Minicar Race 4 Environments Pack

Summary

1 Introduction link
2 Settings Settings needed to use this asset link
3 Tutorial :
Part 1 : Create rooms link
Part 2 : Create beach floor (Unity Terrain) link
Part 3 : Lights, reflection probes and lightprobe overview link
Part 4 : Calculate Lightmaps link
Part 5 : Light Probe creation link
4 Mesh Combiner link
5 Export to mobile link

1 Introduction

Thank you for purchasing Minicar Race 4 Environments Pack

Minicar Race 4 Environments Pack documentation contains everything you need to get started.
If you have any questions, please contact us at targetsoundfx@gmail.com

How to use Minicar Race 4 Environments Pack :

- Read chapter 2 (Settings needed to use this asset).   link

- Open demo scene to see example scene.
Minicar_Env_Pack → Demo → Demo_Bathroom
Minicar_Env_Pack → Demo → Demo_Beach
Minicar_Env_Pack → Demo → Demo_Bedroom
Minicar_Env_Pack → Demo → Demo_Kitchen

- Open showroom scene to see all prefabs available in asset.
Minicar_Env_Pack → Demo → Showroom_Prefabs

- Read Chapter 3 to learn how to create rooms and beach floor. link

- To have good visual results you need to calculate Lightmaps.
To learn how to calculate lightmaps read Tutorial 3 Part 4 : Calculate Lightmaps link

- A geometry combiner script is also included in this asset. This script is a big help to optimize framerate and reduce lightmap precompute time. Read chapter 4 to learn how to use combiner script. link

- If you want to export to mobile read chapter 5. link

- For new scene preferably using **Starter Kit** scenes
All you need to start scene is set (lights, lightprobe, reflection probe, skybox and lighting panel presets)

Minicar_Env_Pack → Assets → Scenes → StarterKit_Bathroom
Minicar_Env_Pack → Assets → Scenes → StarterKit_Bedroom
Minicar_Env_Pack → Assets → Scenes → StarterKit_Kitchen
Minicar_Env_Pack → Assets → Scenes → StarterKit_Beach
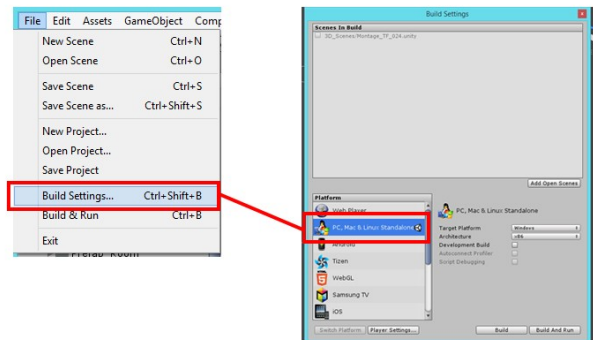*Beach environment useTerrain. Read chapter 3 part 2 for more informations. link*

- 3 ready to use rooms prefabs are available in prefabs folder.
Minicar_Env_Pack → Assets → Prefabs → Rooms_ReadyToUse
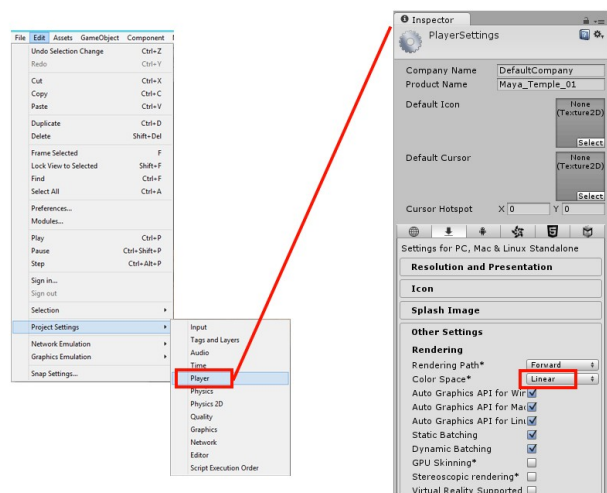
2 Settings

1 Go to **File > Build_Settings**.
Verify that **PC, Mac & Linux Standalone** mode is selected.
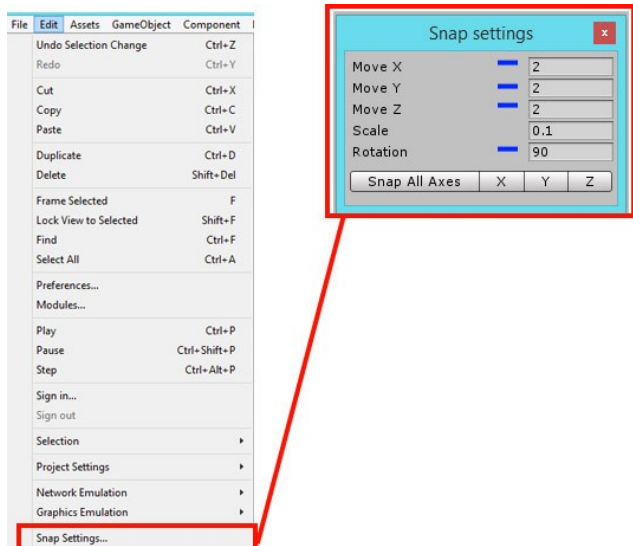

2 Open **Edit > Project Settings > Player**.
In Inspector window open Other settings tab then change **Color Space** to **Linear.**

3 Go to **Edit > Snap Settings**.

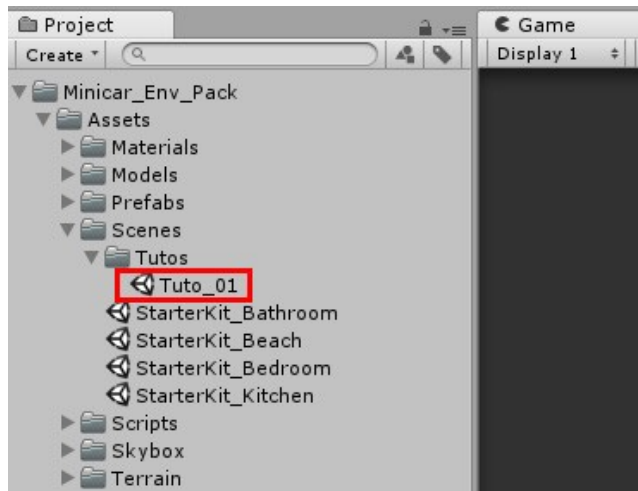Adjust snap settings :

Move X: 2
Move Y: 2
Move Z: 2
Rotation: 90

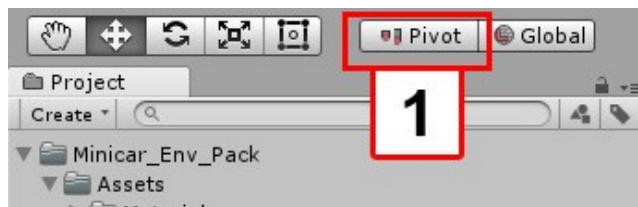# 3 Tutorial

Part 1 : Create rooms

1 Open scene **Tuto_01.**

Minicar_Env_Pack → Assets → Scenes → Tutos → Tuto_01

2 Choose **Pivot** mode.

Important : Use pivot mode to avoid unexpected results when rotate an object in snap mode.

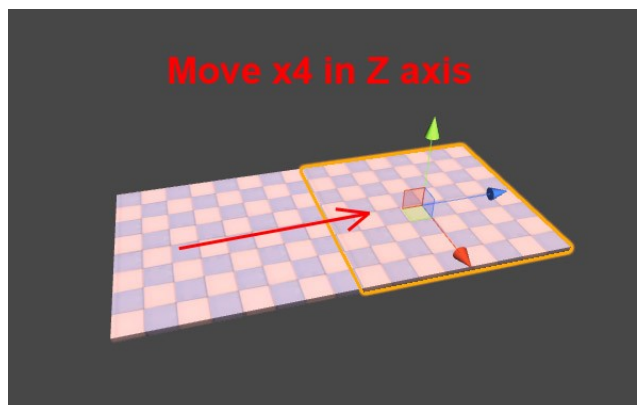**3** From Project tab drag and drop Floor_Kitchen to Hierachy tab.

Minicar_Env_Pack → Assets → Prefabs → Rooms_Modules → Floors → Floor_Kitchen
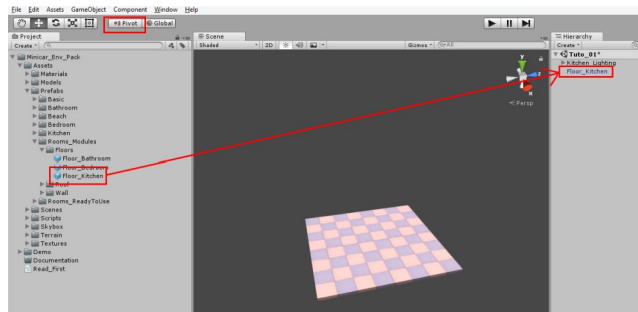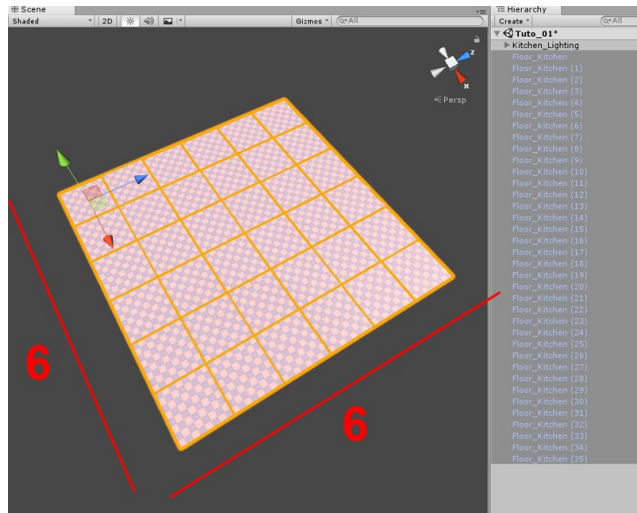

4 In Hierachy tab select Floor_Kitchen.

5 Duplicate it (Ctrl +D).

6 While keeping the Ctrl key pressed move 4 times the new object in Z axis.
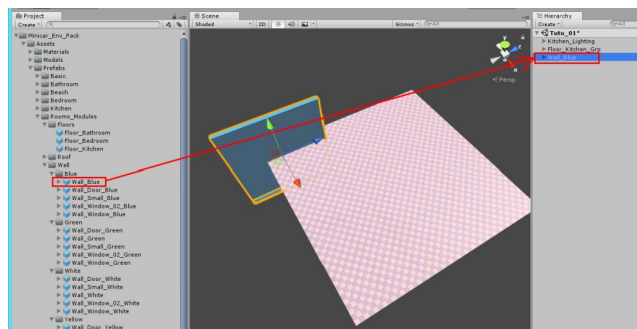
7 Repeat the process until you have a 6x6 square floor.

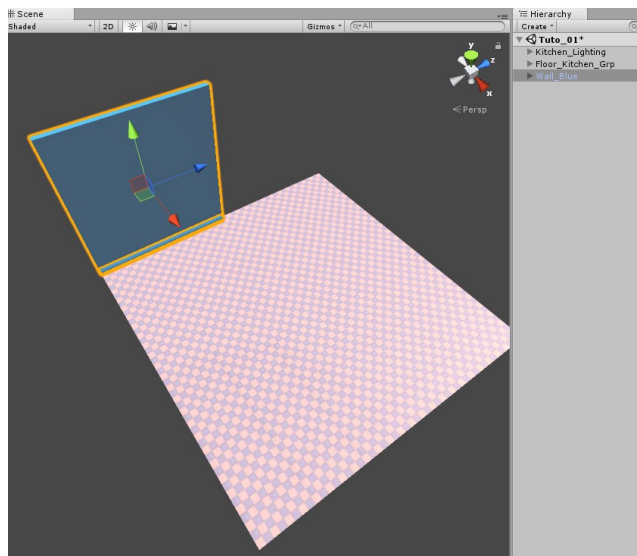**8** Create a group named Floor_Kitchen_Grp. Put all floor objects in this group.

9 From Project tab drag and drop Wall_Blue to Hierarchy tab.

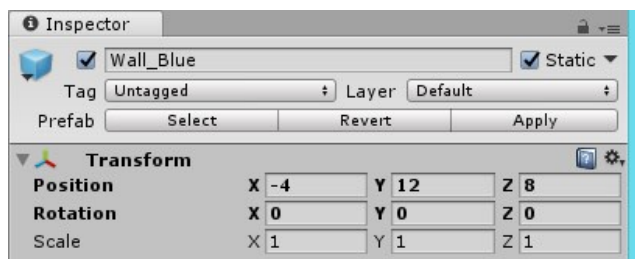Minicar_Env_Pack → Assets → Prefabs → Rooms_Modules → Wall → Blue → Wall_Blue

10 While keeping the Ctrl key pressed :

-move 6 times the new object in Y axis
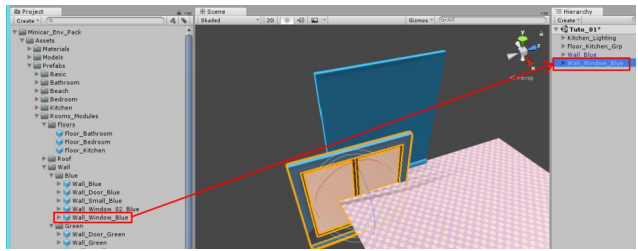-move 2 times the new object in X axis
-move 4 times the new object in Z axis
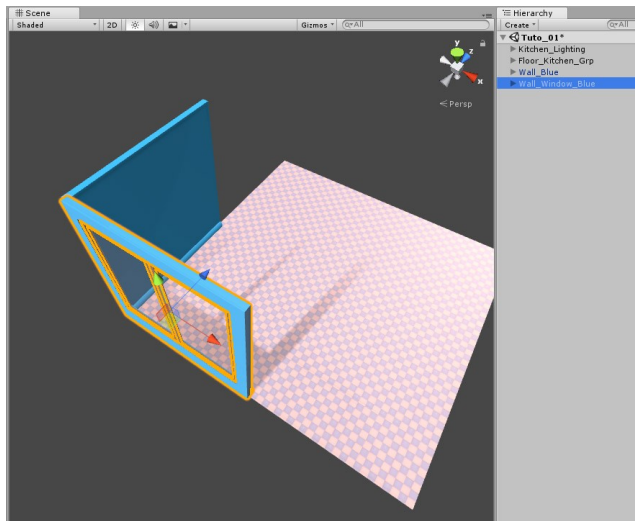
You need to have this value in transform tab (inspector)

11 From Project tab drag and drop Wall_Window_Blue to Hierarchy tab.

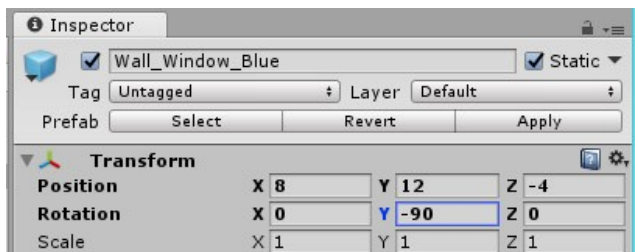Minicar_Env_Pack → Assets → Prefabs → Rooms_Modules → Wall → Blue → Wall_Window_Blue
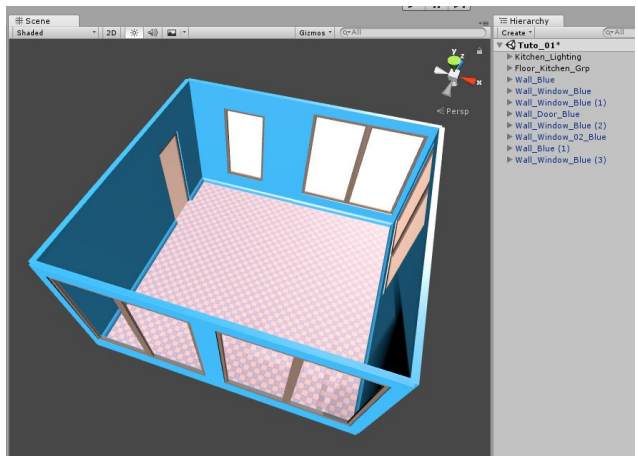

12 While keeping the Ctrl key pressed :

-rotate in Y axis (rotate Y = -90)
-move 6 times the new object in Y axis
-move 2 times the new object in X axis
-move 4 times the new object in Z axis

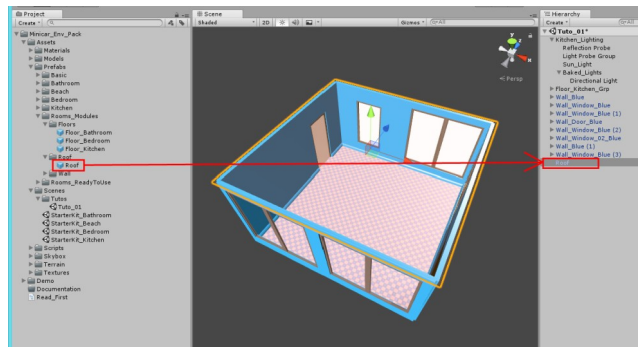

You need to have this value in transform tab (inspector)

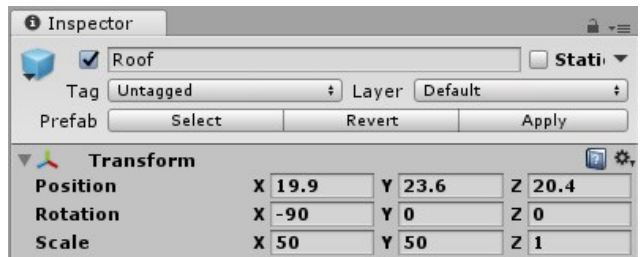**13** On the same principle add walls, door and windows to close the room.

14 From Project tab drag and drop Roof
to Hierarchy tab.

Minicar_Env_Pack → Assets → Prefabs →
Rooms_Modules → Roof → Roof

15 Set translate value to X : 19.9
                              Y : 23.6
                              Z : 20.4

Set Scale value to X : 50
                    Y : 50
                    Z : 1

*To learn how to light your scene read 3 Tutorial Part
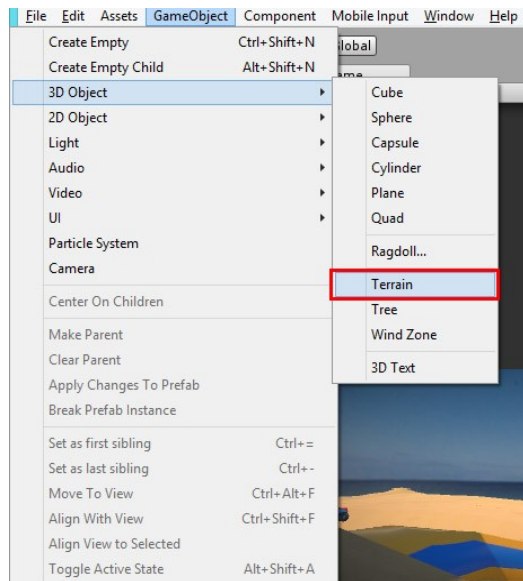3 : Lights, reflection probs and lightprob overview*
link

Part 2 : Create beach floor
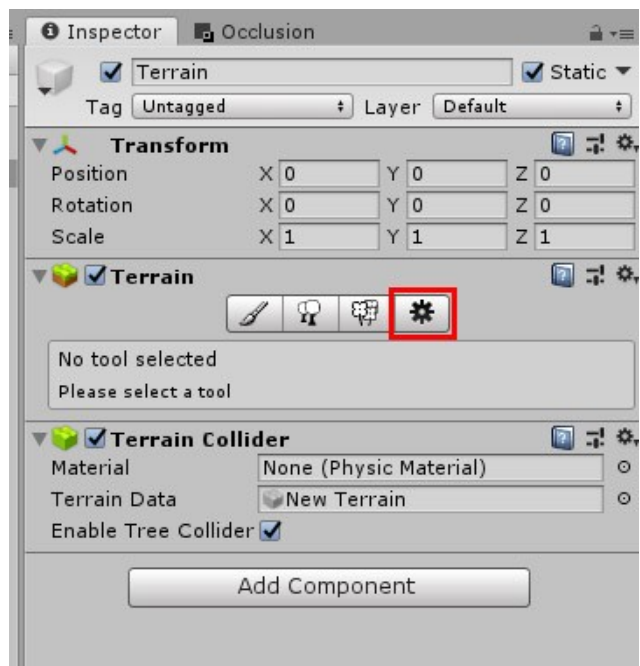
1 Create a new scene.
File > New scene

Important: You need to create a new Terrain for each beach environment scene.
Make changes to a Terrain modifies it at Project level.
Don't duplicate a Terrain, always create a new one.

2 Go to GameObjects **> 3D Object > Terrain**.

3 Select Terrain in hierarchy tab.
In Inspector tab click on Terrain Settings button.

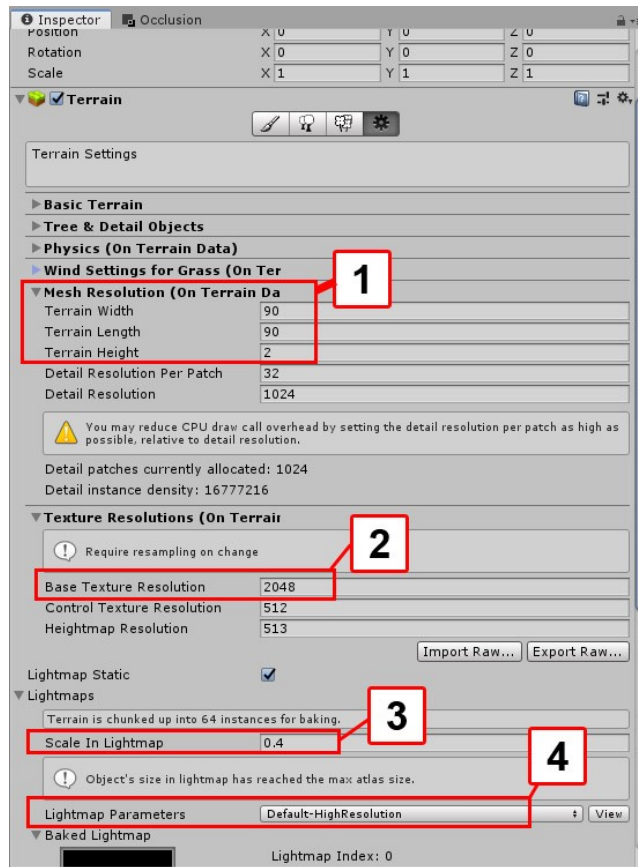**4** Set Terrain width to 90
Set Terrain lenght to 90
Set Terrain Height to 2 (spot1)

*The maximum height of the Terrain will be 2.
If you want a higher Terrain, increase the
value.*

5 Set BaseTexture Resolution to 2048 (spot2)

6 Set Scale in lightmap to 0.4 (spot3)

7 Set Lightmap Parameter to Default
High_Resolution (spot4)

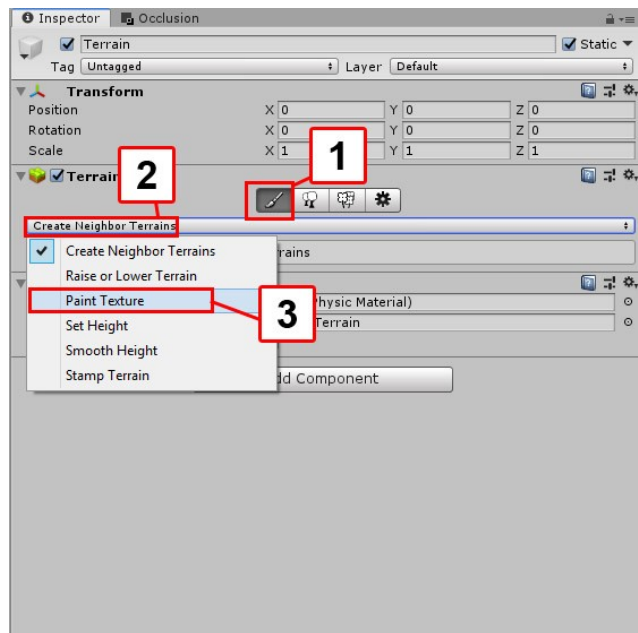**8** Select Terrain in hierarchy tab.
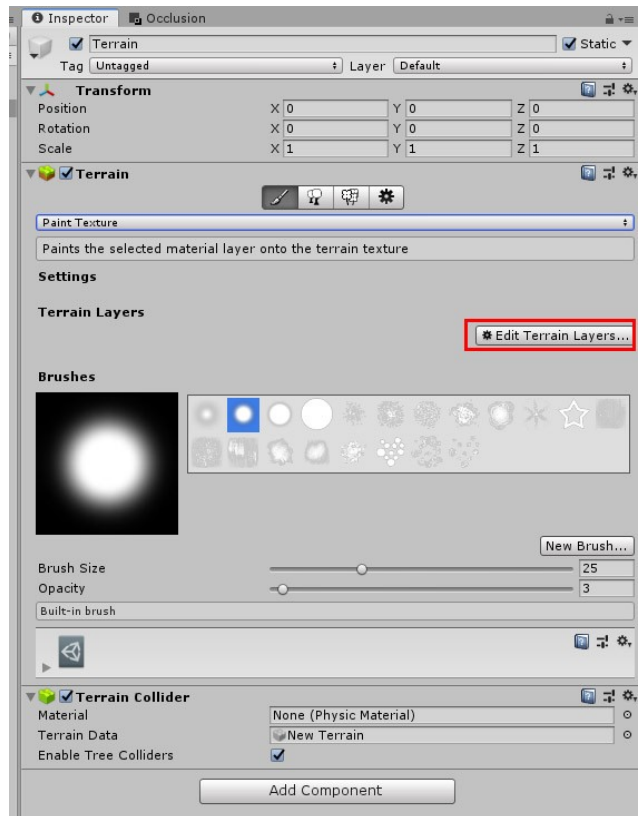
-In Inspector tab click on Paint Terrain button.
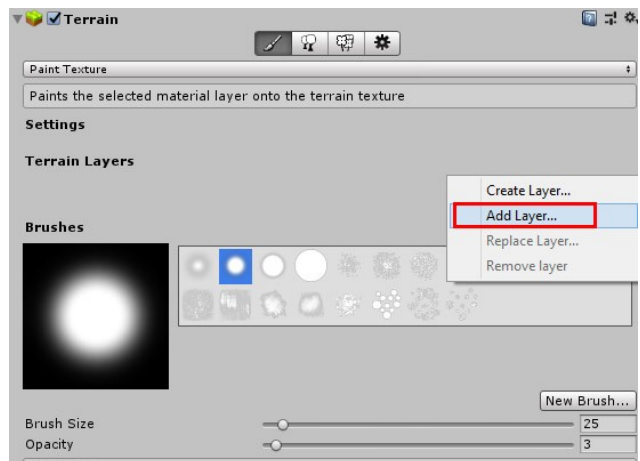(spot1)

-Click on dropdown menu (spot2)

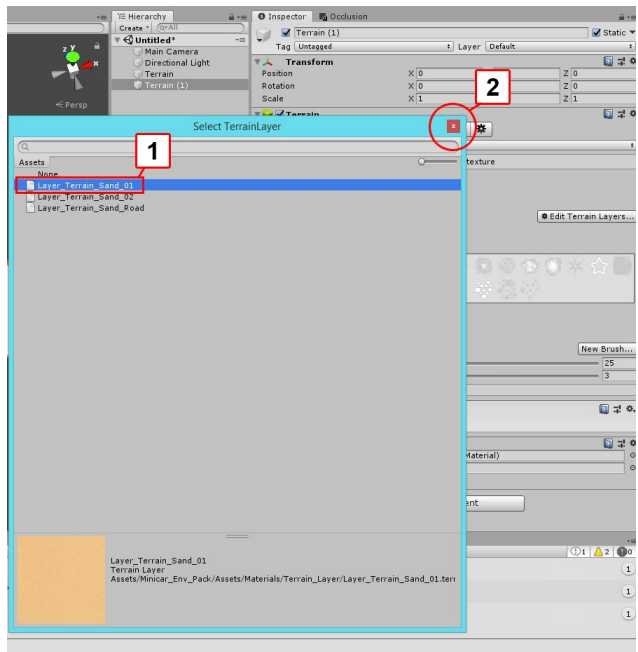Select Paint texture (spot3)f

9 Click on Edit Terrain layers button.
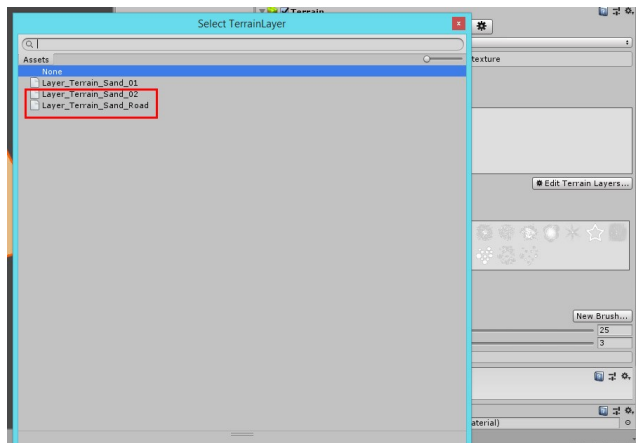

10 Click on Add Layer button.

11 In Terrain layer box select
Layer_Terrain_Sand_01 (spot1)

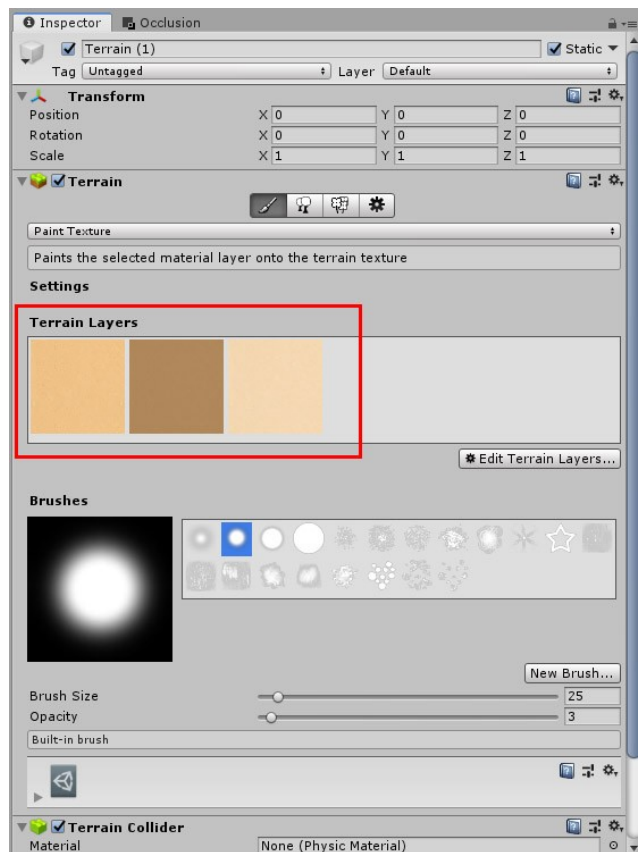-Exit Terrain layer box by clicking cross icon
(spot2)

12 -Repeat the process by adding
Layer_Terrain_Sand_02

13 -Repeat the process by adding
Layer_Terrain_Sand_Road
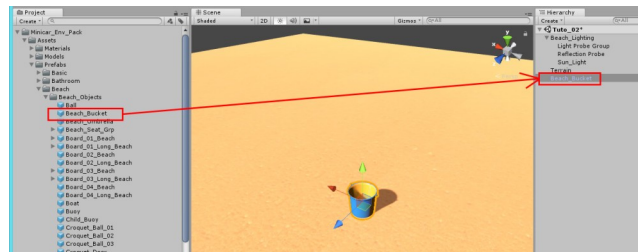
There are now 3 textures in layer terrain

14 From Project tab drag and drop
Beach_Bucket to Hierarchy tab.

Minicar_Env_Pack → Assets → Prefabs → Beach
→ Beach_Objects → Beach_Bucket

15 Set Beach_Bucket position
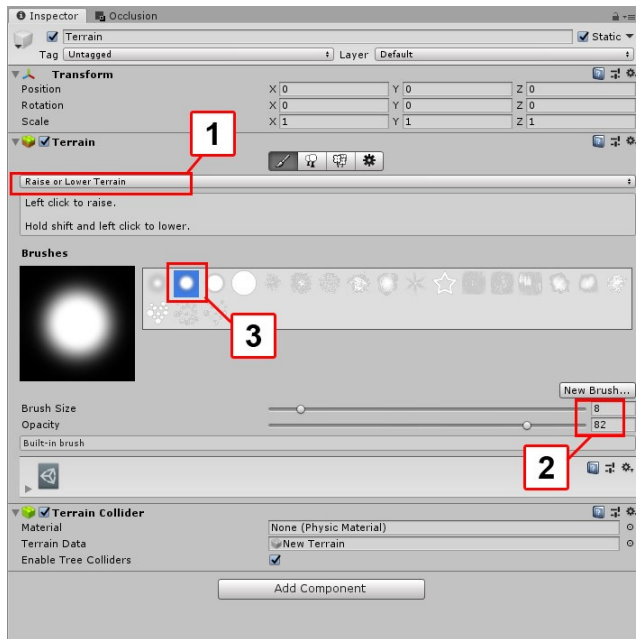X to 60
Y to 0.6
Z to 38

Zoom in on bucket (Shorcut : **F**)

16 Select terrain.
In dropdown menu select Raise and lower terrain (spot 1)

17 Set Brush size to 8
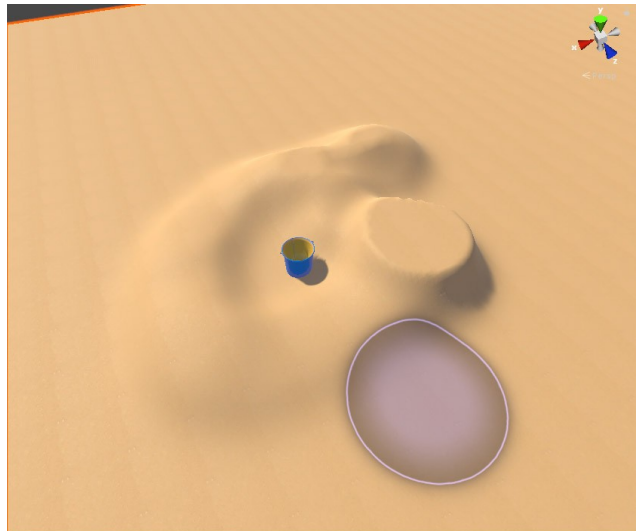Set Opacity to 82 (spot 2)

18 Select a brush (spot 3)

19 Start Painting the volume.

*As you can see in the picture if you go over a certain height the sand becomes flat.
That's because we set Terrain Height to 2 in terrain settings tab.
If you want a higher Terrain, increase the value.*
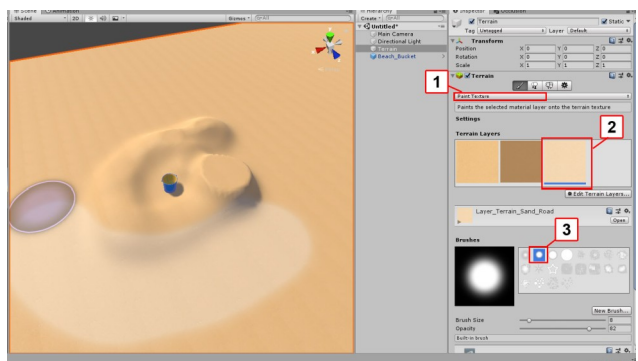
20 Click on Paint Terrain button. (spot 1)

In dropdown menu select Paint Texture(spot 1)

21 Select a texture. (spot 2)

22 Select a brush. (spot 3)

23 Start Painting the terrain texture.

*The first color is used for terrain base color.
The second one can be use to add dark details on terrain (try various brushes).*
The third one is used to paint a road (color) on the Terrain .

Part 3 : Lights, reflection probs and lightprob overview

1 Open scene **Tuto_02.**

Minicar_Env_Pack → Assets → Scenes → Tutos → Tuto_02

2 In hierachy tab open Bathroom_Lighting group.

Sun light is set to mixed mode.

This light is use to light *environment* (rooms, furnitures and objects) and non-static objects (for example cars in a race).

This light is also use to project dynamic shadows from **non static objects** on other static objects (rooms, furnitures and objects) .
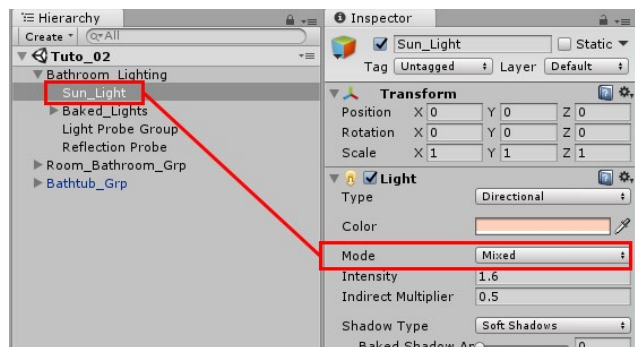
*If you want to export to Mobile this light must be set to baked mode.*
For more informations about mobile export read chapter 6. link

Lights that are in folder Baked_Lights are set to Baked mode (*need to calculates lightmaps*).

To learn how to calculate Lightmaps read chapter 3 Tutorial Part 4 : Calculate Lightmaps link

This lights are used to add more luminosity. This light doesn't project dynamic shadows from **non static objects.**

Non static objects (for example cars in a race) don't use brightness emitted by baked lights. To light up non static objects with baked lights we need to create a Light probe group.
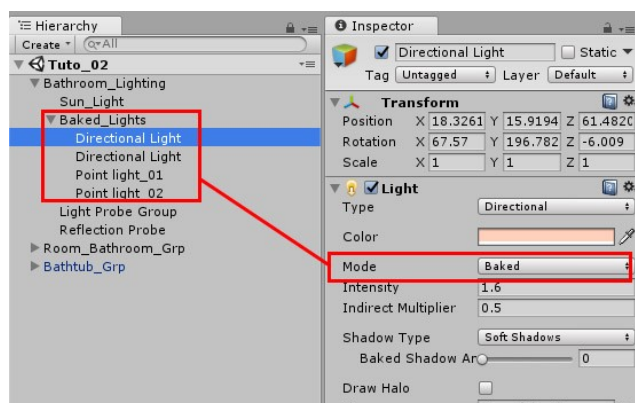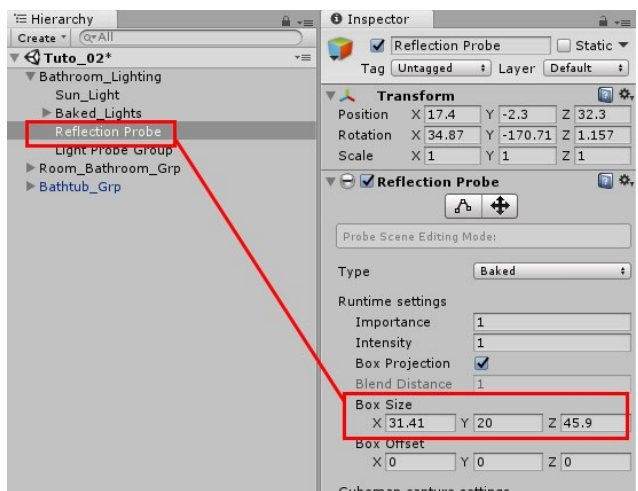
To learn how to create Light Probe Group read
Chapter 3 Part 5 : Light Probe creation link

Reflection Probe is used to add reflection on objects.
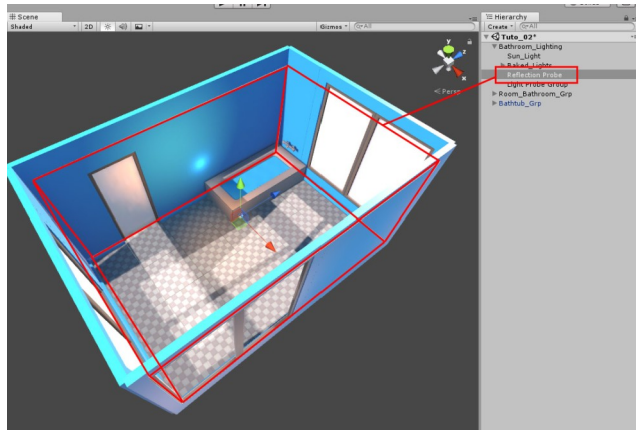
The reflection Probe must to be inside the room and cover all objects.

In Inspector tab use Box Size parameters to adjust the size of the reflection Probe.

Light Probe group is used to add luminosity emitted by baked lights on **non static** objects (for example cars in a race).

To learn how to create light Probe read 3 Tutorial Part 5 : Light Probe creation link
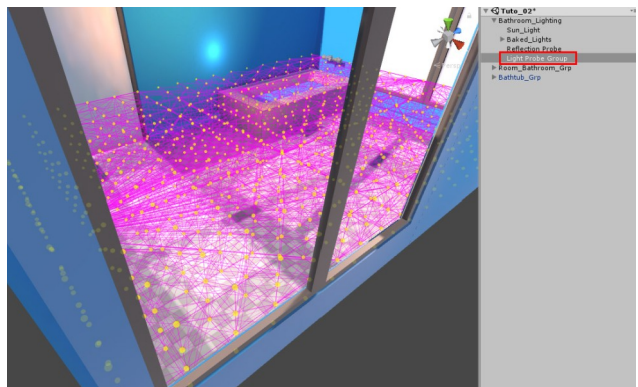
Part 4 : Calculate Lightmaps

Calculate lightmap is the very useful to optimize game.

For the mobile it is essential to calculate the lightmaps to conserve steady FPS .

For the desktop, it is not obligatory but it is advised because it improves the visual result (and optimize FPS too).

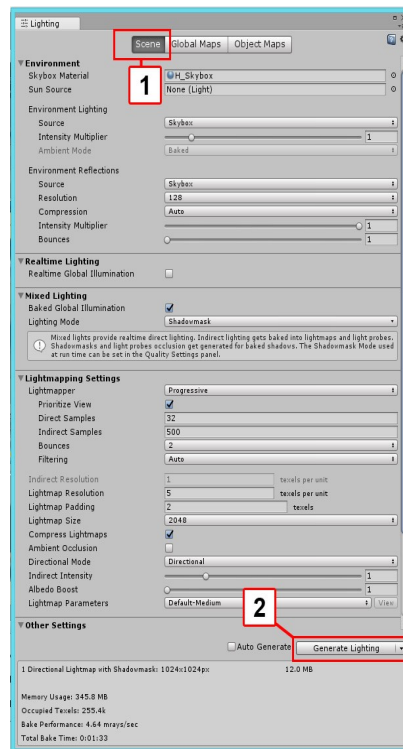Follow this instructions to learn how to calculate Lightmaps.

1 Open lighting panel.

Window > Rendering > Lighting Settings
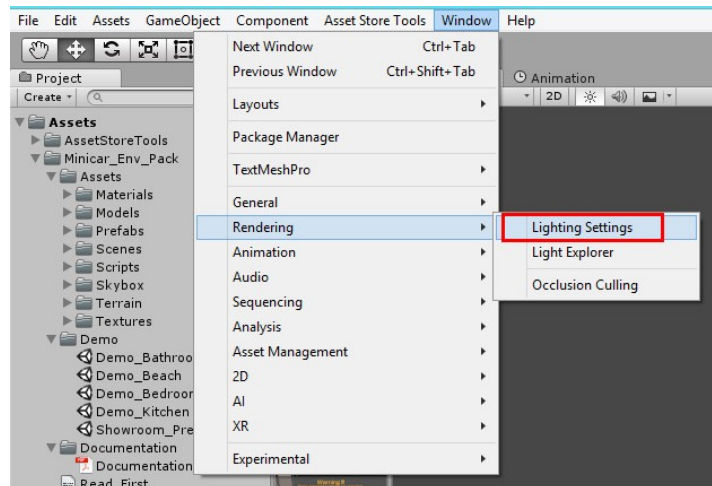
2 Select Scene tab in lighting panel. (spot 1)

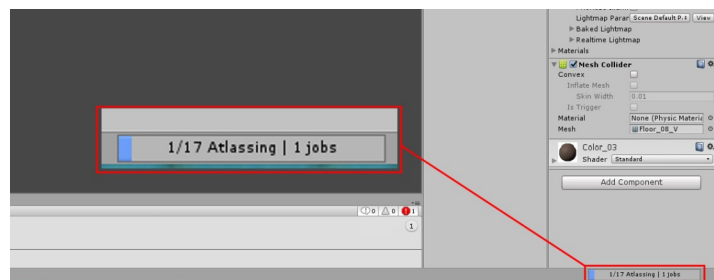**3** Check box *Generate Lighting* at the bottom of lighting tab. (spot 2)

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

Tips :
Calculing lightmaps on a large scene can take time.
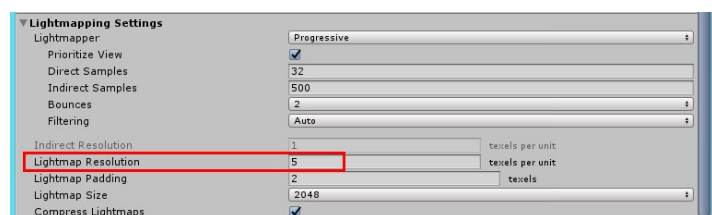*A first it is better to test lightmaps on small part.*

In progressive mode

Set lightmap resolution value to 5 for quick test
Set value to 10 for medium quality result
Set value to 15 for good quality result

A geometry combiner script is included in this asset. This script is a big help to reduce lightmap precompute time.
Read chapter 5 to learn how to use combiner script. link
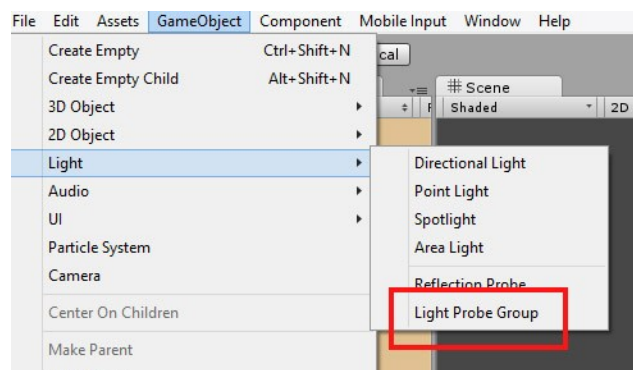
Part 5 : Light Probe creation

Non static objects (for example cars in a race) don't use brightness emitted by baked lights.

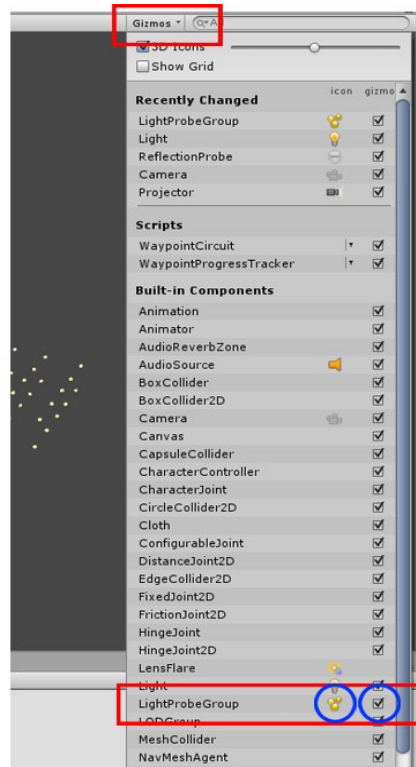To light up non static objects with baked light we need to create a Light probe group.

1 Open scene Tuto_03

Minicar_Env_Pack → Assets → Scenes → Tutos → Tuto_03

2 *Go to GameObject → Light → Light Probe Group.*

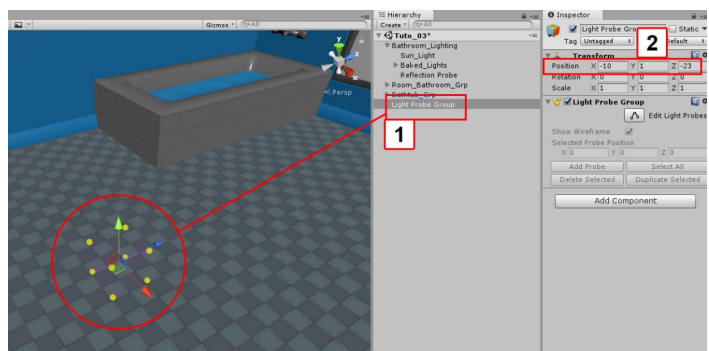*If the light prob doesn't appear check that the lightprobGroup option is selected in Gizmos window.*

3 Select Light Probe Group in hierarchy. (spot 1)

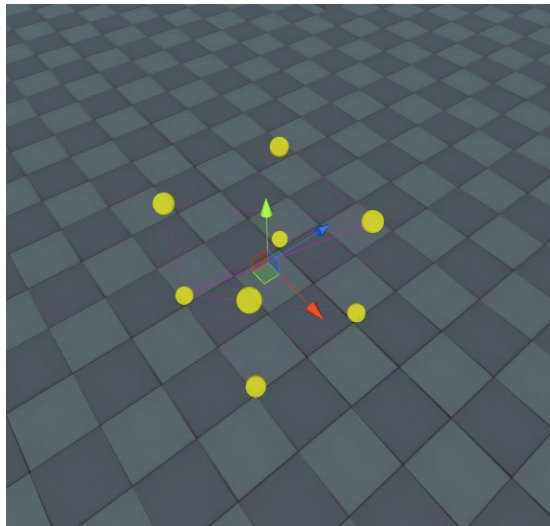In Inspector change the X,Y, and Z coordinates : (spot 2)
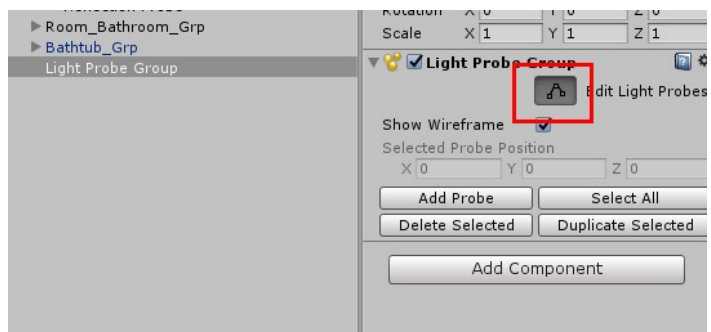**X: -10**
Y: 1
Z: -23

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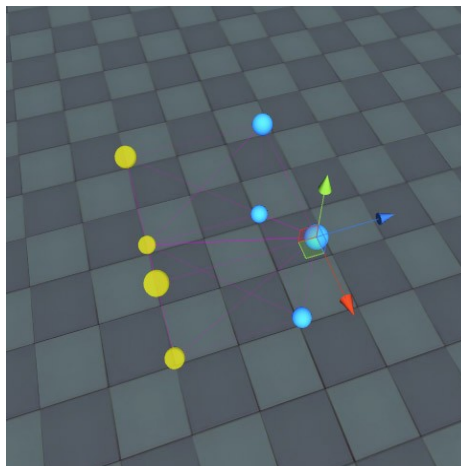

4 Select Light Probe Group in hierarchy tab.
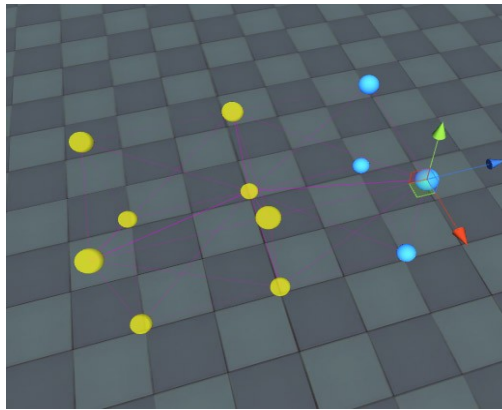
5 Click on Edit Light Probes button.

6 In Scene tab select 4 balls (yellow balls become blue).

Tips:To select several balls use the MAJ keys.

7 Duplicate object by pressing CTRL + D

8 Move the blue balls on the Z-axis for creating a new cube.

9 Repeat the process until the entire area covered by the non static objects (for example the cars) is filled.

Each cube (represented by 8 blue balls) corresponds to a specific lighting area. The smaller the cubes the more precise the light.
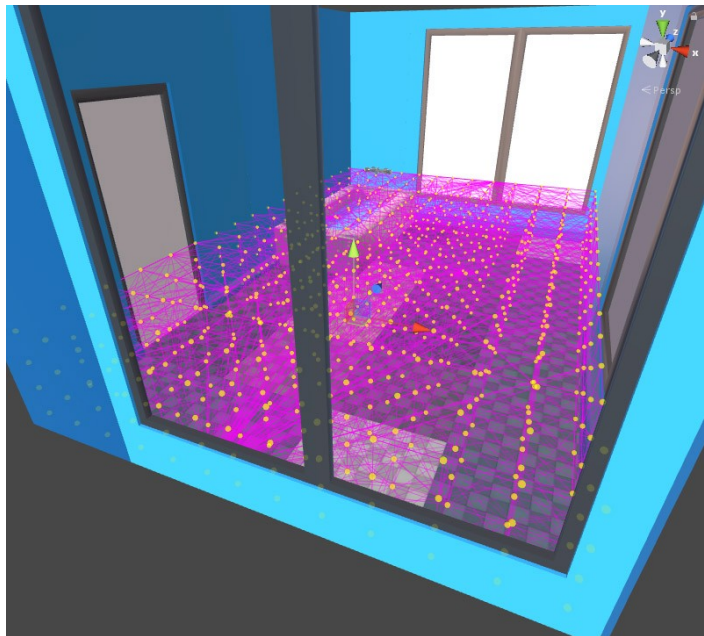
10 Open lighting panel.

Window > Rendering > Lighting Settings

11 Select Scene tab in lighting panel.

12 *Check box Generate Lighting at the bottom of lighting tab.*

4 Combiner

A combiner mesh script is included in this asset.

Minicar_Env_Pack → Assets → Scripts → MeshCombiner → Meshcombinervtwo

Combiner mesh script combine all the mesh that have the same material on a single new mesh.
This a good solution to **drastically reduce drawcalls and reduce lighmap precomputed time**.

1 Open scene Tuto5

Minicar_Env_Pack → Assets → Scenes →
Tutos → Tuto_05

2 From project tab drag and drop
Meshcombinervtwo (spot 1) on Objects_
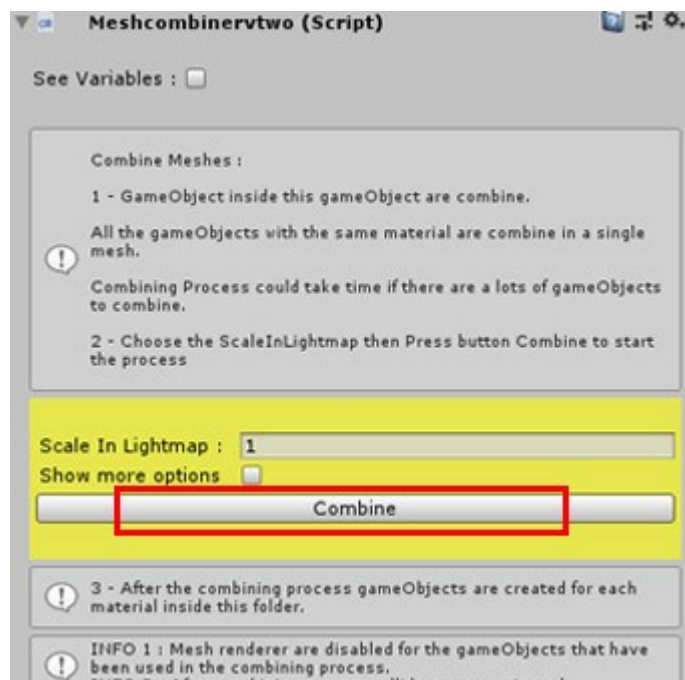Grp in hierarchy tab. (spot 2)

Minicar_Env_Pack → Assets → Scripts →
MeshCombiner → Meshcombinervtwo

Meshcombinerscript is added to
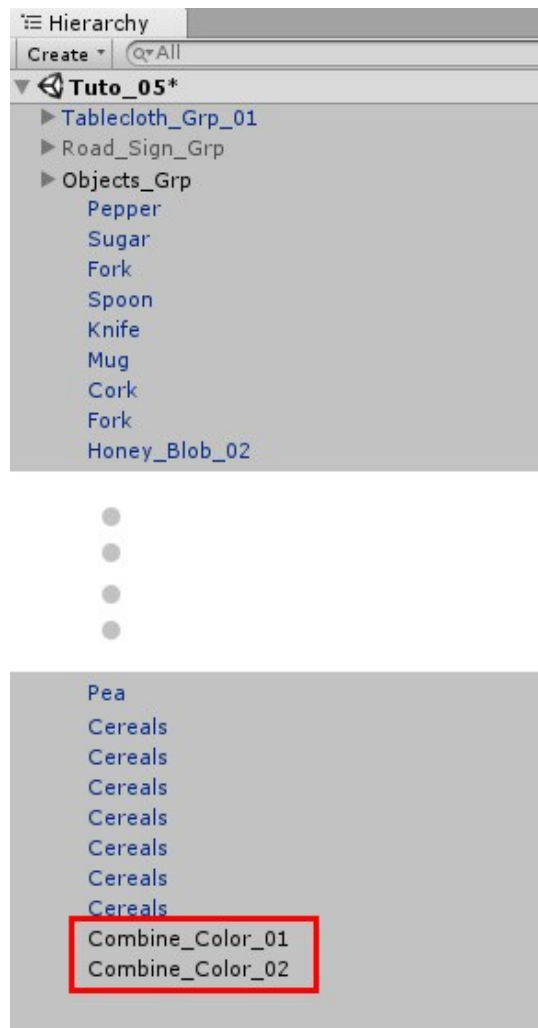Objects_ Grp.(spot 3)
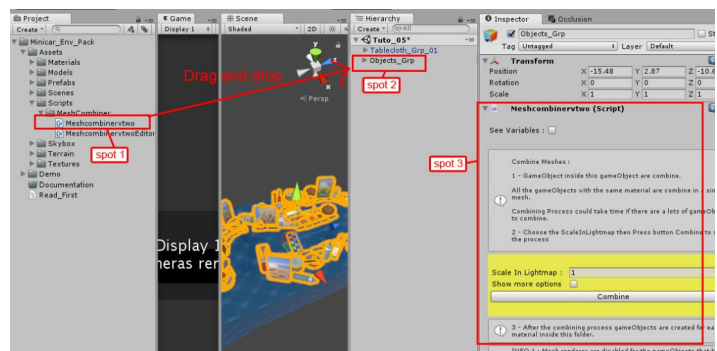
3 Select Objects_ Grp.

4 Click on Combine Button.

After the process new Combine gameObjects are created inside Objects_ Grp group.
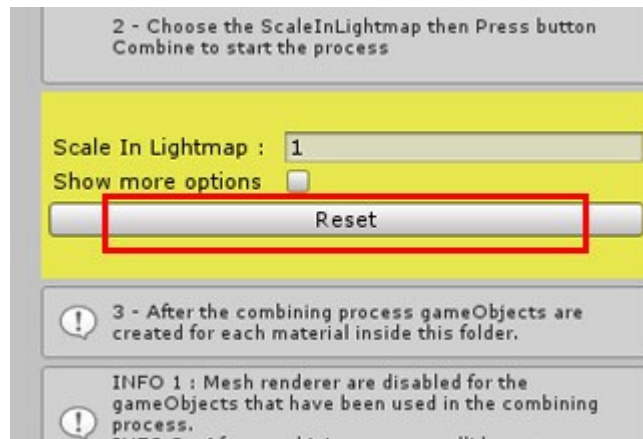
All other objects in the group are hide.

If you want to reverse the process press Reset button or CTRL+Z.

Caution:
- You must combine only static objets.
- Combine together **objects that are close** otherwise there will be a loss of fps
- The number of vertices in a combined object must not exceed 65,000 tris.
If there are too many tris, split them into two groups.

Troubleshooting :

- If you have a lot of objects (or large objects) in group we recommande to separate into several pieces to avoid poor quality lightmaps.

- If you have strange results, this is probably because the number of tris of combine objects are too important.
To solve this issue separate into several groups and combine each group separately.

Options:

Some objects, especially those with rounded edges require more lightmap definition.

To increase the definition of these objects increase Scale in lightmap value.

Exemple :

- Create 2 groups
- Add combiner script on each

- Add to the first group objects with sharp edges (book, table, céreals box …)
- Set Scale in lightmap value to 1

- Add to the second group objects with smooth edges (bottle, bowl, ketchup bottle …)
- Set Scale in lightmap value to 4

Caution: If you change the value you must decombine (reset) and then recombine the group (combine)

Tips: if you want to increase the quality of lightmaps for the whole scene, you can increase lightmap resolution value in lightings settings tab.
*On the other hand the size of the lightmaps will be larger and the lightmaps precomputing time too.*
So it's best to put a low value of lightmap resolution in lightings settings and choose a scale in lightmap value depending on the type of objects(smooth or sharp).

To see more options check Show more options box

Stitch seams improves the quality of lightmaps

Keep shadow Mode allows you to keep the shadows options (for example cast shadow: off)
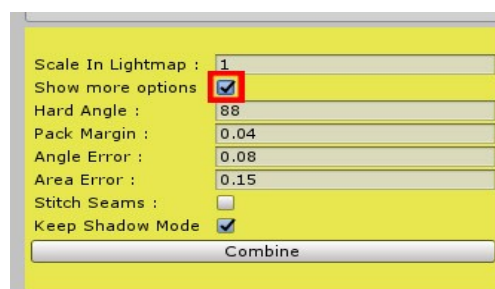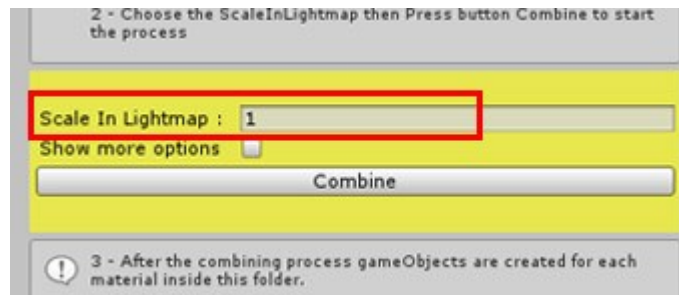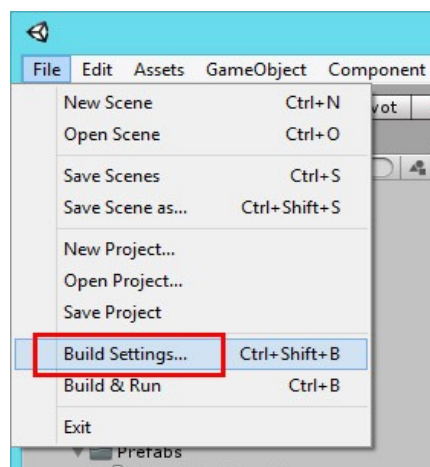
5 Export to mobile

Follow this step to export your project to mobile (exemple for Android)

Before you start :
Combiner mesh script combine all the meshes that have the same material on a single new mesh.
*This a good solution to **drastically reduce drawcalls and reduce lightmaps precomputed time***.
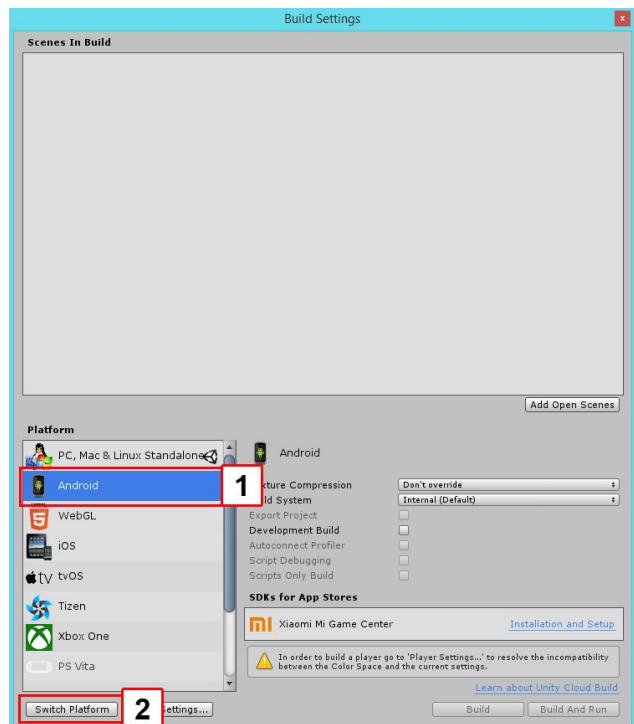*To learn more about combiner script read chapter 5 : Combiner* <u>link</u>

1 Open the scene you want to export.

2 Go to File → Build_Settings.

3 Select Android. (spot 1)
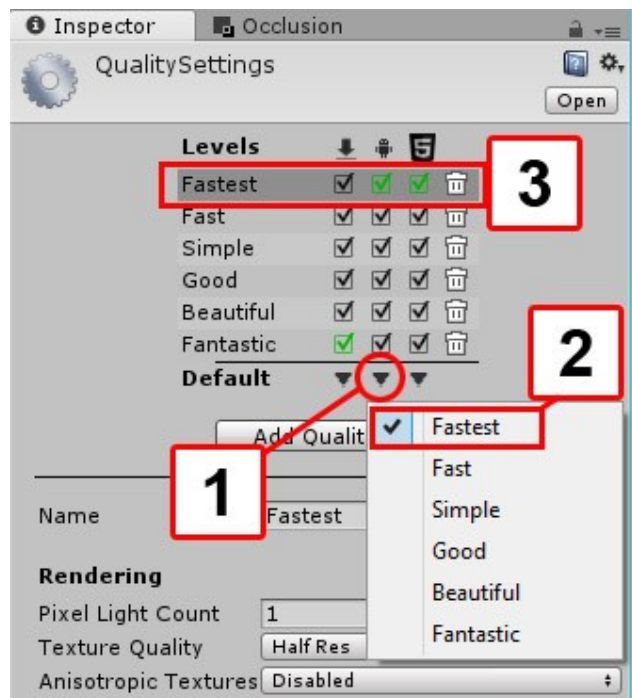
4 Press button Switch Platform. (spot 2)

5 Go to Edit → Project Settings → Quality

6 Press the triangle. (spot 1)

7 Select Fastest to choose fastest when build. (spot 2)

8 Press Fastest to choose fastest visualization in unity viewport. (spot 3)
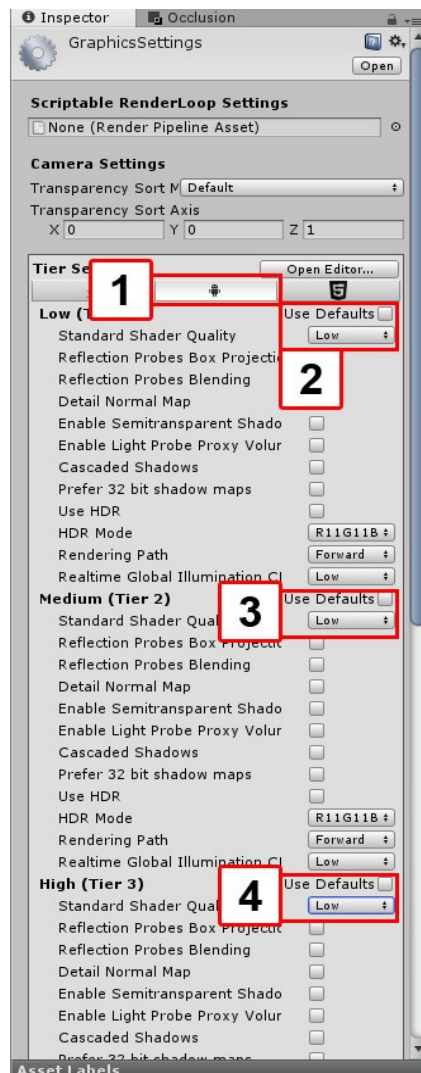
9 Go to Edit → Project_Settings → Graphics.
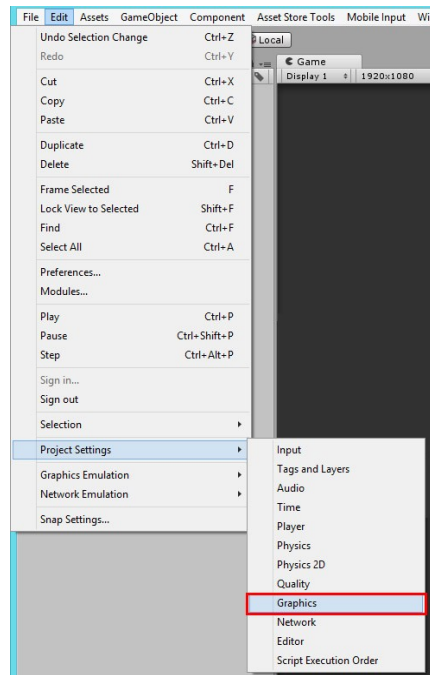
10 Choose Android (press android small icon). (spot 1)

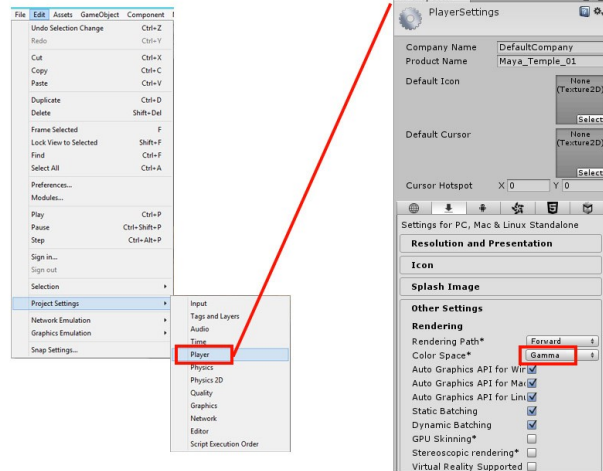**11** Uncheck Use Default checkbox Then choose Low. (spot 2)

Uncheck Use Default checkbox Then choose Low. (spot 3)

Uncheck Use Default checkbox Then choose Low. (spot 4)

12 Open Edit → Project Settings → Player.
In Inspector window change **Color Space** to **Gamma.**

13 Now we want to use optimize materials for mobile.

- First Quit Unity (close software)

On your Pc/ Mac Desktop :

- Open folder yourProject / Minicar_Env_Pack / Assets / Materials / Material_Mobile

- Select all files in folder except .meta files

Very important: do not copy .meta files

- Copy.

- Open folder yourProject / Minicar_Env_Pack / Assets / Materials / Material_Grp

- Paste.

- Restart Unity and open you project.

Tips :

If you want to reverse the process copy materials from yourProject / Minicar_Env_Pack / Assets / Materials / Material_Desktop

Paste in yourProject / Minicar_Env_Pack / Assets / Materials / Material_Grp

14 Open Lighting Tab.

Window → Rendering → Lighting Settings

15 Set Lighting Mode to Substractive (spot 1)

Set lightmap resolution to 30 (spot 2)

Tips :
The higher the number, the higher the quality of the lighmaps.
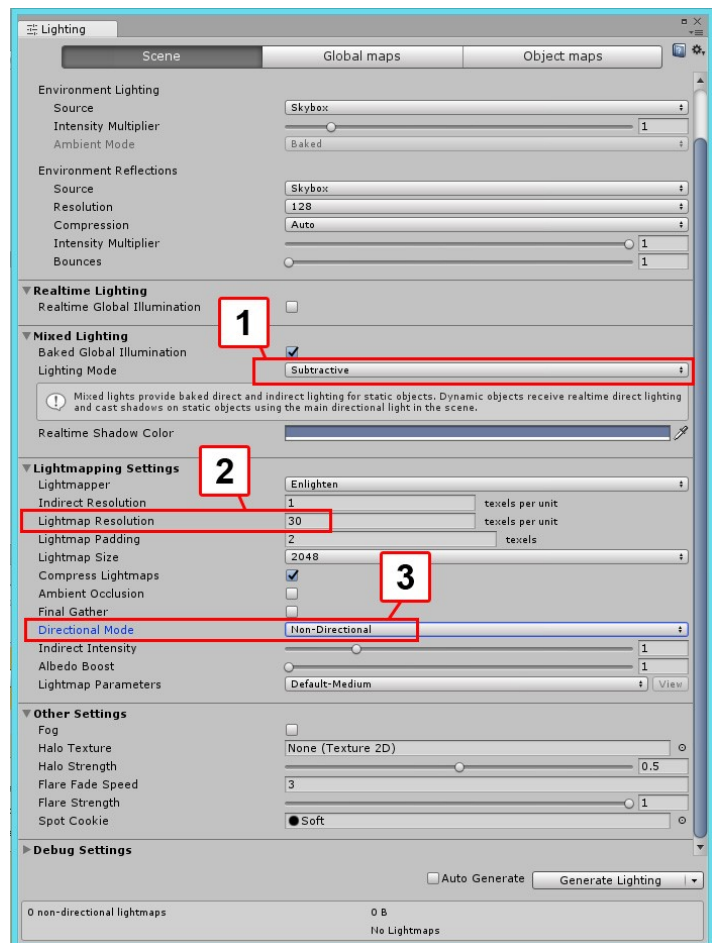*In return the size of the lightmaps will be larger.*
Lightmaps precomputed time will be longer too.

Lightmap resolution to 15 : low quality.
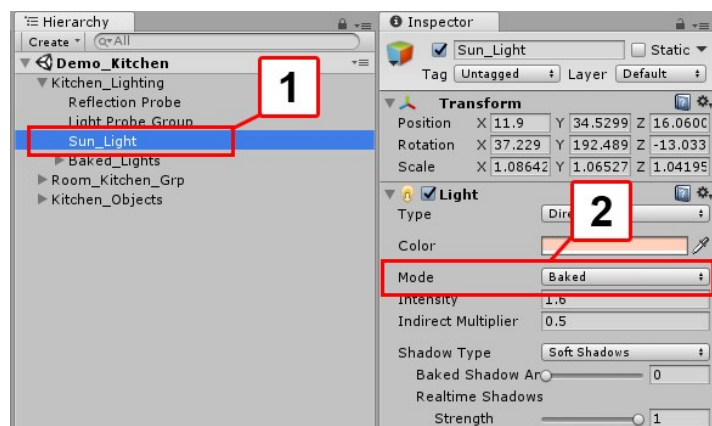*Lightmap resolution to 30 : medium. quality*
Lightmap resolution to 60 : good quality.

Set Directional Mode to Non Directional. (spot 3)

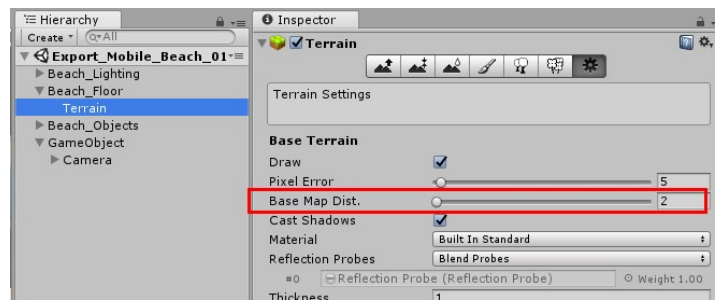**16** In hierarchy tab select Sun_Light. (spot_01)

Set Mode to Baked. (spot_02)

17 *If you use Effects on camera delete Post-Processing Behaviour script.*

18 *If you export a beach environment select your Terrain in hierarchy tab.*

In Inspector tab set *Base Map Dist.* *To 2*

19 *Calculate the lightmaps by pressing « generate lighting » in lighting tab.*

You project is ready to export to Mobile platform.