layer to Realtime



11 Run the scene to test



Only floor set to "Realtime" receive dynamic shadow (barrel, furnitures and book don't receive dynamic shadow).

An issue still to be resolved: character is too bright

why ?

>>Character is light by lightProb (lightprob luminosity generated by baked light) + realtime light

12 select Point_Light_Realtime

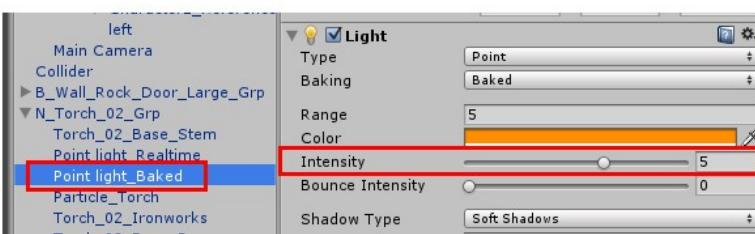
Reduce intensity to 5

Set Strength to 1 (increase shadow strength)



13 select Point_Light_Baked

Reduce intensity to 5



Value in profiler before optimization

SetPass Calls: 169 (Dynamic Batching)	Draw Calls: 437 Batched Draw Calls: 0	Total Batches: 178 Batches: 0 Batches: 16	Tris: 43.2k Tris: 0 Tris: 23.3k	Verts: 49.6k Verts: 0 Verts: 27.6k
Used Textures: 27 - 61.2 MB	RenderTextures: 5 - 24.0 MB			
RenderTexture Switches: 9	Screen: 1616x909 - 16.8 MB			
VRAM usage: 40.8 MB to 103.5 MB (of 0.94 GB)	VBO Total: 208 - 1.5 MB			
VB Uploads: 7 - 406.8 KB	IB Uploads: 6 - 0.7 KB			
Shadow Casters: 134				

Value in profiler after optimization

SetPass Calls: 42 (Dynamic Batching)	Draw Calls: 184 Batched Draw Calls: 0	Total Batches: 46 Batches: 0 Batches: 11	Tris: 20.5k Tris: 0 Tris: 11.0k	Verts: 22.8k Verts: 0 Verts: 13.3k
Used Textures: 27 - 61.2 MB	RenderTextures: 5 - 24.0 MB			
RenderTexture Switches: 9	Screen: 1616x909 - 16.8 MB			
VRAM usage: 40.8 MB to 103.5 MB (of 0.94 GB)	VBO Total: 208 - 1.5 MB			
VB Uploads: 7 - 407.4 KB	IB Uploads: 6 - 0.7 KB			
Shadow Casters: 3				

7 Specials effects : Scripts

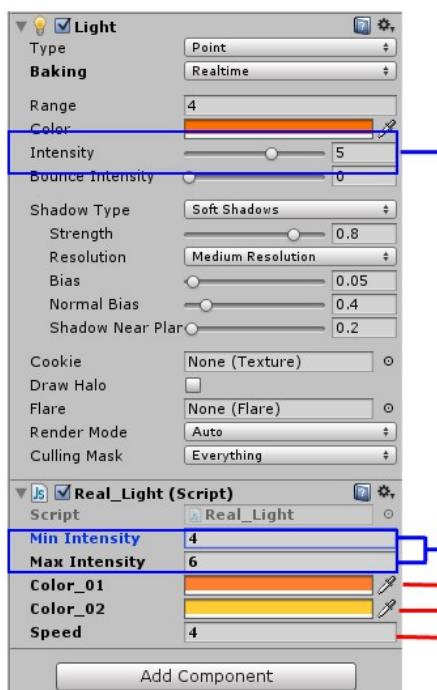
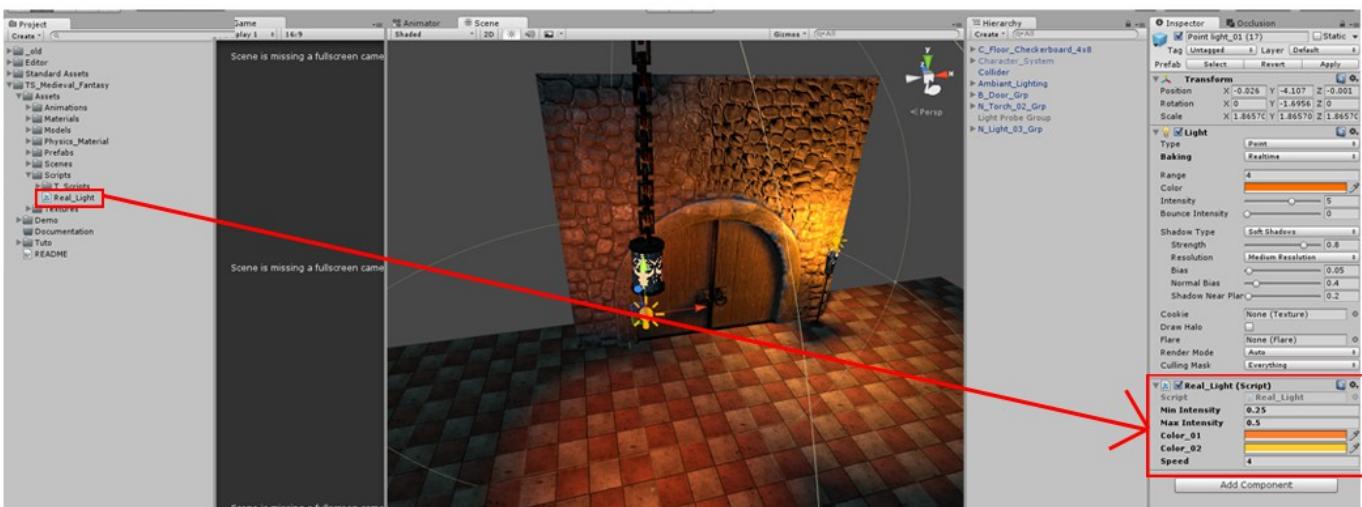
Script 1 : Dynamic lights

Use **Dynamic lights** to animate color and intensity of light.

Work only on realtime light.

Select one realtime light. From project window drag and drop in inspector panel

Assets / Scripts / Real_Light



Variation of light intensity

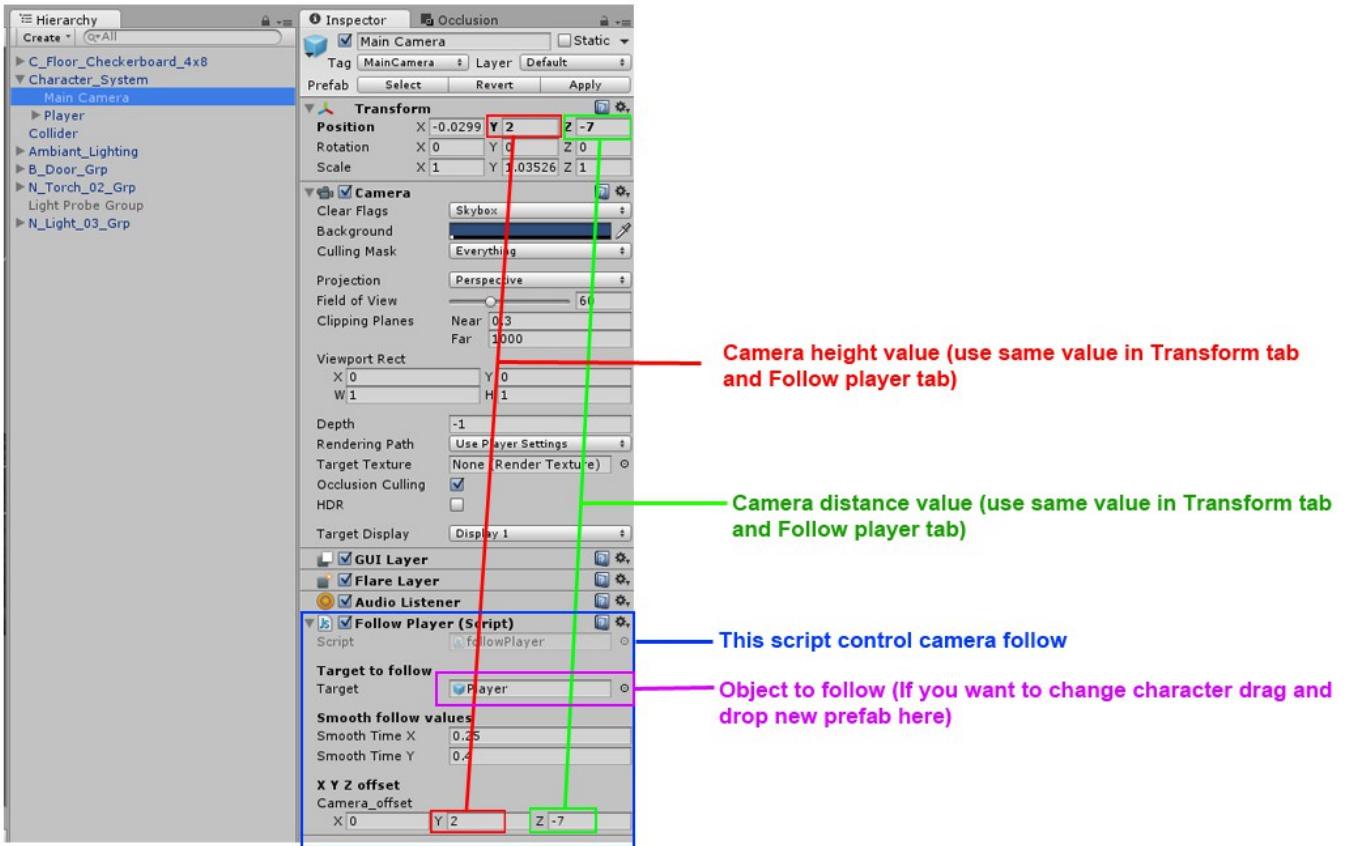
Set a value close to light intensity
(Exemple Light intensity = 5 >> choose values between 4 and 6)

Choose color 01
Choose color 02
Speed of intensity and color change

Script 2 : Camera distance and height control (Tutorial)

1 Open scene : Tuto / Tuto_04_Camera_Distance

2 Open Group Character_System and select Main_Camera



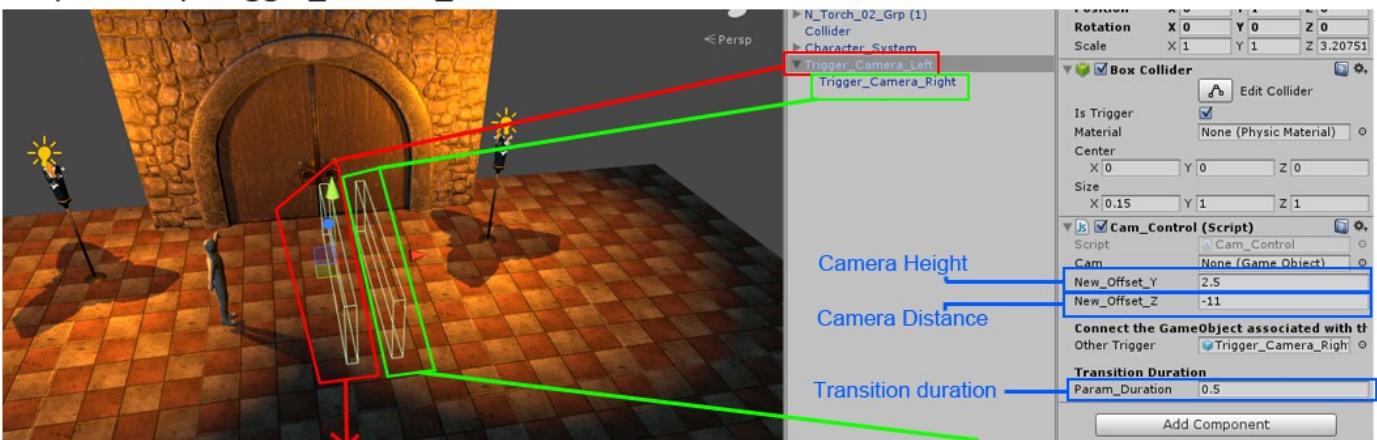
3 From project window drag and drop in inspector panel

Assets / Prefabs / Scripts / Trigger_Camera_Left

Select in hierarchy tab Trigger_Camera_Left

4 Change the X,Y,Z coordinates: X: 0 Y: 1 Z: 0

5 Open Group Trigger_Camera_Left



When Character hit Trigger_Camera_Left camera use New_Offset_Y as Camera Height value and New_Offset_Z as camera Distance value.

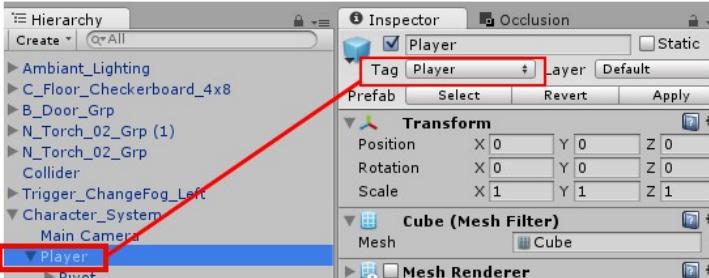
Param_Duration make smooth between old and new values.

When Character hit Trigger_Camera_Right the same thing happen (but with value of Trigger_camera_Right)

6 Run the scene to test the script.



Warning : Character need to use “Player” tag. (Don’t forget it if you use another character)



Script 3 : Fog control : (Tutorial)

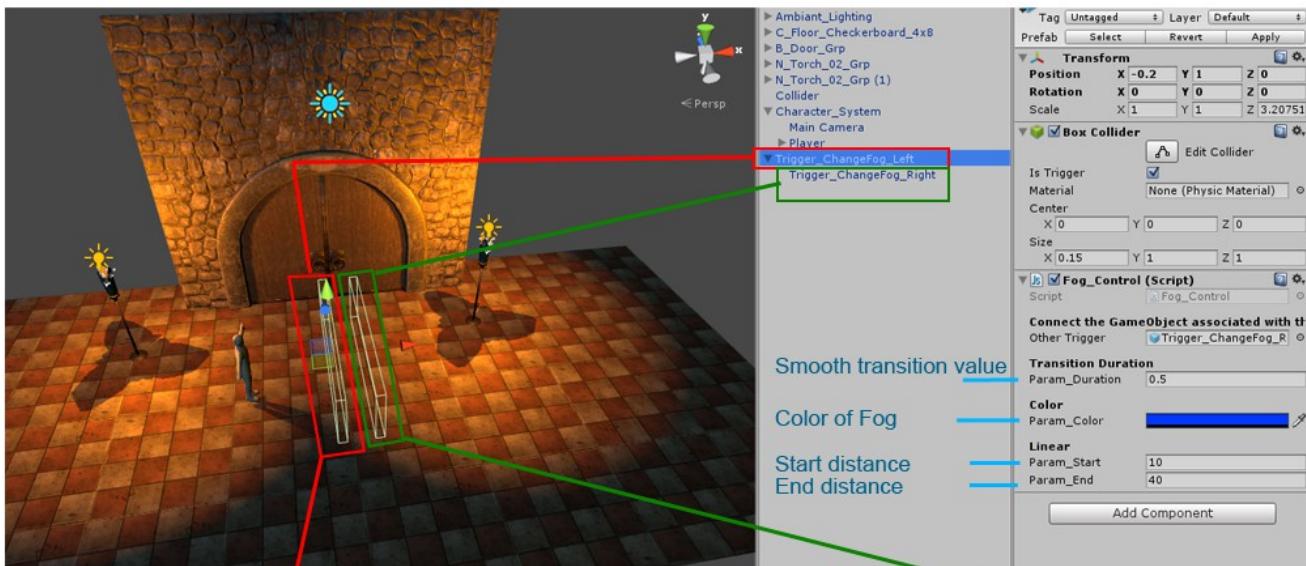
1 Open scene : Tuto / Tuto_05_Fog

2 From project window drag and drop in inspector

Assets / Prefabs / Scripts / Trigger_ChangeFog_Left

3 Change the X,Y,Z coordinates: X: -0.2 Y: 1 Z: 0

4 Open Group Trigger_ChangeFog_Left



When Character hit **Trigger_ChangeFog_Left** Fog use **Param_Start** as Fog start value
Param_End as Fog End value and **Param_Color** as new Fog Color.

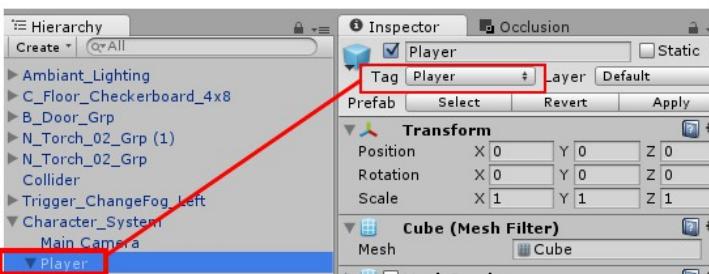
Param_Duration make smooth between old and new values.

When Character hit **Trigger_ChangeFog_Right** the same thing happen (but with value of **Trigger_ChangeFog_Right**)

5 Run the scene to test the script.



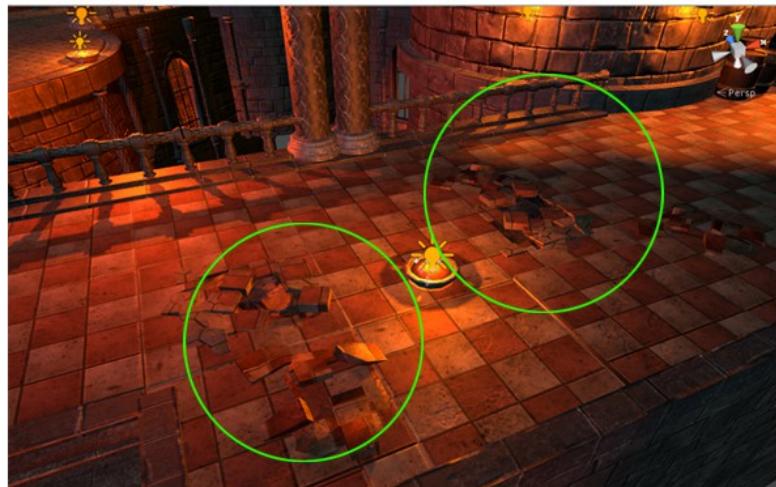
Warning : Character need to use “Player” tag. (Don’t forget it if you use another character)



8 Art Tips:

Here are some ideas to get you started.

1 Create variation on floor : use broken parts



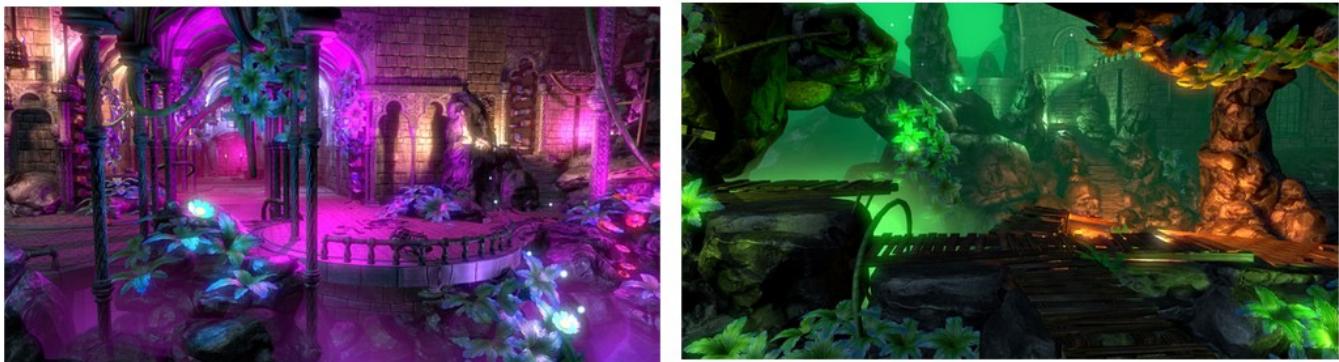
2 Create variation with the same objects



3 Test various lights (folder: `_Prefabs / Lights`) torch, wood fire, oil lamp, candle, candlestick, magic flower



4 Use various light color to create different atmospheres Try various light range and intensity



5 Play with the contrasts : dark and light



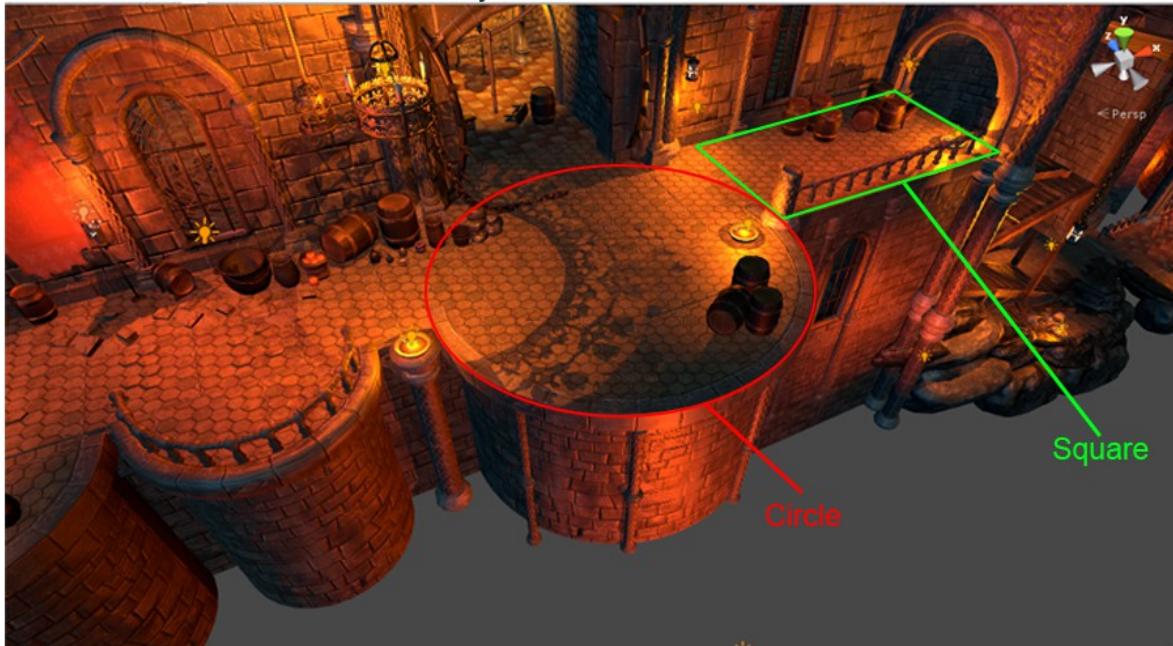
6 Play with the contrasts : use 2 or more colors in the same room



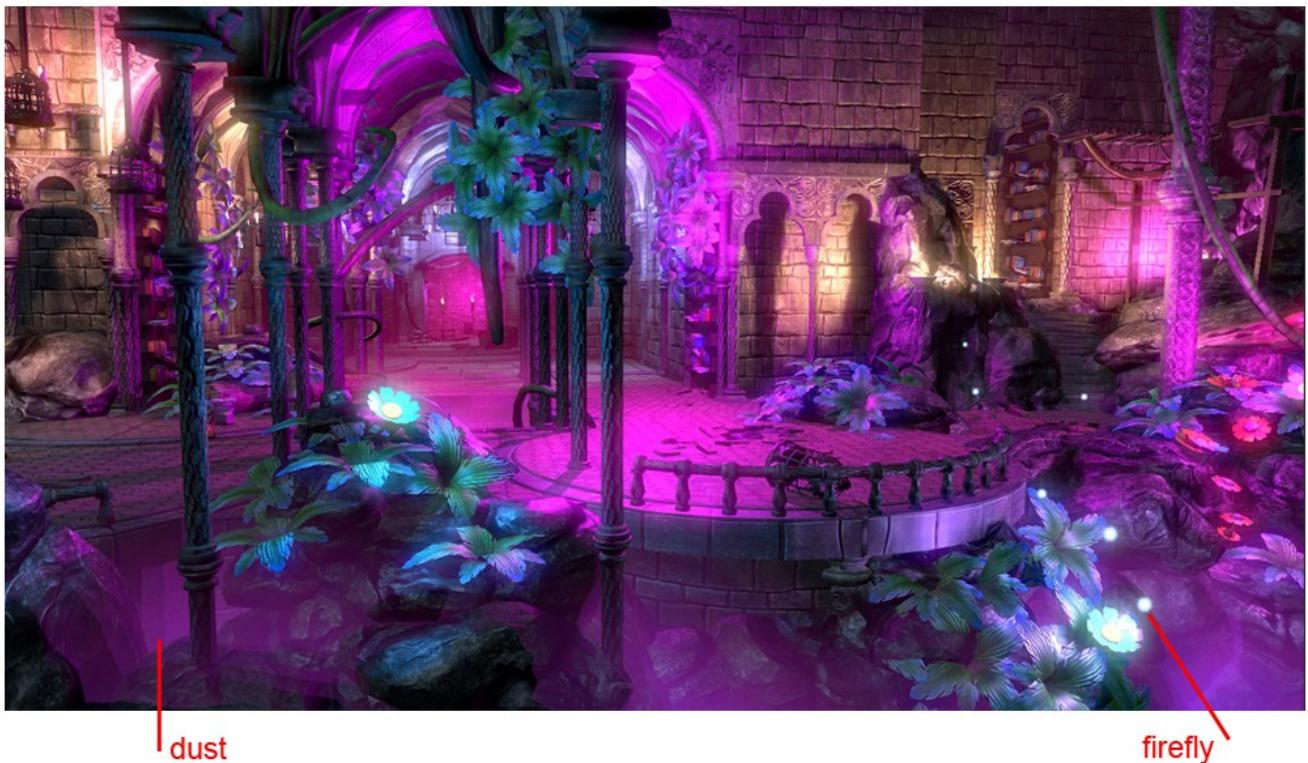
7 Play with the contrasts : large room / small room



8 Use various floors to create variety.



9 Use Particles dust and firefly



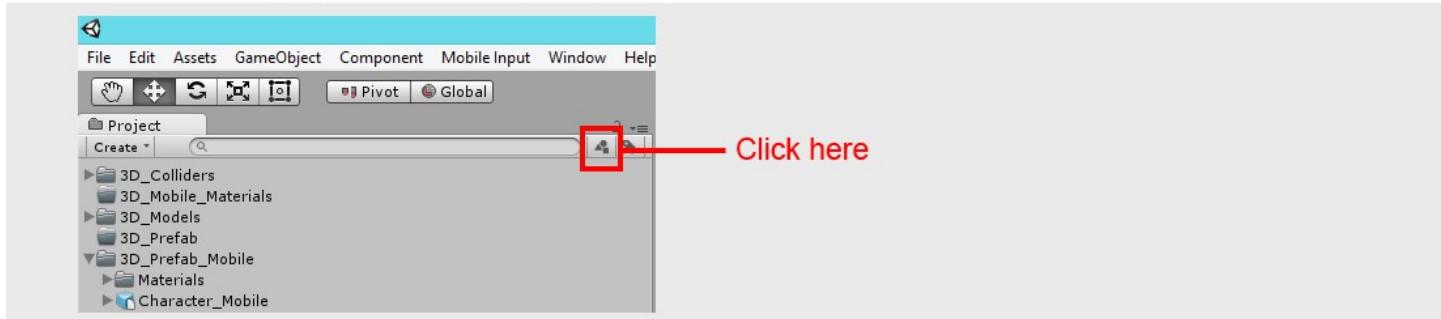
10 Last but not least:

- Use various camera distance and height (see chapter 7 for more informations)
- Use fog (see chapter 7 for more informations)
- Use **Dynamic lights** to animate color and intensity of light. (see chapter 7 for more informations)

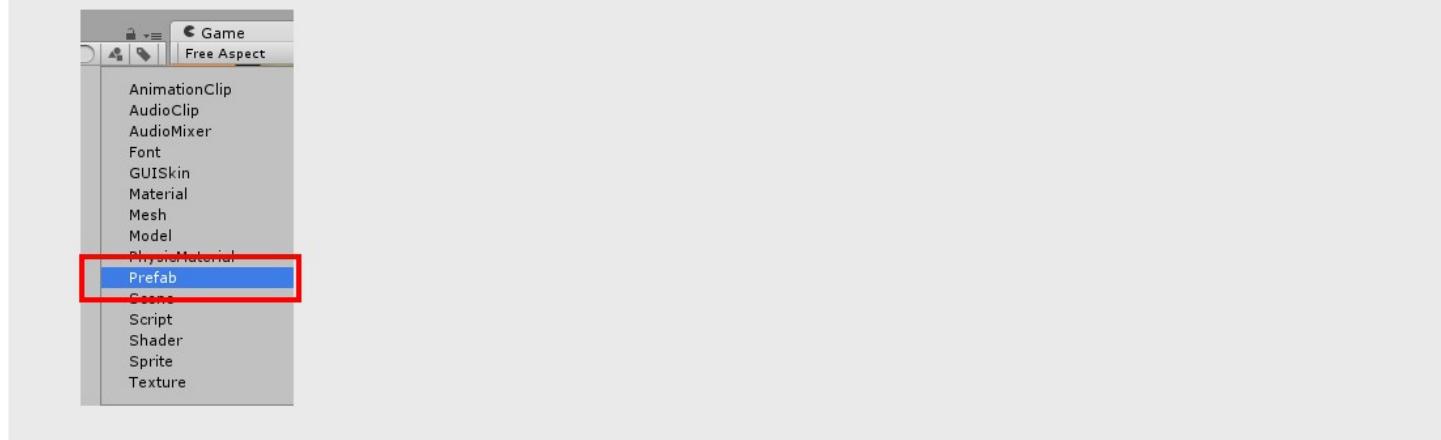
9 Tricks and tips

Tips 1 :Prefabs

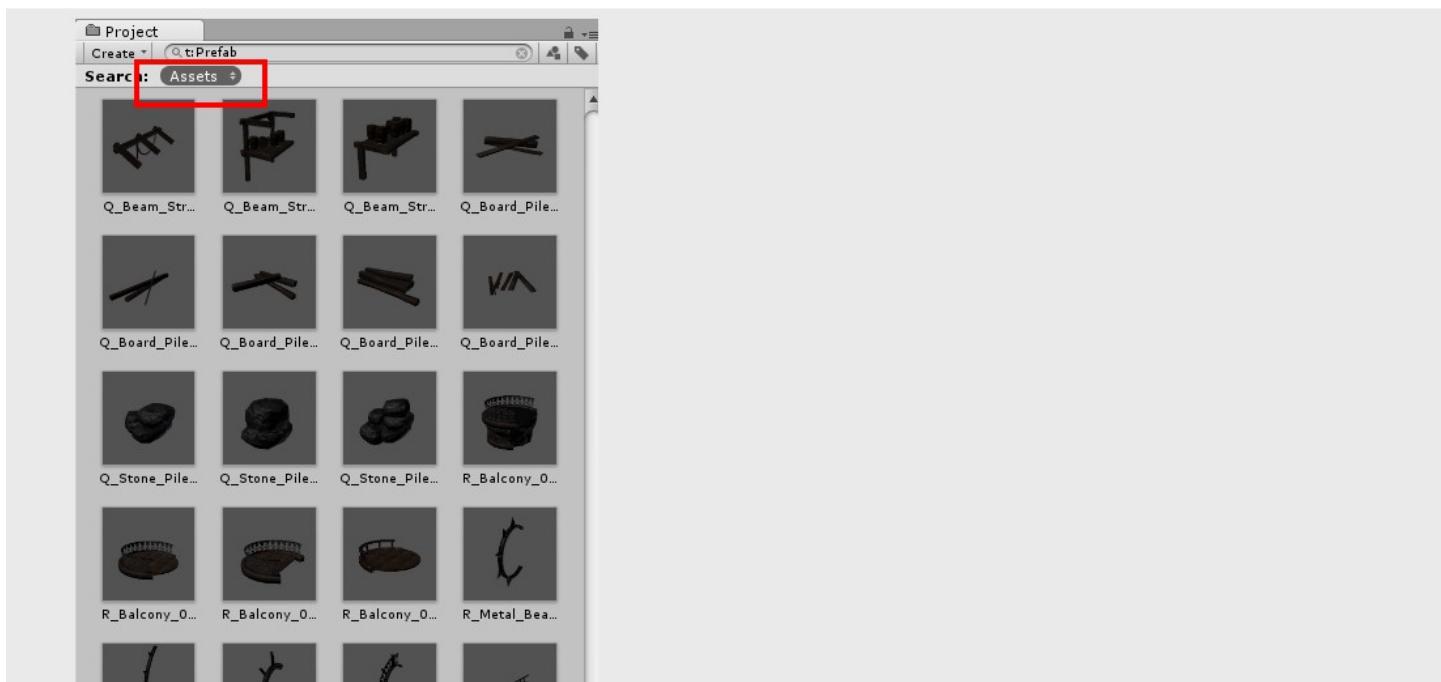
Click this icon in project window to quickly edit prefabs.



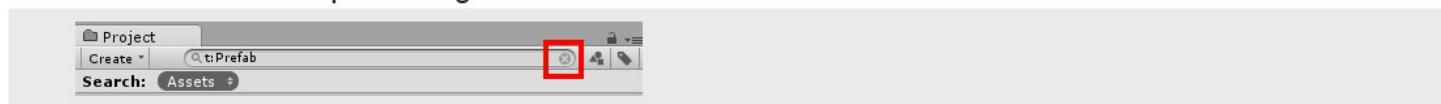
Select Prefab.



Select Asset.



Click on the icon representing a cross to return to the normal mode.



Tips 2

Two objects very close (same position on Y for exemple) may cause visual artifacts.
Move one of the two object by selecting it and dragging it a little bit.

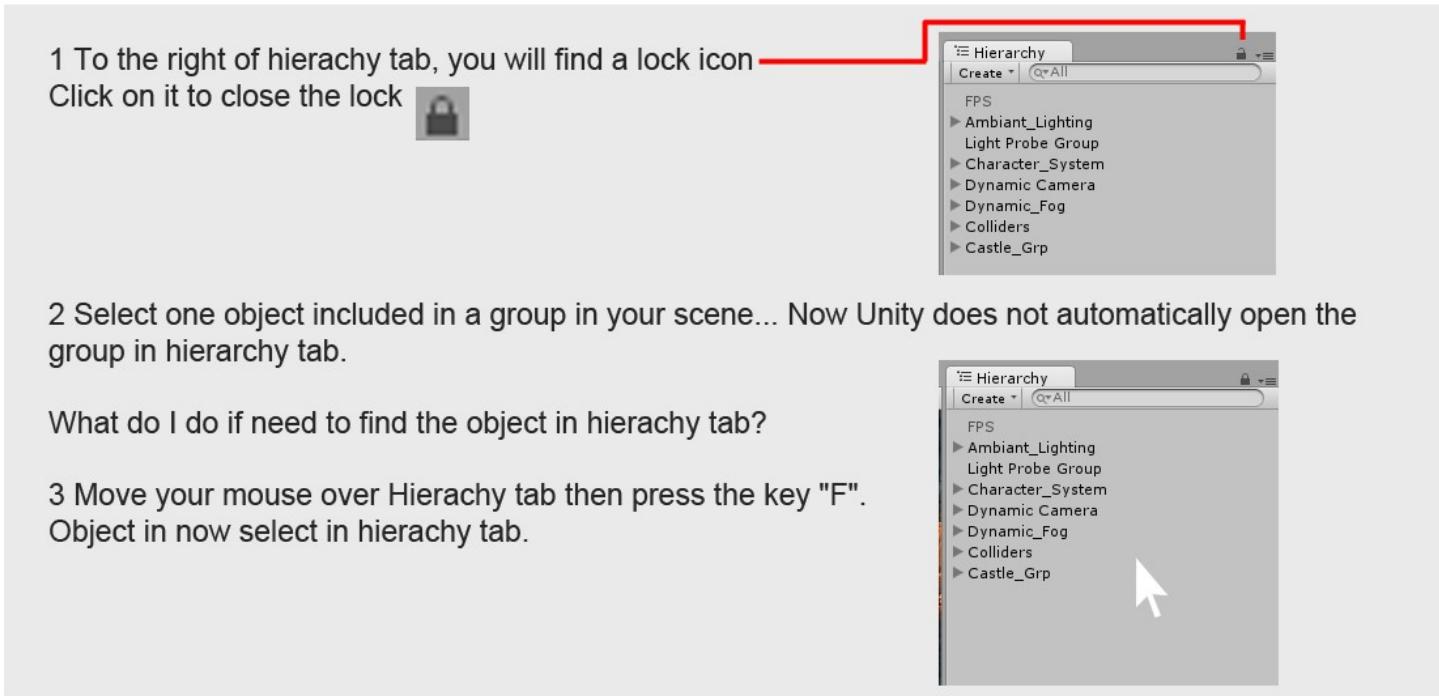


Tips 3 :

When you select an objet included in a group in your scene, automatically Unity open its corresponding group in hierarchy tab.

This can become difficult to navigate in hierarchy tab when there is a lot of objects in the scene.

To prevent this, follow this tips:



10 Appendices : presets

2.5D Medieval Fantasy Environment use this lighting presets:

