Documentation Part 4: Graphics

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Combine mesh

A combiner mesh script is included in this asset.

Assets → PuzzleCreator → Assets → Script → MeshCombiner → Meshcombinervtwo

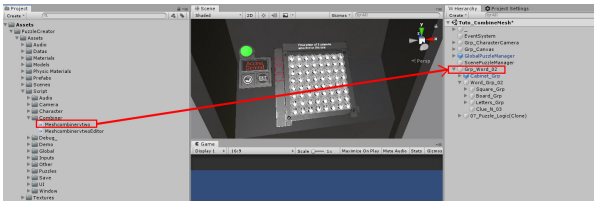
Combiner mesh script combine all the meshes that have the same material on a single new mesh.
This a good solution to **drastically reduce drawcalls and reduce lightmaps precomputed time**.

1 Open scene Tuto_CombineMesh
Assets → PuzzleCreator → Assets → Scenes → Tutos → Tuto_CombineMesh

2 In hierarchy tab open Grp_Word_02

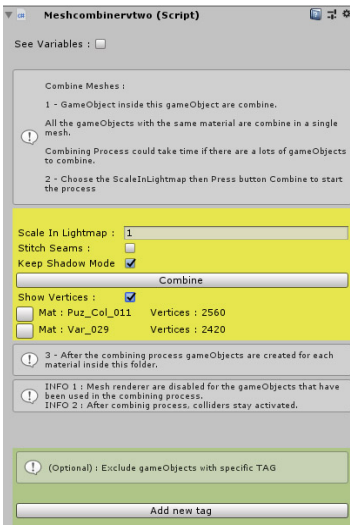
3 From Project tab drag and drop Meshcombinervtwo script to Word_Grp_02

Assets → PuzzleCreator → Assets → Script → Combiner → Meshcombinervtwo

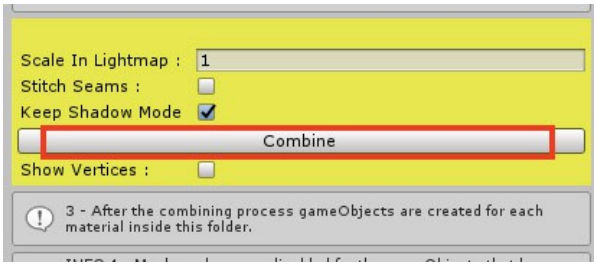


4 Select Word_Grp_02

Note: A new script is added

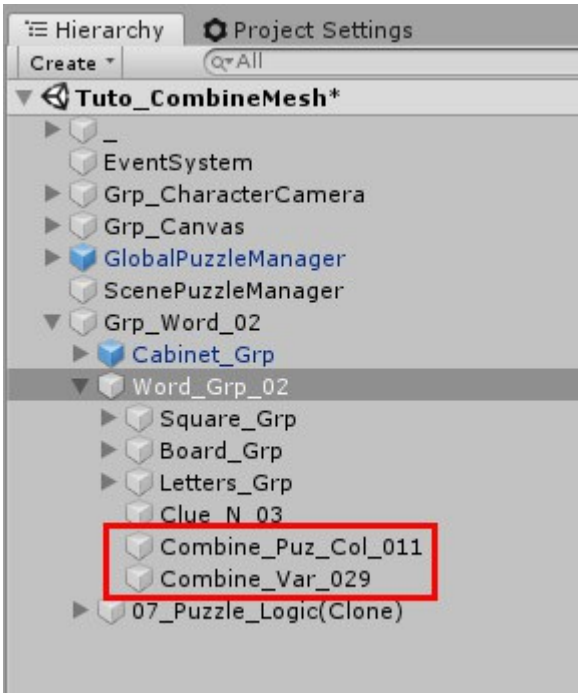


5 In Inspector Tab press Combine button

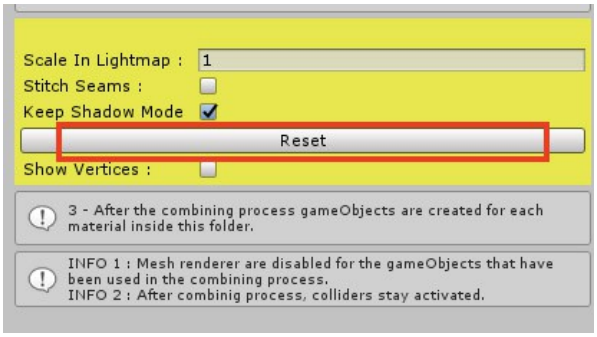


After the process new Combine gameObjects are created inside Word_Grp_02 group (spot 1)

All other objects in the group are hide.



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



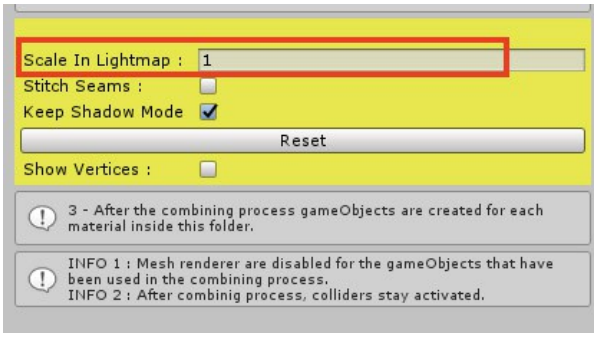
Caution:
- You must combine only static objets.
- Combine together **objects that are close** otherwise there will be a loss of FPS
- The number of vertices in a combined object must not exceed 65,000 vertices.
If there are too many vertices, split them into two groups.

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:
Scale in lightmaps



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

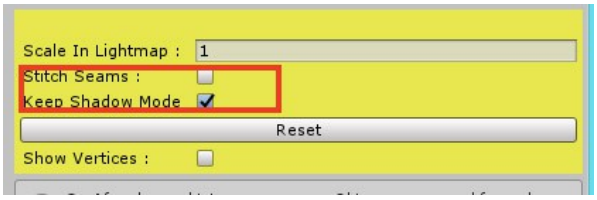
To increase the definition of these objects increase Scale in lightmap value.

Tips: Create combine group specially for round objects. Choose a higher Scale In Lightmap value for this combine group.

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

To increase the quality of lightmaps for the whole scene, 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 use a low value of lightmap resolution in lightings settings tab and choose a scale in lightmap value depending on the type of objects (smooth or sharp).

Stitch seams

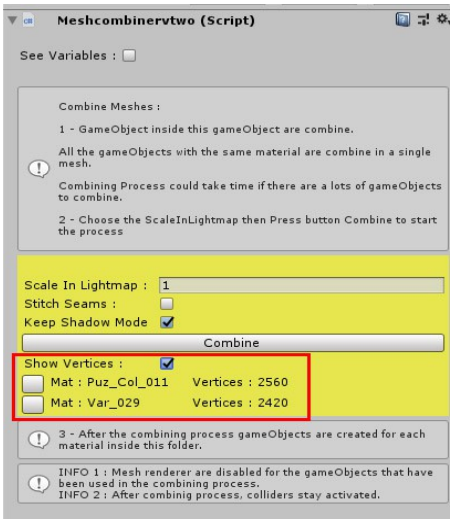


Stitch seams improves the quality of lightmaps

Keep shadow Mode

Keep shadow Mode allows you to keep the shadows options after the combining process (for example cast shadow: off)

Show vertices



Check Show Vertices box to see the number of vertices by material.

The number of vertices in a combined object must not exceed 65,000 vertices.

If there are too many vertices, split them into two groups.

Sprites and textures

Paint on texture:

It can be useful to paint on textures.

Note: Some textures are provided with uvs layout layer (.Psd files)
Assets → PuzzleCreator → Assets → Textures → Textures_Mat→ 01_Uvs

Example with Photoshop:

1 In Project tab make a copy of Puz_S_Col_01_Albedo
Assets → PuzzleCreator → Assets → Textures → Textures_Mat→ Puz_S_Col_01_Albedo

2 Open Puz_S_Col_01_Albedo in your favorite drawing package .

3 Paint on the picture

4 Save the file

Import sprite:

For puzzles it is possible to use objects but also sprites. You can use those included in the asset but also import yours.

1 Create a sprite in your favorite drawing package

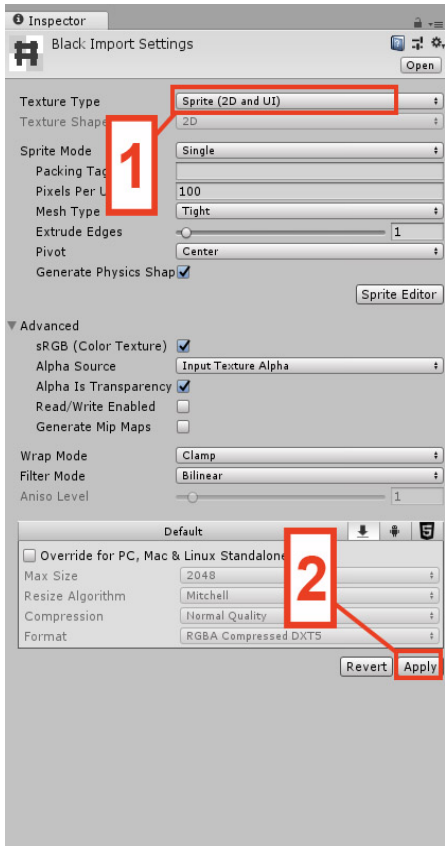
The size of the sprites included in the asset is 256x256. It is not mandatory but the creation of the puzzle will be faster if you respect this size.

2 Import a sprite in your project (for example in Texture folder)

3 In Project tab select your sprite

4 In inspector tab:
For Texture Type select Sprite (2D and UI) (spot1)

5 Press Apply button (spot 2)



Export to Mobile

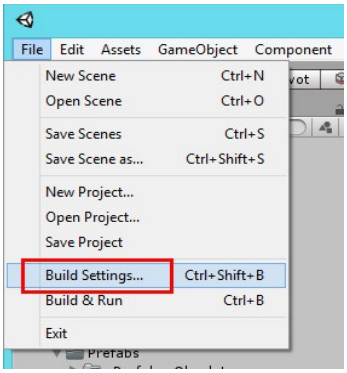
Follow this step to export your project to mobile (example for Android)

This example of export to mobile is based on the demo included in the asset

1 Open scene 01_Demo

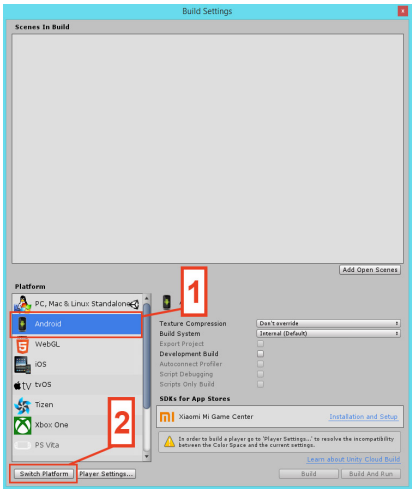
Assets → PuzzleCreator → Assets → Scenes → Demo → Demo_Desktop → 01_Demo

2 Go to File → Build_Settings.

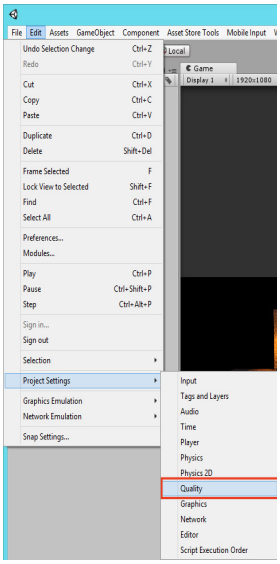


3 Select Android (spot 1)

4 Press button Switch Platform (spot 2)



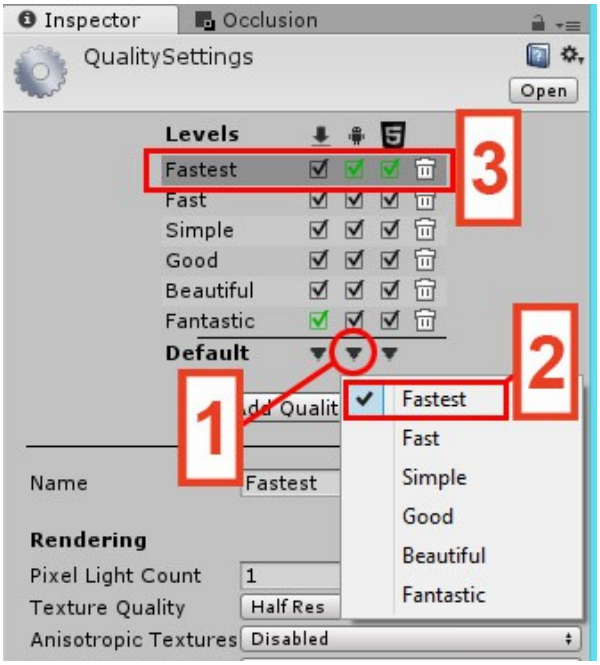
5 Go to Edit → Project Settings → Quality



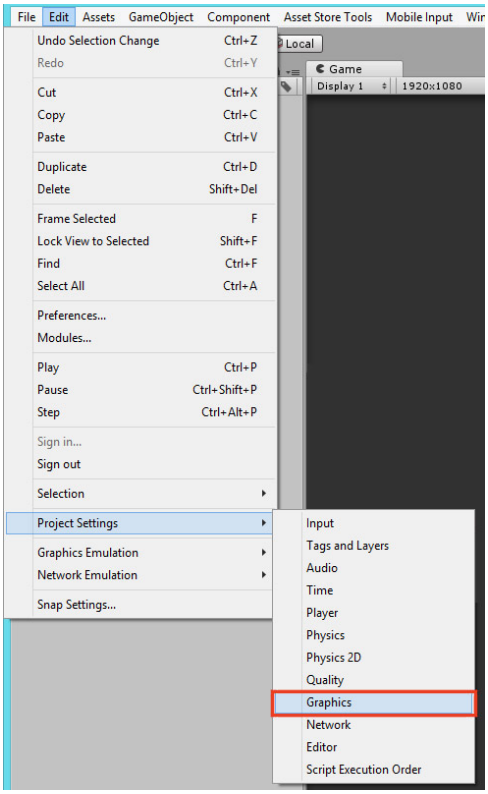
6 Press the triangle (spot 1)

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



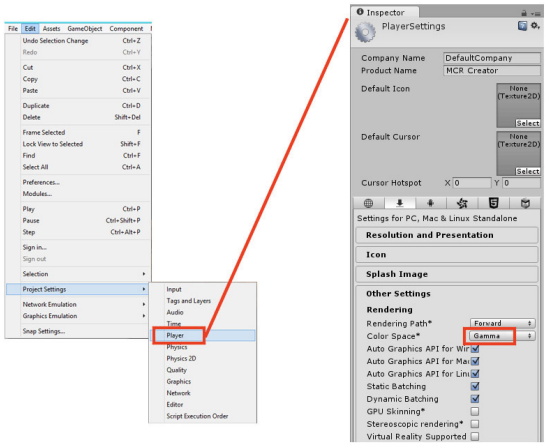
10 Choose Android (press android small icon) (spot 1)

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

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

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

14 Open Edit → Project Settings → Player
In Inspector window change Color Space to Gamma



15 Optimize materials for mobile

- First Quit Unity (close software)

On your Pc/ Mac Desktop:
- Open folder Assets\PuzzleCreator\Assets\Materials\Material_Mobile

- Select **ONLY** all files the .mat in folder.
Very important: do not copy .meta files
- Copy

- Open folder Assets\PuzzleCreator\Assets\Materials\Material_Grp

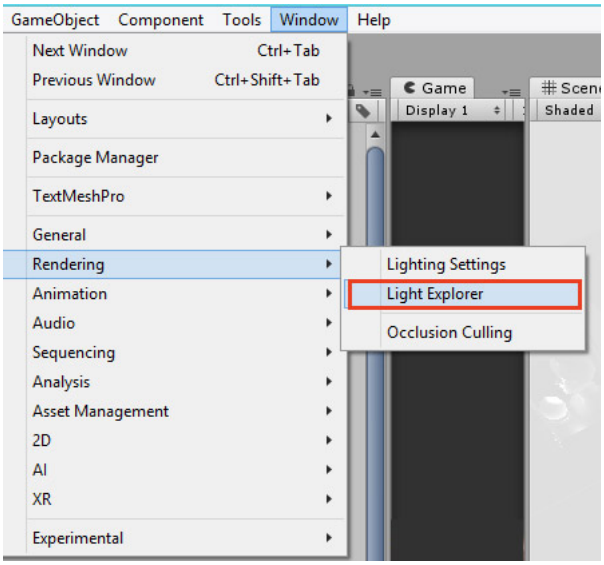
- Paste
- Restart Unity and open you project

Tips:
If you want to reverse the process copy materials from Assets\PuzzleCreator\Assets\Materials\Material_Desktop

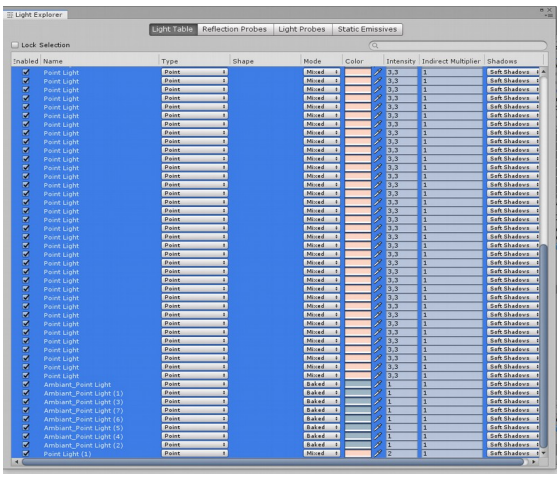
Paste in Assets\PuzzleCreator\Assets\Materials\Material_Grp

16 Convert all the mixed lights to baked lights.

To easily modify all the lights:
Go to Window → Rendering → Light Explorer



17 In Light explorer window:
Select all the lights on the left then choose baked in Mode Column



18 Open Lighting Tab

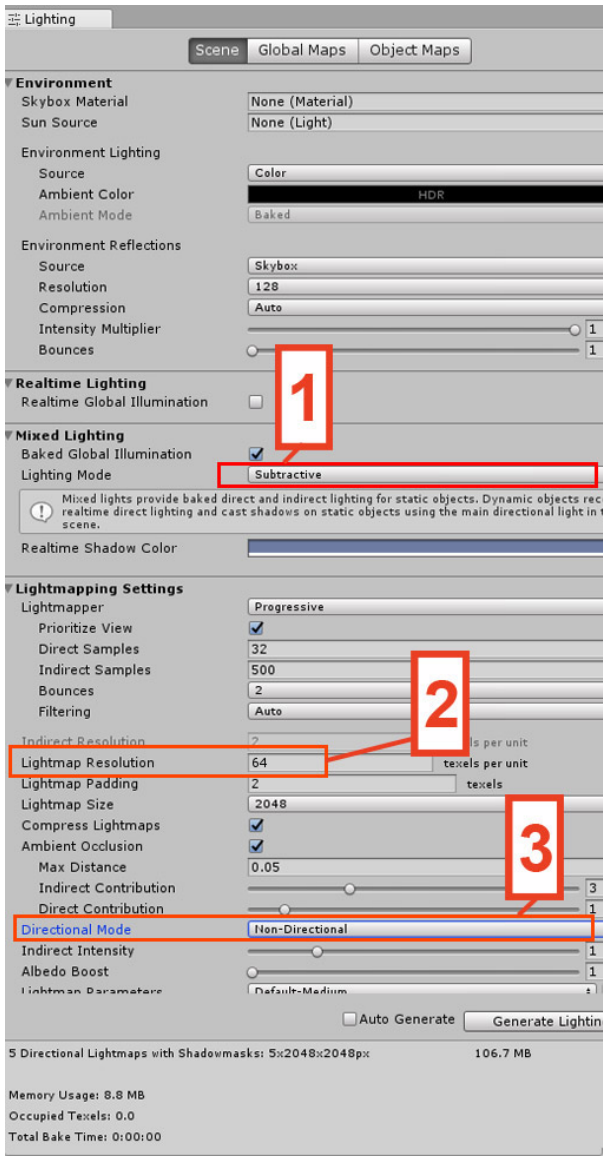
Window → Rendering → Lighting Settings

19 Set Lighting Mode to Substractive (spot 1)

20 Set lightmap resolution to 64 (spot 2)

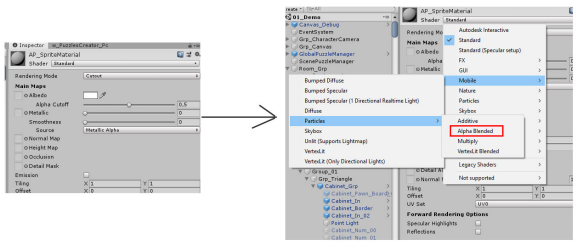
Tips:
The higher the number, the higher the quality of the lightmaps.
In return the size of the lightmaps will be larger.
Lightmaps precomputed time will be longer too.

If you use the combiner script included in this asset you can ealisy increase the quality of lightmaps with less calculation time.
(more infos about Combiner script)



22 In Project tab select AP_SpriteMaterial
(Project Tab : PuzzleCreator → Assets → Materials → Misc → AP_SpriteMaterial)

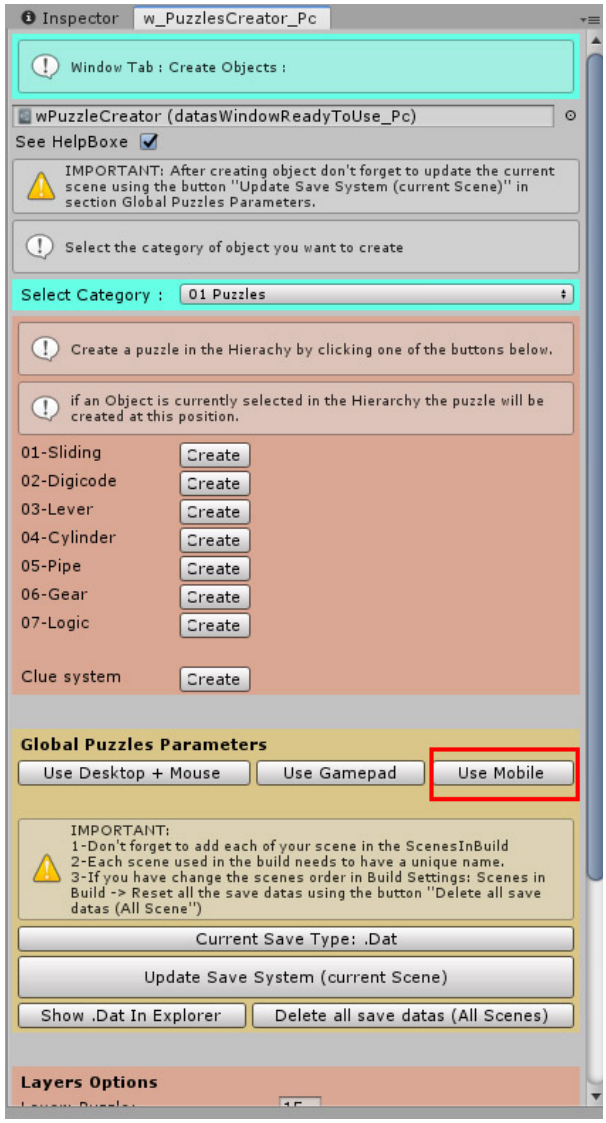
23 In Inspector tab modify standard material by choosing Mobile/ Particles / Alpha Blended



24 Open w_PuzzlesCreator_Pc Window
Tools→ Puzzles→ Puzzles Creator(w_PuzzlesCreator)

25 Click on Use Mobile button.

Info :
Don't forget to press Use Mobile in each gameplay scene you are using for the build)

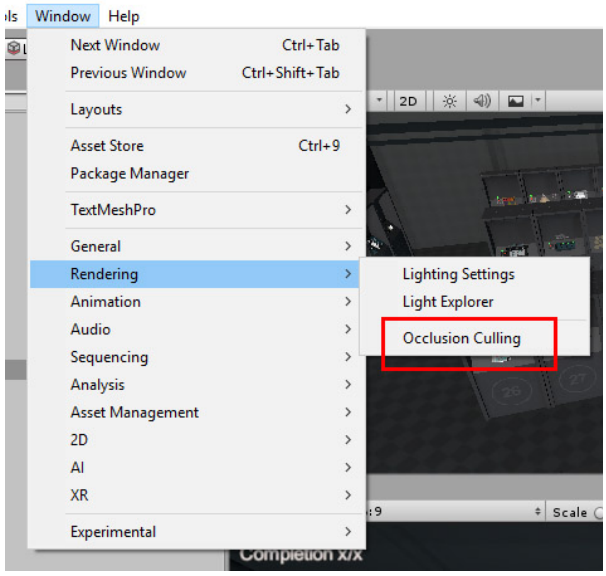


26 Calculate the lightmaps by pressing generate lighting in lighting tab

27 Save scene.

28 Open Occlusion culling tab

Windows→ Rendering→ Occlusion culling

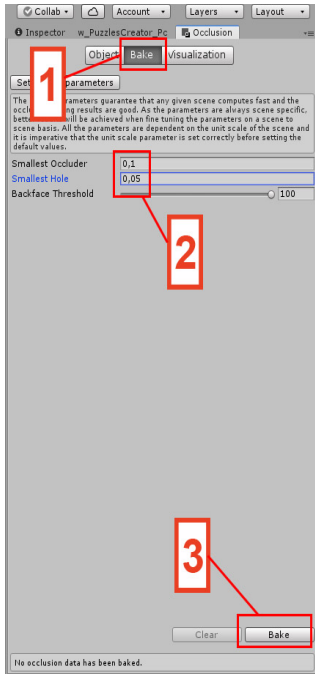


29 Click on the tab Bake (spot 1)

30 Set smallest Occluder to 0.1 (spot 2)

31 Set smallest Hole to 0.05 (spot 2)

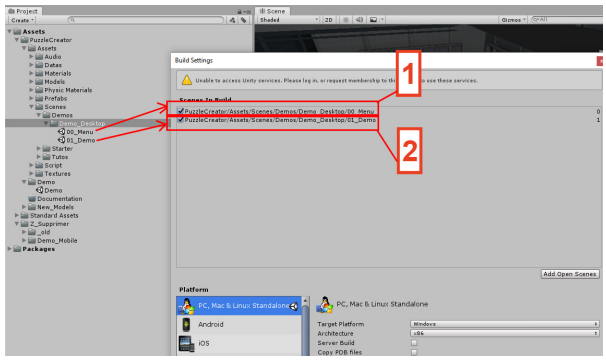
32 Click on Bake button (spot 3)



33 Go to File → Build_Settings.

34 From project Tab drag and drop 00_Menu scene in build settings window (spot 1)

35 From project Tab drag and drop 01_Demo scene in build settings window (spot 2)



36 Save scene.

Your project is ready to export to mobile