

# Modeling a Grizzly Bear

## Step 05

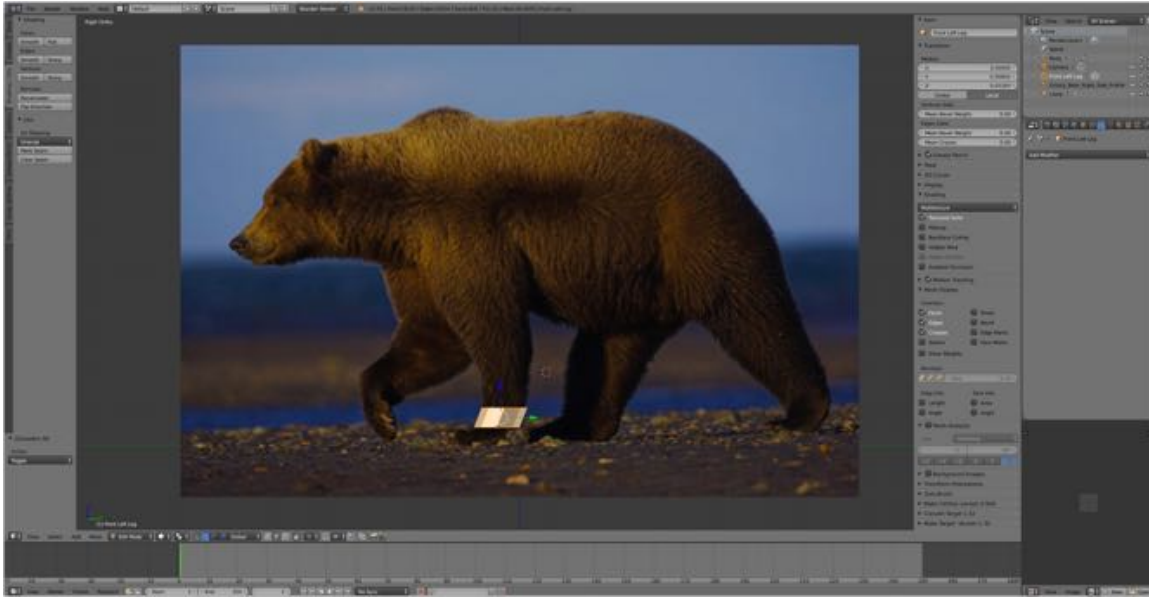
### Modeling - Legs

We now have the bilateral feature complete and are ready to start on the legs. These could also be considered bilateral features if we were to model the two front and two hind legs in the same pose. But I have chosen to give each leg a different pose. So the first thing we need to do is apply the mirror modifier.

- With the **body selected**, switch to **Object Mode** (modifiers can only be applied in Object Mode).
- In the **Properties Panel LMB** click on the **Apply Button** of the **Mirror Modifier**. Now we can model on one side of the model without it affecting the other side.

We'll start with the front left leg.

- **Switch** back to **Object Mode (TAB-KEY)**.
- **Place** the **cursor** at the **origin (SHIFT + C-KEY)**.
- **Select** the **Body (A-KEY)**, **center the scene (NUMPAD-PERIOD-KEY)** and **zoom in (NUMPAD-PLUS-KEY)**.
- From the **Add Menu** select **Mesh > Circle**.
- **Set** the **Vertices** to **8**, the **Radius** to **0.050** and the **Fill Type** to **None**.
- In the **Properties Panel's Item Pane** label the new object "**Front Left Leg**".
- **Hide** the **Body (Outline Editor > LMB Eye Icon)** and bring the **reference image** back into view (**Outline Editor > LMB Eye Icon**).
- **Move** the leg **up** on the **Z-axis** and to the **left** on the **Y-axis** so that the **circle** rings the **ankle** of the front left leg.
- **Switch** to **Vertex Selection Mode** and with the **leg (circle)** selected **extrude** up the **Z-axis** **scaling (S-KEY > Drag)** and **positioning (Transform Manipulator Widget)** the extrusion to surround the reference image leg.
- **Select** the **whole leg (A-KEY)** and **recalculate normals (Tool Shelf's Shading/UVs Pane > Recalculate)**.



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- **Continue extruding up the leg placing edge loops at the leg joints.**



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- To position the leg, **switch to Front View (NUMPAD-2-KEY)** and **move (Transform Manipulator Widget)** the leg to the **right** on the **X-axis**.



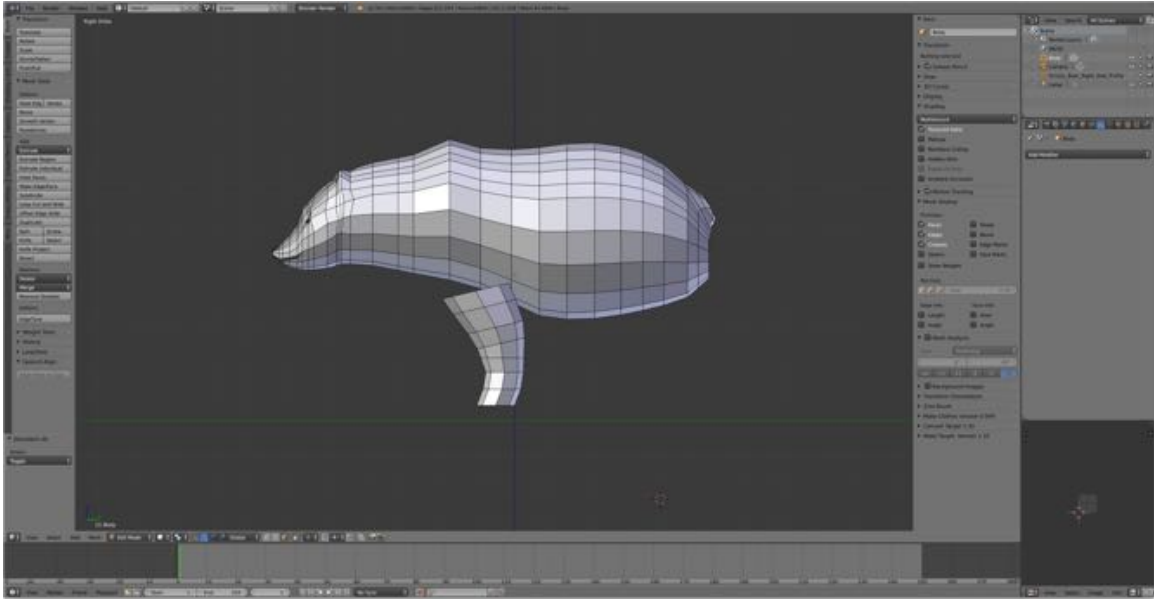
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Now we need to join the leg to the body. To do this we first need to join both objects using the Join Tool (see website). Then we need to insert faces between the leg segment and the body pulling vertices where necessary to make adjustments. Finally, we need to delete the faces of the body that are “within” the body and thus will never be seen.

- To join the leg to the body, in the **Outline Editor** select (**LMB**) the **leg then the body**.

Note: Selecting in this order will mean that the one object after joining will have “Body” as its name (i.e., the new object inherits the name of the last selected object). Selecting the two objects automatically switches the 3D Editor to Object Mode. Objects can only be joined in Object Mode.

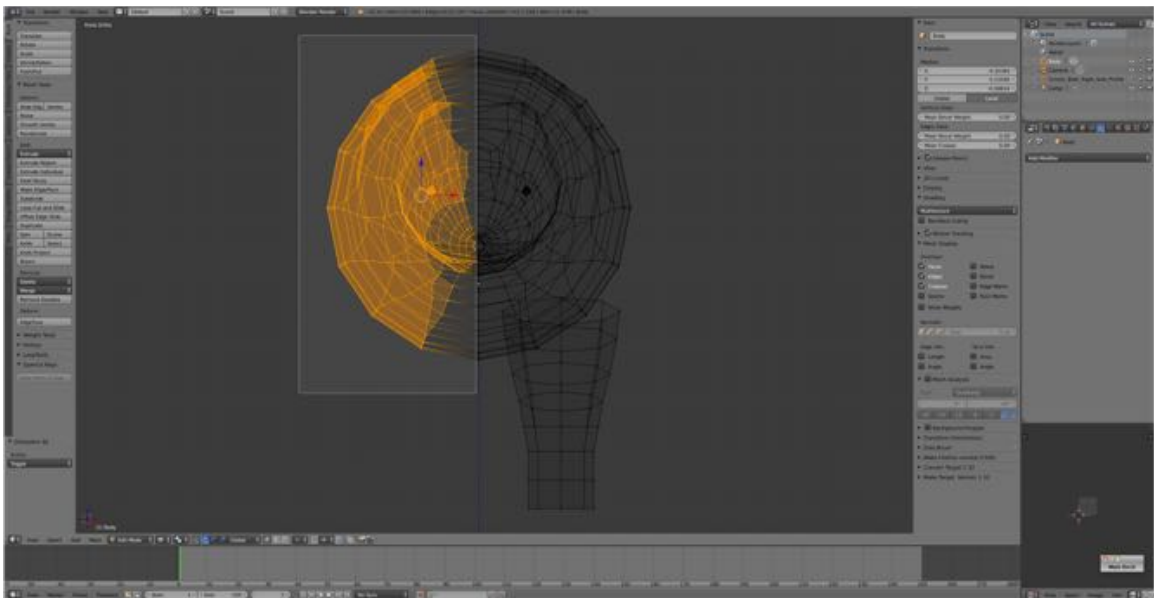
- **Press CTRL + J-KEY** to **join** the objects.
- **Hide** the reference image (**Outline Editor** > **LMB Eye Icon**) and **switch** back into **Edit Mode** (**TAB-KEY**).
- **Switch** the **body** section back to **Flat** (**Tool Shelf’s Shading/UVs pane** > **Flat**).
- **Switch** to **Edit Mode**.



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To facilitate joining the leg to the body hide the right side of the body.

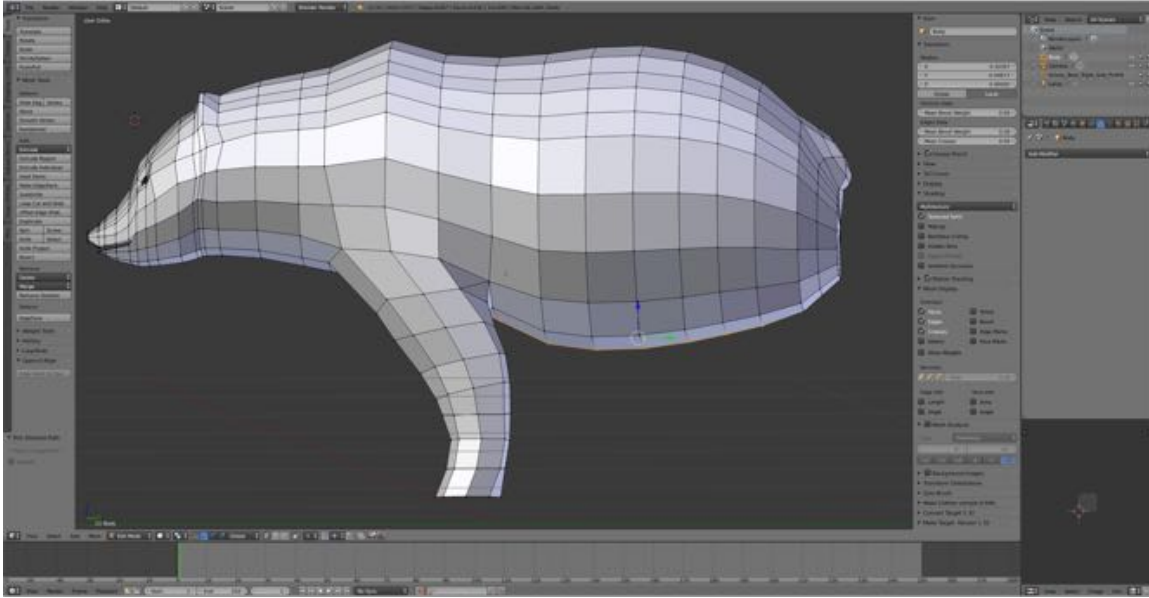
- **Switch to Front View (NUMPAD-1-KEY) and Wireframe View Mode (Z-KEY) and Vertex Selection Mode.**
- **Box select (B-KEY > Drag) the right half of the model and delete (X-KEY > Vertices).**



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- **Switch to Edge Selection Mode and start bridging edges between the leg and body by selecting first edge then the select the second edge and fill in the face (RMB > SHIFT + RMB > F-KEY).**



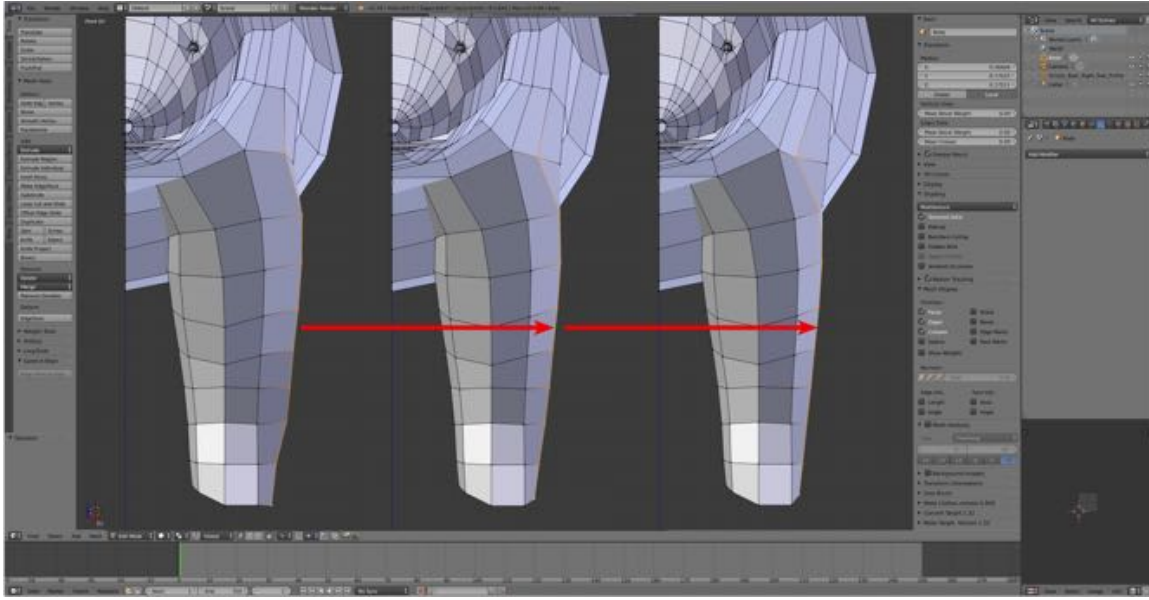


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Note: Another tool I like to use is the Smooth Vertices Tool (see website). The keyboard shortcut is CTRL + V-KEY > Smooth Vertices but I like to add it to my customized list of **Custom Shortcuts** (see website) where it is assigned the 9-KEY.

To demonstrate, suppose we felt the bear leg was a little too fat. We could select a line of vertices using the Select Path Tool (see website) then use the Smooth Vertices Tool to gradually reduce the curve.

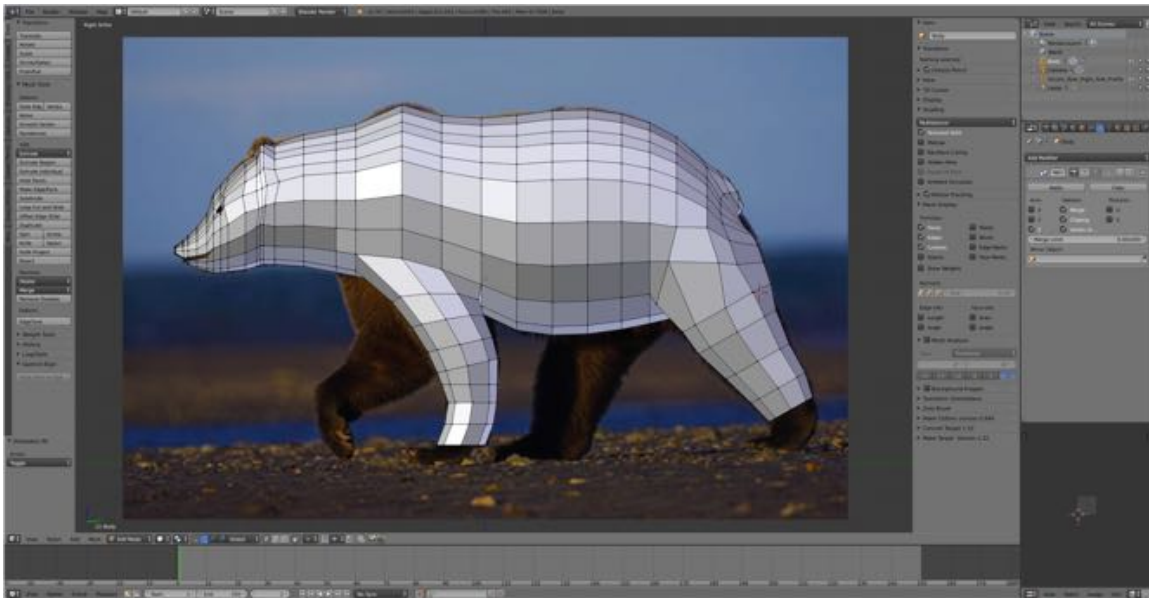
- To use the Select Path Tool, **select** (RBM) the **first vertex** then while holding down the **CTRL-KEY** **select** the **last vertex**.
- Then to use the Vertex Smooth Tool to smooth the curve, repeatedly **press CTRL + V-KEY** and **select Smooth Vertices**.



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- Press the **CMD + Z-KEY** repeatedly to **undo or close** your file without saving and **reopen** GrizzlyBear09.blend.

Let's carry on and add other three legs using the same techniques; adding a circle, extruding to form the leg, positioning and adding faces to connect it to the body. Start by adding the hind leg then unhide (ALT/OPT) the other half of the body and add the front and hind legs.

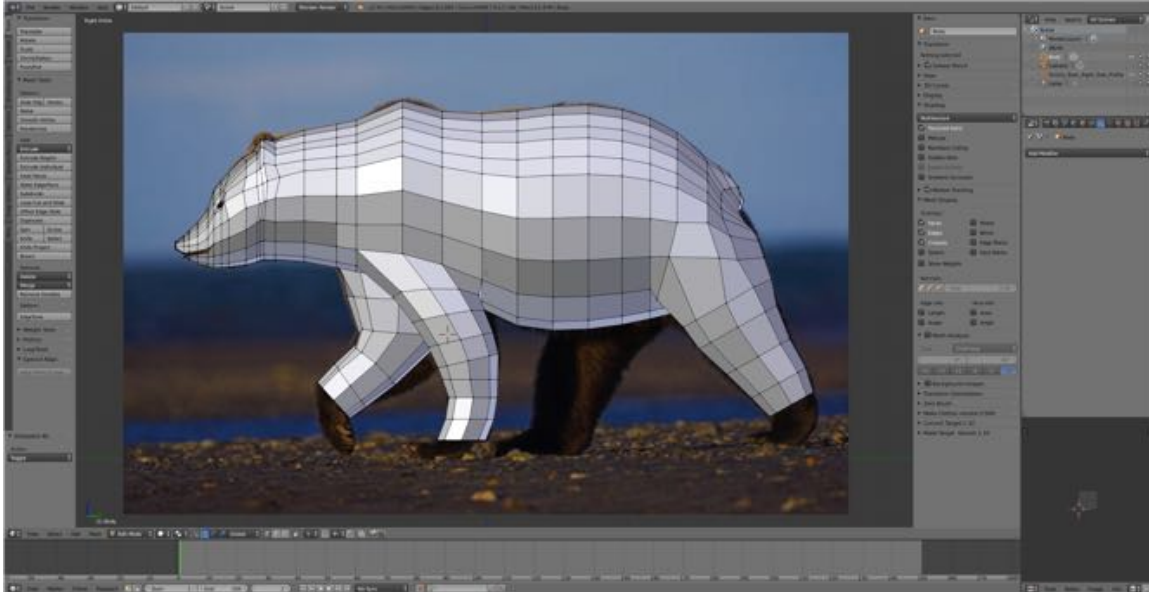


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Save your work.

- **Save a copy of the Blender file (SHIFT + CMD + S-KEY > NUMPAD-PLUS-KEY > LMB Save as Blender File) (GrizzlyBear10.blend if you have saved the same number of times as I have).**
- **Save a screenshot (Information Editor > Window Menu > Save Screenshot).**

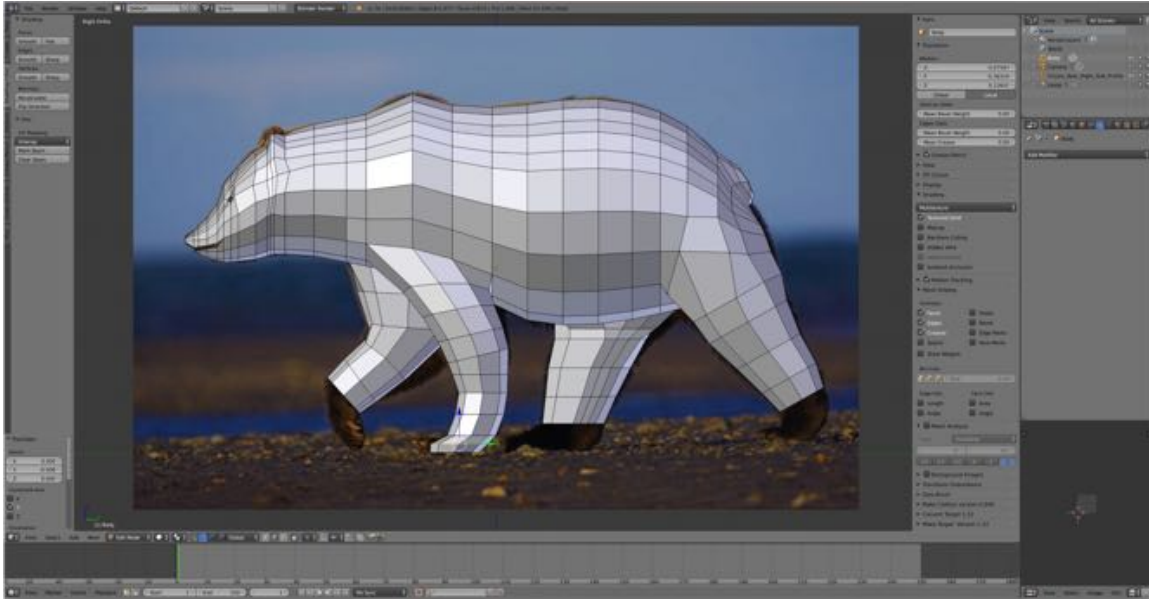


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Save your work.

- **Save a copy of the Blender file (SHIFT + CMD + S-KEY > NUMPAD-PLUS-KEY > LMB Save as Blender File) (GrizzlyBear11.blend if you have saved the same number of times as I have).**
- **Save a screenshot (Information Editor > Window Menu > Save Screenshot).**





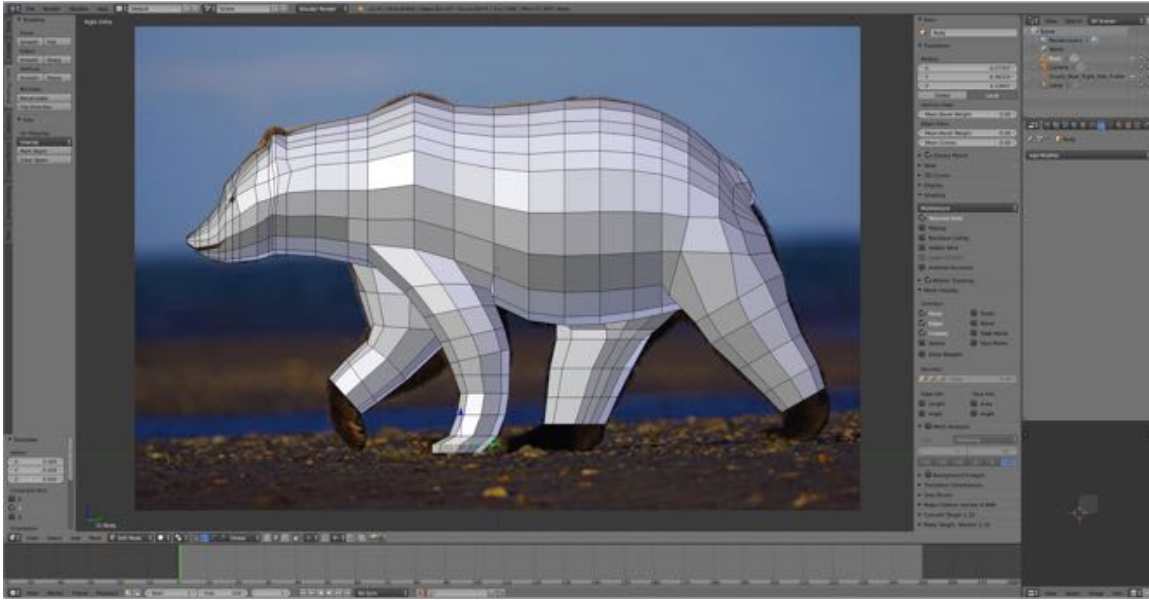
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Save your work.

- **Save a copy of the Blender file (SHIFT + CMD + S-KEY > NUMPAD-PLUS-KEY > LMB Save as Blender File) (GrizzlyBear12.blend if you have saved the same number of times as I have).**
- **Save a screenshot (Information Editor > Window Menu > Save Screenshot).**

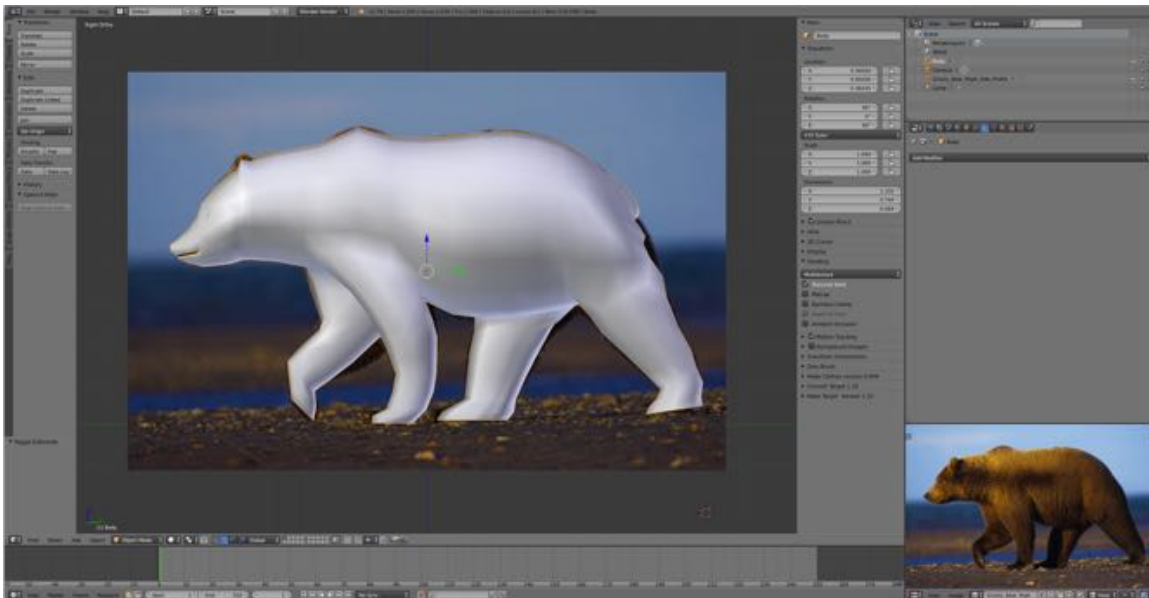
Now we will add the feet. The first step is to extrude the leg down to create a foot. Adding a Loop Cut will define the sole.

- **In the 3D Editor's Edit Mode, Solid View Mode and Edge Selection Mode, select (ALT/OPT + RMB) the bottom edge loop of the left front foot.**
- **Extrude down (E-KEY > Drag) to the sole of the foot.**
- **Add an edge loop (Tool Shelf's Tool Tab > Add Pane > Loop Cut and Slide), scale out and position just above the sole to define the pad of the foot.**



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Now let's model the feet of the other three leg in a similar fashion.



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Almost done. As I look at the model I am not happy with the bridge of the nose. It should be straighter without the turn up nose. The butt should also have a smoother line. So I'll try and fix these. I don't want to more geometry as we are already up to 2,066 triangle.



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Save your work.

- **Save a copy of the Blender file (SHIFT + CMD + S-KEY > NUMPAD-PLUS-KEY > LMB Save as Blender File) (GrizzlyBear13.blend if you have saved the same number of times as I have).**
- **Save a screenshot (Information Editor > Window Menu > Save Screenshot).**