

01

Character Learning Kit



3 DVD boxset

- 01 _ Leon sculpting
- 02 _ The making of Leon
- 03 _ The art of 3d Toons

01

Concept Part

= The Art of 3d Toons

- 01 _Creation Process
- 02 _The Charaters
- 02.1 _Regis the Bat
- 02.2 _Stinson the bird
- 02.3 _Gary the elephant
- 02.4 _Gaston the creature
- 02.5 _Pi the Owl
- 02.6 _Fletcher the rabbit
- 02.7 _Amanda the spider

01 _Creation Process

From Paper to Scan to Flash

At this stage I draw on the cheapest paper that I could find. Normally 3 holed punched paper and placed into a 3 ring binder. I don't care for the expensive stuff cause I feel at a subconscious level you might not draw as plentiful and care free. Also I like to draw (in the beginning of a project) in a sort of busy environment like the subway or restaurant; People have even seen me draw while walking from place to place. Thank the artistic gods that I haven't bumped into anything yet. When I start to find something in the page after I have gone through many pages of scribbles (that shouldn't be seen by the public) I start to get more serious and scan the image into Photoshop then block out shapes and use the liquid tool to morph things into a more dynamic pose or experiment with proportions. Then I print that out & draw more so that it is clear; eventually I'll end up with a single lined image. I convert that into Adobe Streamline to remove all the chunky bits, then copy & paste into Flash for a color bath.



1 _Where do you find inspiration for the poses? Where do you start?

Normally I have a character colored & approved by higher powers before moving onto the next stage of drawing various poses. To stay on model, I print out several onion skinned drawings to constantly look back at, so I don't drift too far from the original approved version. This is when I do the side of character back, various expressions and so on.

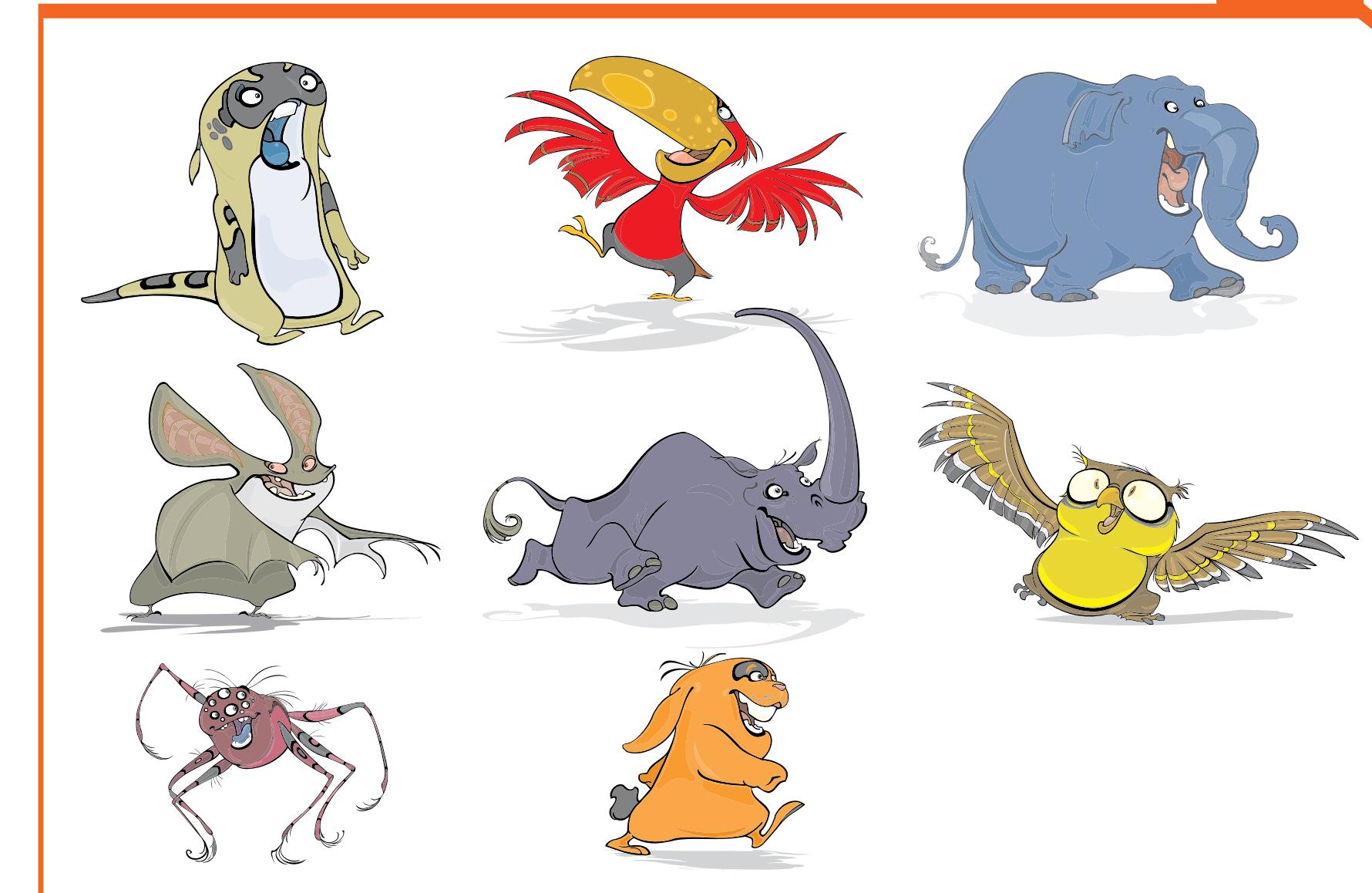
2 _How did u arrive at these forms and shapes?

I normally try to work shapes that are universally liked by most people. For example the owl was in the realm of a kid's proportions 2-3 heads high. The bean shape is always fun to play around with. Contrast in huge shapes and smaller shapes is a classic approach to creating interest & appeal.

3 _How do u give your creatures personality?

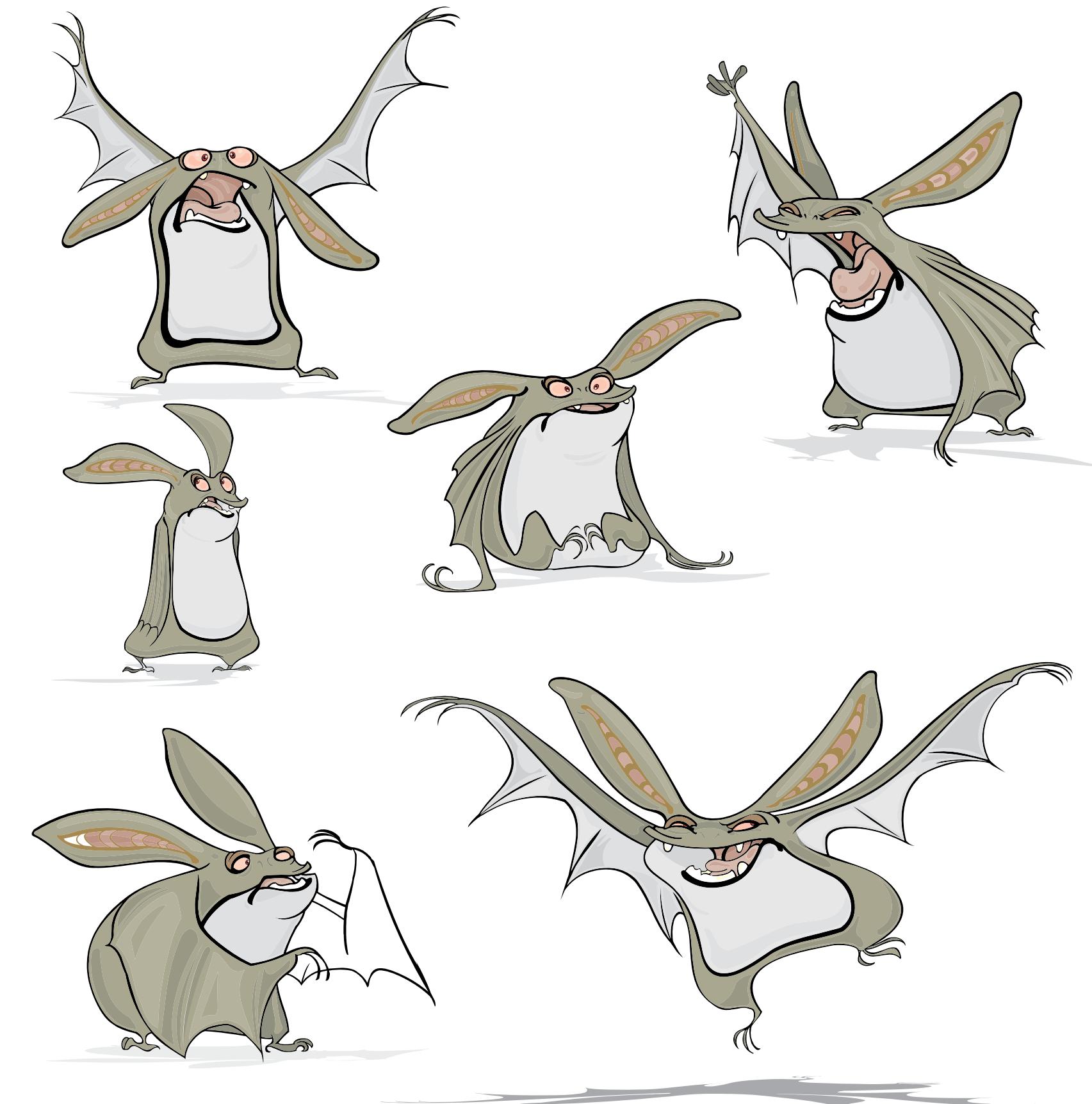
When doing multiple drawings for production use I just do the normal things that are expected such as happy, sad, confused etc. On initial pitching for movies & shows I normally don't have too much time to mess around so that is where it would be better to tell a story with a single image, using props or interacting with another character.

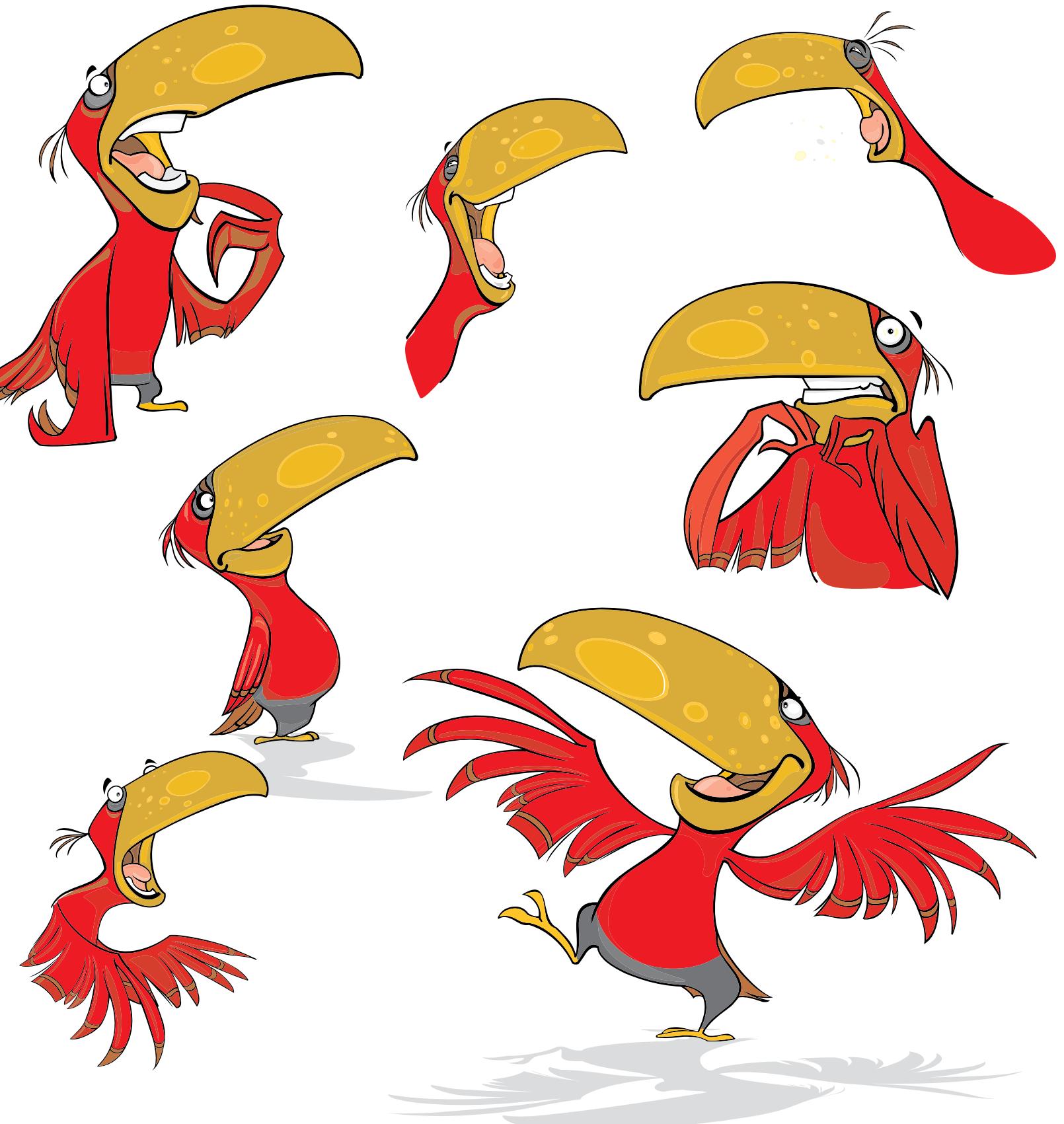
Picture 01_1

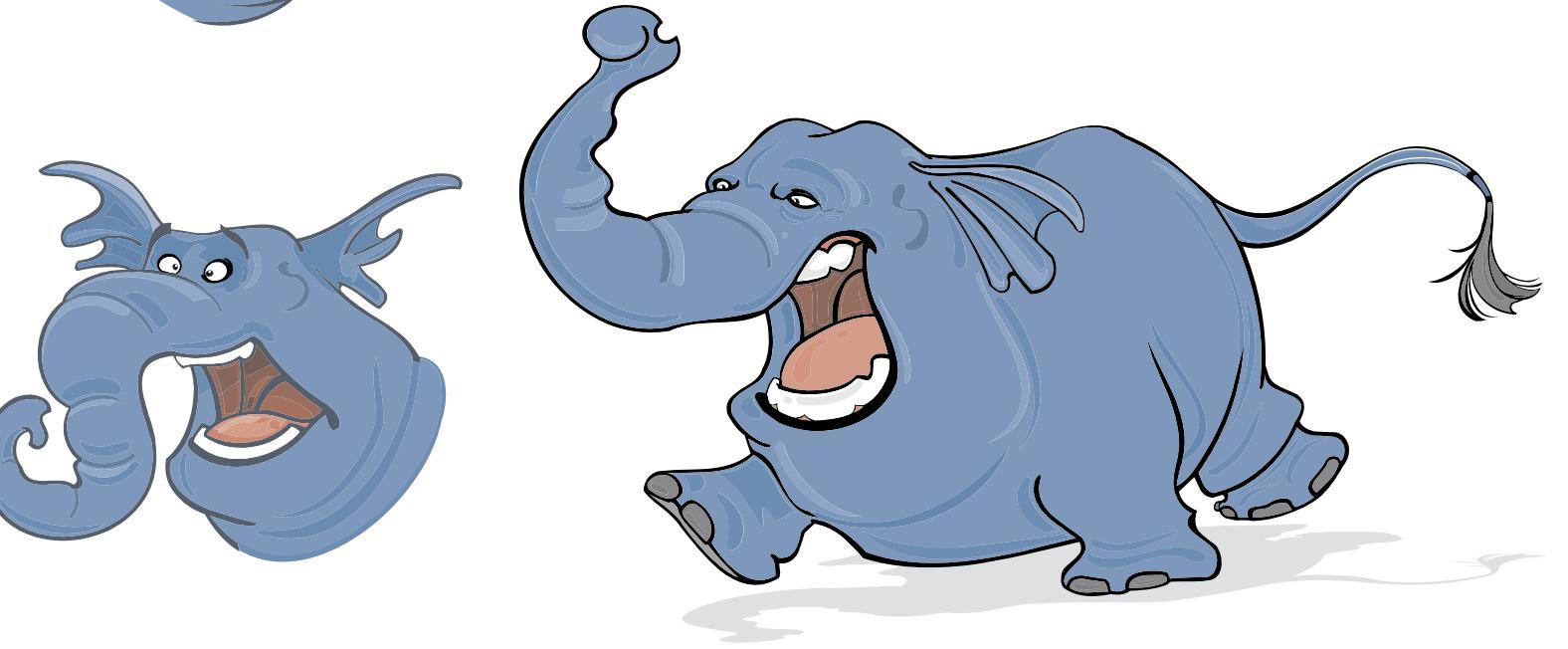
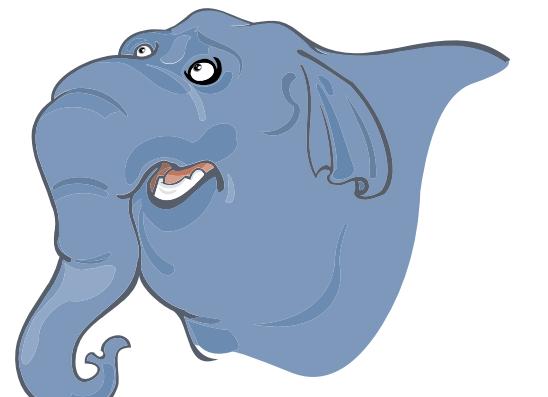
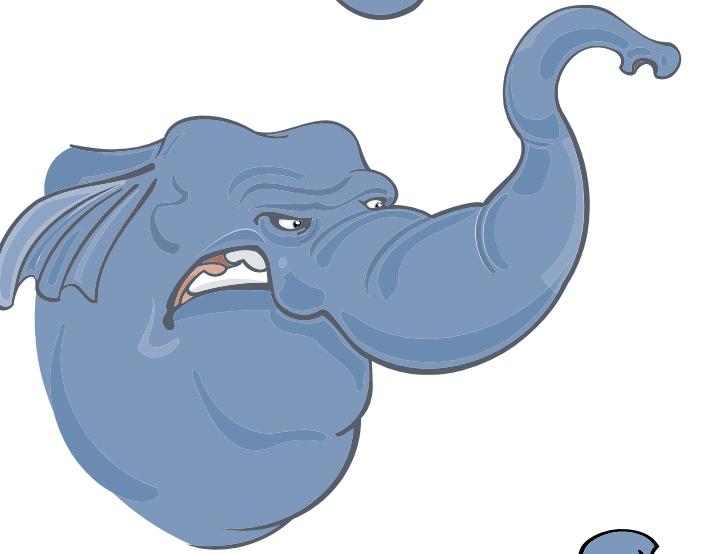
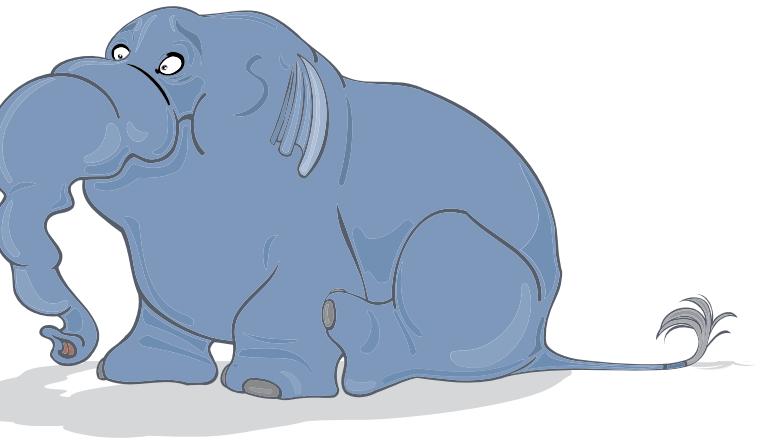
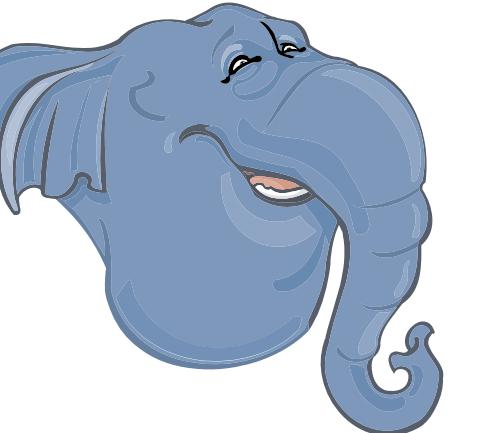
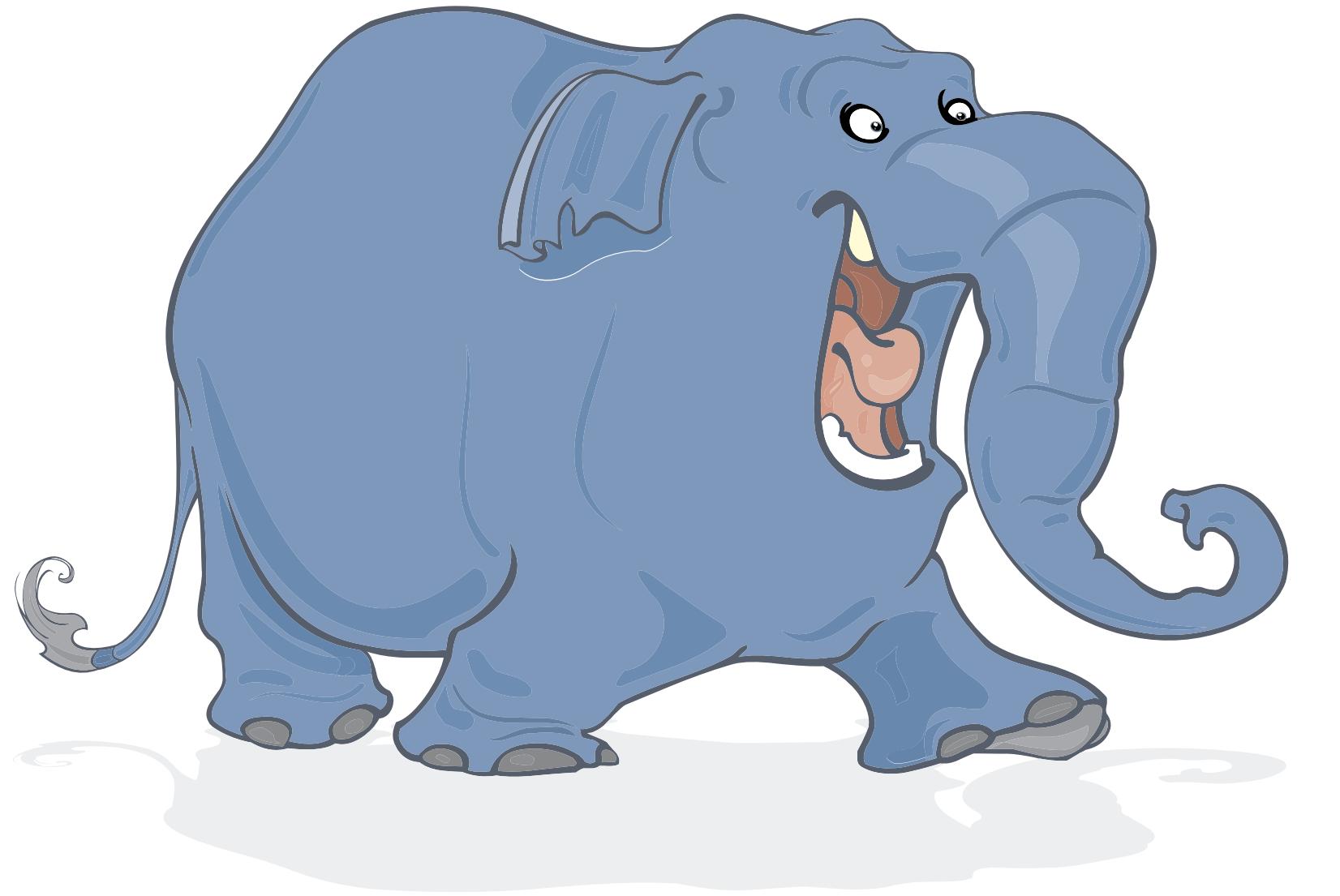


02 _The Characters

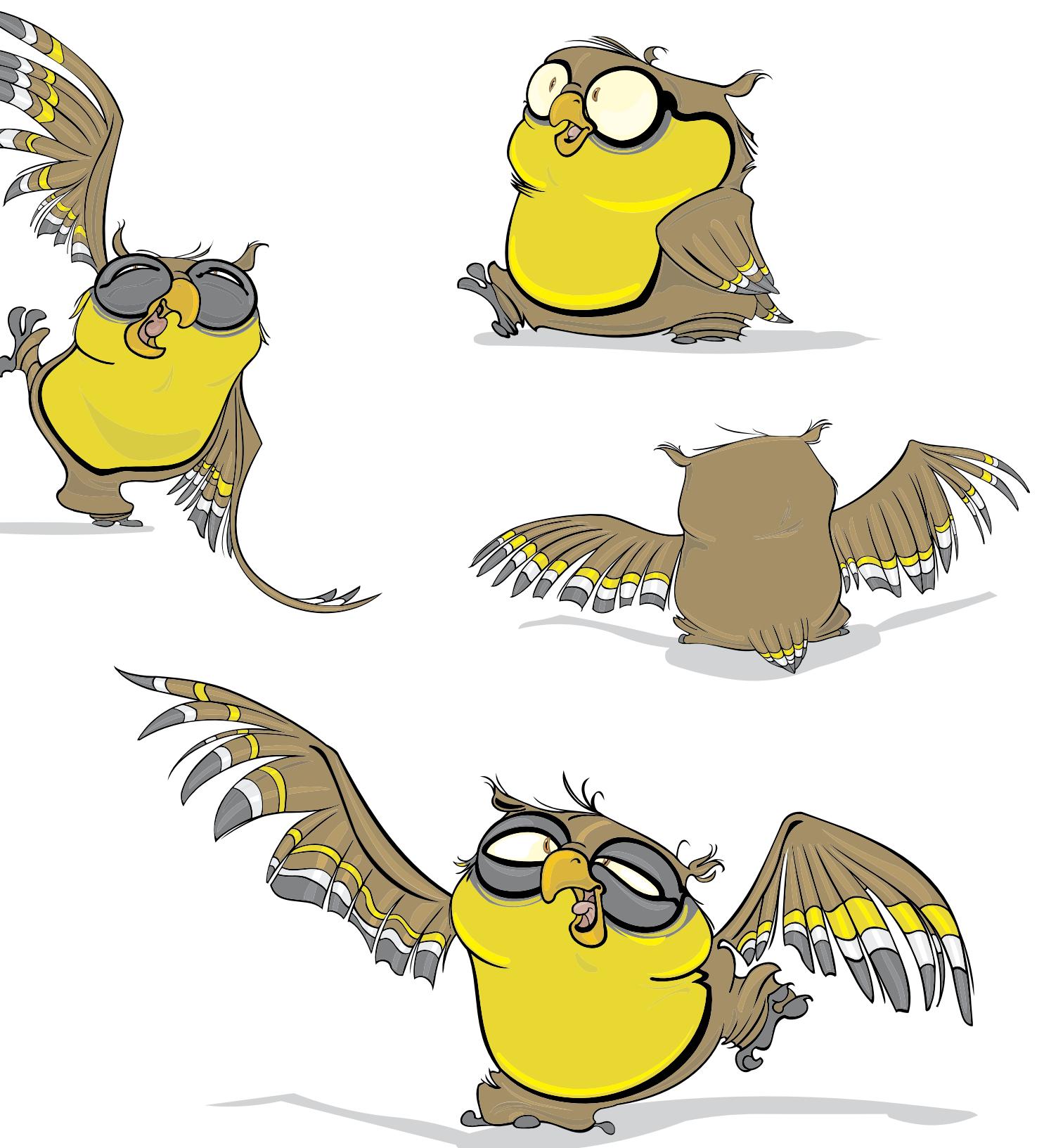
2.01 _Regis the bat

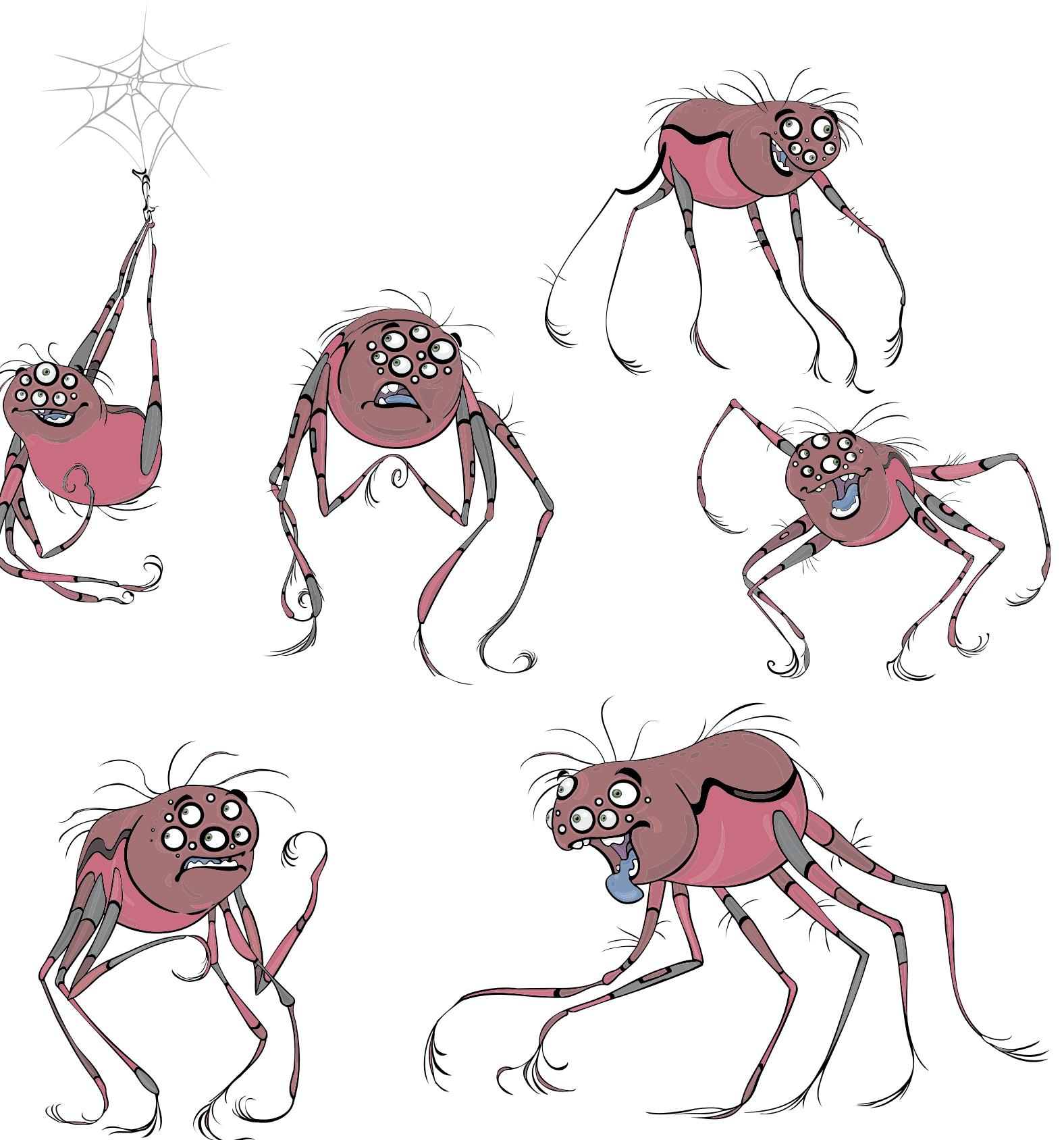
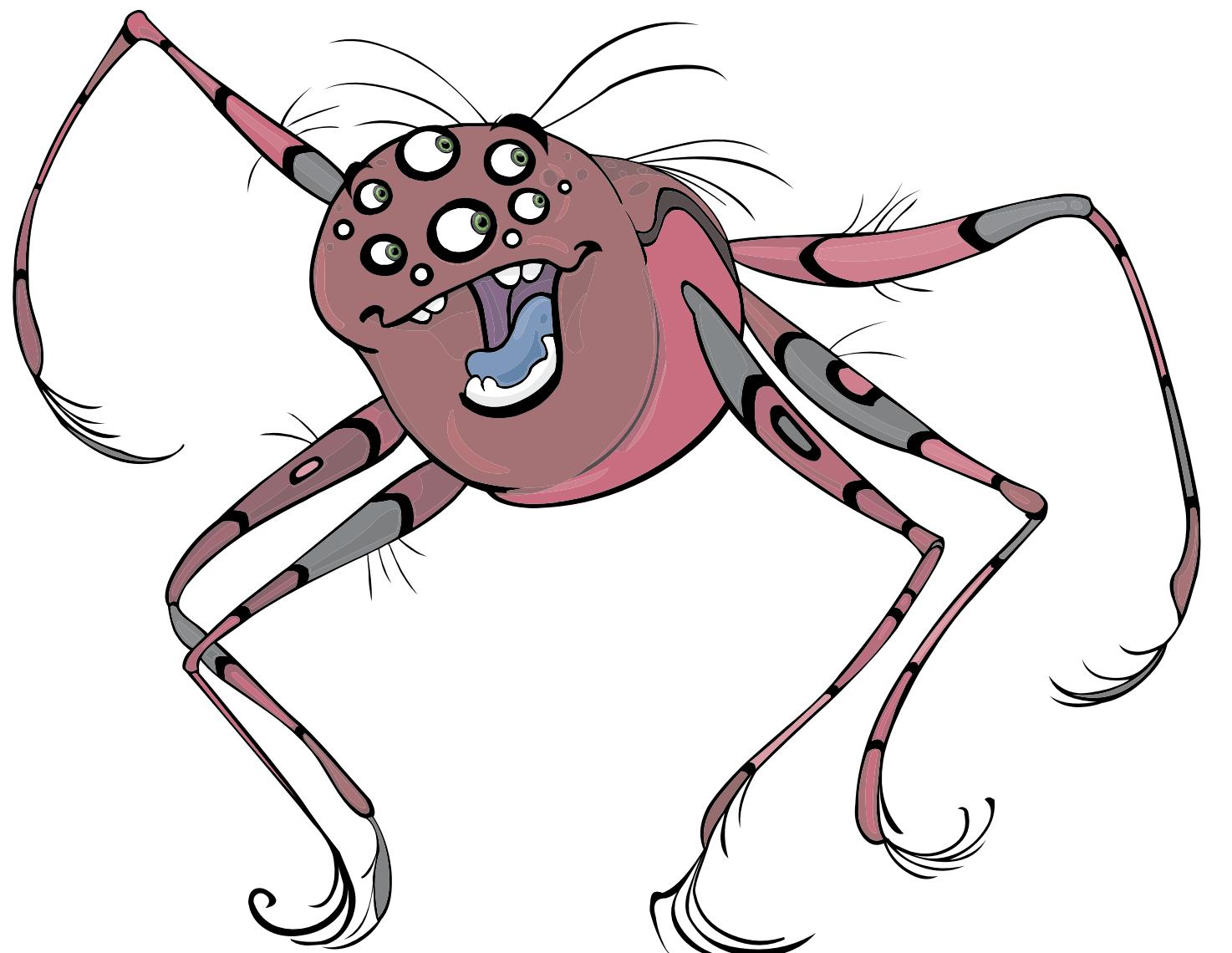












02

Modelling Part

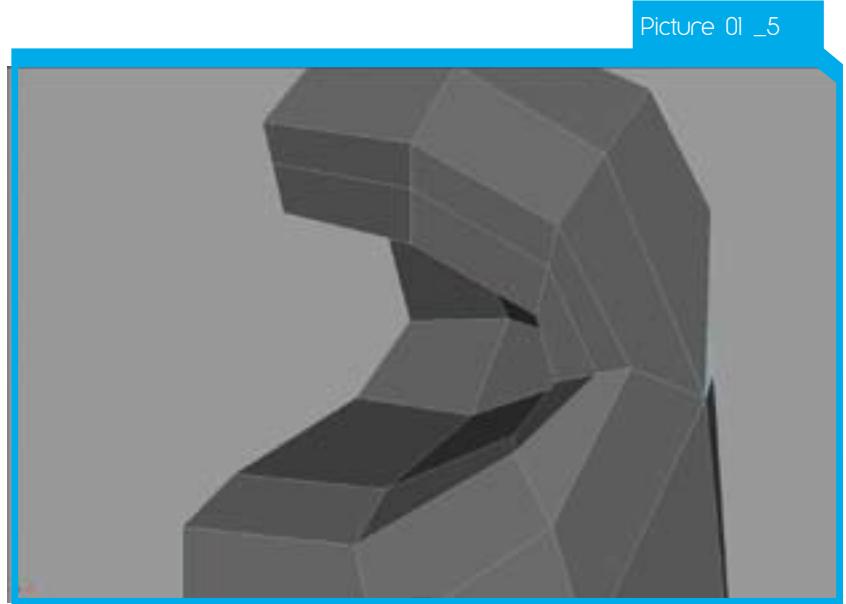
The Art of 3d Toons

- 01_ Regis Part
- 02_ Stinson Part
- 03_ Gary Part
- 04_ Gaston Part
- 05_ Pi Part
- 06_ Amanda Part

01 _Regis

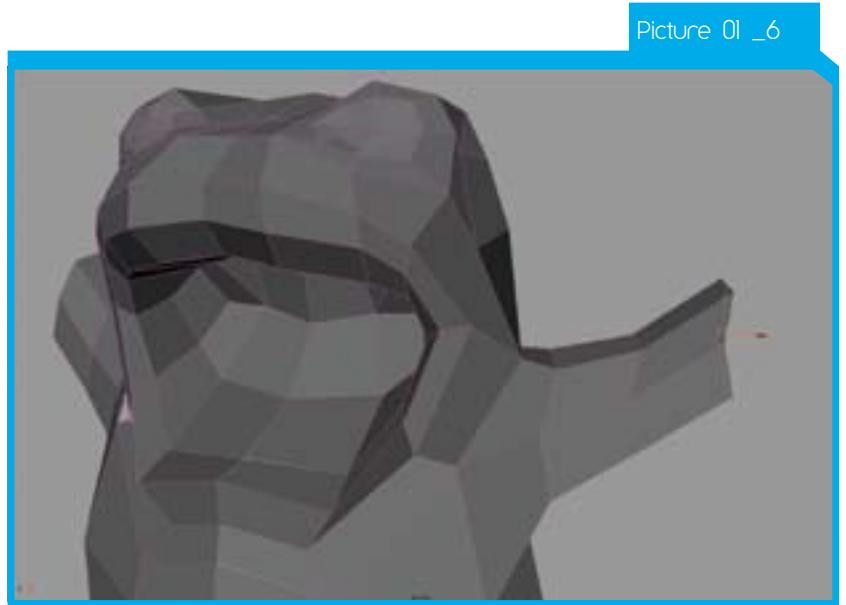


Go back to a single view. It is important to give a model good edge loops especially in areas that will move or crease a lot during animation. Change the flow of the polygons around the mouth using a combination of *Split polygon*, *Merge vertices* and by deleting unwanted edges. With a few commands you can reshape the mouth into a ring or series of edge loops as shown.

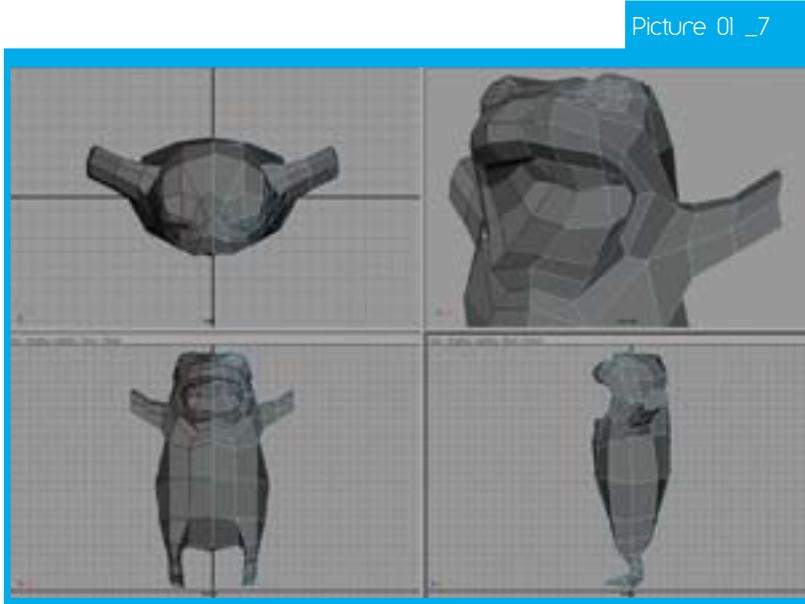


To create an area where the eye will be, select a group of faces on the top of the head and *Extrude* twice. Tweak these new faces into smooth rings as shown. You can select the faces and use *Polygons>average vertices* which smooths out parts of the mesh without adding geometry.

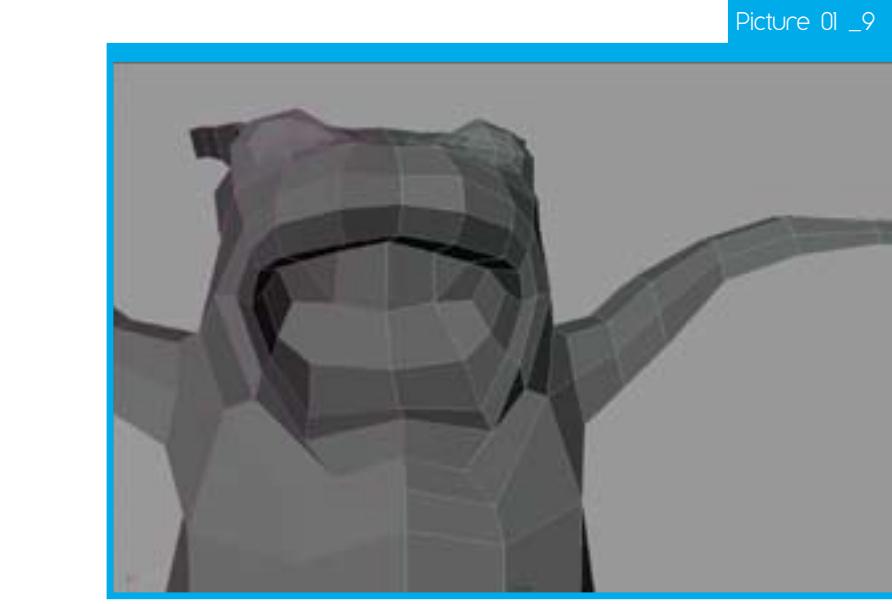
To get a basic arm (Wing), select four faces on the side of the body and *Extrude* out several times.



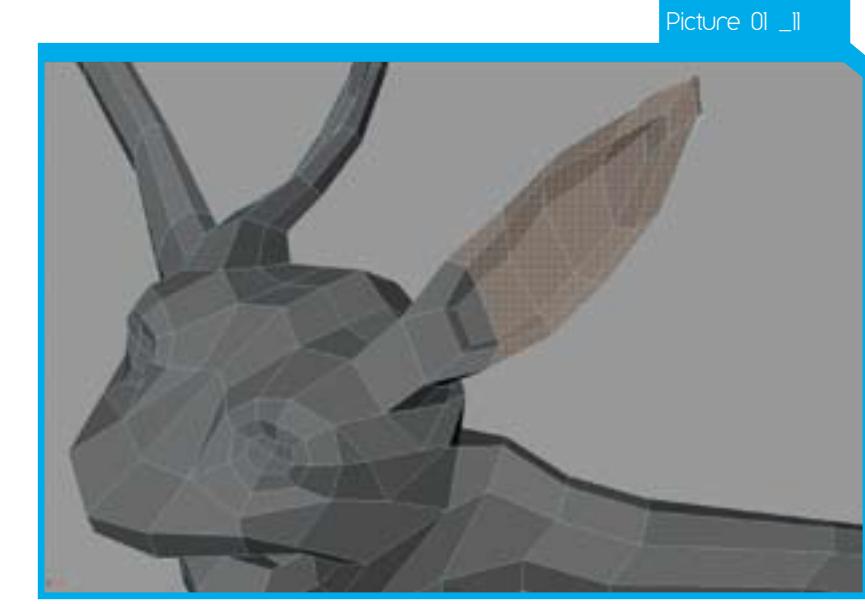
Switch back to the Quad view. Now take some time and tweak the model until you have the shape shown. You can tweak faces, edges and vertices to your preference.



Changing views constantly helps to keep the form correct. Tweak the mesh to achieve the desired result.

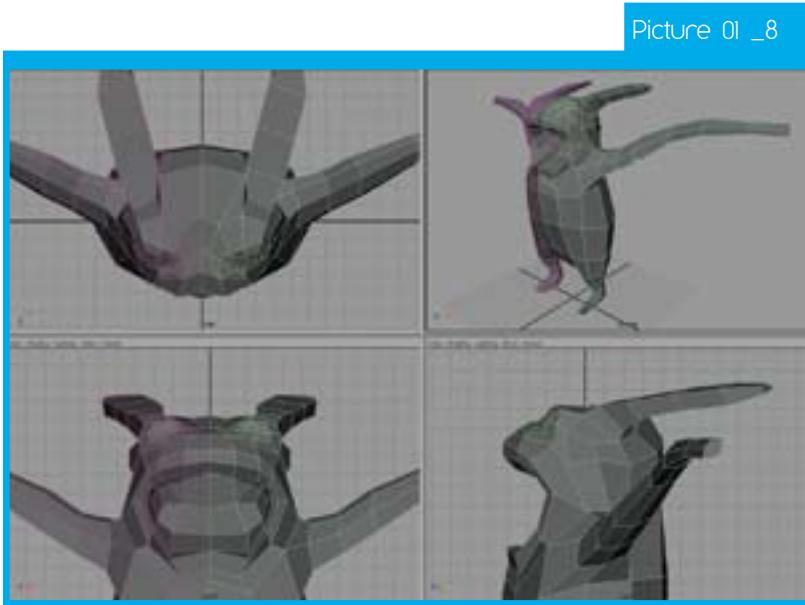


Select the whole ear and use average vertices to smooth out the shape. Then using *deform>soft modification* you can pull out the end of the ear shape. There are several Magnet plug-ins that can help with this.

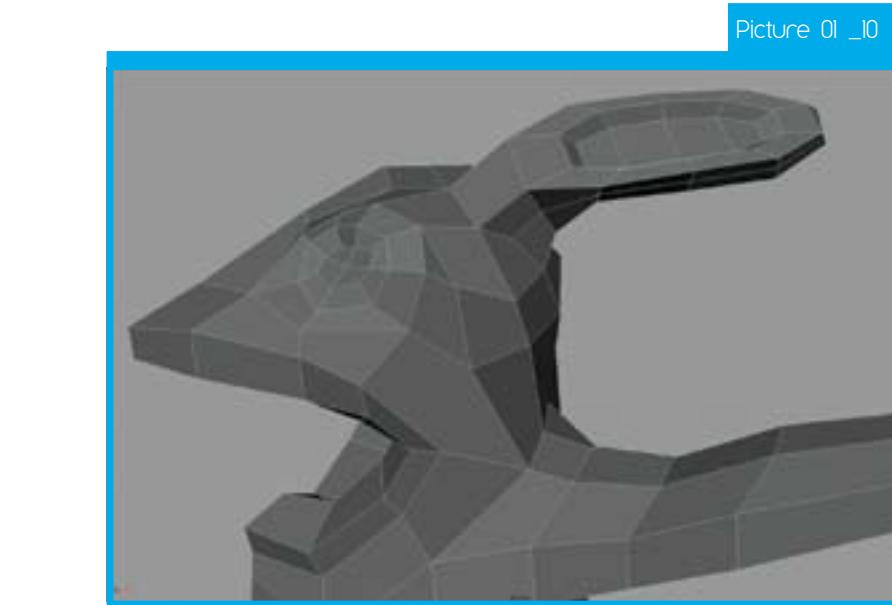


Select a face on the back of the head and do multiple extrudes for the ear shape.

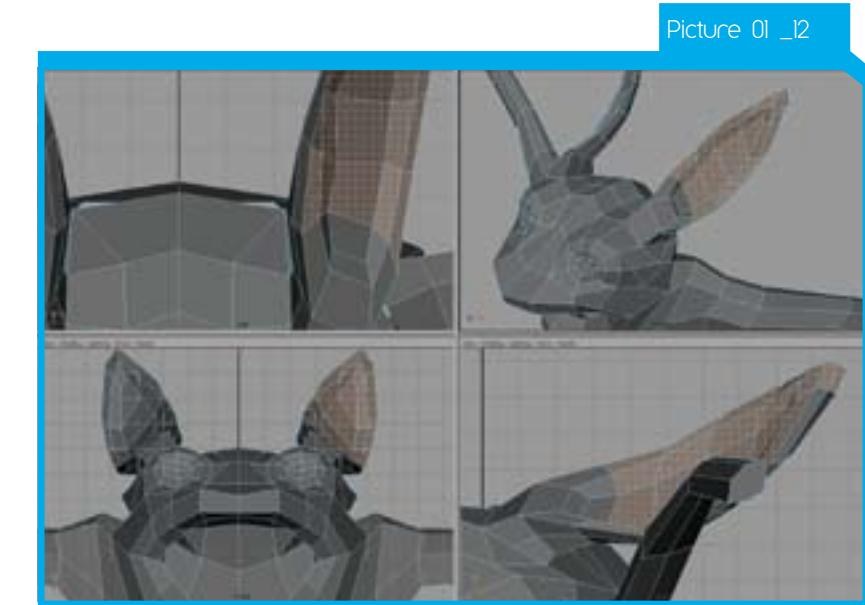
Select the faces on the end of the Wing and keep extruding outwards. Angle these down at the end a little using *Rotate* on them before extruding.



Select a group of faces inside the ear shape and extrude inwards. Use a combination of average vertices and tweaking to get the ear shape.

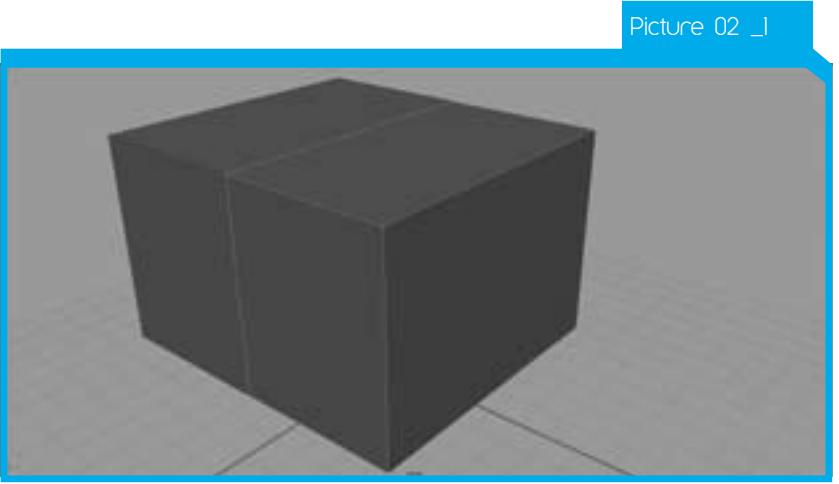


Change views and keep adjusting the shape of the ear as shown.



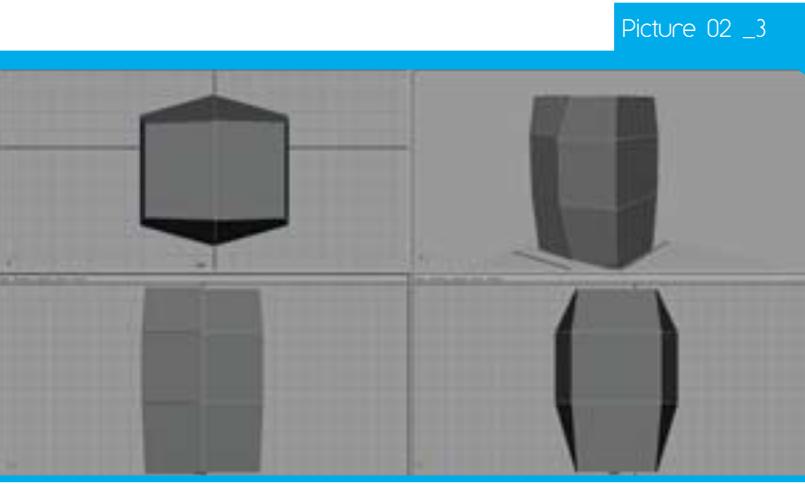


Starting in Maya create a basic cube. Split the cube around the centre axis, back to front. You can do this with a *loop split* or by hand with the *split polygon* tool (CTRL + X)



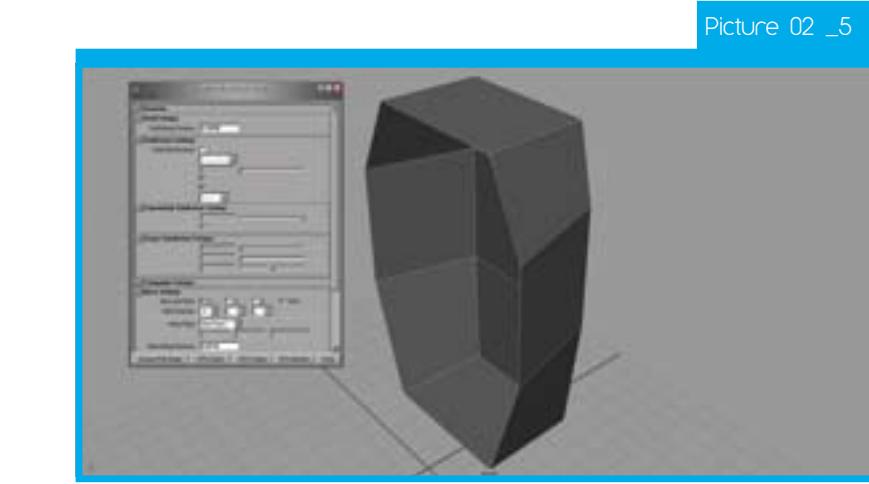
Picture 02 _1

Tweak the shape of the cube into the barrel body of the bird from the reference image. Stay in vertex mode and work around the model getting a rough shape.



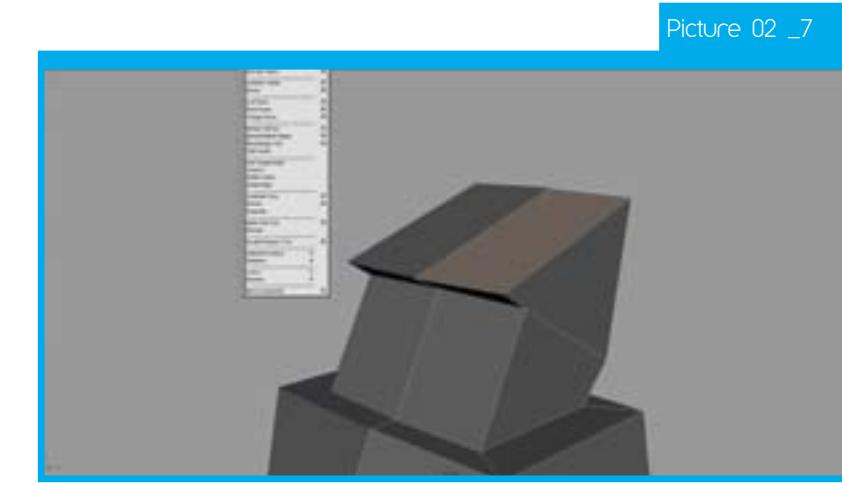
Picture 02 _3

Call the *connect poly shape* script and mirror the mesh over. This will need to be turned off and on during the modelling. It is fine to delete the left half on occasions and simply re-call the script.



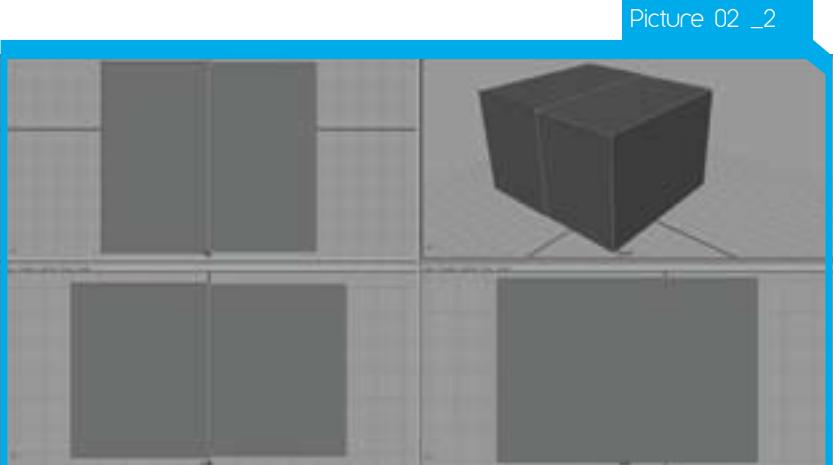
Picture 02 _5

Select a face on the top of the model and extrude upwards. Using *Rotate*, *Scale* and *Move* you can position the new faces then continue to *Extrude*. Here you are trying to form the Birds neck. Keep checking back to your reference image.



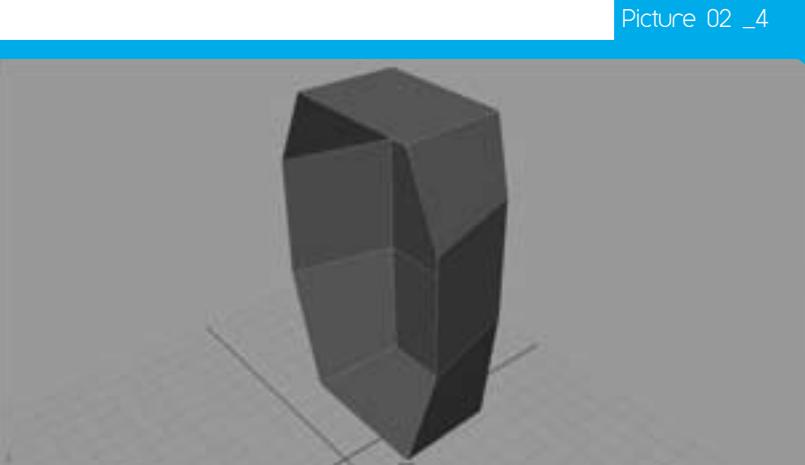
Picture 02 _7

Switch to Quad View and check the shape from all angles. Select faces and move them as needed.



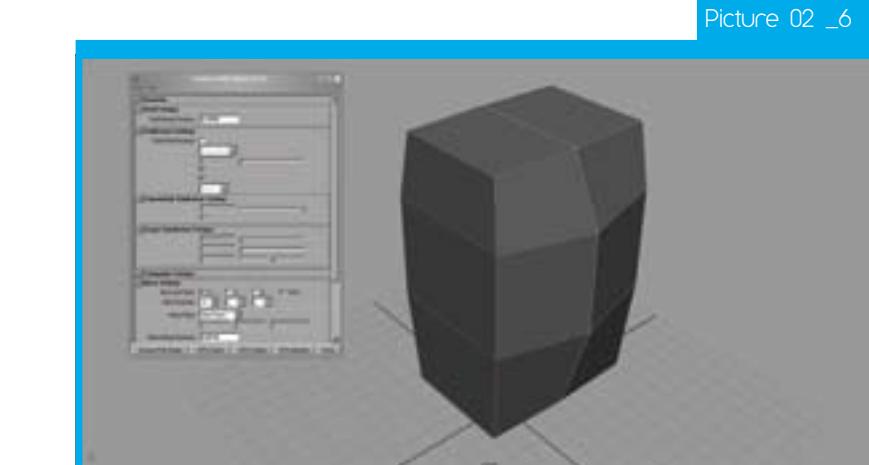
Picture 02 _2

Select the faces that make up the entire left hand side (as you are looking at it) of the model. Delete these.



Picture 02 _4

Check the mesh from all sides and tweak if needed. Try to get as smooth a shape as possible with minimal polygons.



Picture 02 _6

Ensure that the faces arcs around to form the neck. The shape has to roughly conform to the neck area and you can tweak it into shape as you move further into the modelling.



Picture 02 _8

03 _Gary

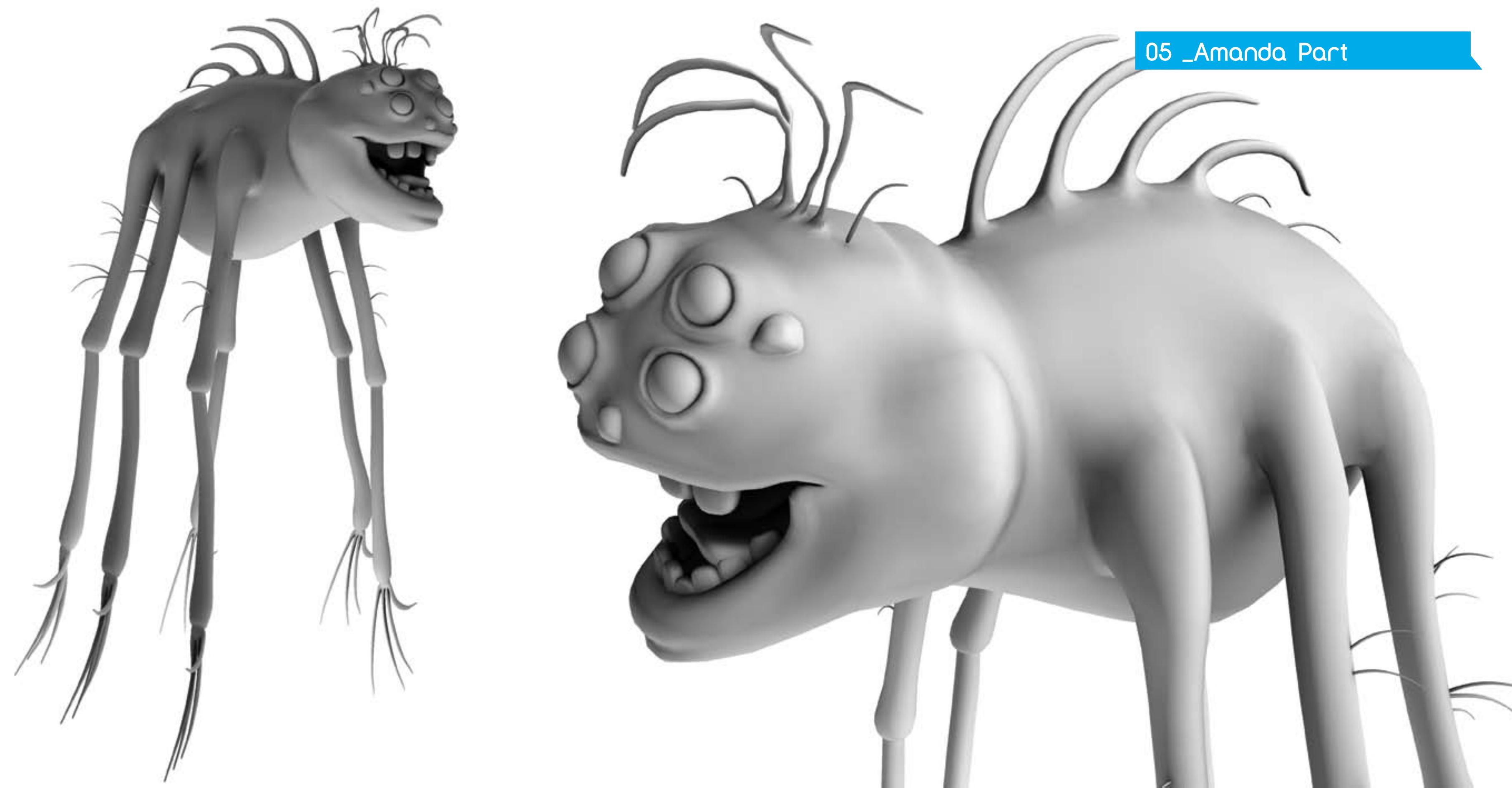


04 _Gaston Part



05 _Pi Part





03

UV Mapping Part

The Art of 3d Toons

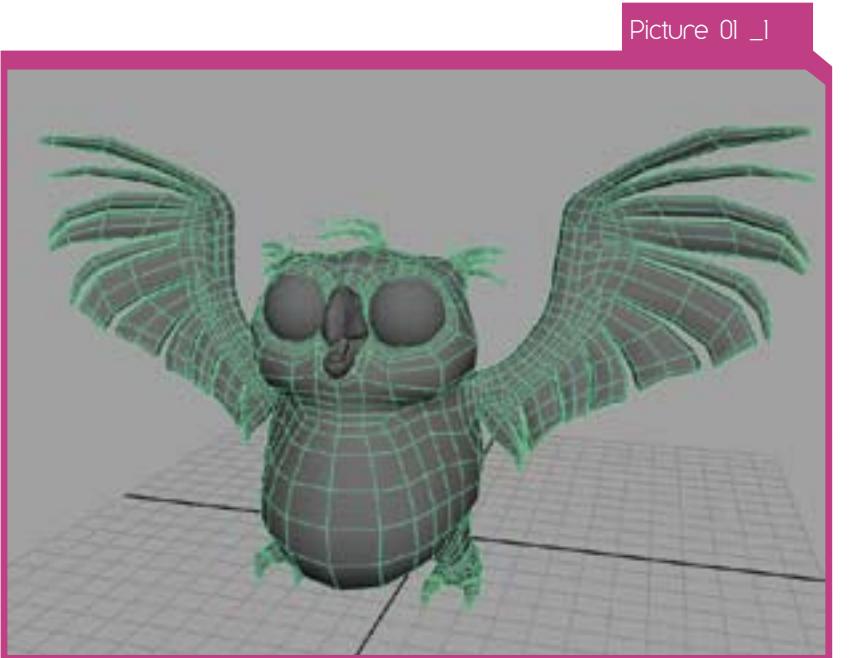
01 _UV Mapping a Character in Maya

01_Uv Mapping a Character in Maya

UV Mapping is the process of unwrapping a polygonal mesh in 2D space so that textures can be accurately applied. Think of it as a bear rug. The 3D bear has been unwrapped to lay flat on the ground.

UV Mapping used to be hard. But now, with the advent of the Unfold UVs tool in Maya 7, UV Mapping is easy! The following is a step by step breakdown of how to UV map a character in Maya.

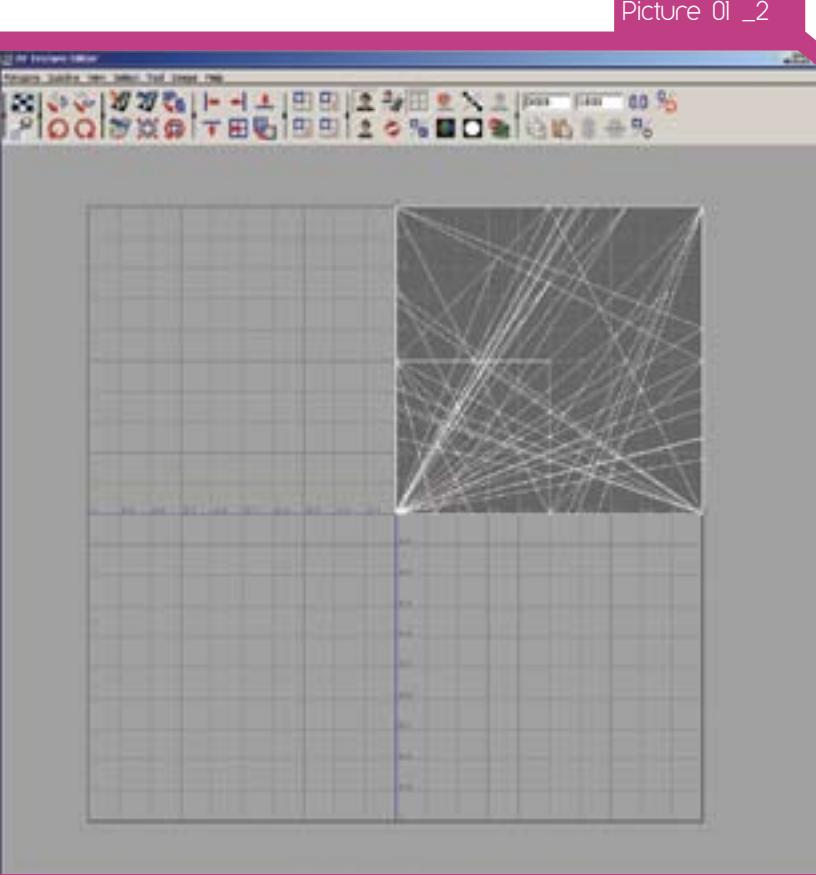
1_ In Maya 7, Open the file Pi_Owl.mb. This is the character we will be UV Mapping. (Picture 01_1)



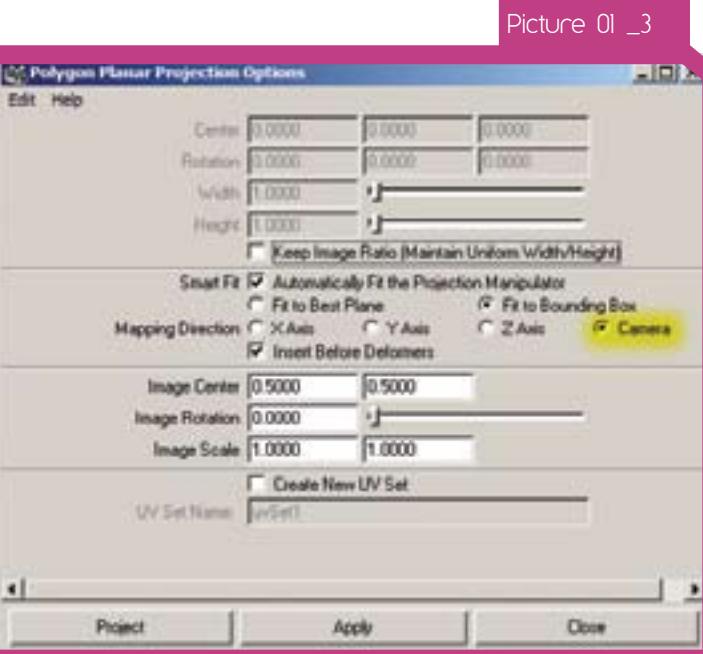
2_ Go to Window > UV Texture Editor and select the Owl's mesh. As you can see, the UVs are a mess right now. But we'll soon fix that!

You can move around in the UV Texture Editor just like you would in any Orthographic view. (Picture 01_2)

3_ Before we can start using the Unfold UVs tool, we must first create a single UV shell for the owl. We can use any of the projection methods, except for the Automatic projection method. In this case, we will simply use Planar Mapping.



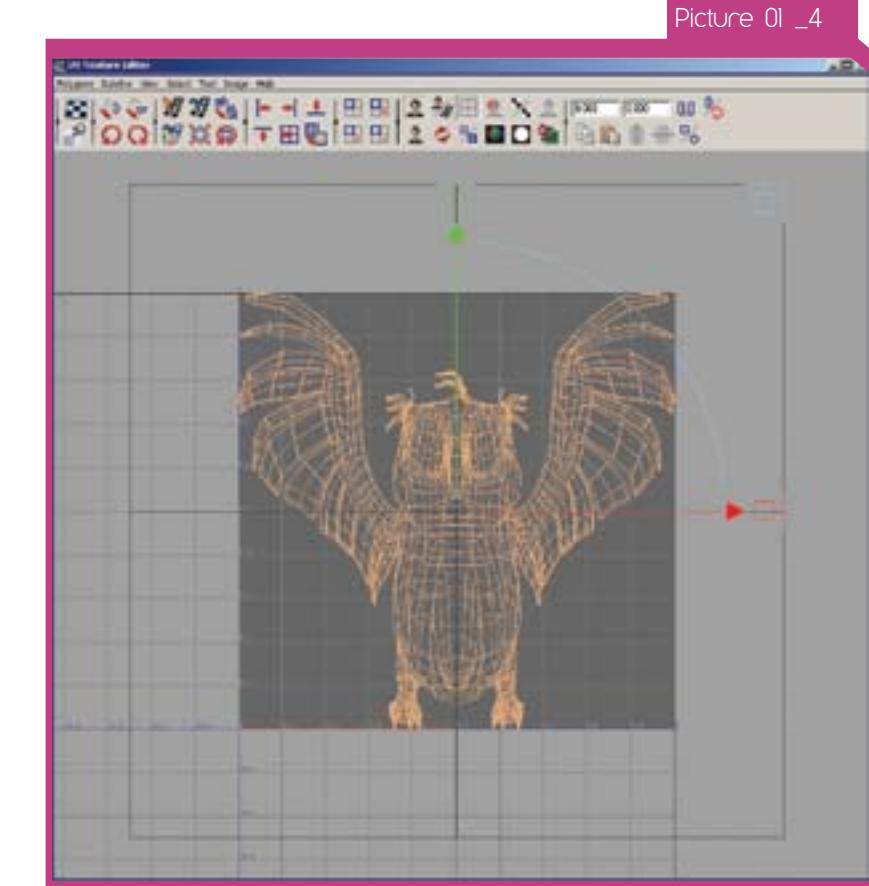
Picture 01_2



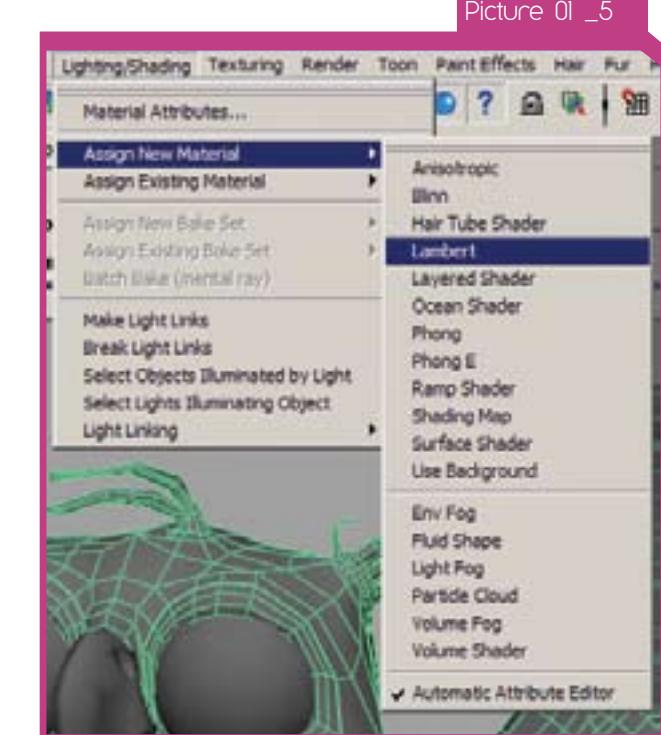
Picture 01_3

Go to Polygon UVs > Planar Mapping > Options. Change the Mapping Direction to Camera. I recommend using this setting because it will simply do a Planar projection from the camera you are currently in. (Picture 01_3)

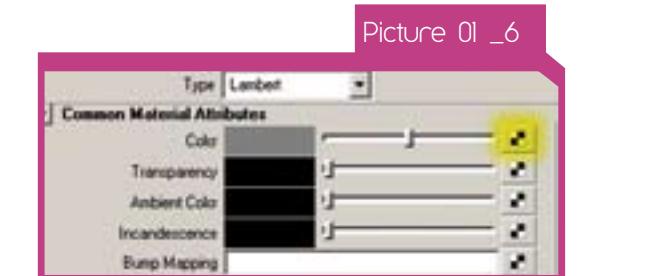
4_ Switch to the Front view and select the Owl. In the Planar Projection Options, click Project. The UVs in the UV Texture Editor should now look like Figure 4. Now the Owl UVs are a single UV shell. (Picture 01_4)



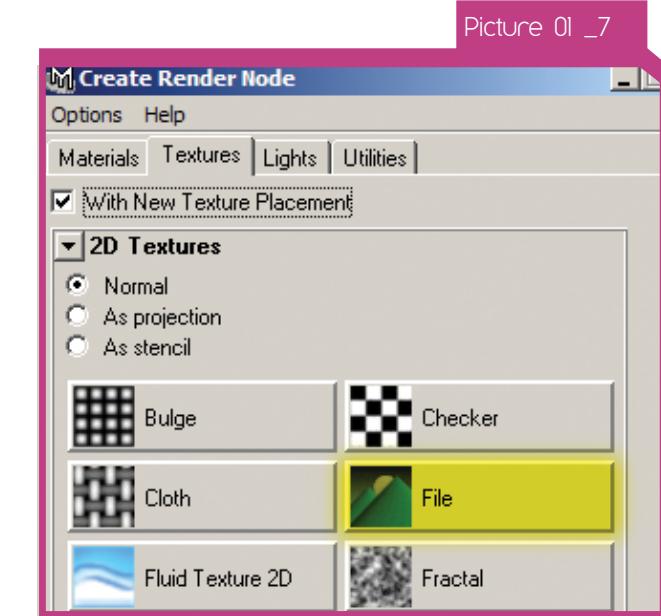
Picture 01_4



Picture 01_5



Picture 01_6



Picture 01_7

5_ Before we continue, let's apply a checker pattern to the Owl. The checker pattern will be an important visual guide for determining the size of the UV shells relative to one another, as well as identifying areas where there is significant texture stretching or overlapping UVs.

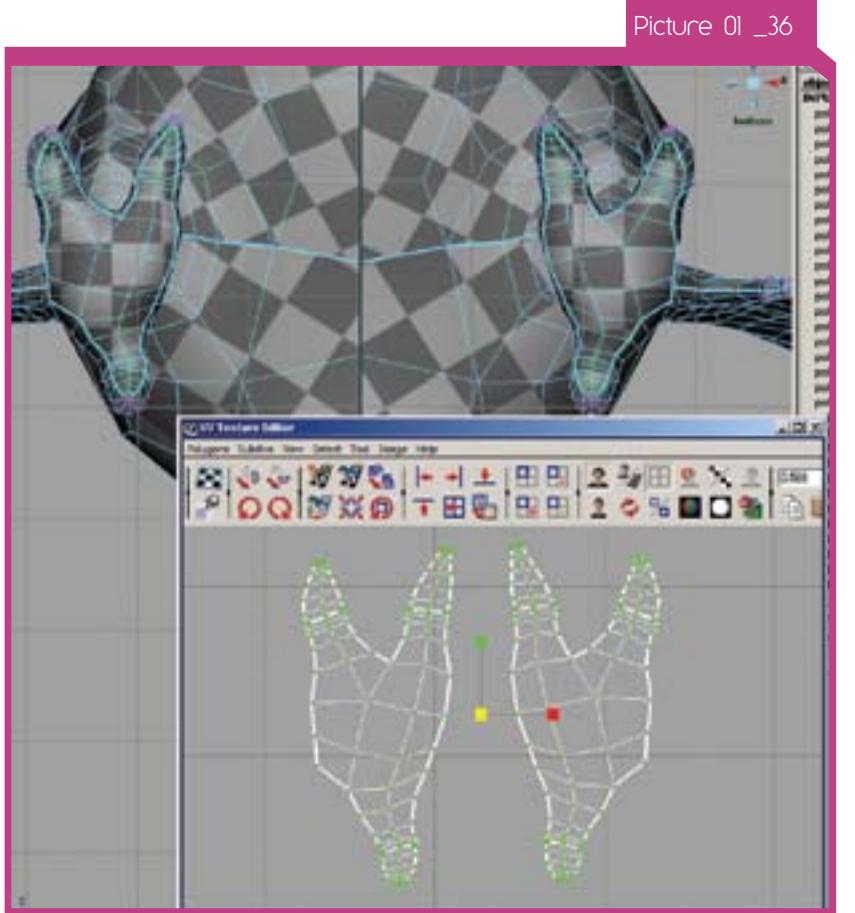
Switch to the Rendering menu set. Select the Owl and choose Lighting/Shading > Assign New Material > Lambert. (Picture 01_5)

6_ In the Attribute Editor that opens, click the checker box next to Color. (Picture 01_6)

7_ In the Create Render Node window that opens, click on File. This will create a File texture node and connect it to the color attribute of the Lambert shader. (Picture 01_7)

36_ Similarly to the wings, reproject the bottoms of the feet. First separate the bottoms of the feet from the tops of the feet, so they are easier to select. Then go to Face selection mode in the UV Texture Editor; select the faces for the bottoms of the feet and do a Planar projection from the bottom view.

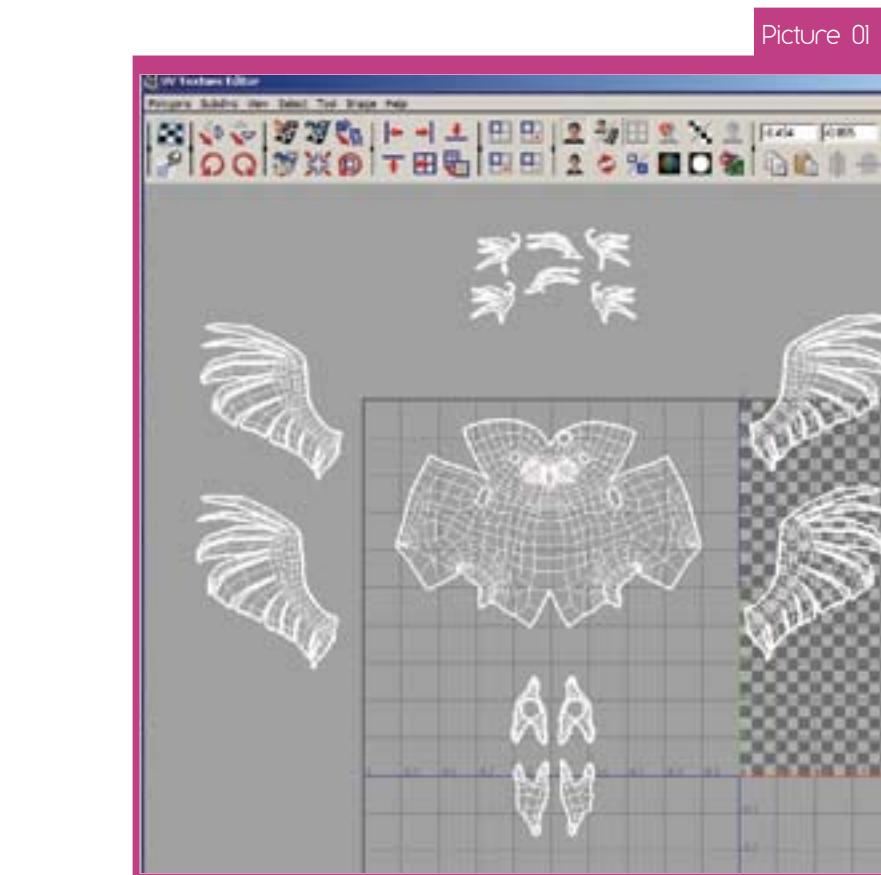
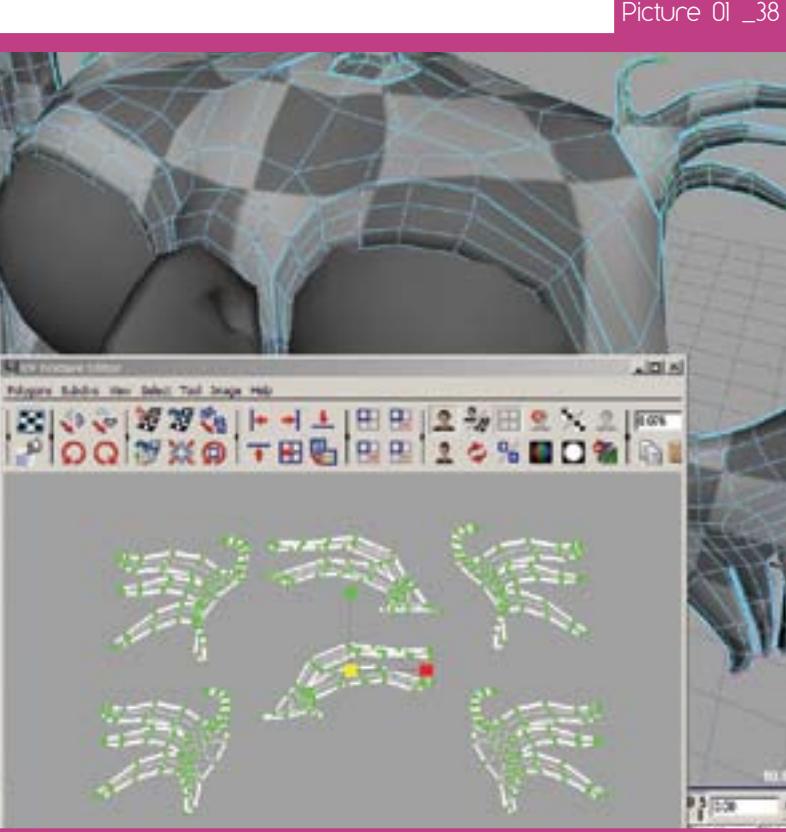
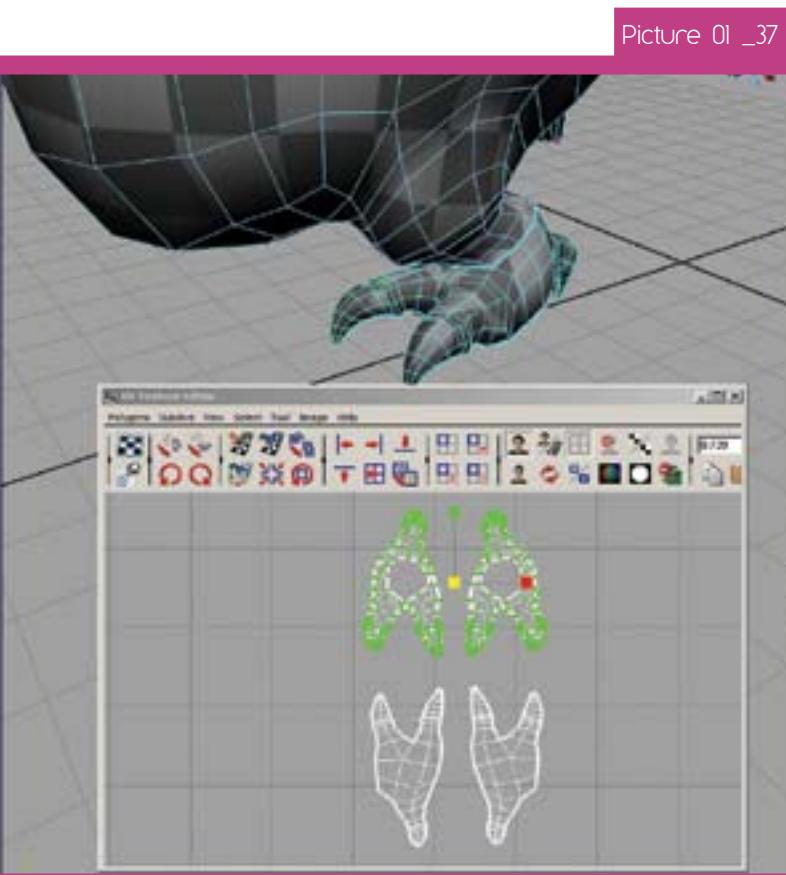
Rescale the feet UVs so that the checkers are approximately the same size as they are on the body. [Picture 01_36]



37_ Now reproject the tops of the feet from the top view. Rescale the UVs again to match the size of the checkers. [Picture 01_37]

38_ Following the procedure outlined in the last five steps, reproject the feathers on top of the Owl's head from the front view and the back view. Rescale appropriately. [Picture 01_38]

39_ Arrange the UV shells roughly like Picture 01_39

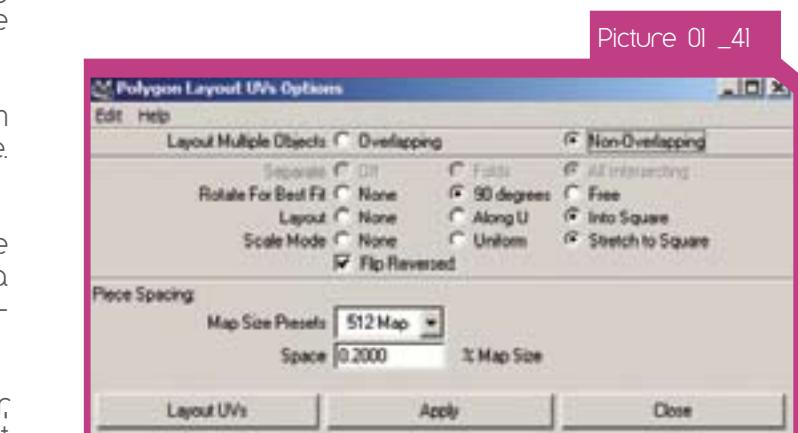
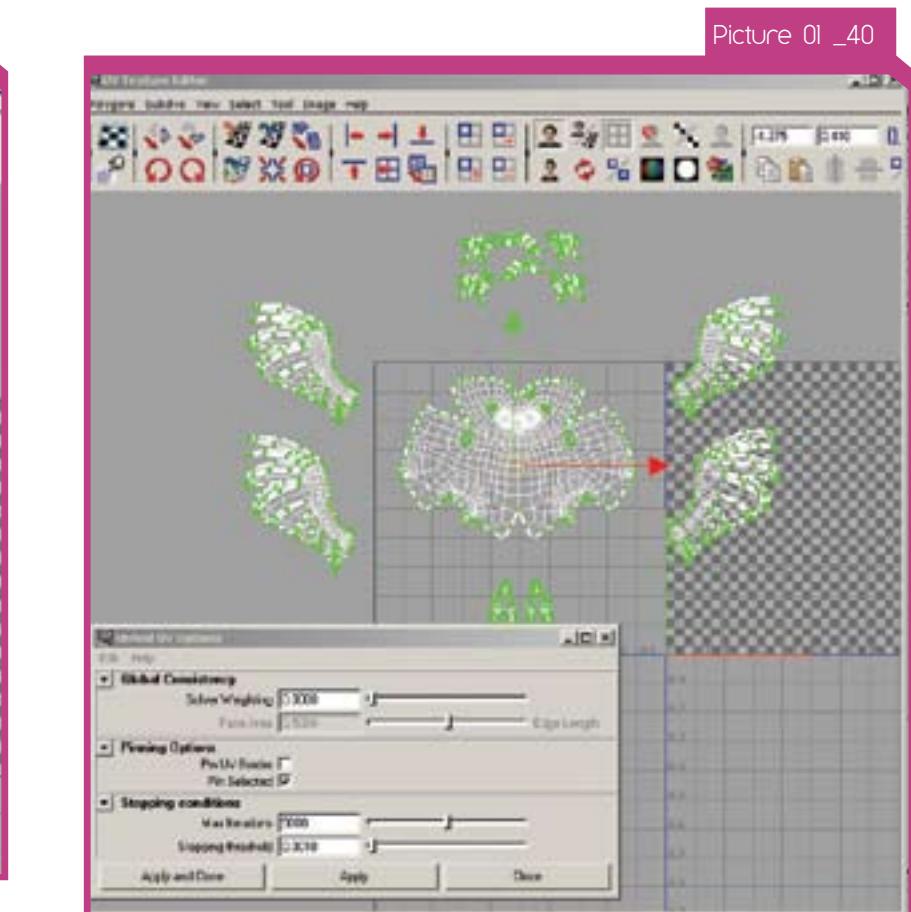


40_ We need to do one more thing before we will be ready to finalize our UV map-do a final Unfold UVs operation with the shell borders pinned.

Select all the UVs, Ctrl-right-click and choose To Border. Perform the final Unfold UVs operation with the same Options as before. [Picture 01_40]

41_ We are finally ready to move all the UV shells into the upper left quadrant and finalize our UV map. Luckily, there is a command in Maya that will help us do this quickly and easily-Layout UVs.

Select the Owl in Object mode and, in the UV Texture Editor, choose Polygons > Layout UVs > Options. Set the options to what they are in Figure 41 and hit Apply. [Picture 01_41]



Picture 01_40

42 All the UV shells should now fit neatly into the 0 to 1 texture space. Feel free to press the Apply button several times—you will get different results every time. Find the layout you like!

When you are satisfied with the layout, select all the UVs and scale them down slightly. This way there will be a small border between the edge of the texture map and the UV shells. [\(Picture 01_42\)](#)

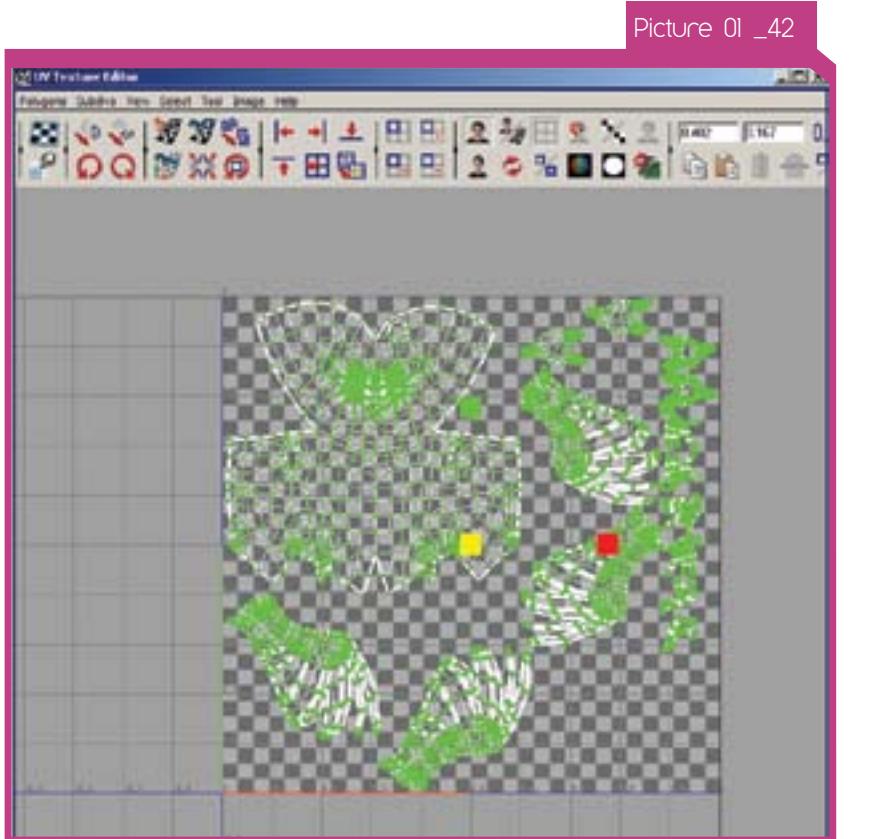
43 We are finished UV Mapping! Take a final look at the Owl. Notice that all the checkers are square and approximately the same size. This means that this is a good UV map with no significant texture stretching.

Open the file owlUVs.ma to see the finished UVs on the Owl. [\(Picture 01_43\)](#)

44 The last step in the UV mapping process is to export the UVs to an image file, so that textures could be painted underneath the UVs in your favorite graphics application.

Select the Owl in Object mode. In the UV Texture editor, choose Polygons > UV Snapshot.

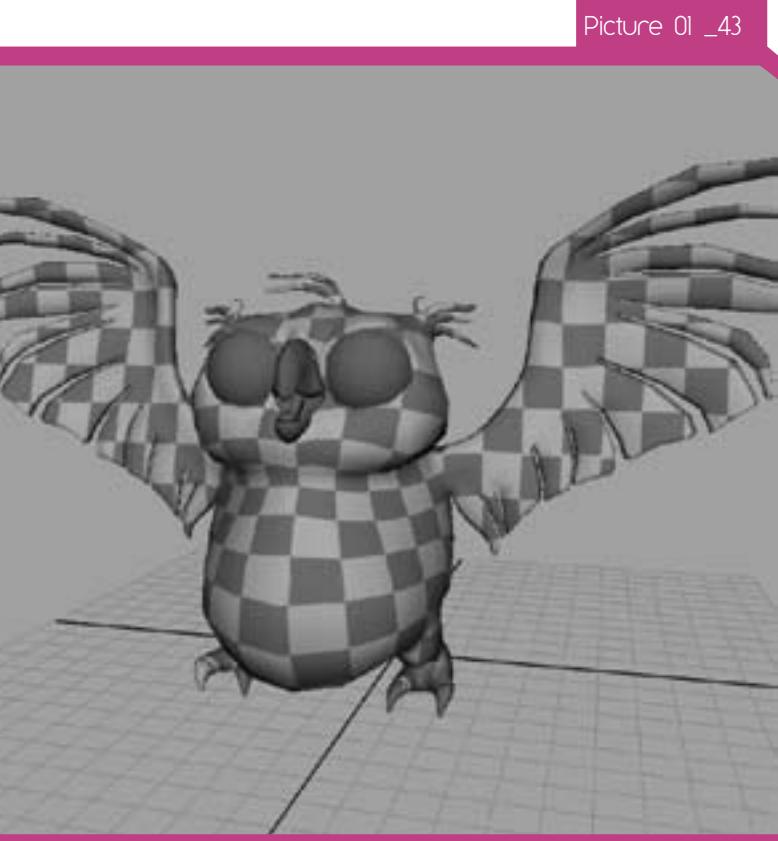
Set the Options to approximately as they appear in [Picture 01_44](#) depending on the setting you prefer, and hit OK.



Picture 01_42

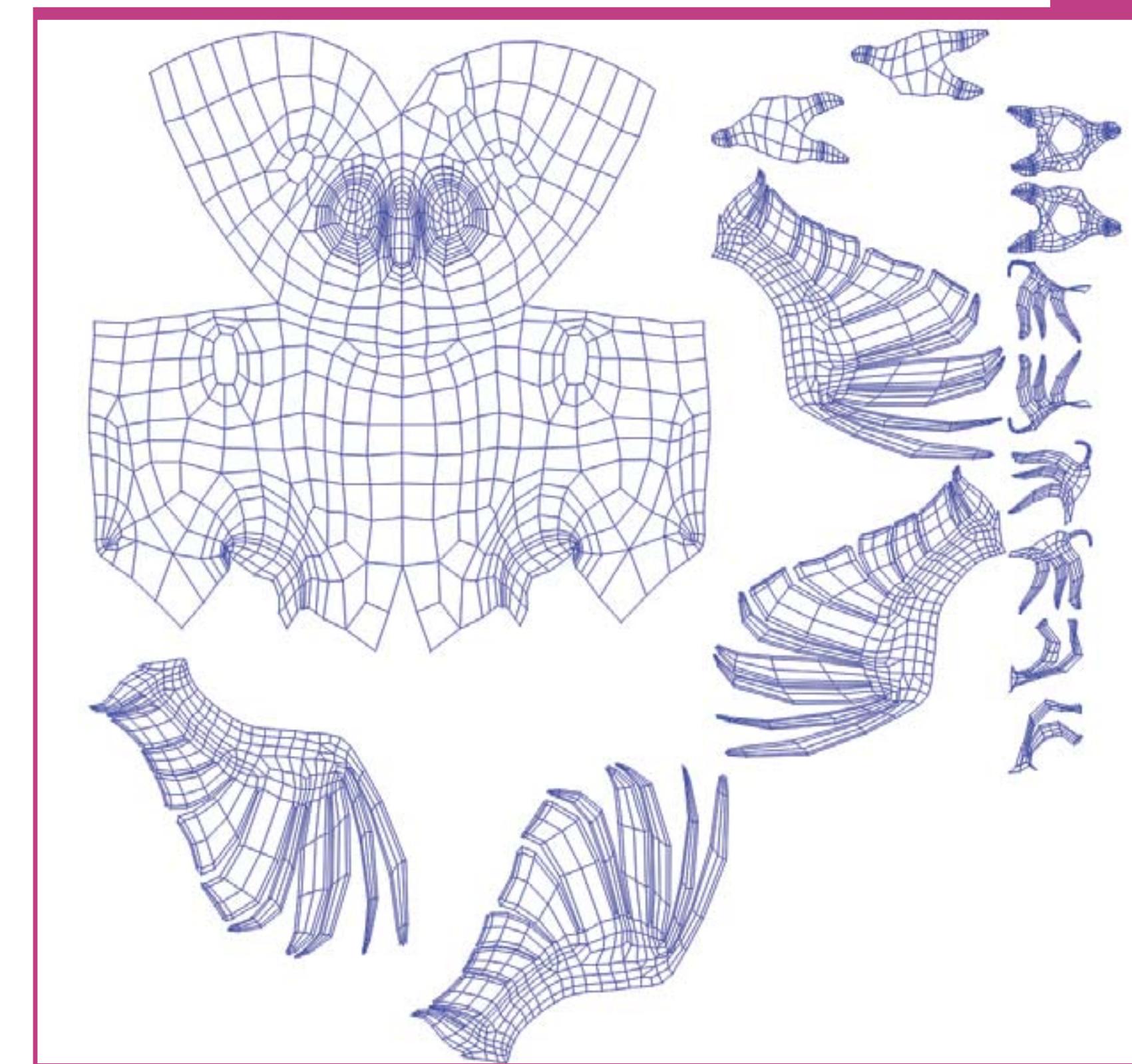


Picture 01_44



Picture 01_43

45 The UVs have now been exported to an image file and the texturing process can begin. [\(Picture 01_45\)](#)



Picture 01_45

04

Texturing Part

The Art of 3D Toons

- 01 [Regis Part](#)
- 02 [Gary Part](#)
- 03 [Pi Part](#)
- 04 [Oscar Part](#)
- 05 [Amanda Part](#)
- 06 [Stinson Part](#)
- 07 [Gaston Part](#)

01 _Regis Part



03 _Owl Part





05 _Amanda Part







05

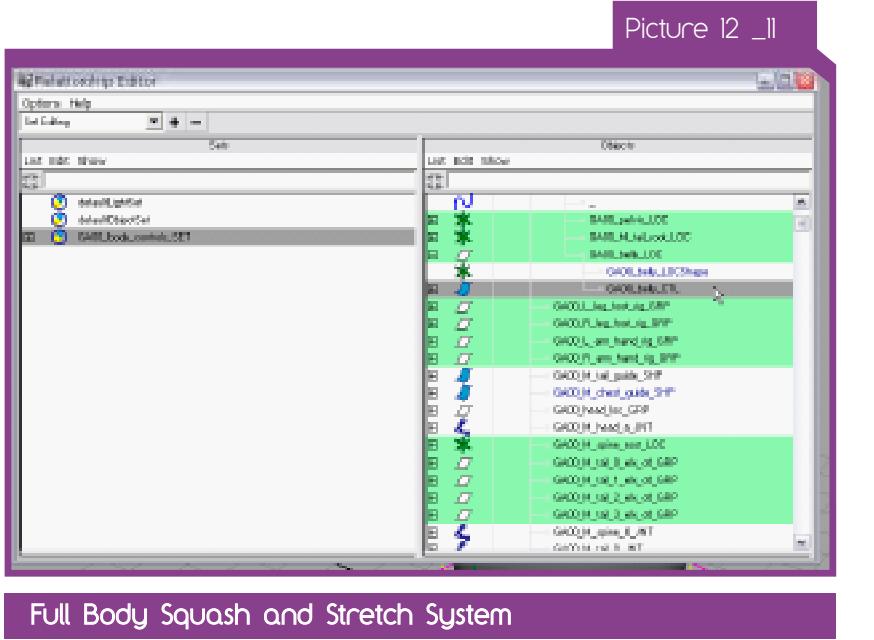
Rigging Part

The Art of 3d Toons

- 00 _Introduction
- 01 _Preparing model
- 02 _Placing bones
- 03 _Control Icons
- 04 _Spine Rig
- 05 _Tail Rig
- 06 _Leg Rig
- 07 _Foot Rig
- 08 _Arm Rig
- 09 _Hand Rig
- 10 _Connection Between Rig Modules
- 11 _Body Skin Binding
- 12 _Additional Deformation Pass
- 13 _Facial Rig

- 14 _Additional stuff
- 15 - Final Gaston Expressions Rig
- NN - Finalizing

In this window first select the set and then click on the belly control to add it. (Picture I2 _11)

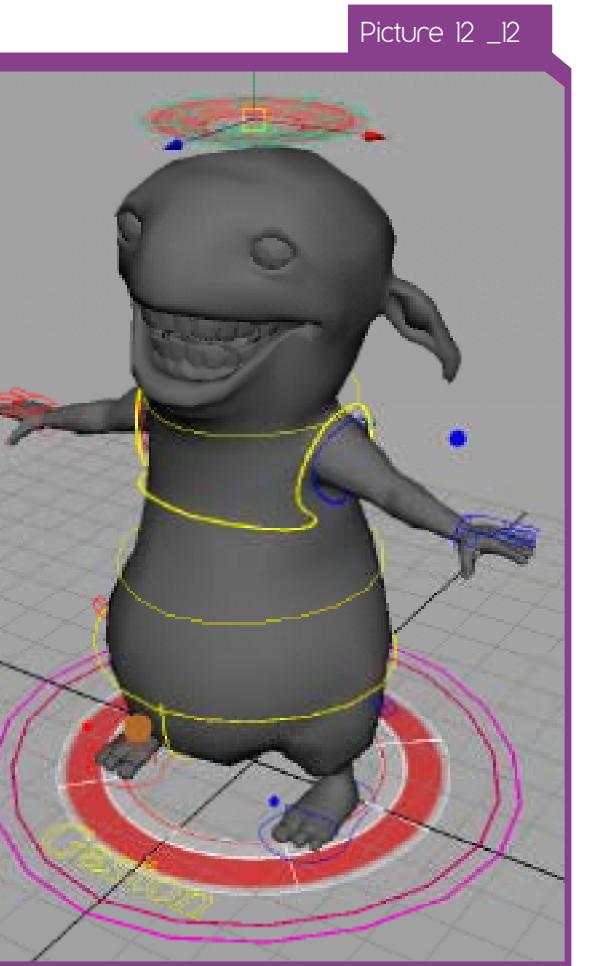


This consist of creating a couple of non linear deformers driven by two controls, one placed on the base and one on the top of Gaston head.

Once complete these two controls will allow the animator to squash, stretch and bend the full body. This is funny to animate.

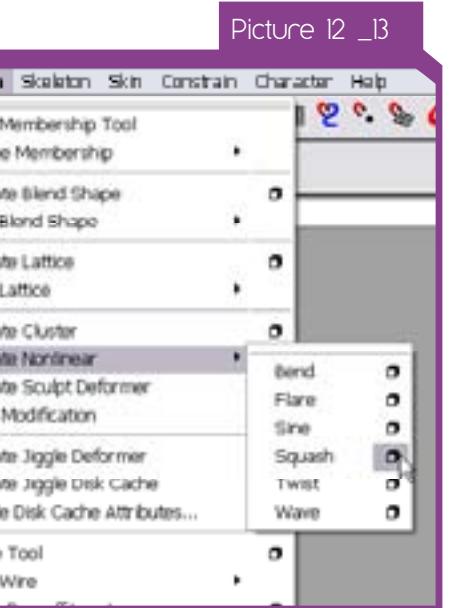
Start with:

- Create two controls with a shape similar to the picture and put one at the base of Gaston and the other a little bit above to the head. Freeze transformations and rename it respectively "GA00_nonlin_base_CTL" and "GA00_nonlin_top_CTL"; (Picture I2 _12)

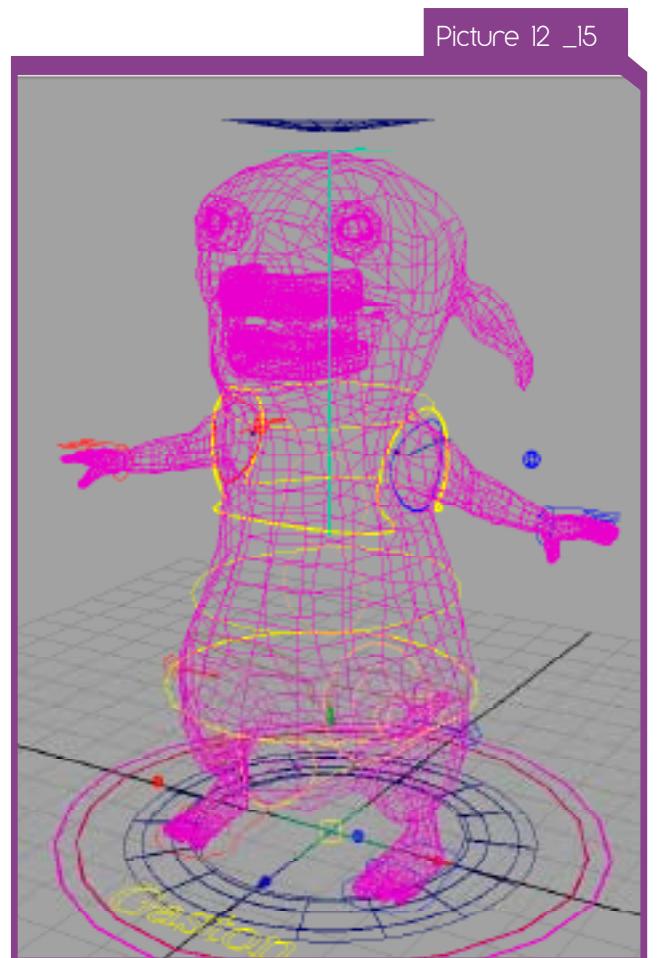
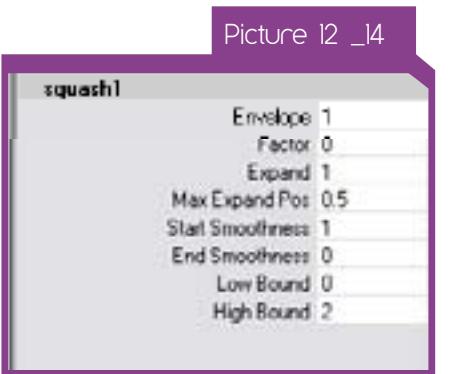


Now select "GA00_geo_GRP" group and in the menu:

- Deform ---> Create Nonlinear ---> Squash (Picture I2 _13)

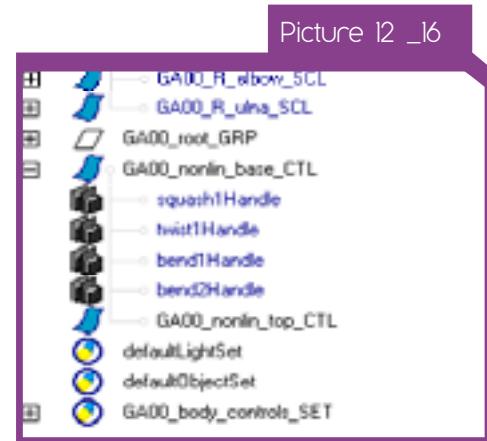


- Change the value of Low Bound to "0" and High Bound to "2". Then place the Nonlinear deformer at the base of Gaston, the same place as the "GA00_nonlin_base_CTL"; (Picture I2 _14) (Picture I2 _15)



- Repeat the same process to create the two bends (the second one rotated of -90 degree on the Y axes) and a twist Nonlinear deformer;

In the Outliner the hierarchy will appear like this: (Picture I2 _16)



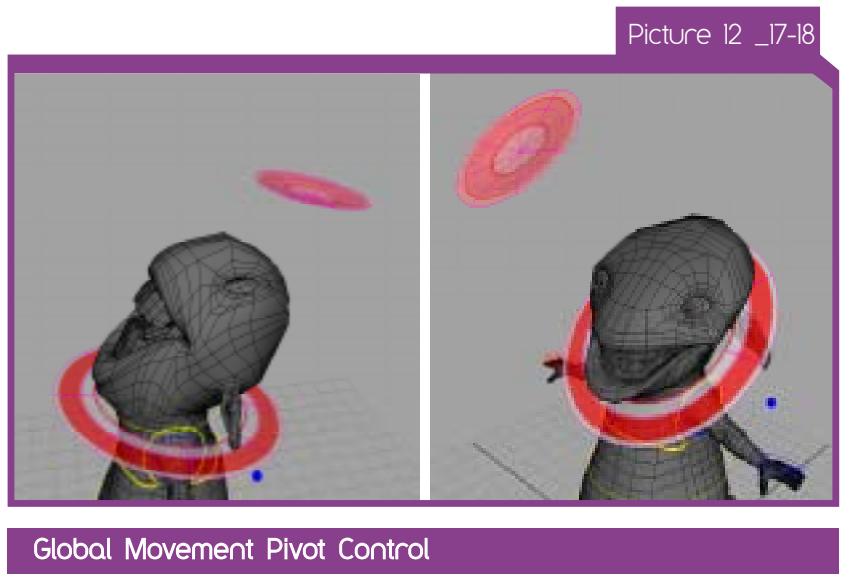
- Hide the visibility of all this new deformer;

Some connections:

- Connect the "GA00_nonlin_top_CTL.translateY" with the value "factor" of the squash Nonlinear deformer;
- Connect the "GA00_nonlin_top_CTL.rotateY" attribute with "twist1.endAngle";
- Connect the "GA00_nonlin_base_CTL.rotateY" attribute with "twist1.startAngle";
- Connect the "GA00_nonlin_top_CTL.translateX" attribute with "bend1.curvature";
- Connect the "GA00_nonlin_top_CTL.translateZ" attribute with "bend2.curvature";
- Create a new "boolean" type attribute on GA00_name_SHP called "nonlinear_ctl_vis" and connect with the shape visibility of the two Nonlinear controls.
- Parent the "GA00_nonlin_base_CTL" under the local control of Gaston ("GA00_local_body_CTL");

Done :)

(Picture I2 _17)



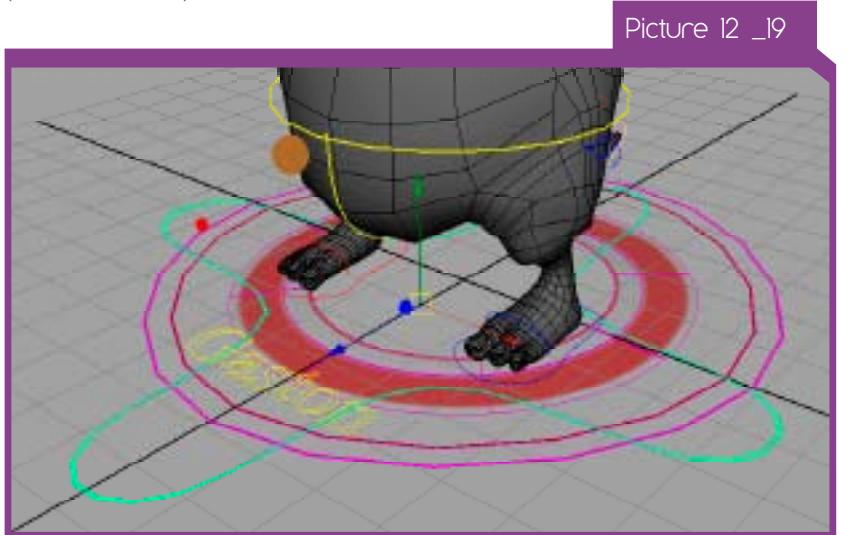
Global Movement Pivot Control

The global movement pivot control is a control to change the rotation position of the world of our rig. If in animation we use the "GA00_local_body_CTL", the pivot is placed at the base every time. Sometimes however if Gaston's need to swim or jump or do a flip, the pivot may need to be in the middle of the body or a similar location.

To create this animation system :

- Import or create a control with a star or recognizable shape and snap it to the "GA00_local_body_ctl_LOC". Freeze transformations and rename with "GA00_mvp_CTL";

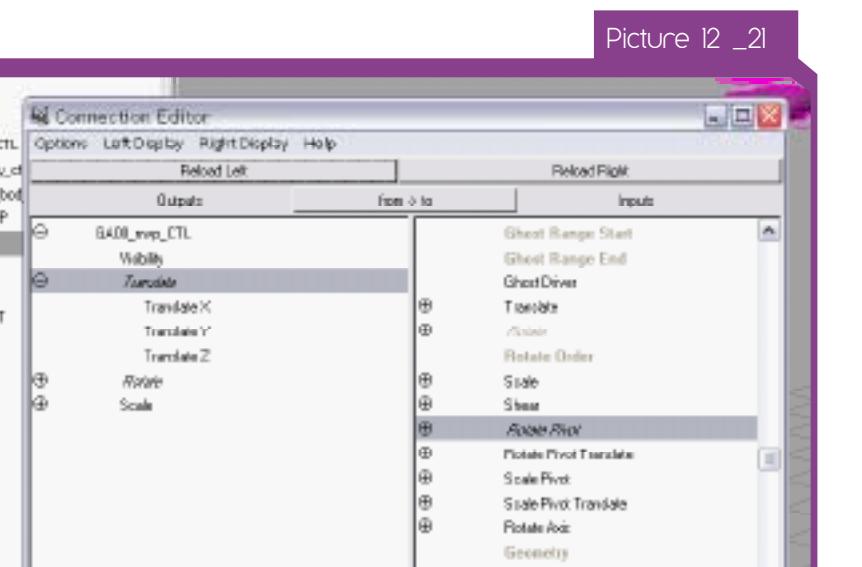
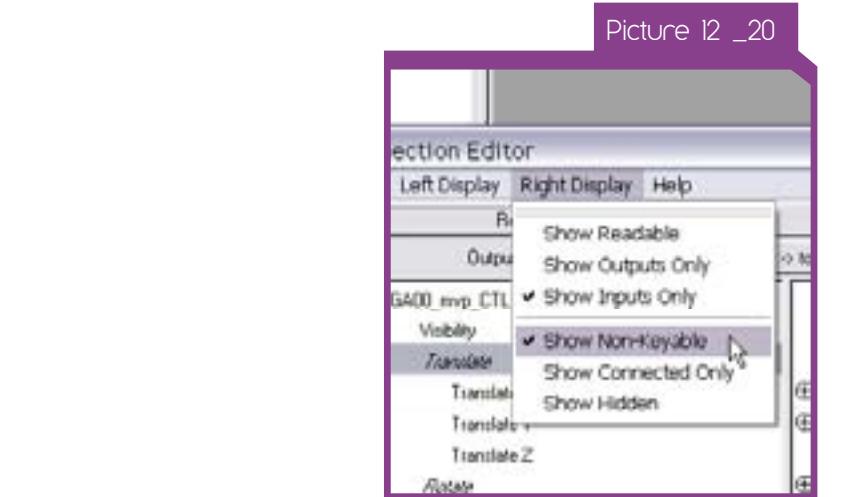
(Picture I2_19)



- Connect "GA00_mvp_CTL" translations to the "Rotate Pivot" attribute in the "GA00_local_body_ctl_LOC" and directly connect the rotations to the rotation of the locator.

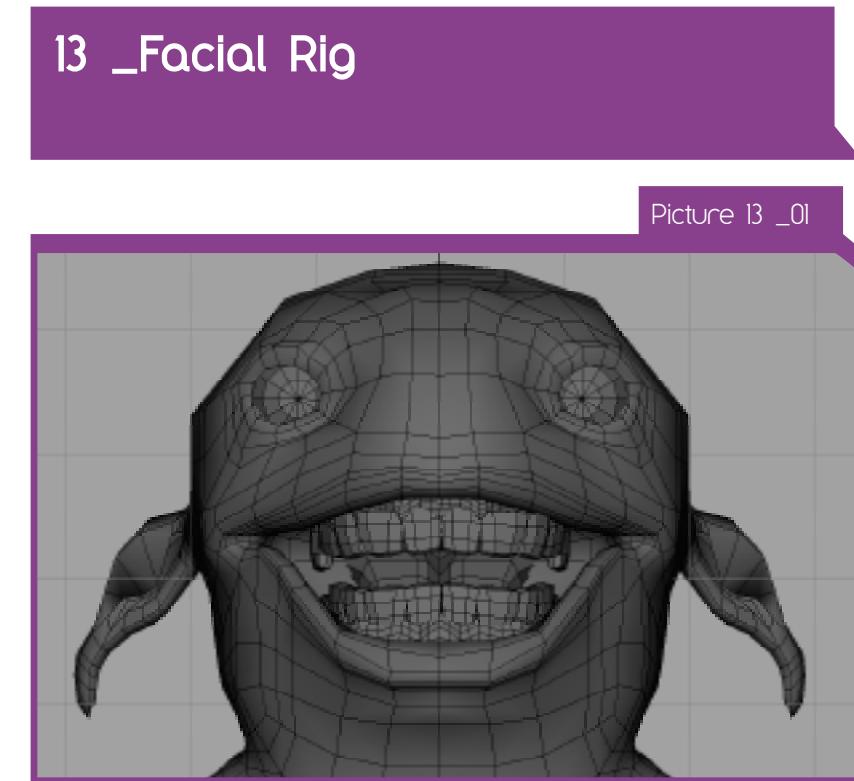
To find the "Rotate Pivot" attribute you have to turn on "Show

Non-keyable" in the Right Display option of the Connection Editor window. (Picture I2_20) (Picture I2_21)

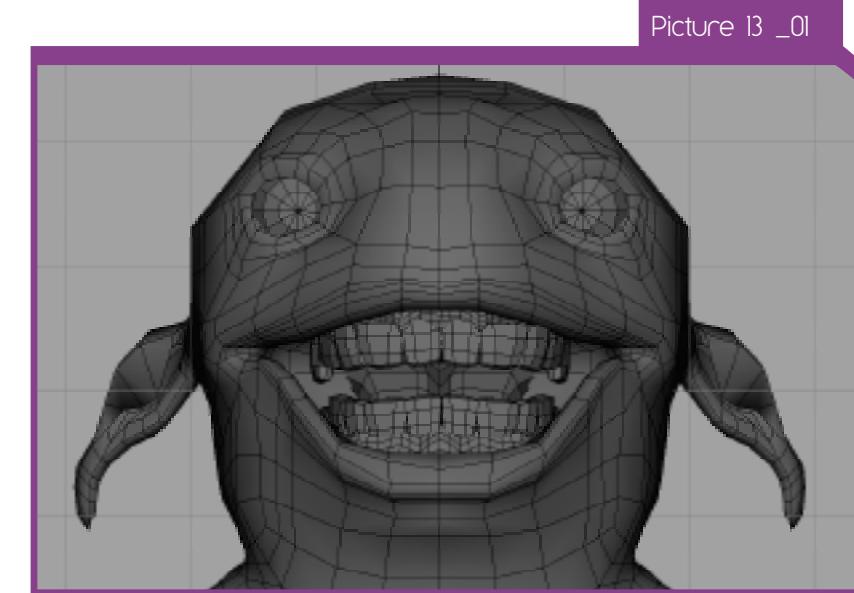


- Parent "GA00_mvp_CTL" under "GA00_global_body_CTL".
- Add this new control to the selection set ("GA00_body_controls_SET");

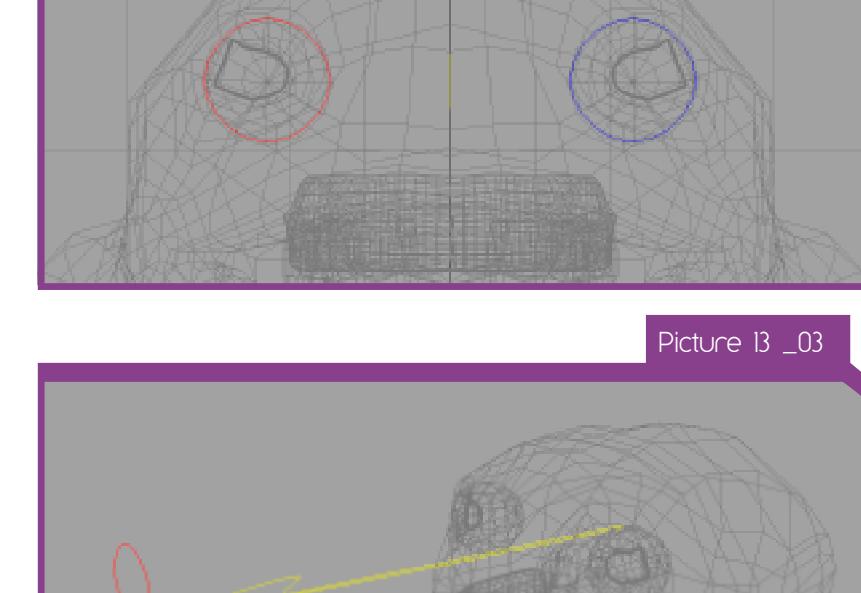
Remember you can only use this control to change the rotation point of Gaston at the beginning of your animation because if you alter it more than once you will have weird global movements.



I3 _Facial Rig



Picture I3_02



Picture I3_03

The most important part of a character during the acting process is the face, body expressions are also important but the face is vital.

During this chapter we shall analyze :

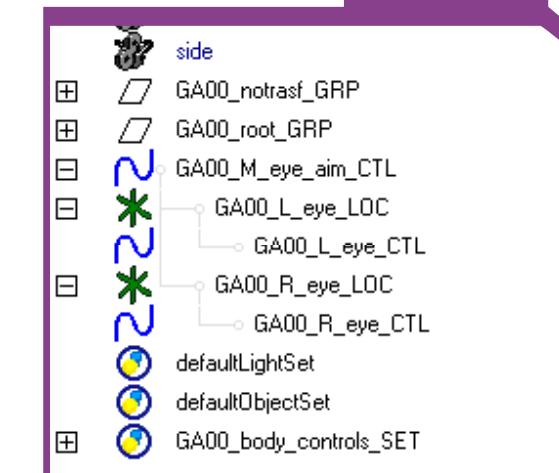
- Eye animation rig : aiming of the eye and pupil animation;
- Eye Blink setup;
- Eyebrow animation rig ;
- Jaw animation rig ;
- Mouth animation rig;
- Tongue animation rig;
- Ear animation rig;

Eyes Setup

This section explains a method to prepare a good eye rig. Start:

- Import or create three control shapes for the eye aim, one main control and two for the left and right eye, freeze transformations and rename them properly (e.g "GA00_M_eye_aim_CTL" "GA00_L_eye_CTL" "GA00_R_eye_CTL")

(Picture I3_02) (Picture I3_03)

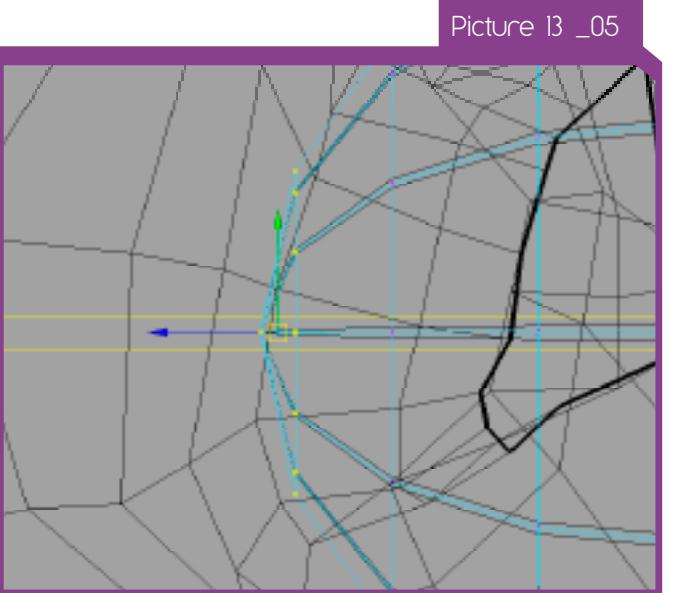


- Select the pupil's vertex of the left eye mesh and press:

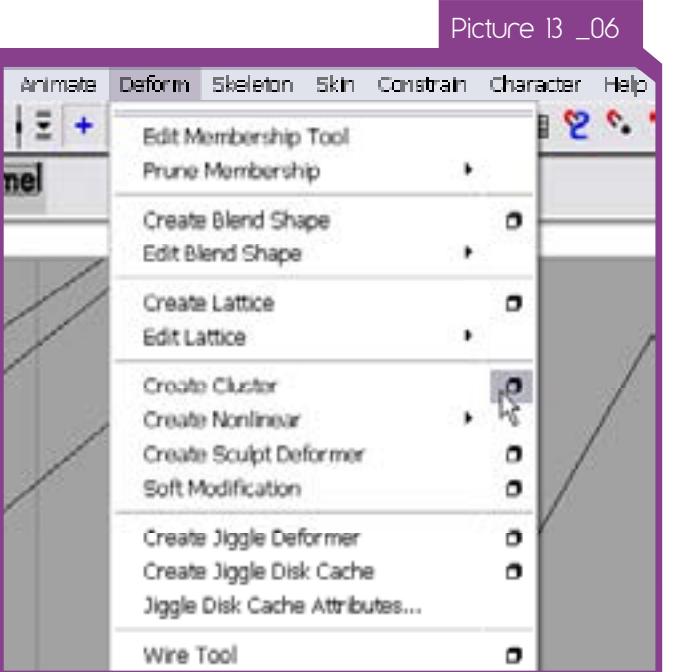
Deform ---> Create Cluster with "relative" option turned on, rename it properly ("GA00_L_eye_CLS")

Using this cluster deformer create a group of vertices that you can move, rotate and scale at the same time.

Parent the cluster under a new group called "GA00_notrasf_face_GRP" and hide it. (Picture I3 _05) (Picture I3 _06)



Picture I3 _05

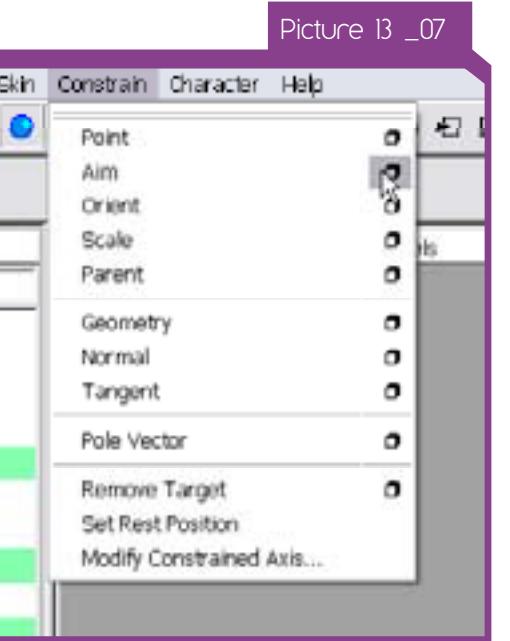


Picture I3 _06

- Create a parent group of "GA00_L_eye_GEO", rename it "GA00_L_eye_GRP";

- Select the left eye control "GA00_L_eye_CTL" shift select the "GA00_L_eye_GRP" and press:

Constrain ---> Aim with "maintain offset" option enabled and "none" with world up type. (Picture I3 _07)



Picture I3 _07

This constraint works like the aiming cannon of a tank, we "look at" the target object every time we take aim. This is what we want to control the eye.

- Lock and hide all the useless attribute on the eye. In this rig we shall only using the X and Y translations and all the scale values;

- Lock and hide all the attributes of the main aim control of the eye (except the rotations).

- Connect "GA00_L_eye_CTL .scale" "with GA00_L_eye_CLS .scale";

Cool, we are now able to decide the size value of the pupil.

Repeat this process for the right eye.

- Now create a "float" type attribute on "GA00_M_eye_aim_CTL" called "cross_eyed";

In the animation expression editor window, add a new expression:



