**Blender**

Based on <https://www.youtube.com/watch?v=nIoXOplUvAw&list=PLjEaoINr3zgFX8ZsChQVQsuDSjEqdWMAD>

1. Timestamps per video: By https://www.youtube.com/channel/UCNbXsJkJWkEOpP6h4\_F\_yjA

Timestamp

0:54 – donut!

1:15 – 3d viewport

1:48 – render (hotkey:F12)

2:45 – moving the object (hotkey:G, left click to confirm; right click to cancel; x/y/z to snap along the axis)

4:02 – moving object along specific axis (alternative: hold middle mouse button while moving)

5:07 – rotate and scale (hotkey:R(rotate); hotkey:S(scale)

6:20 – orbiting the view (click middle mouse button)

6:36 – laptop user without middle mouse button (Edit>Preferences>Input>Enable Emulate 3 Button Mouse, hold ALT + left click to orbiting)

7:17 – interface resolution scale (hold CTRL for incremental numbers)

7:58 – industry compatible keymap

8:30 – panning the view (shift + middle mouse button)

9:04 – zoom in and out (scroll wheel; hold CTRL + scroll wheel for smooth movement)

9:25 – inspect the object (number pad period(.); tilde key(~), select view selected)

10:25 – align view to axis (number pad 1(front view); number pad 3(side view); number pad 7(top view), hold CTRL for back, another side, bottom view)

11:21 – switching orthographic view and perspective view (number pad 5)

12:00 – alternatives for align view (1. tilde key(~), 2. [View] at the top left (beside the [Object Mode])>viewport, 3. Hold ALT + middle mouse button )

13:00 – properties(right hand side of the screen)

14:14 – outliner(top right of the screen)

14:40 – duplicate object (shift + D, left click to confirm with movement; right click to cancel movement)

14:53 – camera view (number pad 0)

15:14 – delete object (hotkey:X; hotkey:DELETE)

15:25 – keyboard shortcut PDF

16:02 – subscribe to Blender Guru newsletter

16:16 – Create your own new scene in blender and start the learning journey!

Timestamp:

0:00 – Poliigon

0:20 – delete default cube (hotkey:X)

0:25 – add new object (hotkey: shift+A)

1:10 – donut shape (Add mesh > Torus)

1:35 – options for the mesh added

2:11 – recall the options menu (hotkey:F9; or just delete and re-add)

2:38 / 3:04 – make the donut thick (changing minor radius in option menu)

3:26 – changing major and minor segments (resolution of donut / amount of geometry)

4:55 – segments of the donut (40 for major, 16 for minor, < just for reference, can try with your own number)

5:41 – size of the donut

6:08 – properties of the object (the sidebar at the second right part of the screen); (hotkey:N)

6:33 – unit system (wacky imperial!)

6:58 – scaling (hotkey:S), 10cm/0.1m for reference

7:24 – apply the scale, should always be 1.0, otherwise everything will be messed up (CTRL+A to apply > Scale)

8:15 – remove jagged lines (shade flat / shade smooth), (select the object then right click)

9:05 / 9:42 – sub-surf / subdivision surface modifier (right part of screen > spanner > add modifier > subdivision surface)

10:37 – what is sub-surf modifier doing

11:52 – edit mode (1. hotkey:TAB; 2. Top left corner[Object Mode]; 3. CTRL+TAB )

13:47 / 14:35 – add imperfect details to donut(make it bumpy), (hold shift to select multiple vertices, G for moving/grab)

14:44 – proportional editing (hotkey:O)

15:58 – proportional editing for trackpad

17:18 – problem while moving

17:51 – shrink and flatten (moving along normal) (hotkey:ALT+S)

19:20 – problem: why I can’t click on my camera? (object and editing mode)

20:05 – select random

20:36 – falloff type (beside the proportional editing)

* 1. Timestamp:

0:40 – how to make the icing

0:50 – entering edit mode

0:57 – straight on view (numpad 1,3,7)

1:14 – orthographic and perspective mode of view (numpad 5)

1:46 – X-ray mode (hotkey:ALT+Z)

2:21 – duplicate (hotkey: shift+D, left click to confirm with movement, right click to duplicate without movement)

2:57 – separate (hotkey:P)

3:37 / 4:14 – select linked (select all things connected) (hotkey:CTRL+L)

4:37 – rename objects (hotkey:F2)

5:04 – add thickness to the icing (solidify modifier)

5:36 – wireframe mode (hotkey:Z)

5:51 – changing the offset and thickness in solidify modifier (negative: add thickness inward; positive: add thickness outward)

6:17 – subtle/precise movement(hold shift), incremental movement(hold ctrl)

7:10 – order of modifier

* 1. Timestamp:

0:59 – hide the solidify modifier (to see the vertices and faces of the icing in editing mode)

1:24 – move the vertices down, with proportional editing turning on

1:52 – problems

2:18 / 3:44 – snap to the face (magnet)

4:10 – project individual elements (everything in proportional editing circle area will also snap)

4:52 – believe him, he made millions of donuts before

5:28 / 5:52 – split the window

6:25 – image editor

7:26 – apply sub-surf modifier

8:16 – hide and unhide object (hide: H; unhide: ALT+H)

9:43 – add back sub-surf modifier (get the smooth edge)

9:51 / 10:06 – extrude (hotkey: E)

(extrude = add extra face. Select two or more vertices first, extrude, move and left click to confirm, right click to cancel)

14:20 – working on donut (apply sub-surf modifier)

14:39 – edge loop (hotkey: ALT + left click) , to select a ring of vertices

Meanwhile, O is hotkey for proportional editing, turn it on; and turn snapping off

15:18 – shrink wrap modifier

16:38 – ALT+S: shrink / flatten (vertices moving along normal, review tutorial Part2 at 17:51)

* 1. Timestamp:

0:26 – sculpting

0:40 – apply all modifiers in correct order

1:36 – sculpt mode (CTRL+TAB > 2)

2:21 – draw tool (hold CTRL to reverse brush)

3:00 – brush size (hotkey: F)

3:22 – brush strength (hotkey: shift+F)

4:12 – smooth tool (hold shift to temporary toggle on)

4:58 – inflate tool

5:48 – stroke method of inflate tool

6:23 – switching stroke method to space

7:18 – stylus(pen)

8:50 – make depth on top of icing layer

10:47 – make depth at bottom of donut

13:22 – back to layout mode(default)

* 1. Timestamp:

0:24 – render (hotkey: F12), just render the image, the image will not be saved to your computer

0:44 – move the camera (1.) (hotkey: CTRL+ALT+ numpad 0)

1:06 – move the camera (2.) (N to bring up properties menu > Enable Lock Camera to View > Middle mouse to move camera)

1:58 – move the light

2:05 – snap objects selected to center of the 3d viewport (hotkey: ALT+G)

2:35 – move the donut

2:43 – move the camera (3.) (hotkey: numpad 0 to switch to camera perspective > G to pan camera, then middle mouse button to zoom; R to rotate camera, then middle mouse to change direction of camera facing)

2:57 – lighting (changing the power (brightness of the light) , changing radius will affect the shadow(bigger size = softer shadow) )

3:23 – viewport shading (hotkey: hold z)

5:00 – render engine (Eevee and Cycles)

8:18 – Cycles render devices setting

10:14 – add plane below donut

10:48 – Eevee shadows setting (at render menu(camera icon at right part of screen) > changing cube size (resolution of shadow) )

11:45 – Eevee shadows setting (at light menu(lamp icon at right part of screen) > changing bias (self-shadowing) )

13:10 – still Eevee shadows setting (at render menu > Enable Ambient Occlusion )

13:48 – icing material

14:52 – changing material properties (base color, roughness (0-shiny/glossy) )

15:43 – donut and plane material

16:04 – render slots

16:35 – again Eevee shadow setting (at render menu > Enable Screen Space Reflections )

17:25 / 18:17 – material subsurface (were light enters into the object and scatters out)

21:05 – material view

22:02 – samples

23:08 – denoiser

* 1. Timestamp:

Procedurally colour the donut

1:43 – hide everything except donut and light (hotkey: H to hide, ALT+H to unhide)

3:09 / 4:26 – node editor

3:27 – merge windows (at corner of window, click and drag across; or right click the edge of windows and select join area)

5:44 – why use node to create texture (< procedural way, can also use painting way for texturing)

6:41 – create texture

6:46 – add noise texture node (hotkey: shift+A to add > texture > noise texture)

7:38 – cut node string (1. Click the input dot(left side of the node) and drag the line to empty space; 2. Hold CTRL+ right mouse then slices the line)

7:55 – change the node string colour (add ColorRamp node: Add > Converter > ColorRamp)

8:56 – enable node wrangler add-on (Edit > Preferences > Add-on > search node wrangler in search bar)

9:22 – use node wrangler to preview the raw output of the node (CTRL + shift + left click on any node, CTRL + shift + left click the last node(Principled BSDF) to bring everything back )

9:52 – problem: visible stretching

11:06 – fix the stretch (add Texture Coordinate node: Add > Input > Texture Coordinate)

11:35 – node socket colour(the colour of those input and output dots)

11:49 – connect Object in Texture Coordinate node to Vector in Noise Texture node, then adjust the Scale

13:14 – use same noise texture node to make donut bumpy

13:55 – normal (direction perpendicular to the surface)

15:00 – convert Fac(grey) to Normal(blue) (add bump node: Add > Vector > Bump),

connect Fac(Noise Texture) to Height(Bump), connect Normal(Bump) to Normal(BSDF)

adjust distance(as the value is in metric, default is 1meter)

* 1. Timestamp:

0:33 – texture painting

1:13 – add image texture at node editor (Add > Texture > Image Texture)

1:38 – no need ColorRamp anymore (revise ColorRamp node: added in Part7 7:55, used to convert the node colour from grey to yellow, gave the donut brown colour)

2:00 – open texture image from hard drive

2:32 – create a new texture image

2:44 – resolution of texture image

3:50 – some tips for changing the value in blender (1. select multiple and change at the same time by clicking and dragging; 2. Do mathematic operation (multiply / divide / … ) in the field)

4:58 – change base color and name of texture image, disable alpha(alpha = transparency)

5:36 – texture paint mode

6:30 – change from view mode to paint mode at image editor(right half screen)

6:43 – explaining uv map

8:30 – color the middle part of donut (as like sculpting; hotkey: F to change brush size; shift+F to change brush strength)

9:37 – G for grab, R for rotate, S for scale everywhere in blender

10:14 – flip the brush colour (hotkey:X)

11:59 – save the texture image (at top left, If Image have \* : [Image\*] < like this, indicating there are unsaved changes)

13:23 / 14:08 / 14:48 – back to shader, use noise texture node and infuse to the image texture

14:48 – combine Color(Donut Base/ Image Texture) and Fac(Noise Texure): (add mixRGB node: Add > Color > mixRGB)

15:07 – Fac value in mixRGB (0-1: 0 = 100% use the first input(Color1); 1 = 100% use the second input(Color2) )

Additional: the node socket color meaning- light green for functions(no value); blue/purple? For vectors or coordinates; yellow for colours or RGB, light grey for single numerical value or float value

15:28 – blending mode (Mix/Multiply/Overlay/ … ) (I also don’t know how it works, I will put a further reading below this comment, or read other comments for better understanding)

16:30 – Overlay is used, Fac(Overlay) and Scale(Noise Texture) is adjusted

17:55 – experimental: connect Fac(noise texture) to other properties(roughness) in BSDF, add ColorRamp node