Blender Visualization Tutorial WS2014-15 II Part III

CELLmicrocosmos Cell Modeling Project WS2014-15,
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Version 12.11.2014

Forum:
http://www.cellvisualization.org

Direct link to this forum entry:
http://www.cellmicrocosmos.org/Cmforum/viewtopic.php?f=21&t=760

Actual Version of Blender:
http://www.blender.org

Here, Blender 2.7X is used.

Remarks

Some images were taken from the first version of this tutorial with 2.67b. So do not be confused, the explanation works also with the new version and where required, the images were updated. This tutorial is an update of the tutorial from WS2013-14. Please use this actual version, because it was slightly improved and extended.

Target

First, this tutorial describes how to create a simple plane with hills, stones and grass moving in the wind. Second, the swan from the previous tutorial is used to fly across this landscape.

Abbreviation

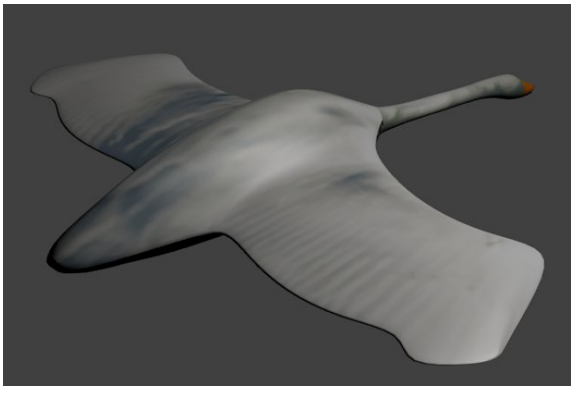
RMB Right Mouse Button

LMB Left Mouse Button

! For using most of the shortcuts discussed in this tutorial, you have to be sure that the mouse cursor is WITHIN the view port of the 3D View !

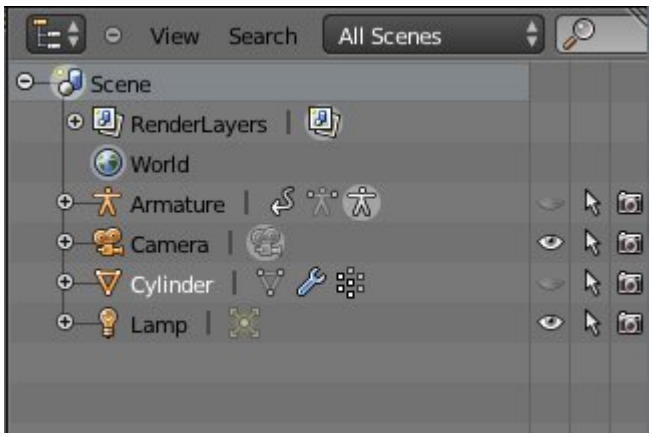
Base

Blender Visualization Tutorial WS2014-15 II Part II



Hide the Swan – let him make a nap!

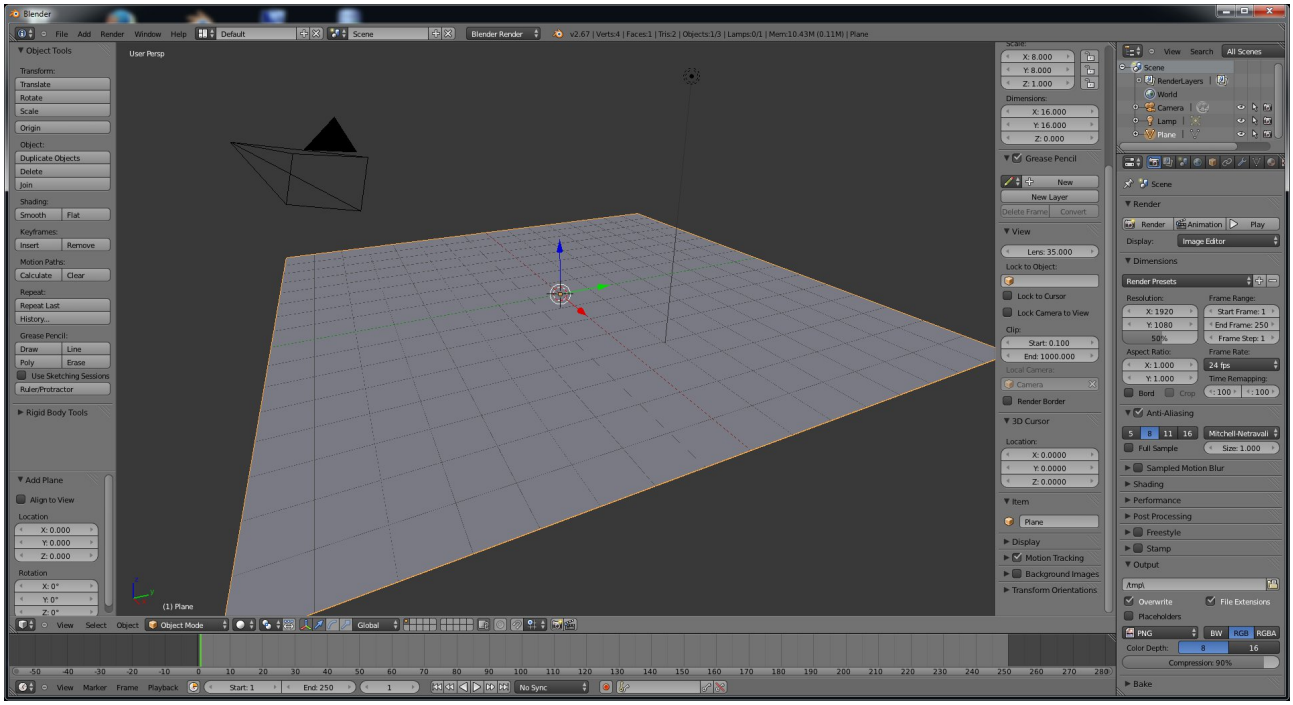
First, open your project containing the actual version of your swan from the previous tutorial. You can move the whole swan aside or just hide him using the Outliner. Just click on the eye symbol to hide the objects, in my example they are called “Cylinder” and “Armature”. You can also give the objects more reasonable names by using RM and selecting “Rename”.



The Plane

Create a plane: Add → Mesh → Plane

Set the position to (0, 0, 0) and the size to 16 X 16 (X/Y), so that the whole Blender viewport area is filled.



Go to Edit Mode, subdivide this base pane 4 times (with shortcut w)

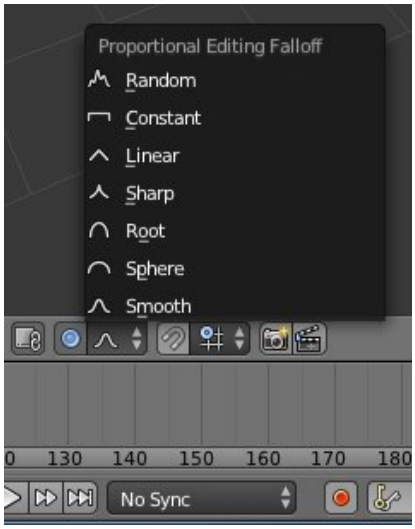
Set Shading to Smooth

Proportional Editing/Falloff

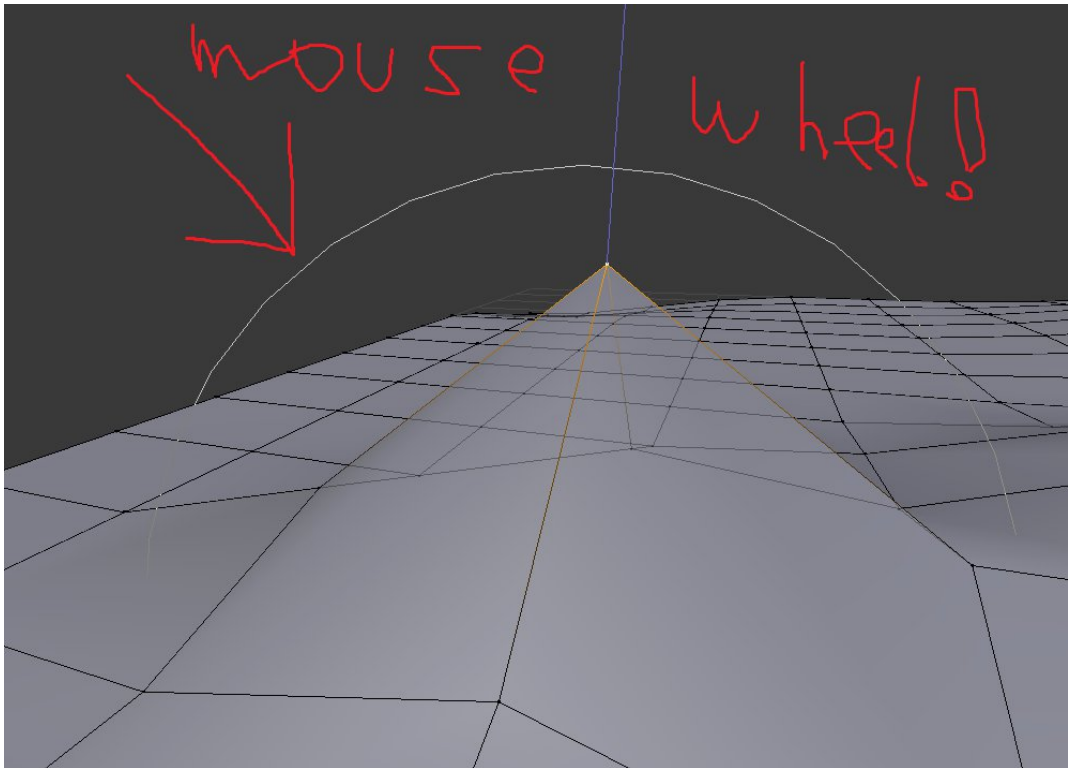
First activate the Proportional Editing mode by selecting the blue circle

Then, additional options appear, see image below, e.g.:

Select: Smooth → Circle-like smooth fall-off



To change the falloff, this means the vertices affected by proportional editing, choose one of the manipulators you already know (by pressing G or R or S) and move then the mouse wheel. The size of the white circle changes now – and it is exactly this circle which allows you to define the affected area (see image below)



The size of the circle is toggled by the mouse wheel! Attention: It may happen that the circle is very large and you do not even see it in the view port. Remember: move the mouse wheel away from you (in the opposite direction) and the circle shrinks. Do this, in case the circle is not visible, until you see the circle again!

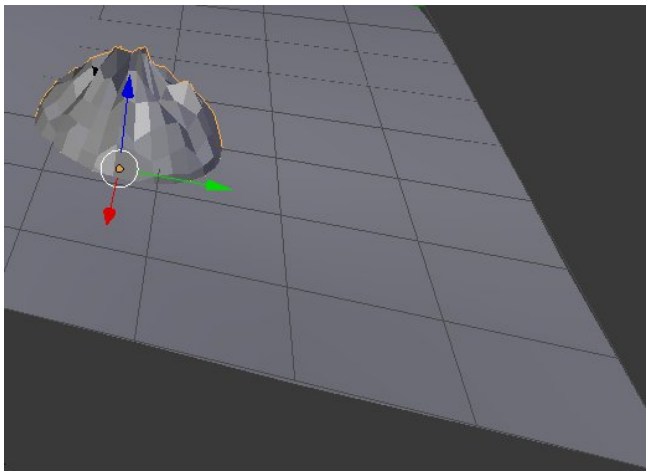
The Stone and the Hole

Back to Object Mode, add a “UV Sphere”

Change this sphere to a stone-like structure with an uneven surface by using proportional editing and the random function:

Random → generates rough edges

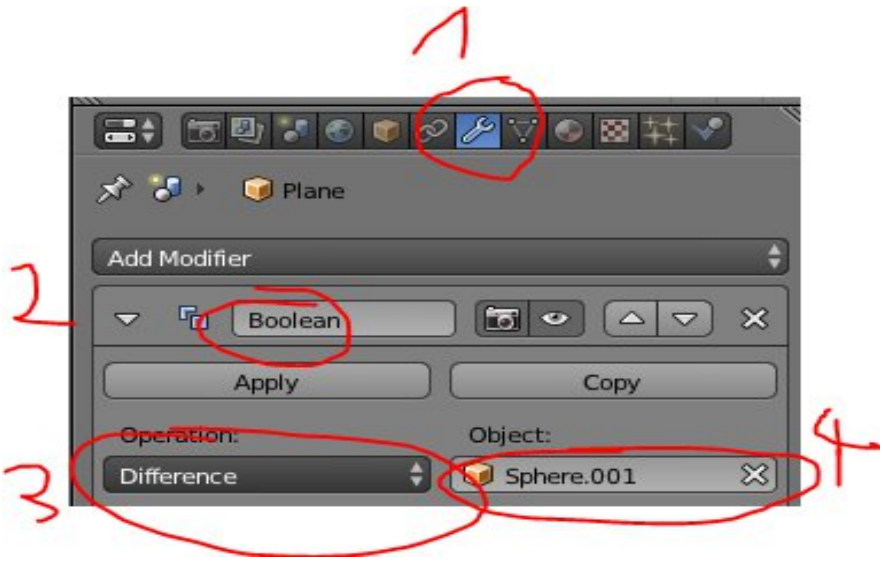
Back to Object Mode, place it into the correct place where it should stay



Duplicate it with CTRL+C and CTRL+V. Now, a second object was created with the same properties of the previous one.

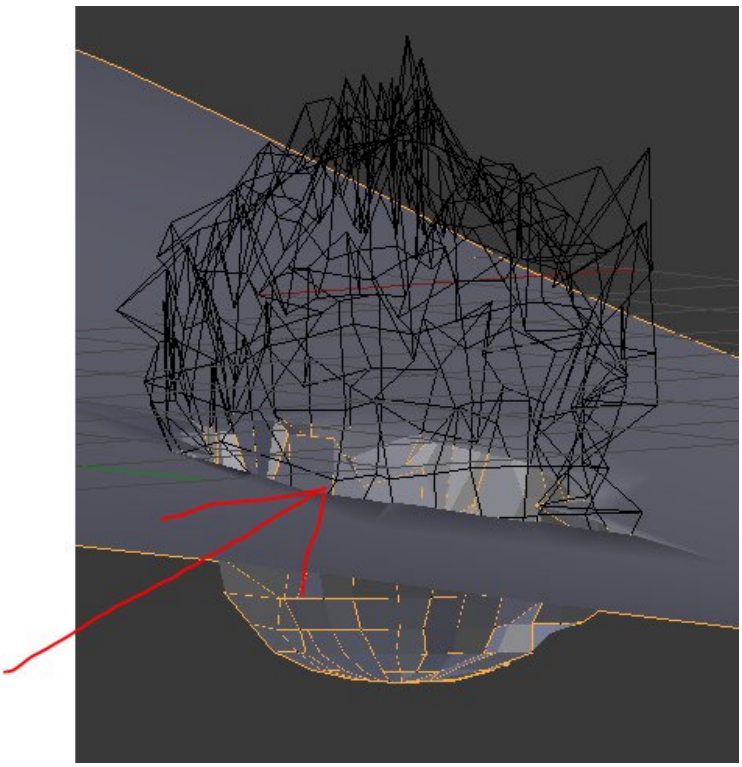
Hide one Sphere/Stone object

Go to the 1) Modifiers panel, add 2) a Boolean Modifier to the plane to create holes inside the plane during the next steps. These holes should prevent that the grass – which will be generated in the next steps – will be placed *inside* the stones!

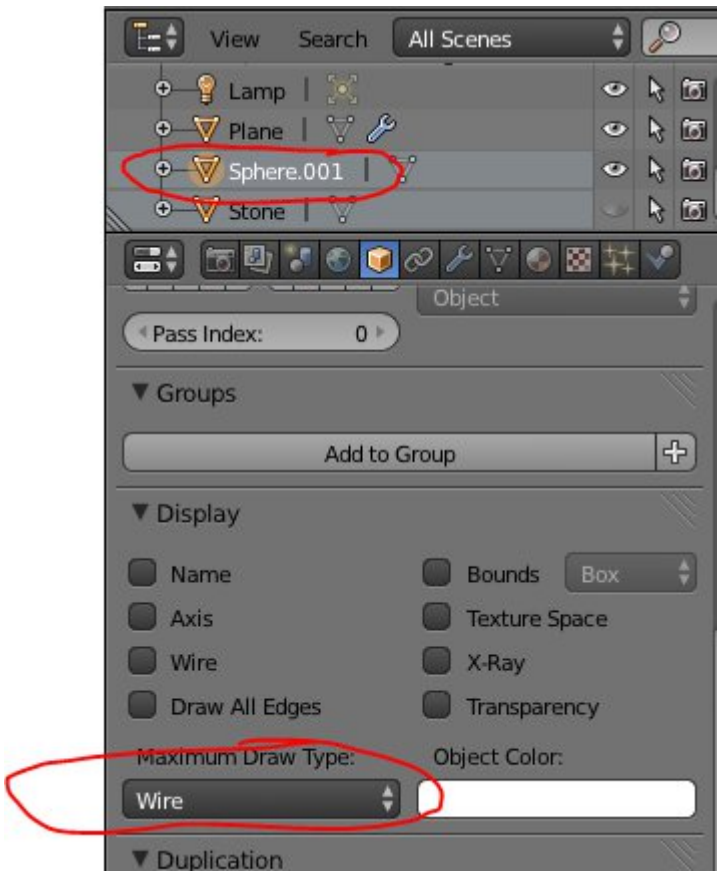


Select 3) “Difference” and then choose the 4) visible sphere the object of choice

What has happened now? The plane was combined with the sphere, and the part of the sphere intersecting the plane was subtracted from the plane and the mesh of the plane was passed along the bottom part of the sphere:

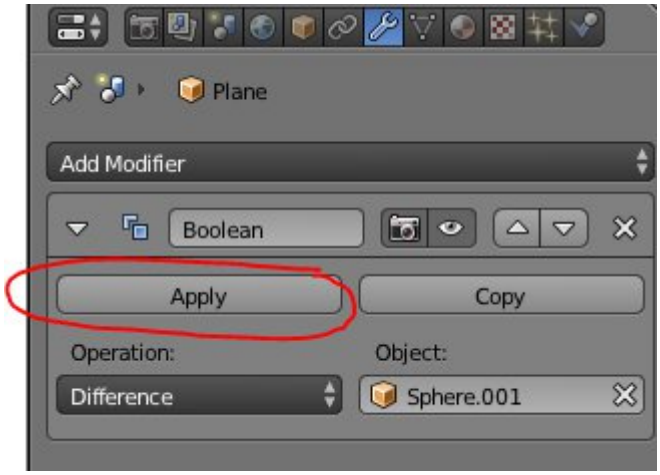


Here, the sphere was switched to wire mode to be able to see resulting plane in the background. You can use this mode to move the sphere around an observe how the plane changes and find the optimal position in your environment.



Now, after finding the optimal position, select the plane. Go again to the Boolean modifier and click to “Apply”. Now the Boolean modifier disappeared and you cannot change the position anymore. But now it is possible to edit the complete mesh.

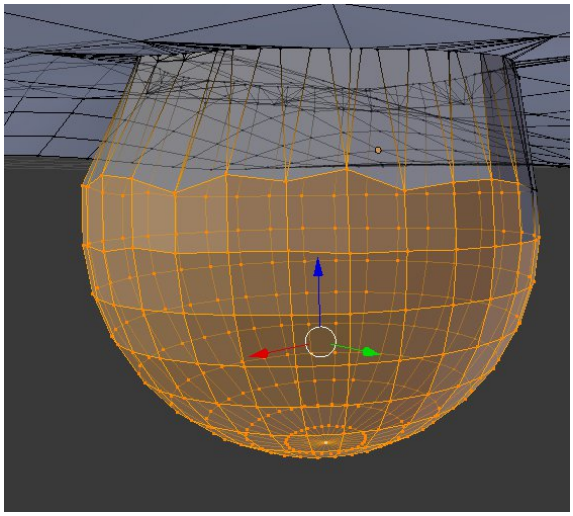
→ Blender_Tutorial_WS2014-15_2pt3__1.blend



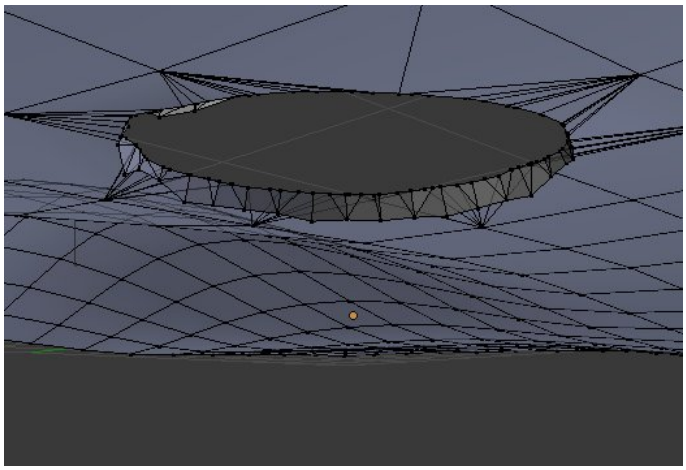
Now, we want to delete the hemisphere, we only want to have a hole in the plane there in the end.

There are different ways to do so. You may go to edit mode, use proportional editing but this time in constant mode, select the center point of the sphere with RM and use the scroll wheel as you know to select the whole sphere and then move it apart.

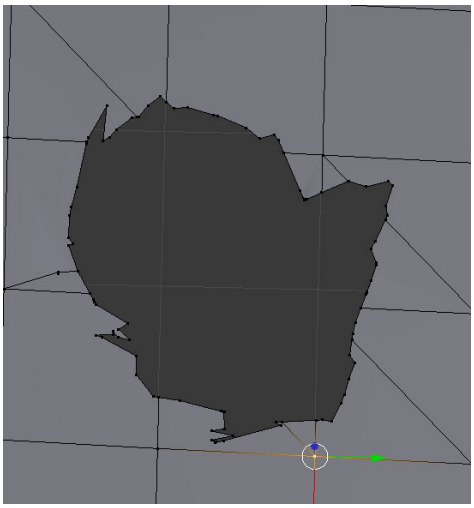
After this, use CTRL+LM to select the whole part which should be deleted, then press DEL and delete it.



The hole could look like this:



Or this:



→ Blender_Tutorial_WS2014-15_2pt3__2.blend

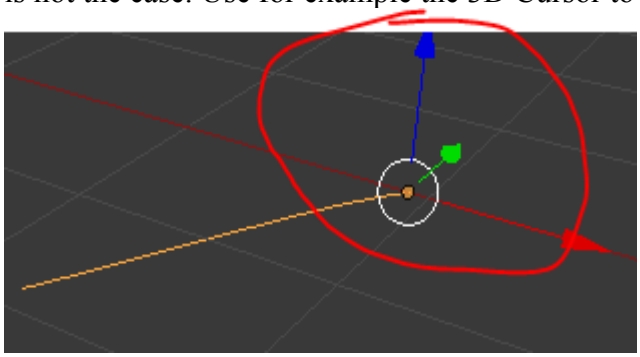
A Blade of Grass

Now, we will start to add grass, because the whole area still looks quite boring.

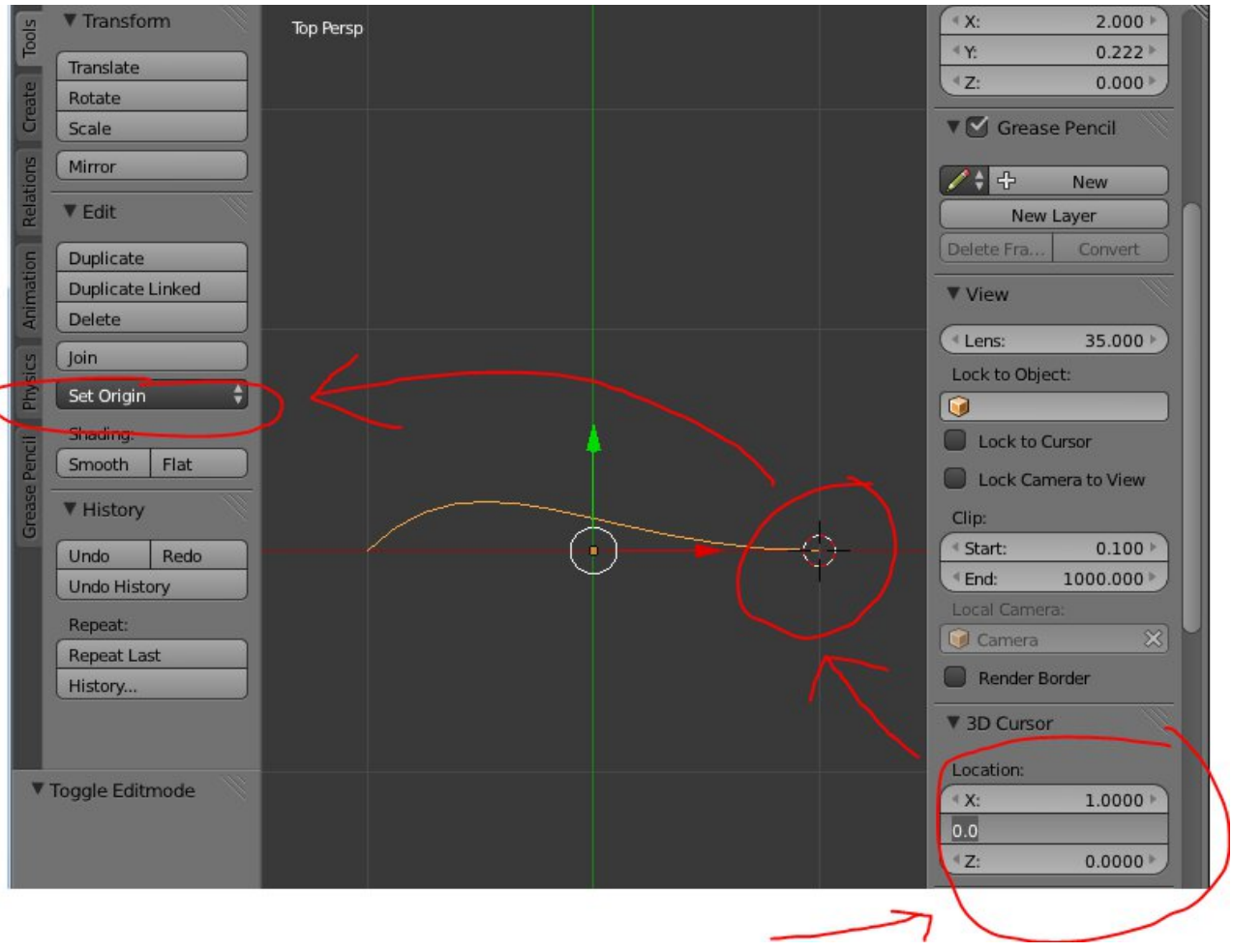
First, we need a small piece of grass. You may hide the actual plane first.

Add → Curve → Bezier

Make sure that the Origin of the Bezier Curve is add the bottom of the object. In the beginning, this is not the case. Use for example the 3D Cursor to reposition the Origin



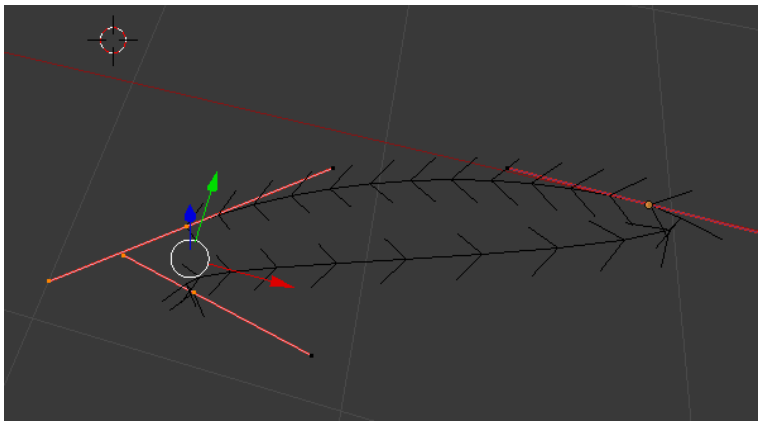
You find the options here:



Now, go to edit mode and add a second strand by using “e” for extrude.

By the way, make sure that the proportional editing mode is deactivated now! 

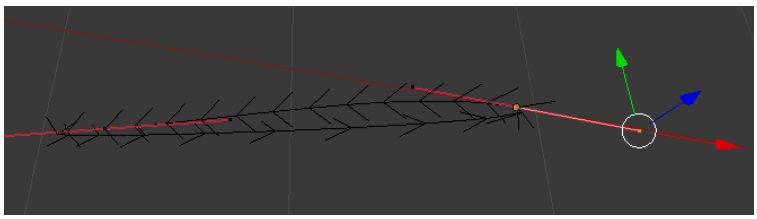
The two lines are not connected, for this purpose, just select the last two nodes.



And then connect then by using “Make Segment”, just press f

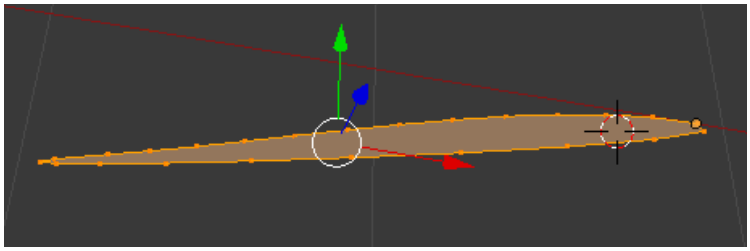
They are now connected, now you can delete the new generated connecting node, the two lines will still be connected afterwards

Adjust now the Bezier curve to create a nice grass blade



Because we want to have a surface on our grass blade, we have to convert it to Mesh; use ALT+C for example for this purpose and select “Mesh from Curve ...”

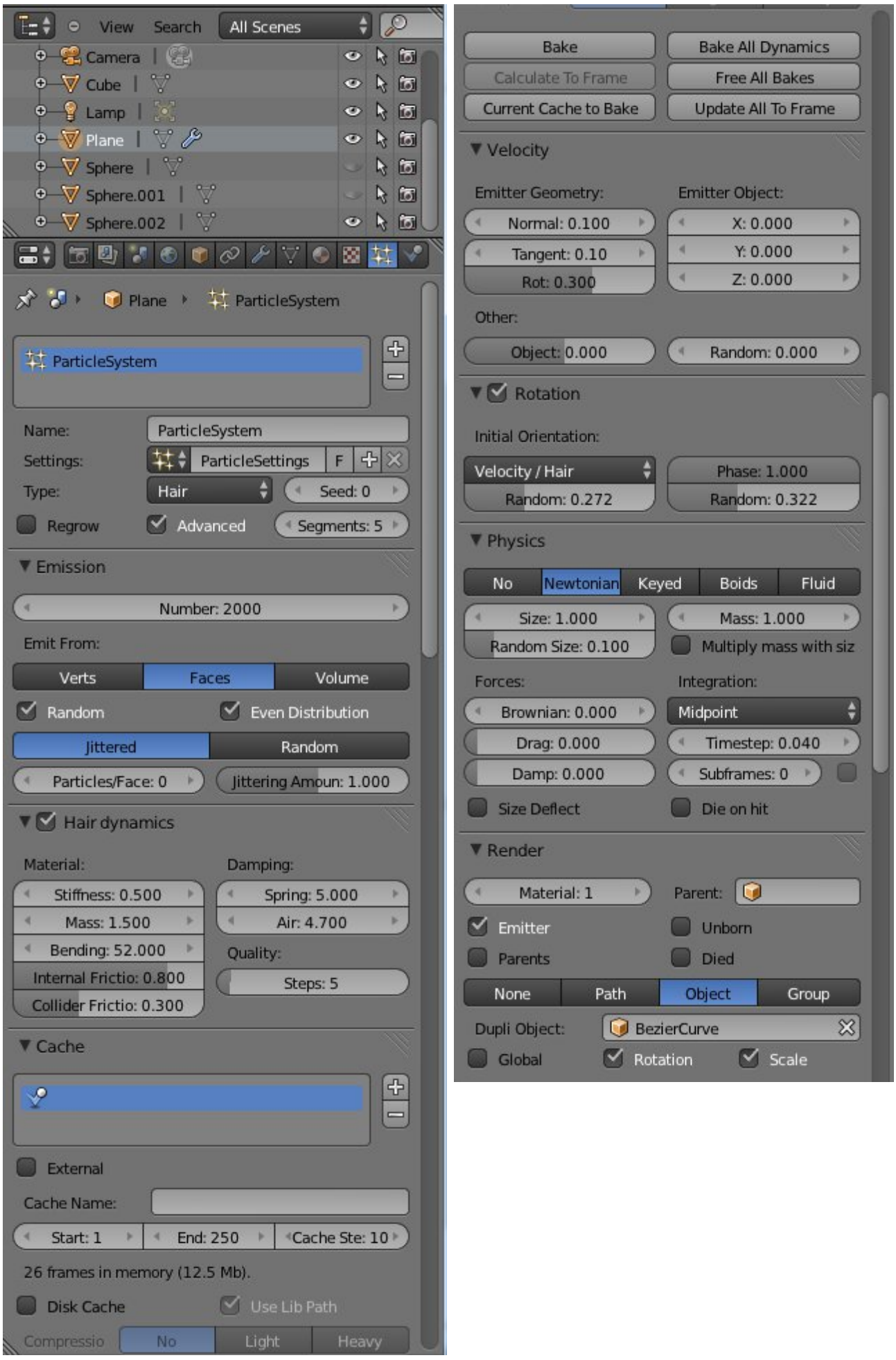
Go back to edit mode, select all points and create a face by pressing f again

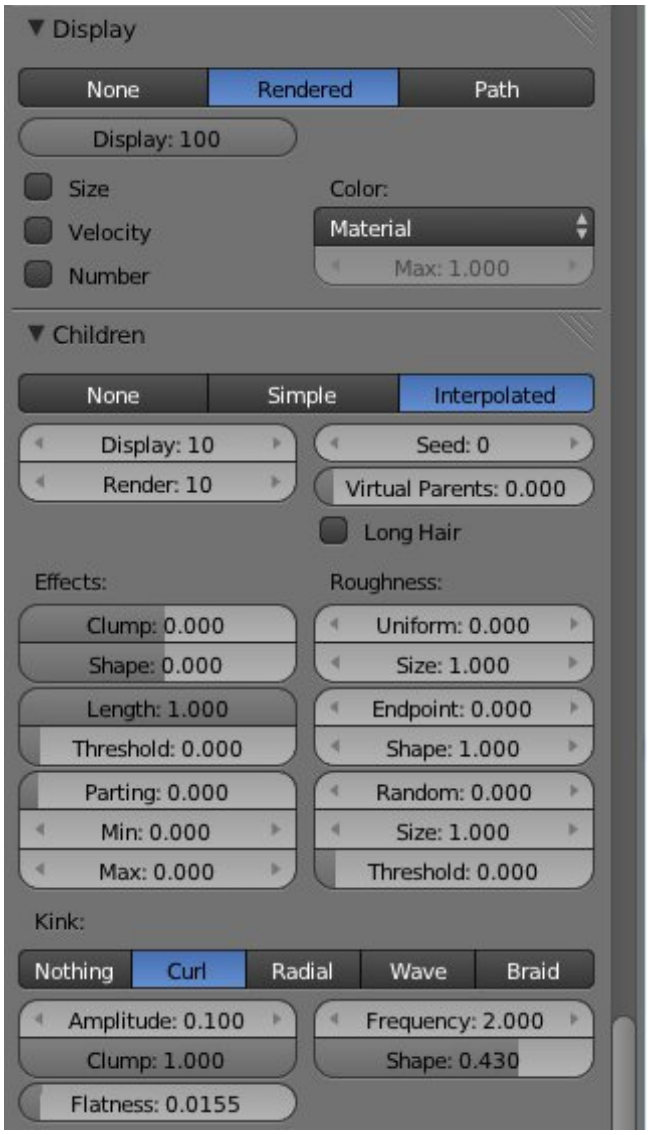


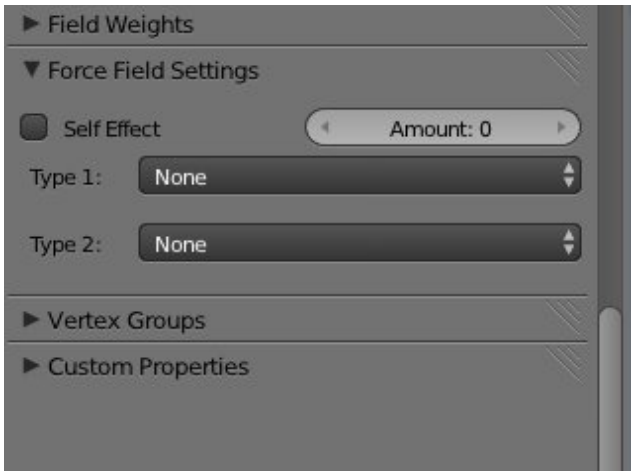
Finally, make sure that the Origin is still in the right position (the green point)!

Grass Land

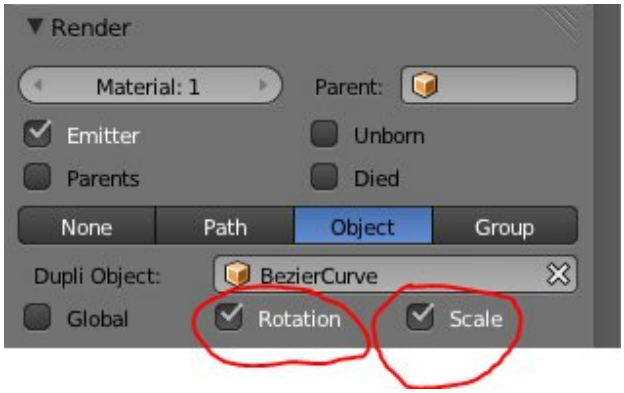
Add now a Particle System:


View
Search
All Scenes
Camera
Cube
Lamp
Plane
Sphere
Sphere.001
Sphere.002
Plane
ParticleSystem
ParticleSystem
Name:
ParticleSystem
Settings:
ParticleSettings
F
Type:
Hair
Seed: 0
Regrow
Advanced
Segments: 5
Emission
Number: 2000
Emit From:
Verts
Faces
Volume
Random
Even Distribution
Jittered
Random
Particles/Face: 0
Jittering Amoun: 1.000
Hair dynamics
Material:
Stiffness: 0.500
Mass: 1.500
Bending: 52.000
Internal Frictio: 0.800
Collider Frictio: 0.300
Damping:
Spring: 5.000
Air: 4.700
Quality:
Steps: 5
Cache
External
Cache Name:
Start: 1
End: 250
Cache Ste: 10
26 frames in memory (12.5 Mb).
Disk Cache
Use Lib Path
Compressio
No
Light
Heavy
Bake
Bake All Dynamics
Calculate To Frame
Free All Bakes
Current Cache to Bake
Update All To Frame
Velocity
Emitter Geometry:
Normal: 0.100
Tangent: 0.10
Rot: 0.300
Emitter Object:
X: 0.000
Y: 0.000
Z: 0.000
Other:
Object: 0.000
Random: 0.000
Rotation
Initial Orientation:
Velocity / Hair
Random: 0.272
Phase: 1.000
Random: 0.322
Physics
No
Newtonian
Keyed
Boids
Fluid
Size: 1.000
Random Size: 0.100
Mass: 1.000
Multiply mass with siz
Forces:
Brownian: 0.000
Drag: 0.000
Damp: 0.000
Integration:
Midpoint
Timestep: 0.040
Subframes: 0
Size Deflect
Die on hit
Render
Material: 1
Parent:
Emitter
Unborn
Parents
Died
None
Path
Object
Group
Dupli Object:
BezierCurve
Global
Rotation
Scale





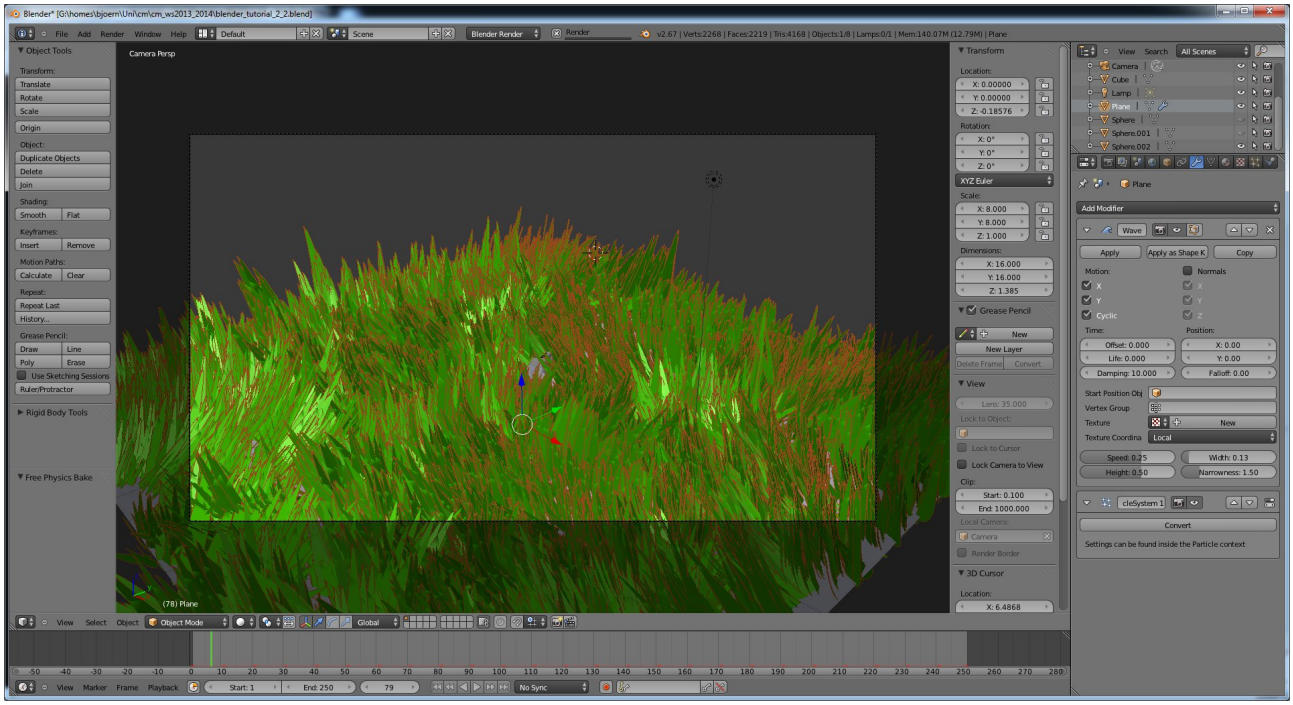
In these images, there is already a Grass Blade added. Add the grass blade now in the following way:



If you change now the rotation of this blade, the rotation also of the blades on the plane will change

Make sure that in the Particle System the BezierCurve is chosen (your grass blade) and Rotation and Scale are selected.

This is how the result could be:



So the grass has to point upwards. After you have done the steps previously discussed, it still may be that the grass is pointing into the opposite direction.

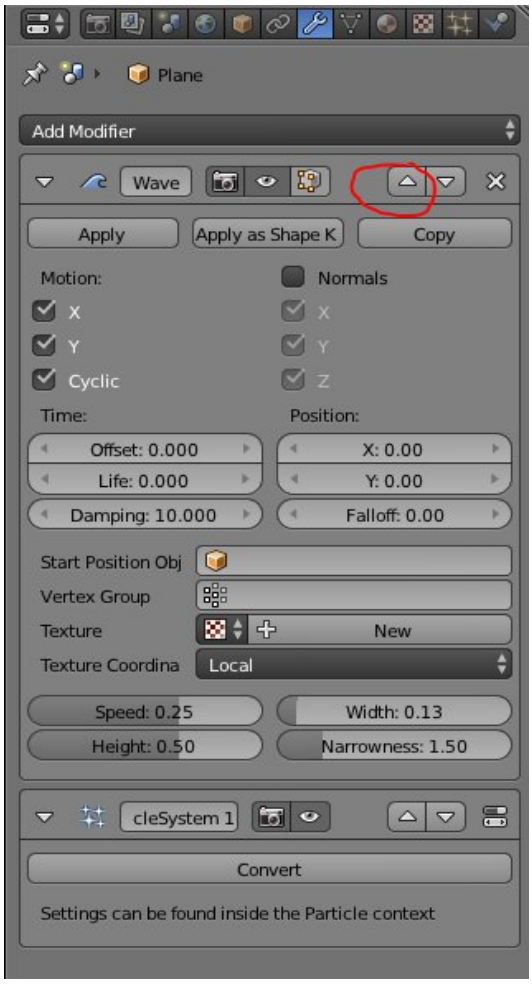
To change this, select the original grass blade, change to edit mode (!), select the complete grass blade (e.g. with shortcut a) and

- rotate it, if it is pointing into the wrong direction,
- scale it, if it is too large or too small,
- and always keep in mind, that the origin in the end have to be at the bottom of your grass blade; you can also just correct the position by moving it towards the origin.

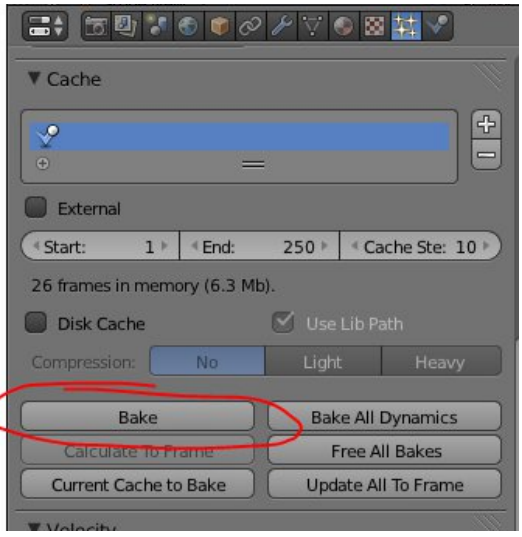
→ Blender_Tutorial_WS2014-15_2pt3__3.blend

Moving Grass

Finally, add a Wave modifier to the plane to keep the grass moving! Please be aware that the Wave modifier has to placed on top of the Particle System. If it is not directly placed there, then press the arrow (red circle) to move it upwards.



Because we are using a Physics engine here and some special properties in the particle system, we need to “bake” the system. Go to the particle system, find the Cache section and press “Bake”.



→ Blender_Tutorial_WS2014-15_2pt3__3.blend

Importing the Swan

We have now the environment and we have the swan!

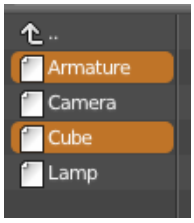
If your swan is in the same file, where the landscape is located, you just have to make it visible again *and you can skip the rest of this section now.* If this is not the case – which means that the swan is in one file and the landscape in the other one – the do the following steps:

Make sure your swan is saved and open the last version of your landscape now.

Now go to

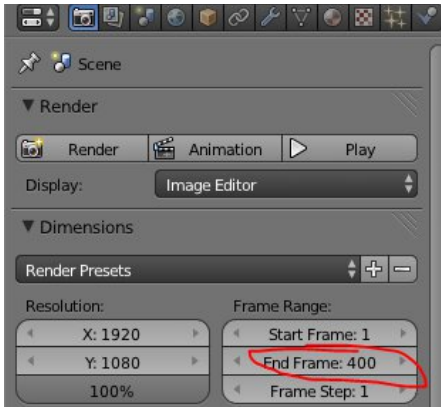
File → Append …

and select the last version of your swan file. If you click on this file, you see a number of folders. Select the one names "Object" and then select the mesh and the bones (your names might differ):



You do not need other objects, now click "Link/Append from Library". Your swan should appear now in the center of your world.

Now first remember to adjust the length of your animation to 400:



Note: If you have past the previous tutorials, check this:

- If you have used the Ocean effect, remember that you have created a key frame for the "Time" variable, move this now to frame 400 by using e.g. the DopeSheet editor or just make another key frame for "Time".
- If you have used the grass effect, the cache might be limited to the old end frame. Change this one to 400 and bake it again. In my case, the previous animation was limited to 250 frames.)

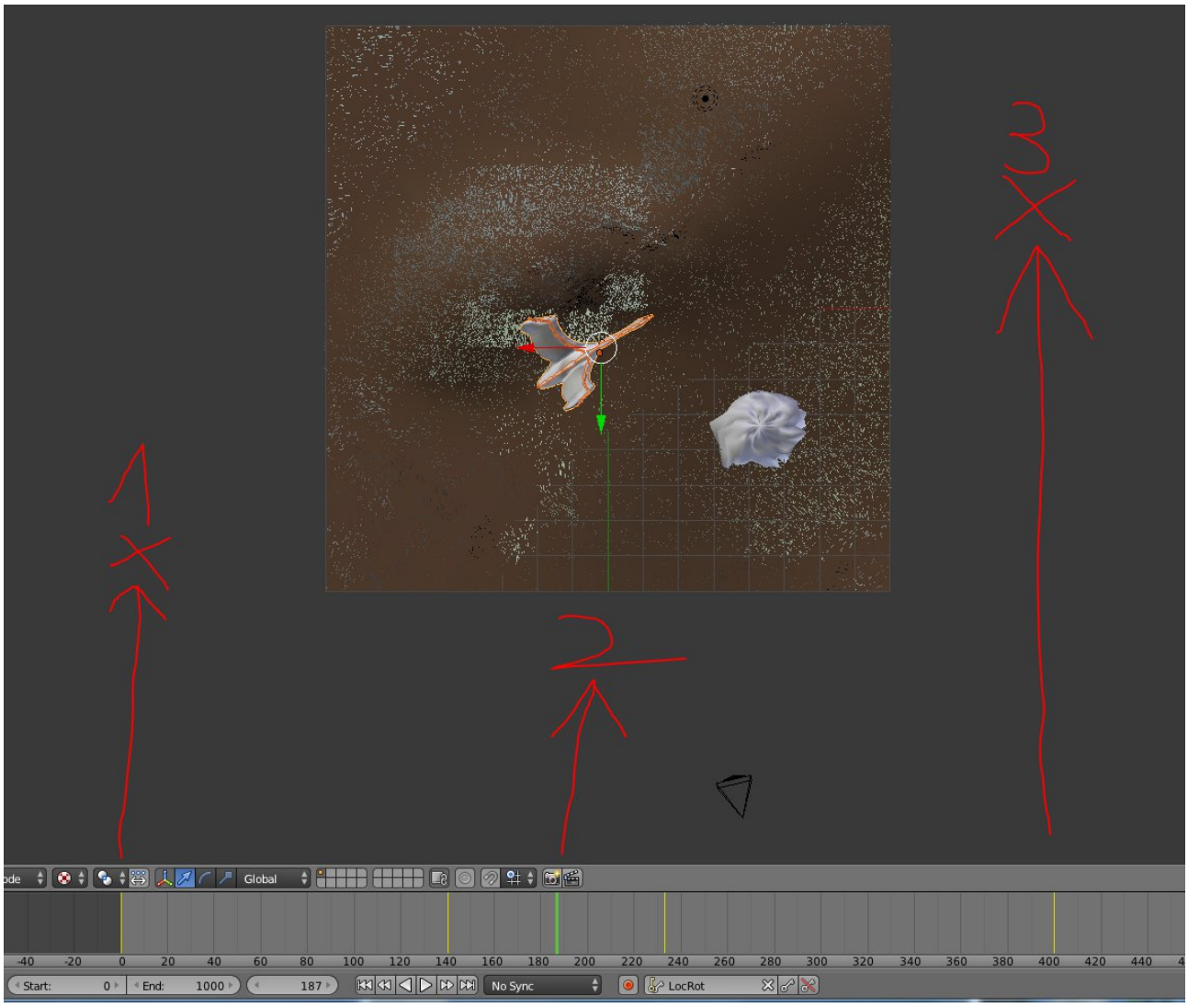
Let the Swan fly now!

Now your environment is prepared. Let us animate the swan, this will be very simple now. Select the mesh of the swan and the bones/Armature.

Check now, if the size relation environment/swan is okay or if you have to change the scale of the swan, just use *S* to change the scale.

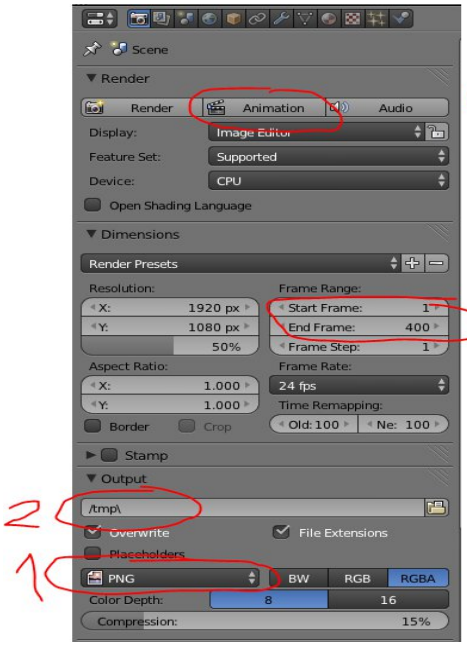
Select the swan. In the following steps, always sure that both, mesh and bones are still selected – otherwise you will run into problems! Go to frame 0. Then, place the swan at the starting point. But where is the starting point?

This screenshot shows the scenario from the top. We are currently at frame 187, so in the middle of our animation. The animation starts at 0 and finishes at 400. Position 1 is the starting position at frame 0. Position 2 is the actual position at frame 187. Position 3 is the final destination at frame 400. The camera you see at the bottom of this image. Position 1 and position 3 have to be outside the camera perspective. Remember: you can toggle to camera perspective by pressing *NUM 0* (see the following image) and return to the top view by pressing *NUM 7*.



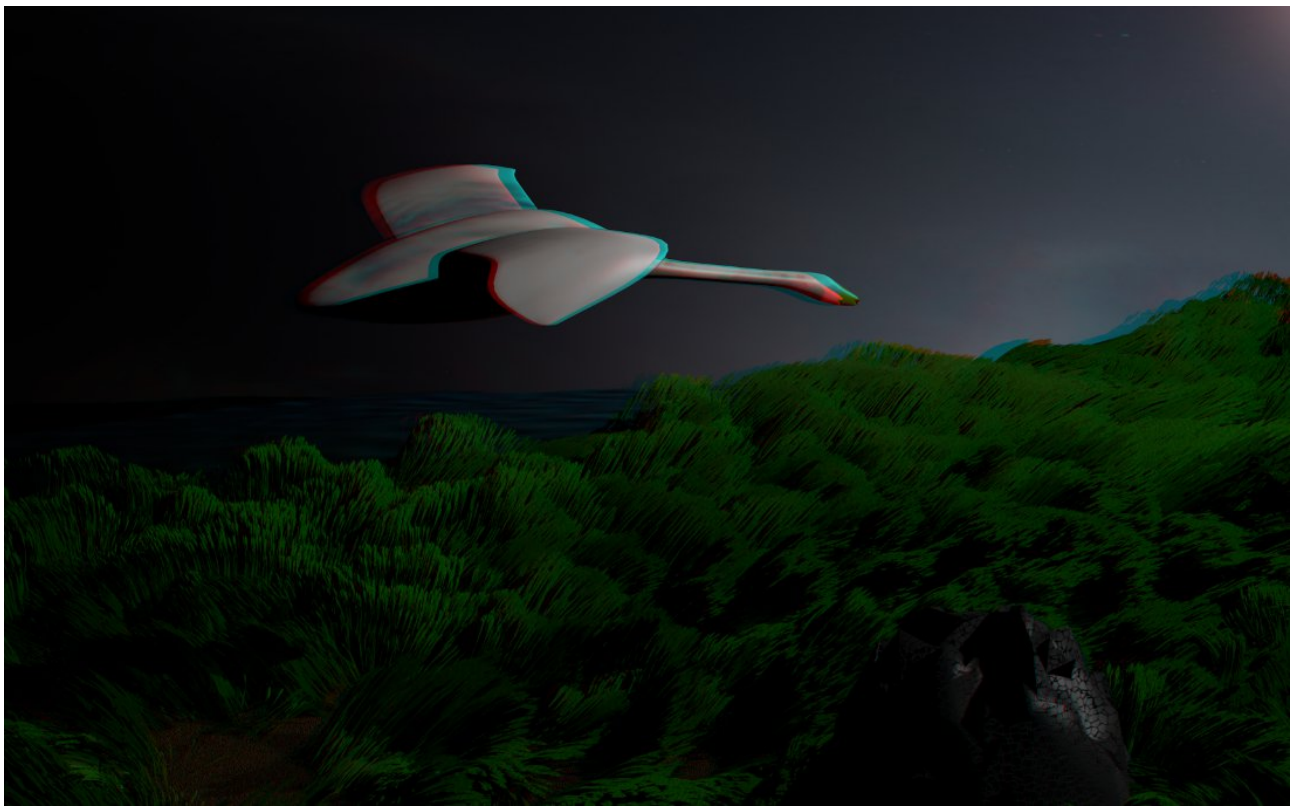
Another important aspect is the position of the camera. In the image above you see, that the perspective is chosen in a way that the grass land seems to be only a part of a large area. So prevent that the perspective of your camera shows the edges of the plane.

Now, if you have you starting position, press  . Make sure that “LocRot” is chosen! Now move the cursor in the timeline to the next position, just as you see it in the screenshot above, e.g. to frame 187. Change the position now of the swan and press again the key. Do the same thing for the final position. Remember: you have selected the “LocRot” mode, therefore you can also change the rotation of the swan, making the movement more dynamic.

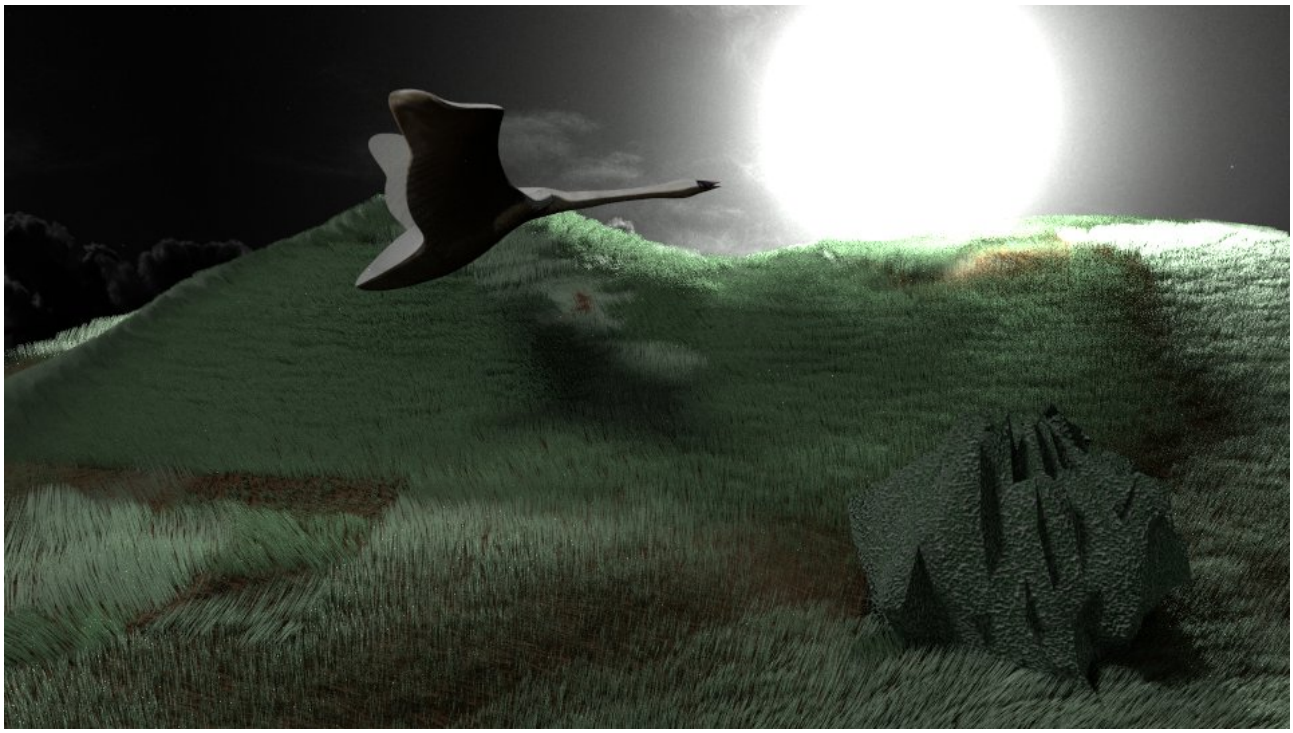


In addition, it is a good idea to add a sky in the background. The way to do this was already described in the first tutorial this semester. Position the plane with the image in the background just as you see it at the screenshot above. It is a good idea, if you have a light source at this image, so a moon or a sun, to position the light which you are using just in front of the sun on the image plane!

The last thing to be done is to render it. Just have a look to the left screenshot. 1) Select, in which format you want to save the files. You can save them as a whole movie (e.g. H.264) or single images (PNG). 2) define your export location on your harddisk. 3) Select the range, we will need to render fram 0 to 400! And then, 4) press “Animation” to render the whole movie. That's it!



The swan from the Tutorial WS2013-14 rendered with the “Blender Renderer”.



The swan from the Tutorial WS2014-15 rendered with the “Cycles”. We will learn how to use this renderer in one of the next sessions.

References/Images

Thanks go to the following photographers:

[FB] Photo: © Byrant Olsen/flickr.com
http://www.flickr.com/people/bryanto/
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A nice texture tutorial:
Blender-Tutorial - Texture Painting (AgenZasBrothers)
http://www.youtube.com/watch?v=l06iV1TSWm4