

Gear Factory

Gear Factory v1.x – Tutorials



This tutorial pack will cover the basic first time use of Gear Factory. We assume you know how to use Unity3D and are familiar with the interface, so we won't have to go into details on that stuff.

We also assume you know how to apply any material to an object in Unity3D.

Therefore the basic tutorials are as clean and simple as possible without anything else added to keep things simple.

All inspector navigation will be **[inside brackets, black and bold]** and menu navigation will be **[inside brackets, blue and bold]**. Steps will be separated by a ">"-sign. Side notes will be *italic*. And keys/clicks you have to press are inside brackets like enter/return: [ENTER], a-key: [A], up arrow: [UP], right mouse button: [RM] or combinations like [CTRL][A], [HOLD SHIFT][LM] etcetera.

All tutorials will be saved in their own scene. Tutorial scenes will also be integrated inside the gear factory package.

Want to know more: visit us at <http://www.atomiccrew.com/gearfactory/>

Contents

Gear Factory v1.x - Tutorials 2

 Setting up our tutorial project..... 4

 1 Basic Tutorial: spinning our first gears 5

 2 Gear me up: gears of different sizes 6

 3 Serious Gearing: get in control!..... 10

Setting up our tutorial project

Step 1:

Open Unity3D (we will be using the pro version 3.5.6f4)

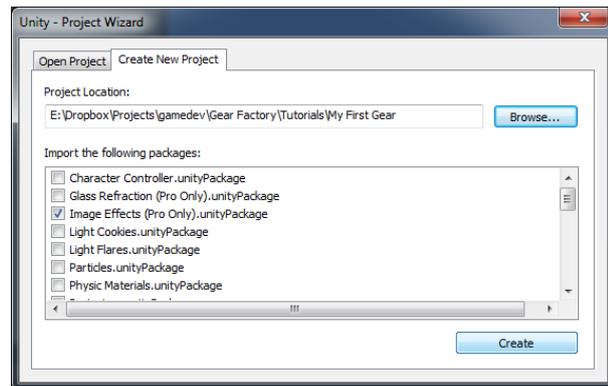
Step 2:

[\[File > New project...\]](#)

Let's call it "My First Gear"

Important: If you want to run the pro examples, you must pick Image Effects (Pro Only).unityPackage or import them at a later time.

If you don't, you get an error. If you don't want to: just remove the effect from the camera in all the pro scenes and it will run without the effects pack, but doesn't look as cool as it was meant to be. You can also choose to not import the pro example scenes off course. Whatever suits you best.



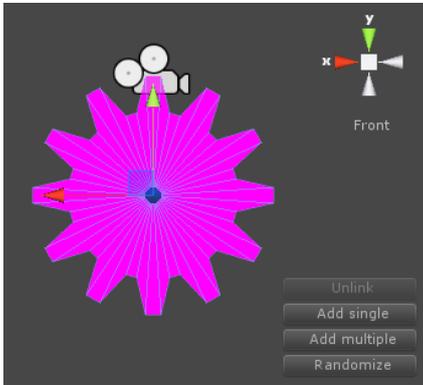
Step3:

Import the components from the asset store. As this is just a test project, we will import all assets. If you just want the core components: uncheck the examples sub tree. Click import and our project is ready!

1 Basic Tutorial: spinning our first gears

Step 1:

Now let's create some gears! To simplify our view, we switch to Front view in the editor. And we create a new gear by selecting from the main menu: [\[GameObject > Create Other ... > Gear Factory > Gear\]](#) or by choosing from the hierarchy create button sub menu: Create > Gear Factory.



To get the gear in view: select "Gear" from the Hierarchy pane, place the mouse cursor inside the scene pane and press [F]-key to get the gear in view.

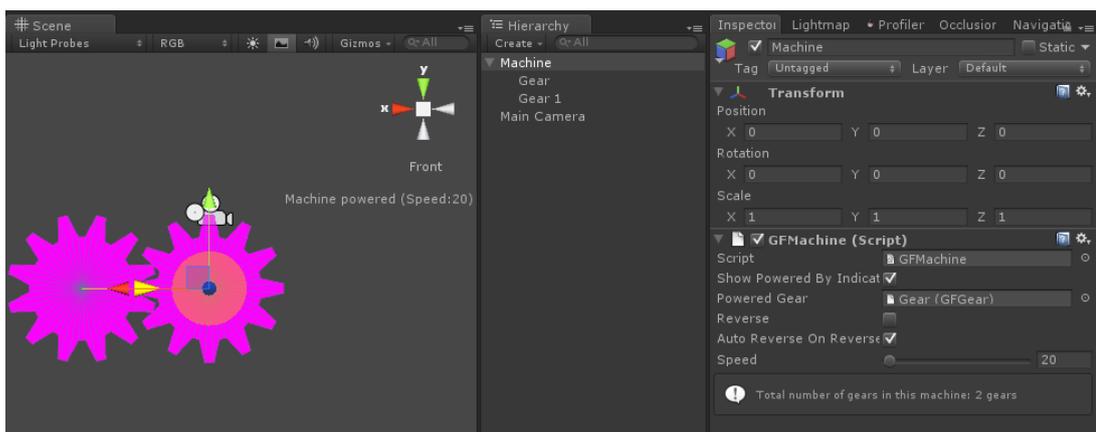
In the lower-right corner of your scene view you'll find your quick edit controls. These will allow you to quickly create large scenes (add single and add multiple) and to quickly set multiple settings (unlink and randomize).

Click on Add single and it will create a gear which is linked to our first gear. It's automatically sequentially named "Gear 1". You may rename it to whatever it is you like. Now these gears are not powered, yet.

Step 2:

Let's move some gears! This is the easy part. We create a machine object by choosing: [\[GameObject > Create Other ... > Gear Factory > Machine\]](#) or by choosing from the hierarchy create button sub menu: Create > Gear Factory. In the hierarchy pane: select both gears and drag them into the Machine object.

To let the machine know which gear should be powered: Select the Machine object in your hierarchy and drag the first gear named "Gear" from the hierarchy into your inspector [\[GFMachine > Powered Gear\]](#) slot.



Hit play and watch them turn. You can drag the speed slider of the machine to make them turn faster.

2 Gear me up: gears of different sizes

For this tutorial we are going to create even more gears. We continue from our scene, from the previous tutorial. This means we already have the two machine powered gears.

Step 1:

For some variation in speeds we are going to resize our second gear.

Note: As from version 1.1 the auto align also takes care of repositioning when the radius differs.

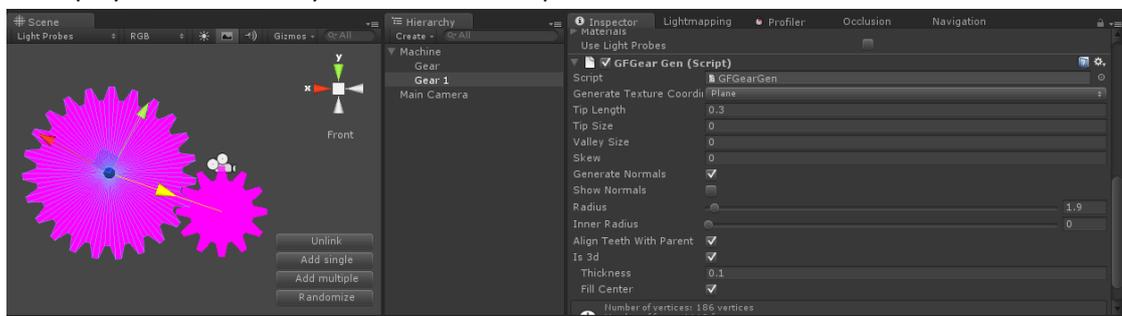
Select "Gear 1" in the hierarchy.

Step 2:

Change the radius by changing the value in the inspector [**GFGear Gen > Radius**] from 1 to some other value. The number of teeth will automatically change, it will automatically align the teeth with its parent and it will automatically reposition the gear to keep interlocked with its parent. This automatic behavior is all thanks to the option in the inspector [**GFGear Gen > Align Teeth With Parent**].

This is an option only available when using the procedural gears as we need to know where each tooth is and what each tooth size is.

Press play to see how they turn at different speeds based on their ratio.

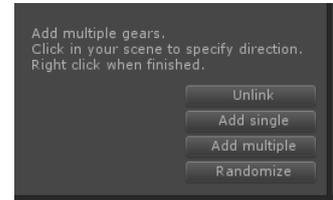


Step 3:

Adding more gears fast!

The Add multiple button.

To add more gears, there's a button called "Add multiple". This allows you to quickly add multiple gears. It switches into the "Add multiple"-mode and can be exited pressing the "Done"-button or by pressing right mouse button in the scene. Otherwise, each click in the scene is adding a gear. The new gear is cloned from the original or the previous added gear and is placed in the direction of the mouse cursor.



Select "Gear 1", click on "Add multiple".

Notice how the button is now called "Done". Pressing it will exit the "Add multiple"-mode.

Step 4:

Click once right above the large gear. A new gear is created straight above the large gear.

Step 5:

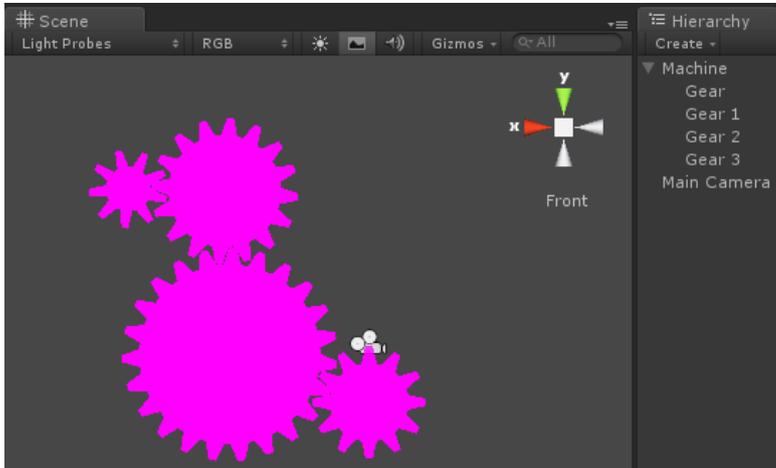
While in the mode, you cannot click inside the scene view without creating a new gear. But you can change the parameters in the inspector of the last added gear. This allows us to change its size to get some variation.

Set the radius a bit smaller.

Step 6:

Now click to the left of the last added gear. Another gear is created straight to the left. Set the radius even smaller. Press “Done” or right click inside the scene. The “Done” button caption is back to its old name and therefore know we exited the mode.

This should get you the following example scene:



Because all gears are automatically linked to its closest neighbor and because our “Add multiple” feature clones the gear with respect to its original parent. There are no special actions needed to make them turn!

Press play to see them turn.

Step 7:

The “Add multiple” button also works on existing configurations. So if you feel like expanding the machine fast: this is a good feature to use!

Select “Gear 2”.

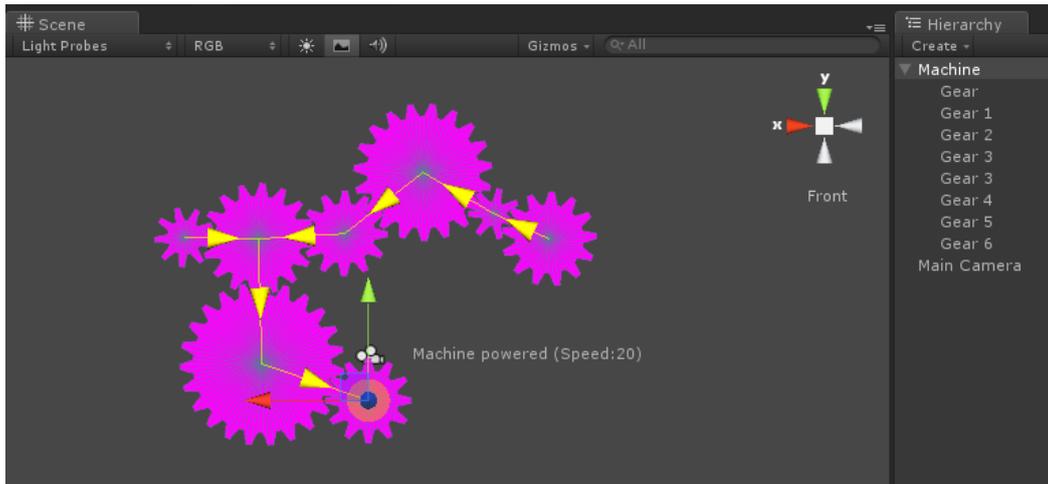
Step 8:

Click “Add multiple” again. And click to the right of the selected gear.

If you are not happy with the placement. Right click, move or delete the gear and redo step 8. Right click when finished.

Step 9:

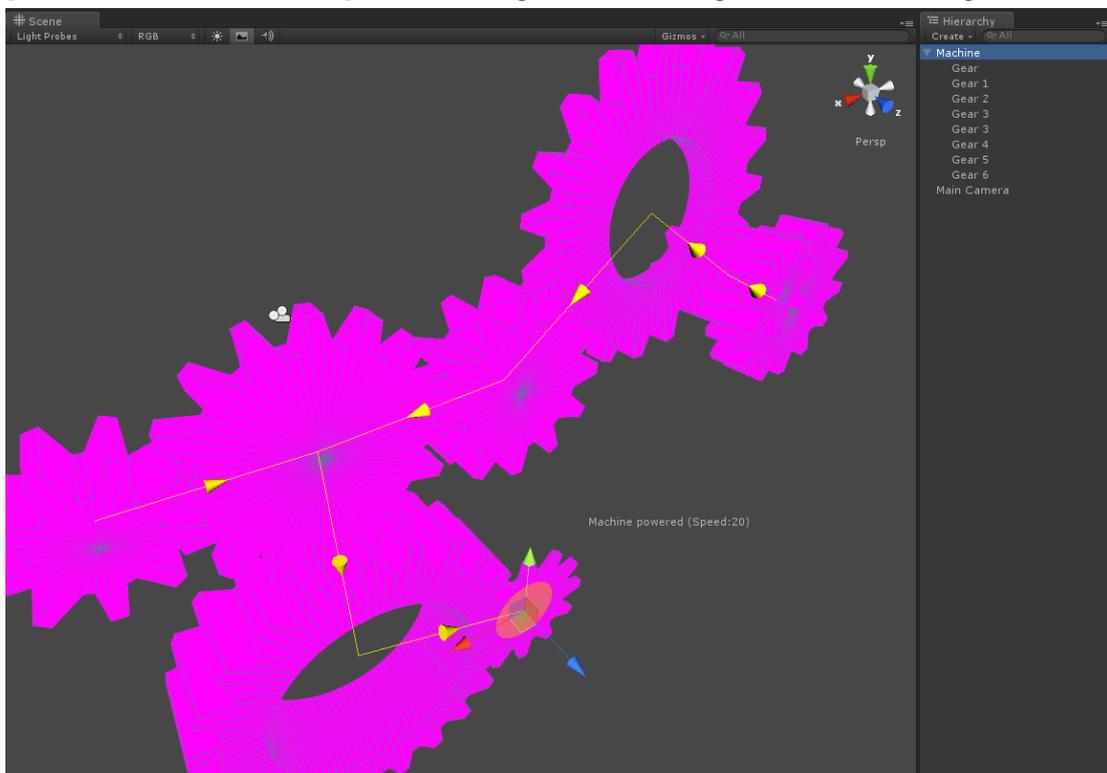
In the hierarchy select the Machine and you should get something like this:



The yellow arrows point towards the parent (the gear that is powering the gear at the start of the arrow). The yellow disc marks the gear that is powered by the machine component.

Step 10:

Change the view to a 3d perspective view and change some of the thickness to make it a bit more interesting to look at [GFGear Gen > Is 3d > Thickness]. And set the inner radius [GFGear Gen > Inner Radius] to a value larger than zero to get a hole inside the gear.

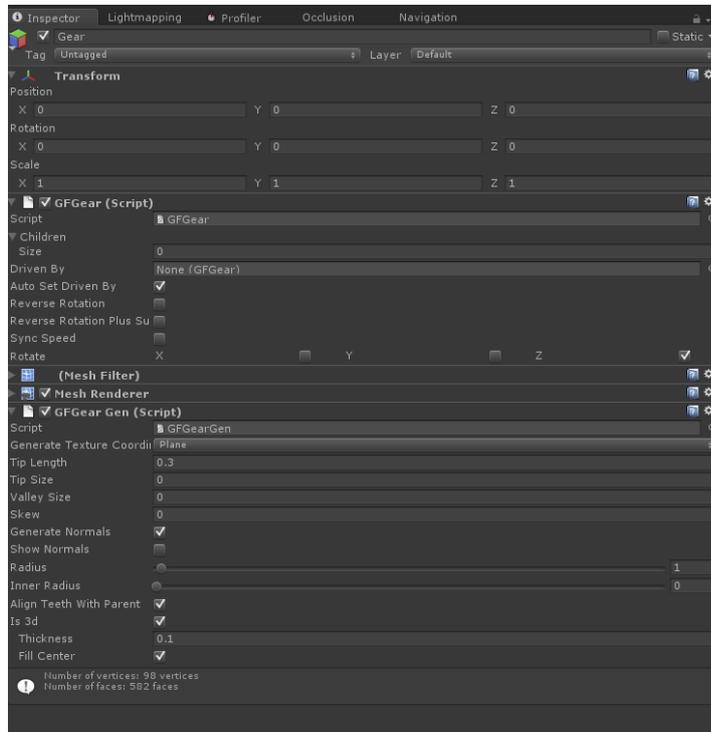


Press play in unity to see them turn.

3 Serious Gearing: get in control!

Now that we have learned some of the quick editor functions. We can get a bit more in-depth with the more advanced features.

Create a new scene. Create a gear [[GameObject > Create Other ... > Gear Factory > Gear](#)].



In the inspector we notice two Gear Factory components:

[GFGear] Component responsible for telling the Machine gameobject what and how to turn things. All motion related stuff of the gear will be specified in here.

[GFGear Gen] Component responsible for telling the GFGear and Mesh Filter how our generated gear looks and behaves. This component draws the gear. It will tell GFGear internally how many teeth there are on the mesh.

When “Align Teeth with Parent” is turned on, not only will it align the teeth and position it automatically, but

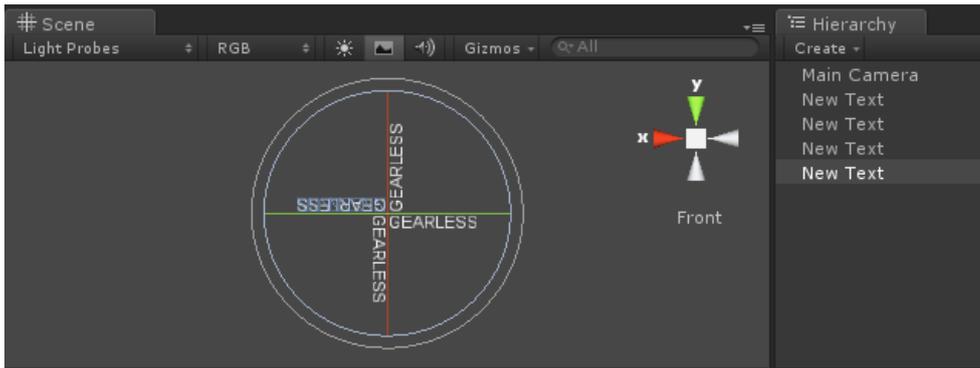
it will also calculate the number of teeth automatically based on the radius and number of teeth of its parent. Switching it off will reveal the setting to specify this manually.

- Delete all gears from your scene.

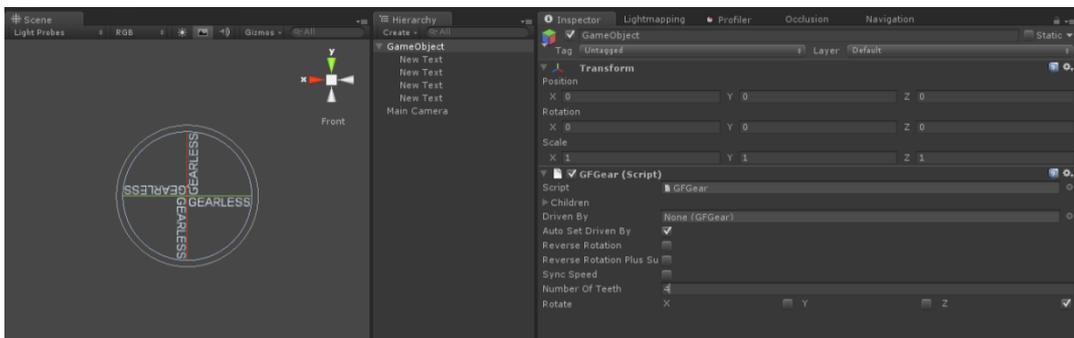
To show you the power of separation of concerns we are showing you how to power gears without actually having gears.

- Add [[GameObject > Create other > 3d Text](#)] and in [Text Mesh > Text] type the text "GEARLESS".
- Duplicate this text 4 times.
- Rotate them each on Z at 0, 90, -90 and 180 degrees.

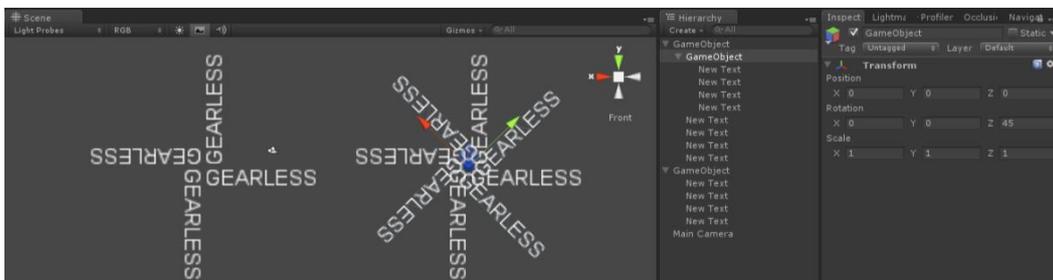
To get something like this:



- Put the texts in a new empty gameobject. Make sure all texts are still at 0,0,0 inside the empty gameobject.

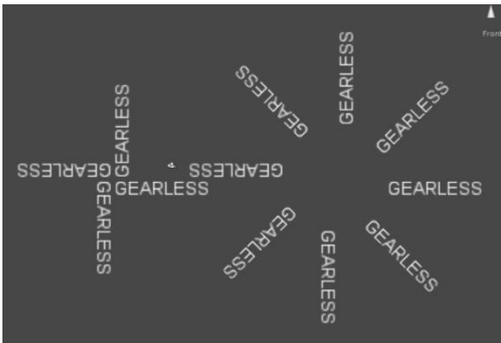


- Duplicate the gameobject
- Duplicate the gameobject again and drag it in the gameobject
- Rotate the gameobject we created in previous step by Z=45 degrees, to get something similar like this:

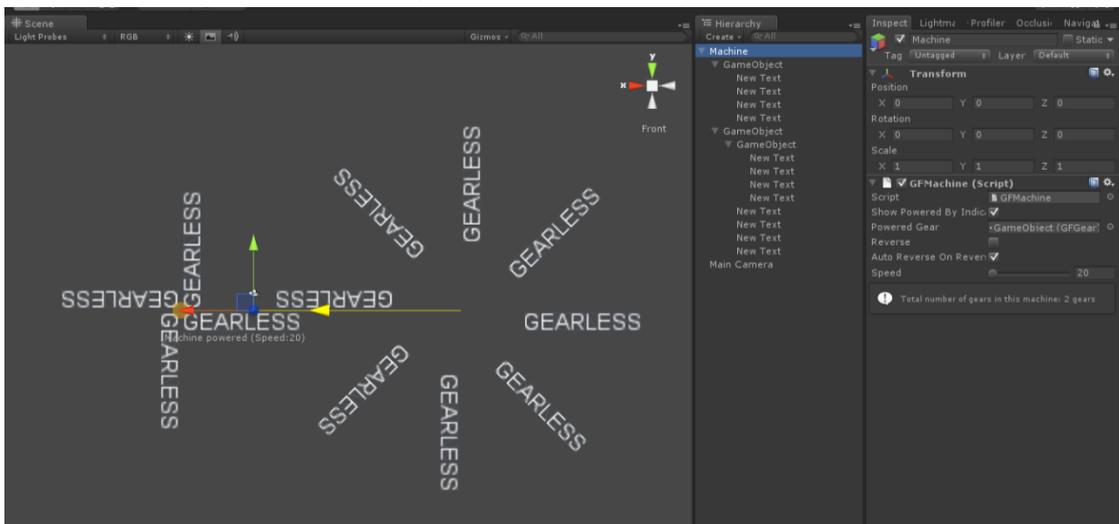


- Add the [[Component > Gear Factory > Gear](#)] to the two root main gameobjects.
- Set number of teeth to 4 and 8

- Scale the gameobject with 8 teeth to 1.5 or whatever scale feels nice. Or drag the text slightly outwards to make it a bit larger.



- Now we have to hook it up to a machine to get things going. Create a machine object [[GameObject > Create Other ... > Gear Factory > Machine](#)] and drag the gameobjects inside the machine to get something like the picture on the right side of this text.
- Select the machine. Drag the small 4 word game object inside the **[GFMachine > Powered Gear]** slot.
- Select the large 8 word gear and uncheck **[GFGear > Auto Set Driven By]**. This option only works with larger 3D objects and what it does is what we are going to do now manually: Drag the 4 word gameobject inside the **[GFGear > Driven By]** slot.
- Select the machine in the hierarchy and it should show up like this:



- Because the smaller 4 worded object hits the larger gear below the word of the 8 worded object. We want to rotate counter clockwise. Check the **[GFMachine > Reverse]**.
- Hit play and watch our texts rotate as actual gears!

Combine this with a procedural gear or with a mesh of your own, the possibilities are endless!