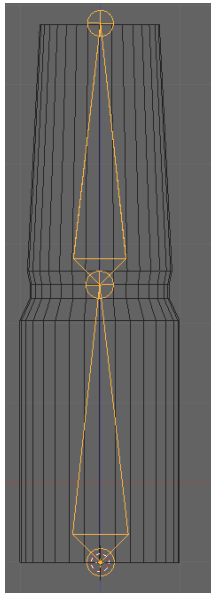


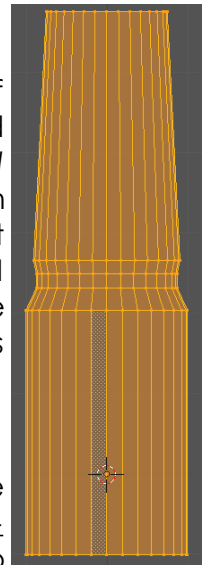
Using Armatures to Deform Meshes

Blender's animation capabilities are great for most object animation except when you want to animate something bending like a person in motion or a tree bending in the breeze. This calls for a mesh to deform which can't be done with traditional modifiers. We can deform a mesh in 2 ways in Blender. One way is to create a skeleton and have it deform a mesh (*armatures*) and the other method is to move the mesh vertices in edit mode and create sliders that deform the mesh (*vertex keys*). This chapter deals with creating armatures. The armature feature in Blender is constantly under development. For this discussion, I will stick with the fundamentals. More information can be found at www.blender.org or at www.blenderartists.org.

The first thing you need to do is create a mesh that has a few groups of vertices where you would like the object to bend. Any mesh will work and to get additional vertices you can either **extrude** or **subdivide**. *Be careful not to create too many vertices.* It may slow your model down considerably. Let's use a cylinder to create an arm. I will use a cylinder set at the default divisions of 32. Next, I will change to a front, ortho view and box select the top set of vertices and *Extrude* them up. I prefer to use extrude rather than subdivide to keep the vertex count down as low as possible. As I extrude the vertices, I am also using *Scale* to shape them.



Next, place the 3D cursor directly at the bottom of the shape you just made. Hit "Shift-A", to add an "Armature-Single Bone". You will immediately see a bone begin to form at the cursor location. Enter *Edit Mode* and type "**G**" to *grab* the top of the bone and lengthen it to a desired size. Move your cursor up to lengthen the bone and click where you would like the joint to be. To create another bone at the top of the first one, press "**E**" to *extrude* another bone from the first one. If you run out of room to drag the mouse up, just click wherever and hit "**G**" again to move the end. To always adjust bones, you must be in *Edit mode*. Also, make sure you have the end of the bone select and not the entire bone. When finished, press *Tab* to exit edit mode. Double check the armature to make sure that the ends and joint are well aligned. To add more bones, enter edit mode again to extrude with the end bone selected.



Your next step is to create a Child-Parent relationship between the mesh and the armature with the mesh being the Child and the armature being the Parent. While holding the "Shift" key, select the mesh first, then the armature. Press "Ctrl-P" to make parent. Select the option "Armature Deform" and "With Automatic Weights" so the computer will figure out which vertices to deform to which bones. If it's not right, we can fix this later.

