Parametric Primitives

Interactive primitive tool for Unity3D

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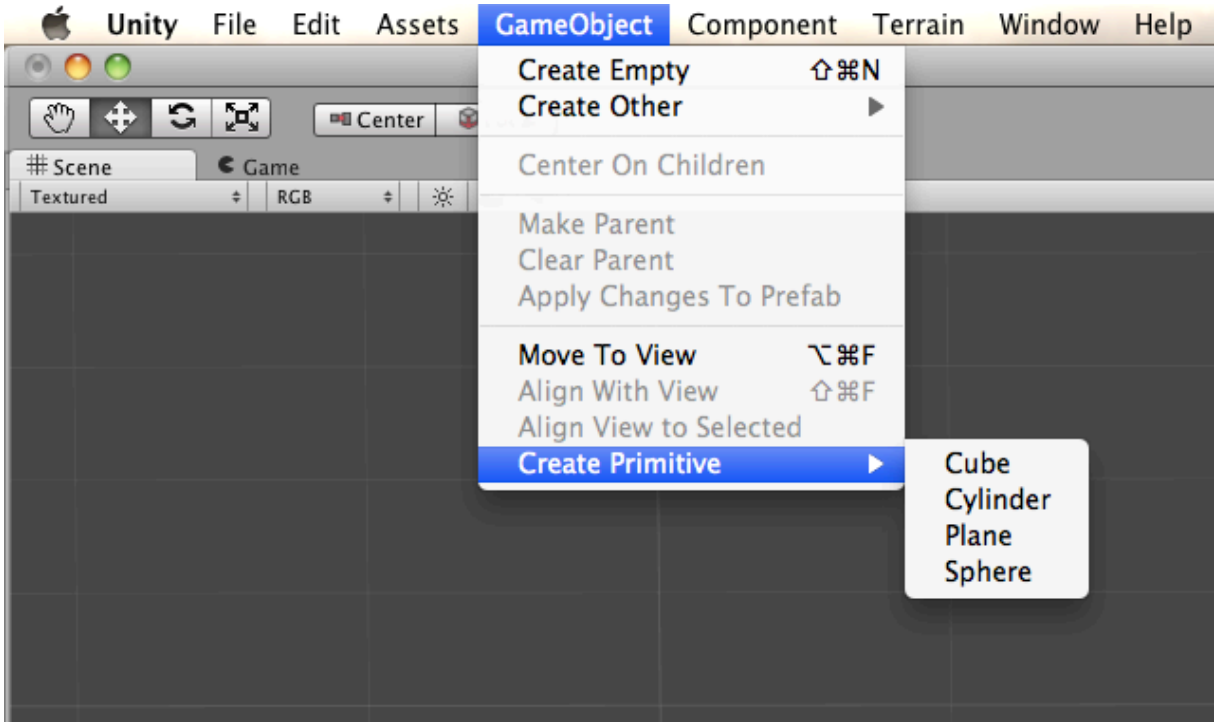
Contents

Introduction

Parametric Primitives allows you to create easily custom primitives, as Sphere, Cube, Plane or Cylinder. You can change in real time the primitive's level of subdivision. This can be usefull if your want an extremely detailled sphere, or a low poly sphere for your mobile game.

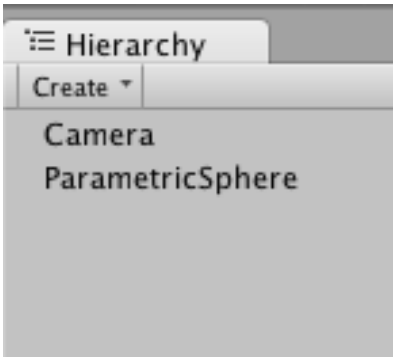


1. Tutorial – Creating your first parametric primitive

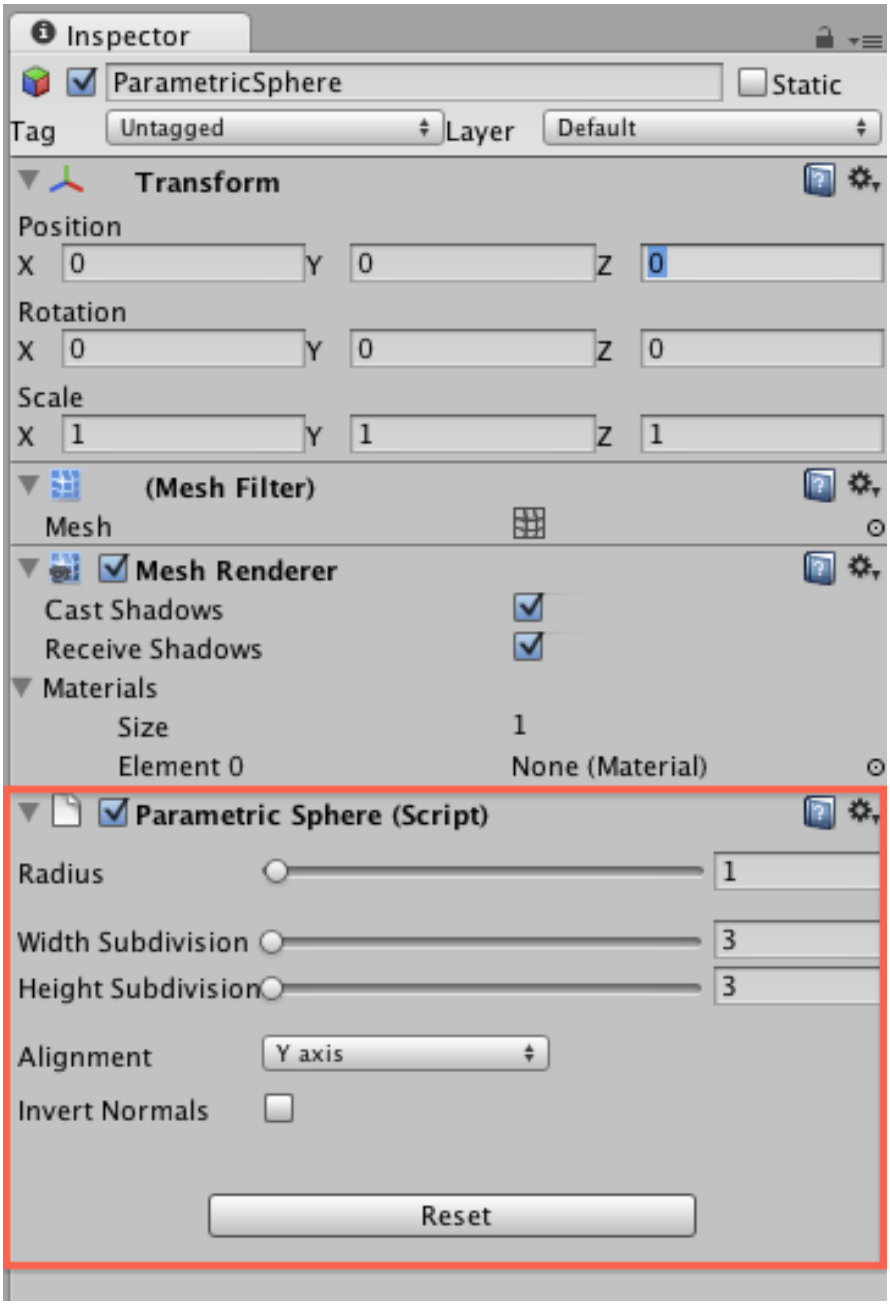
First, open up Unity, and create a new Project. Then, import the **Parametric Primitives** package by selecting *Assets* > *Import Package* > *Parametric Primitives*.

After, create a new Scene, and name it as you want.

Now, let's start adding some primitives to the scene. To add a sphere, for example, select *GameObject* > *Create Primitive* > *Sphere*.



You can see in your Hierarchy an object named **ParametricSphere**. Click on it, and all options will be available into the Inspector.



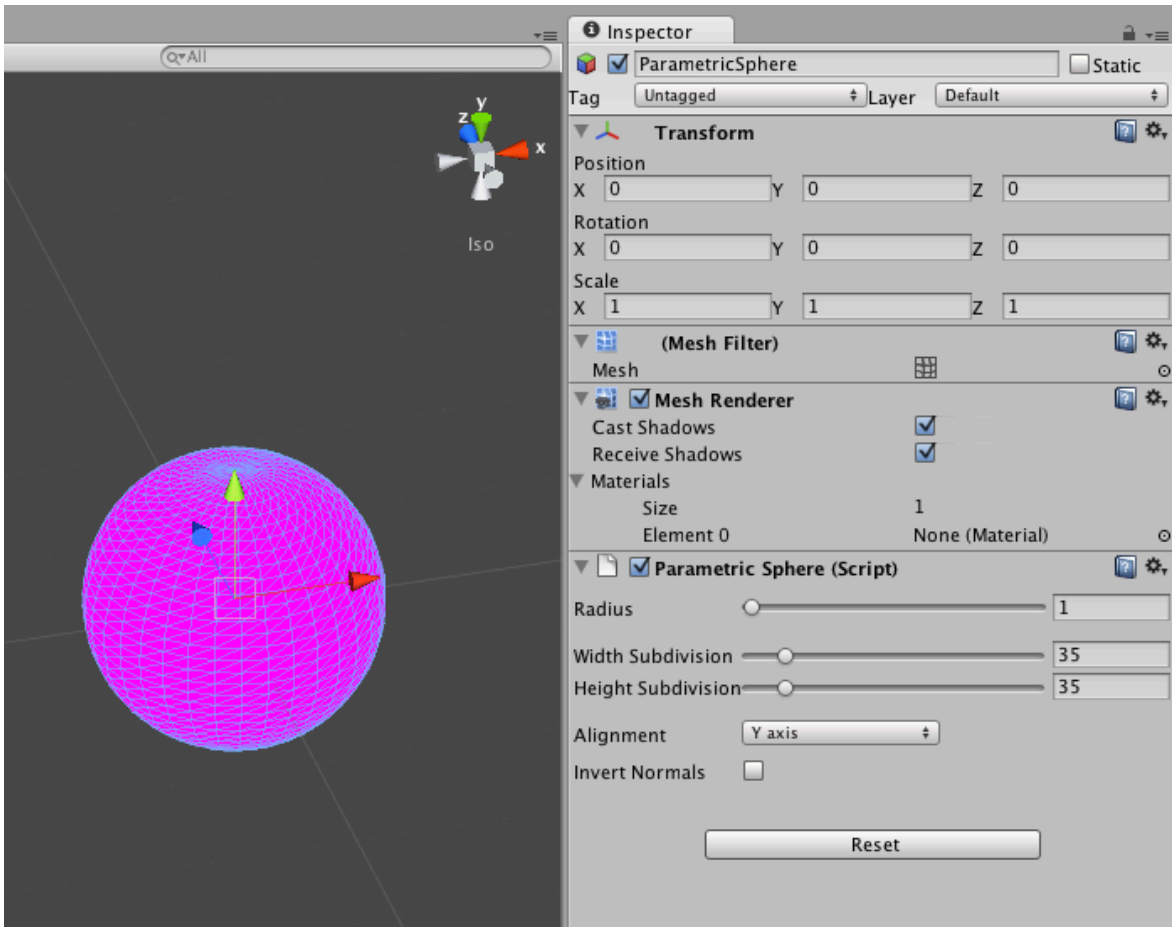
Let's focus on the Custom Sphere category, on red color on the screenshot.

You can change the radius of the sphere, the number of subdivision (to increase/decrease is precision). Increase them to obtain a look-like sphere.

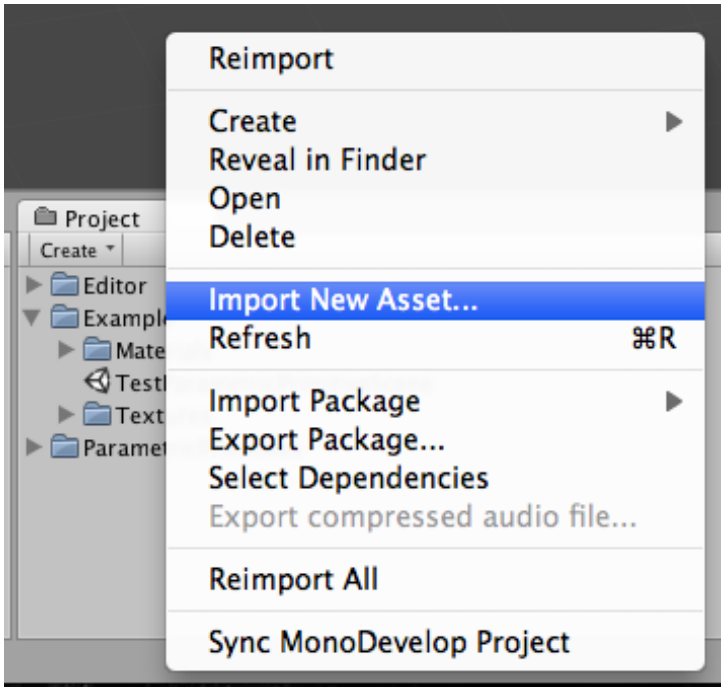
You can change the axis of construction of the primitive with Alignment toggle.

If you choose **Invert Normals**, you will create easily a skysphere.

By pushing the **Reset** button, you will delete all your modification by resetting all fields.

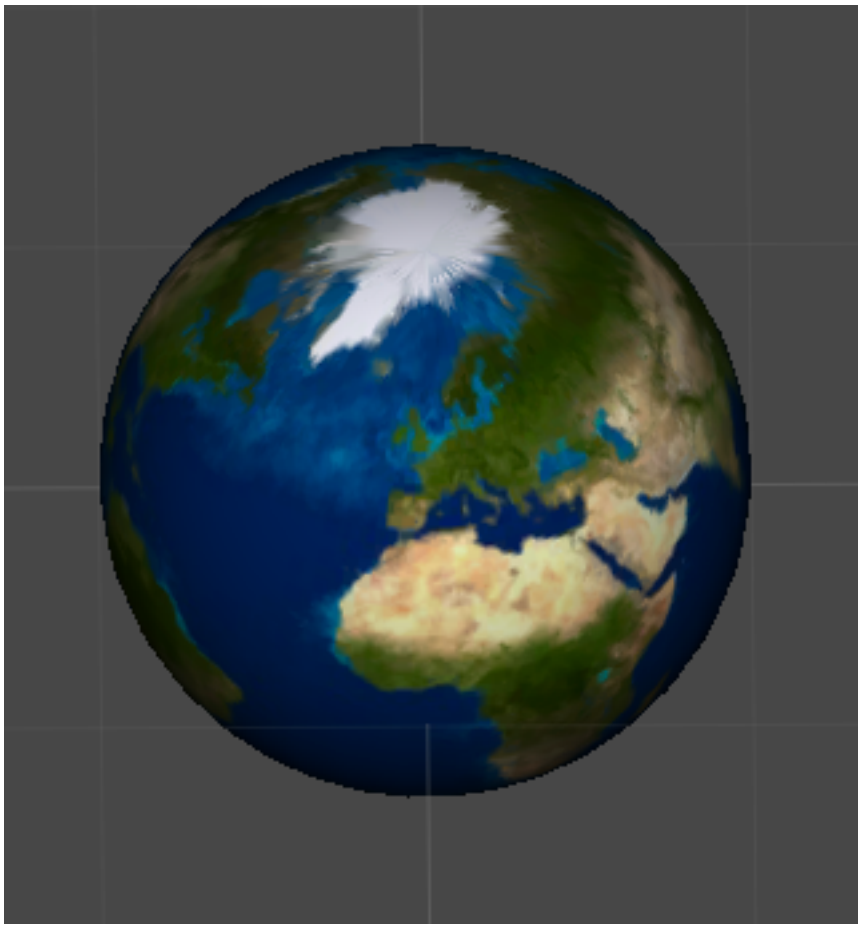


As a Unity3D primitive, add a texture by importing her into the project. Create a folder Texture by right clicking into the Project window, and selecting *Create* > *Folder*. Rename it Textures. Now right click on Textures Folder, and *Import New Asset*

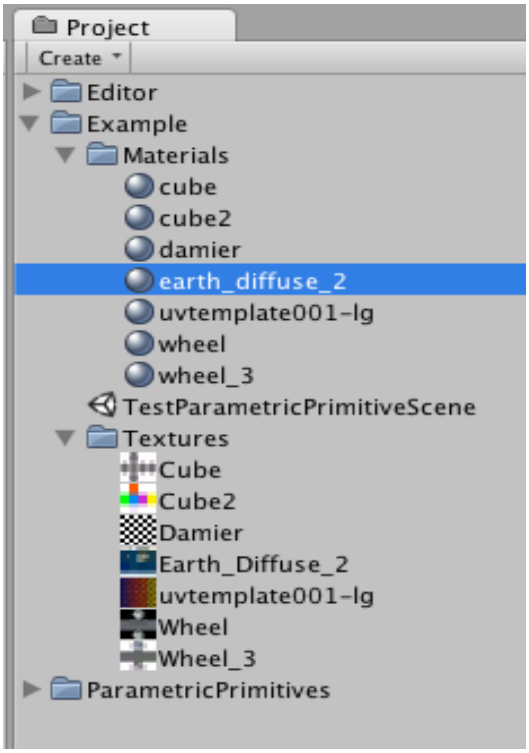


Choose your texture, and validate. You can see your texture inside **Textures** folder.

Dragging & dropping your texture inside your sphere will create the material for the sphere, and assign it to the sphere. You can see your sphere textured.



We recommend you to create another folder, named Materials, and drag & drop the new material inside, to keep a great hierarchy.



You can, as a usual Unity3D primitive, change all **Transform** parameters. But we recommend you to change primitives parameters inside the **Parametric Sphere** category with a (0,0,0) Rotation and a (1,1,1) Scale. After, you can change these parameters at your convenience.

2. Parameters

a. Plane

Width : Width of your plane (*The X-Axis with Alignment on the Y-Axis*).
value ∈ [0, +∞[

Height : Height of your plane (*The Z-Axis with Alignment on the Y-Axis*).
value ∈ [0, +∞[

Width Subdivision : Number of subdivision on the width axis.
value ∈ [1, 250]

Height Subdivision : Number of subdivision on the height axis.
value ∈ [1, 250]

Alignment : The axis of construction of your primitive.
value ∈ {X axis, Y axis, Z axis}

Invert Normals : Invert the direction of your normals.
value ∈ {true, false}

b. Cube

Width : Width of your cube (*The X-Axis with Alignment on the Y-Axis*).
value ∈ [0, +∞[

Height : Height of your cube (*The Z-Axis with Alignment on the Y-Axis*).
value ∈ [0, +∞[

Depth : Depth of your cube (*The Y-Axis with Alignment on the Y-Axis*).
value ∈ [0, +∞[

Width Subdivision : Number of subdivision on the width axis.
value ∈ [1, 40]

Height Subdivision : Number of subdivision on the height axis.
value ∈ [1, 40]

Depth Subdivision : Number of subdivision on the depth axis.
value ∈ [1, 40]

Alignment : The axis of construction of your primitive.
value ∈ {X axis, Y axis, Z axis}

Invert Normals : Invert the direction of your normals. Ideal to create a skybox.
value ∈ {true, false}

c. Sphere

Radius : Radius of your sphere.
value ∈ [0, +∞[

Width Subdivision : Number of subdivision on the longitudinal axis.
value ∈ [1, 250]

Height Subdivision : Number of subdivision on the latitudinal axis.
value ∈ [1, 250]

Alignment : The axis of construction of your primitive.
value ∈ {X axis, Y axis, Z axis}

Invert Normals : Invert the direction of your normals. Ideal to create a skysphere.
value ∈ {true, false}

d. Cylinder

Radius : Radius of your cylinder.
value ∈ [0, +∞[

Height : Height of your cylinder (*The Y-Axis with Alignment on the Y-Axis*).
value ∈ [0, +∞[

Width Subdivision : Number of subdivision on the longitudinal axis.
value ∈ [1, 40]

Height Subdivision : Number of subdivision on the latitudinal axis.
value ∈ [1, 40]

Top Subdivision : Number of subdivision on the top/bottom of the cylinder.
value ∈ [1, 40]

Alignment : The axis of construction of your primitive.
value ∈ {X axis, Y axis, Z axis}

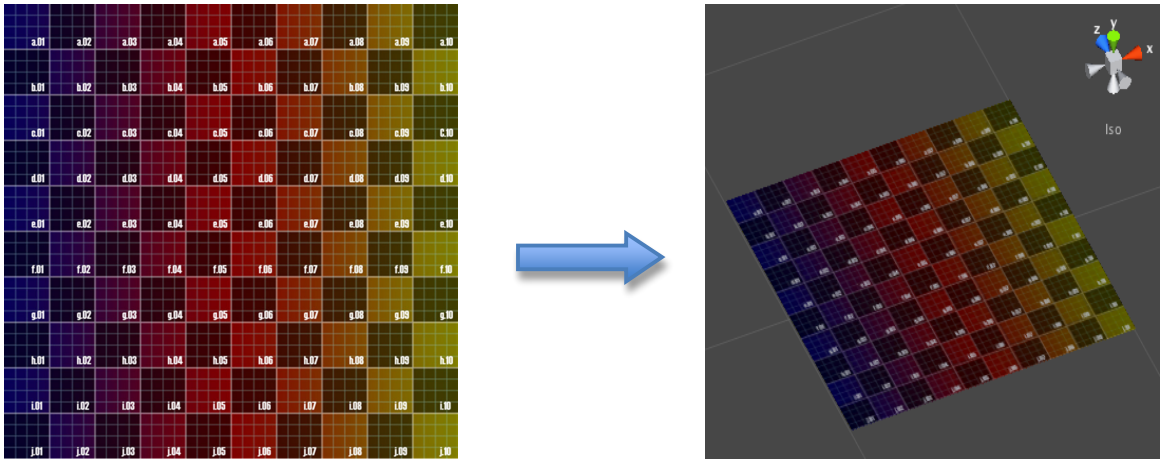
Invert Normals : Invert the direction of your normals.
value ∈ {true, false}

3. Texturing

a. Plane

You can use a rectangular image. If your plane isn't rectangular, the texture will be scaled.

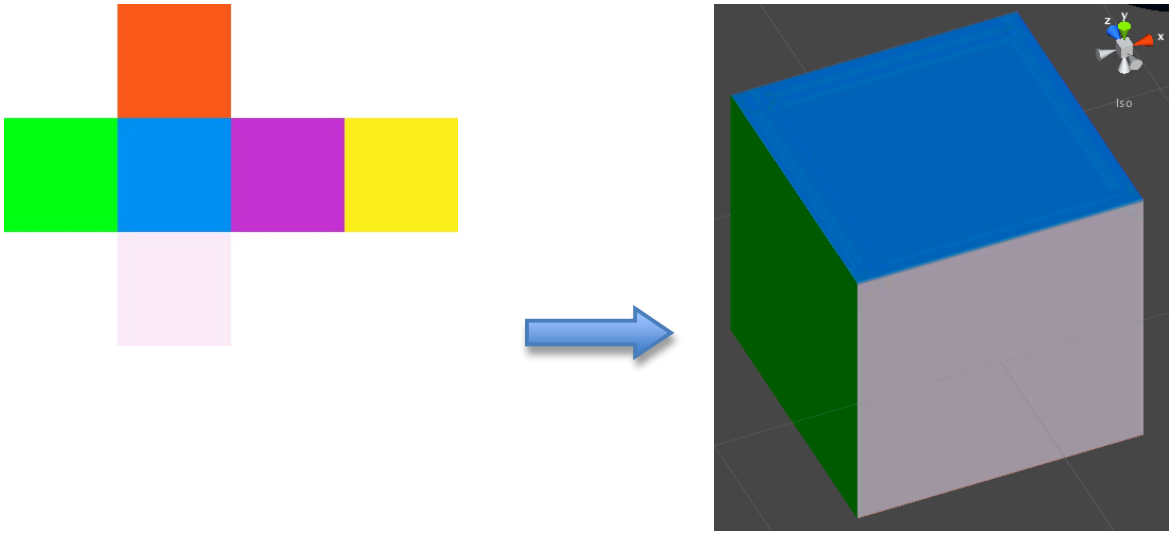
Example :



b. Cube

Each section must measure 1/3 size height, 1/4 size width.

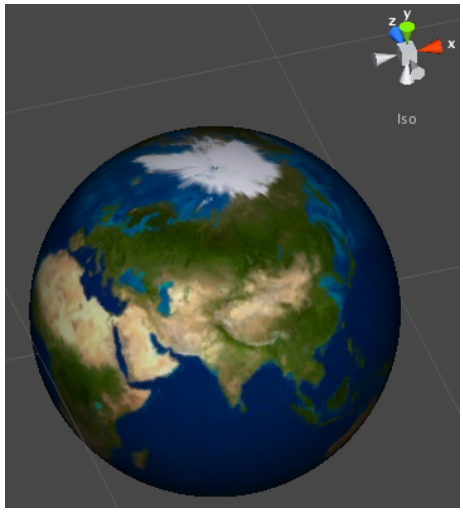
Example :



c. Sphere

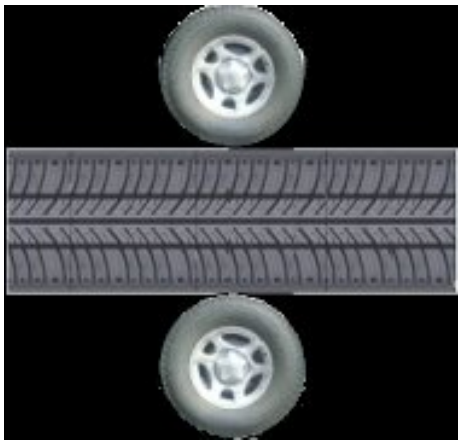
You can use a rectangular image

Example :



d. Cylinder

The texture of the cylinder must be placed in the center of the texture, and measure 1/3 size height. The two top circles must be placed on the center of the U-axis, with a u size of 1/3, and with a v size of 1/3. If your texture wasn't a square, you will obtain an ellipse on your texture (but still a circle on the mesh).



4. Q&A

Q : Why the number of subdivision is limited ?
A : Unity3D limits the number of vertice per mesh to 65000. If you choose a number of subdivision greater than the max number of subdivision, you will exceeded this vertex number and your object will not be shown.

Q : Is the width/height/depth/radius size limited ?
A : No, you can modify this number with the slider, but, if you want a size greater than the max of the slider, you can adjust it with the value field.