# Morphing in Blender

Morphing in Blender allows you to change one shape into another shape. This is useful in creating facial expressions or changing a default cube into a cat (literally)…

1) Import the head mesh provided in IS.
2) You will proceed to create so-called **Shape Keys:**
3) Select the object you would like to morph your head, in Object Mode.

4) Go to the 'Object Data Properties' tab in your Edit menu (Bottom right)
5) Click the '+' in the 'Shape Keys' window. This will add '**Basis**' which is literally the base of your morph and doesn't do anything. You will need more Shape Keys for an animation...
6) Add another Shape Key, this will be named '**Key 1**' by default. Feel free to name it whatever you like, for example 'Angry' if you are going to morph a neutral face into an angry one.


x
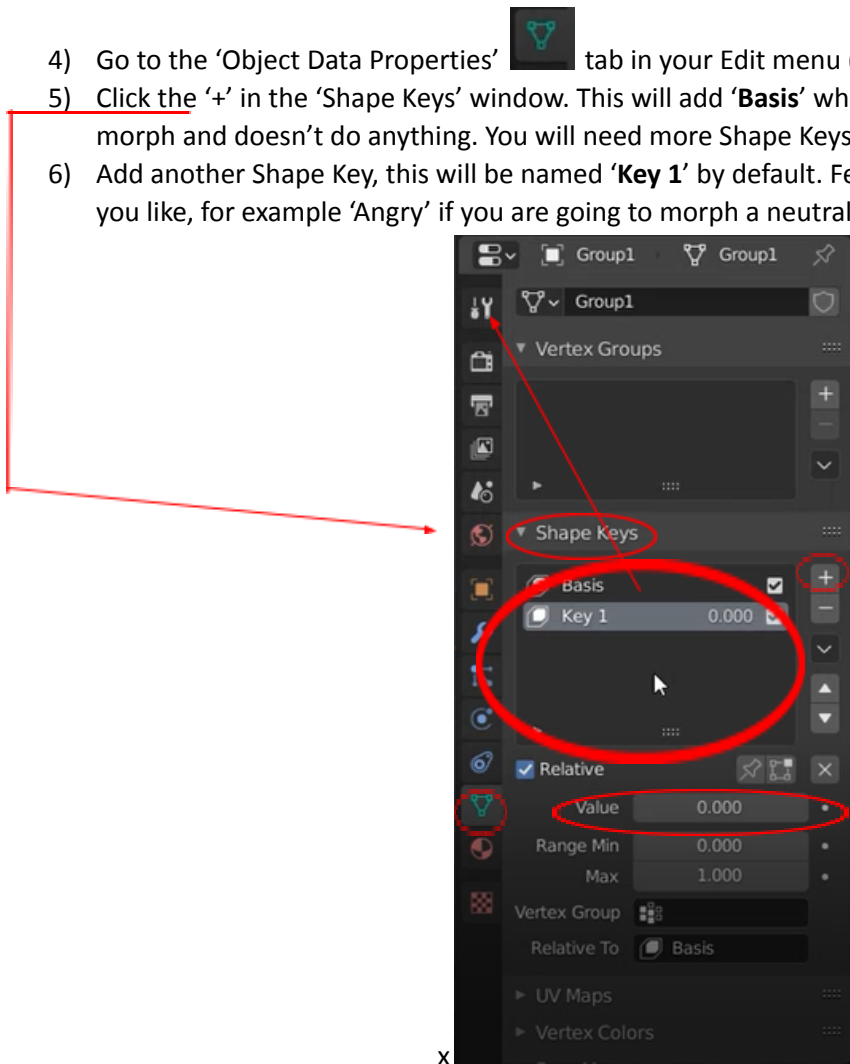
7) While you have your new shape key selected (in this example Key 1 renamed to Angry), bring up the 'Value' all the way to 1
8) While this Shape Key is still selected, go to either Modelling or Sculpting view (top ribbon menu). This example uses Sculpting view as we are using pen and tablet.
9) Because the face is symmetrical and we are creating a frown on both eyes, turn on the Mirror in top right ribbon menu.

x

10) Then choose a brush that doesn't add mesh, for example the Grab Brush (or press G).

11) Resize your brush/ strengths as desired with F/ F+Shift
12) You can mask the part of the face, example the eyelids by pressing M, inverting the mask, then move the eyelids with other masked parts being unaffected.
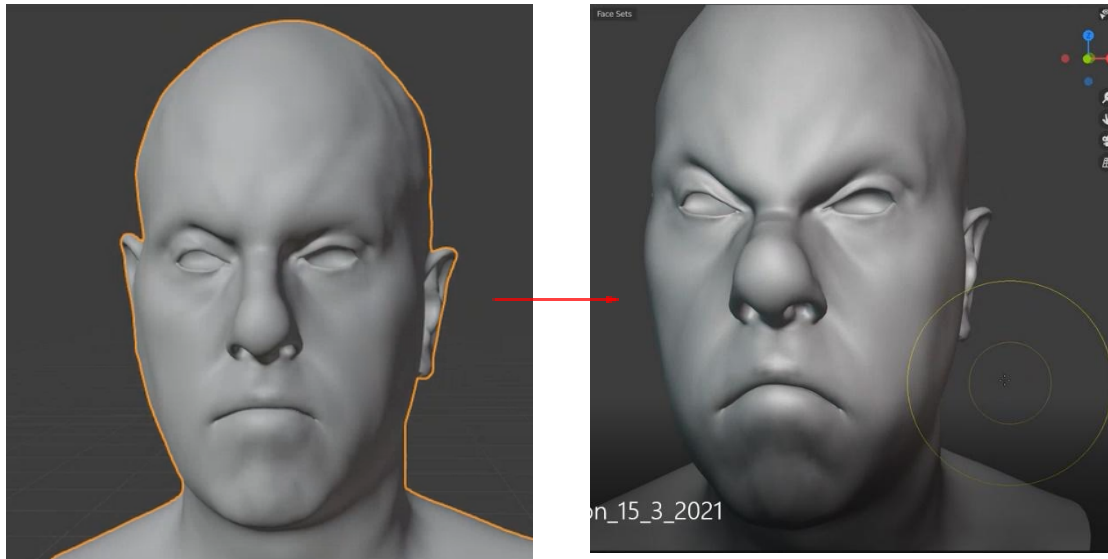
13) Now you can go back to your Object Data Properties tab in the Edit Menu
14) When you go to 'Volume' slider, which is currently at 1, it shows an angry face. But when you move your Volume value to 0, it will be a neutral face again. As you move the slider between 1 and 0, the mesh morphs from neutral face to angry face.
15) You can add multiple shape keys. To do this, Press + next to the Shape Keys window and while highlighted, repeat the process. In class we used 'Blink' and closed the head mesh's eyes.
16) Once you have created your desired Shape Keys, you can use them in animation. The nice thing is, that you can use and combine several Shape Keys at once. For example, you can have an angry face with closed eyes by bringing up both corresponding Shape Keys to value of 1 in the Value slider.
17) You can edit the mesh in Blender by adding vertices/ mesh, however, this creates mesh imperfections. It's better to edit mesh by moving already existing vertices. For example, you can add a Shape Key where the mesh has horn, however it will create some artefacts. So it is possible to do it in Blender, but it will create some artefacts because the new mesh will modify the original mesh.
18) Creating Animation: set all your Shape Keys into the value you want to start off with. In our case, we will start with a neutral face, so we brought the values of both Shape Keys 'Angry' and 'Blink' to 0.
19) Go to Layout Mode (top ribbon menu) and at the bottom of the viewport, pull out a new screen called 'Timeline, which will be used for animation.
20) Change the number of the frames for the length of your animation in the top right of your Timeline Sheet.
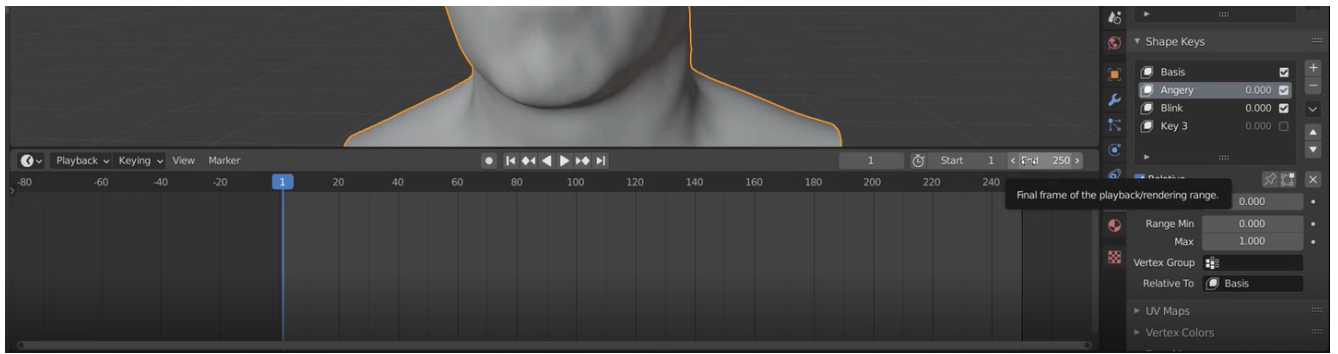
21) In your Edit menu (Bottom right of screen) go to Output Properties tab you can change your file format (for example rendering a set of png. Pictures that will be made into video in another post-processing software or straight up a video format), in Encoding -> Container you can keep Matroskha, or change it to MPEG-4, or if you are a Mac user, to Quicktime.

22) Once your animation is completed (not at this stage) you can press Ctrl + F12 to render it.

23) Once you are happy with your render and output settings, we will start in setting the Shape Keys into the Timeline Sheet

24) To do this, click the small circle next to the 'Value' slider of the desired shape Key in the Editor Menu in Object Data Properties tab. This will highlight your Value slider and value of the chosen Shape Key in 'Shape Keys' window yellow. This will add a little diamond Shape Key on your Timeline Sheet in the place, where a blue line is (because it's the beginning of an animation, this should be at 1. Tip for future: Whenever you see the yellow highlights, animation is involved.
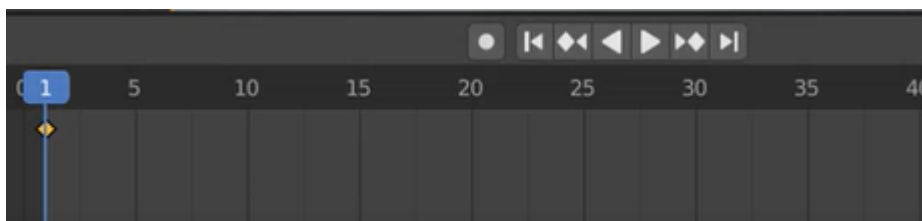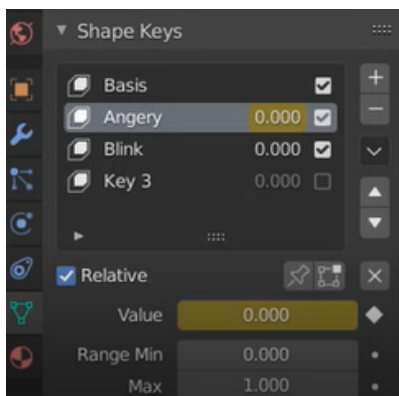

25) This first Shape Key is your start of morph animation, and unless you add more shape keys, it will be only in this position. So, we add second shape key.

26) Move the time slider line in your Timeline Sheet further up the timeline, for example 15 frames.

27) Then chose you shape key, can be the same (Angry) and pull the volume slider all the way up to 1. Then click the circle next to the Value Slider which will add a Key Frame in your Timeline

sheet. Now you have a small animation. If you drag your timeline line in your Timeline sheet between frame 1 and 15, it will go from neutral to angry.

28) To make things interesting, on frame 40, add a neutral face again by bringing down the value of 'Angry' to 0 and adding that shape key.
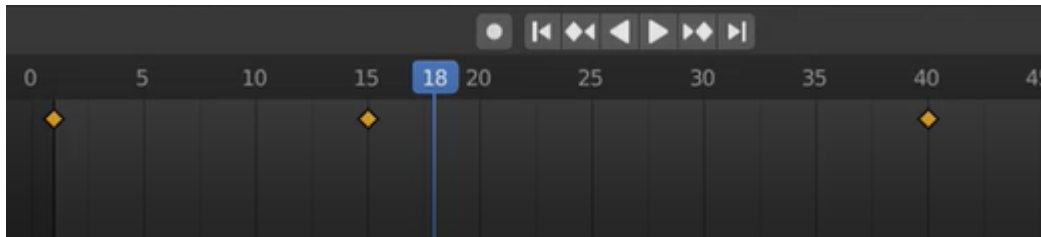
29) You can add in the other morph shape keys, in our case blinking. In this example, move your timeline line to to frame 18, and add 'Blink' Shape key while its value is at 0.
30) Then add a 'Blink' Shape key when its value is 1 at frame 22. To unblink yourself, add another 'Blink' Shape Key with 0 value at frame 26.

Angry-0   Angry-1   Blink-0   Blink- 1   Blink-0   Angry- 0
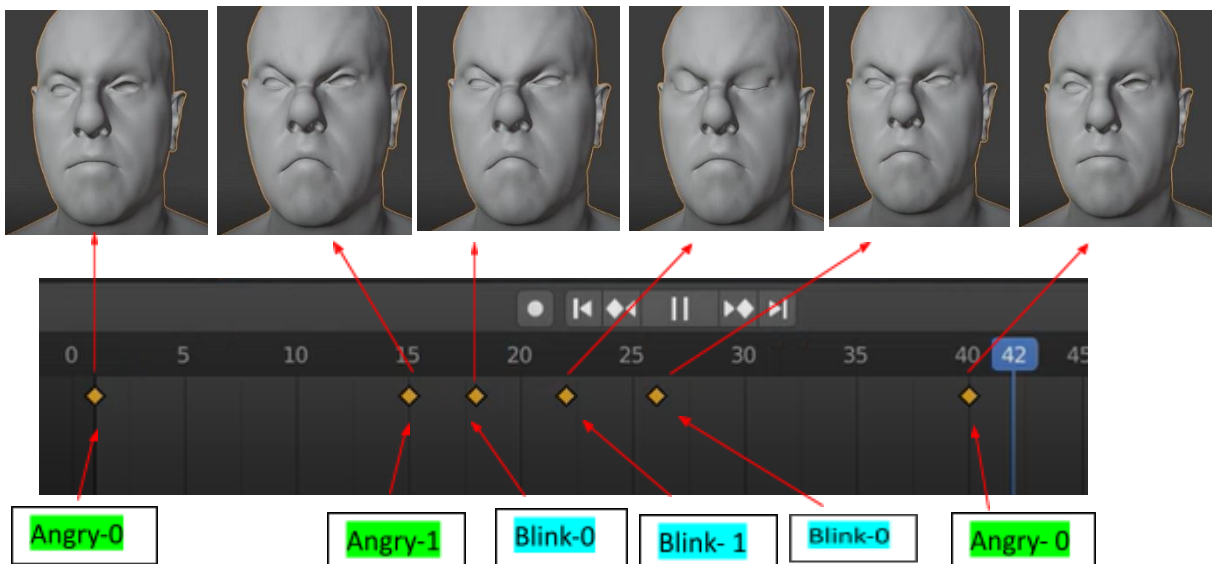
Now you have an animation where the person goes from Neutral to Angry, blinks, blinks and goes from Angry to neutral.

31) You can move the Shape Keys by clicking on them and pressing G, S to 'scale them and move them closer and apart in equal measures, duplicating them, delete them…
32) To make animations look fluid, you will play around with the animations a lot. As with all 3D modelling, it's very important to use references. So, for blinking, watch videos of people blinking, watch your friends blink….
33) You can control the transition between the Key Frames in the Timeline Sheet. To do this, Right click on the Key Frame -> Interpolation Mode -> choose whatever you like. This is called 'interpolation' and will not change the number of keyframes or how fast they go, but how quickly the mesh transition between them occurs.
34) If you don't like any of the pre-set interpolations, you can always change your Timeline Sheet to Graph Editor (top left corner of your Timeline Sheet), and tune fine details of your animation, such as very fine interpolation.