polygonal modeling & Blender 101

this tutorial consists of the following:

1. barebones step by step howto (what do I do so at least SOMETHING SOMEHOW MEANINGFUL HAPPENS ON THE SCREEN)
2. polygonal modeling - general concepts and terms *(not specific to Blender, yet more important to understand than anything about a particular piece of software)*
3. me too lazy (to do page numbering)
4. controls for navigation inside the 3d viewport
5. most used mesh editing tools
6. various ways of mesh selecting
7. 3d cursor explained (that weird crosshair thing that you place by leftclicking)
8. customizing window layout (read it if you want to save yourself from pain, anger, and frustration)
9. using shortcuts, right-click select, and other pointless chant (that is hardly useful for anybody)
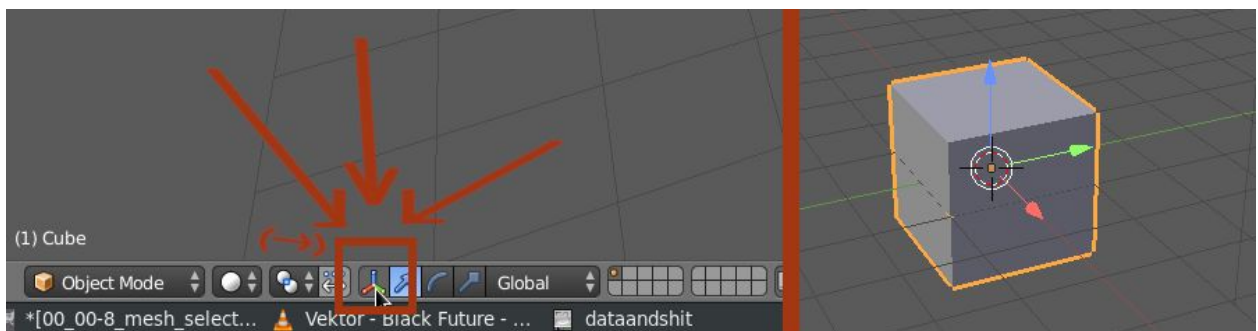
//summary, like whay I did for photoshop then?

1. barebones howto

First, the second most important part. You may be a bit frightened by lots of buttons and whatnot. At least 10 years ago you definitely would've been, when Blender's UI looked more like something they use to launch intercontinental ballistic missiles. Now it's less cluttered, but lots of buttons you don't need anyway. So.

> > click anywhere inside blender window so splash screen disappears
> > and 3d viewport is this whole big grey area with grid and cube and other weird thengs you kno
> > While holding a **cursor within the 3d viewport,**
> > `shift + space` = fullscreen or unfullscreen
> > `N, T` = show/hide N-panel and T-panel. Yeah, that's how they are called. Anyway, just hide them.
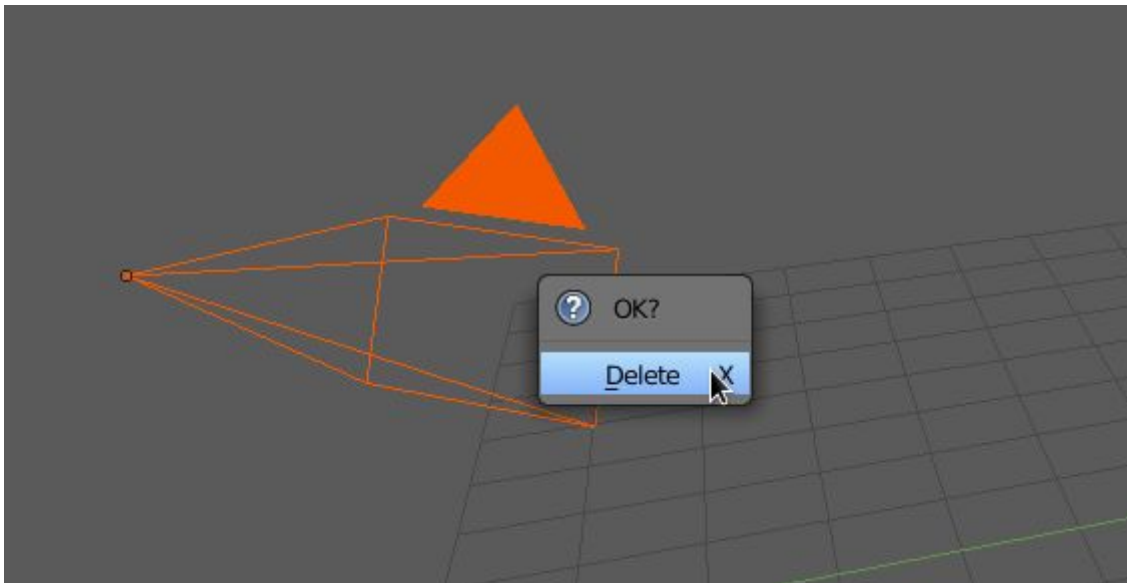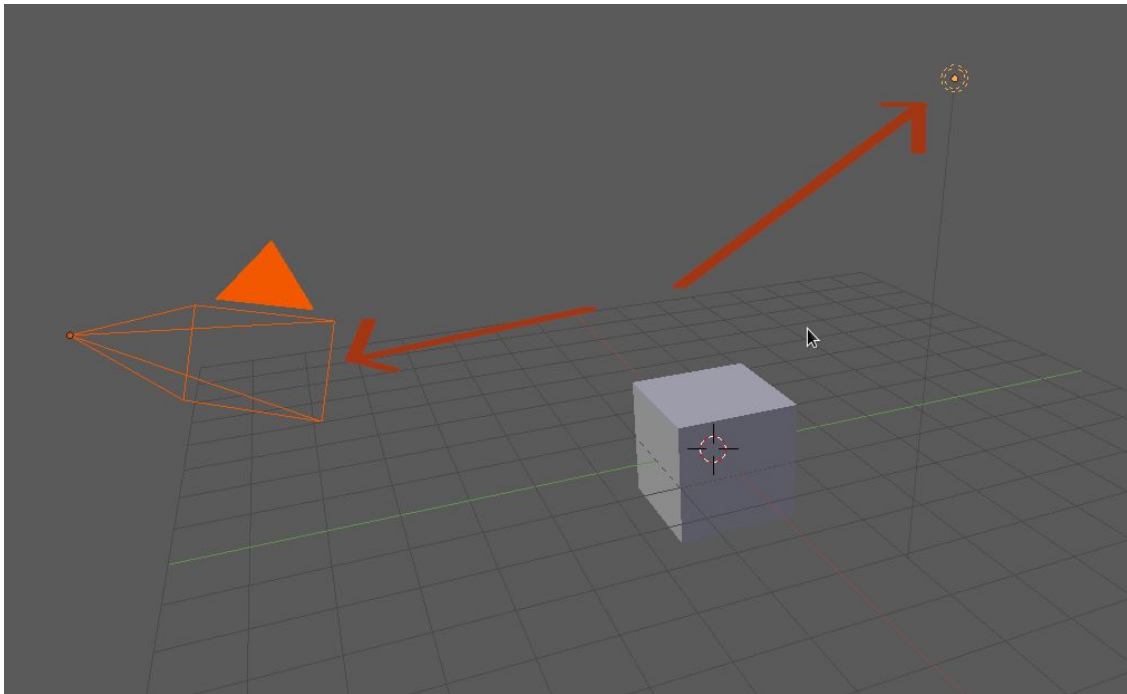
Now you have much less things to distract you.

Second, the first most important part. Yeah. Set teh focken **transformation widget** invisible, for no one needs it in 2018.
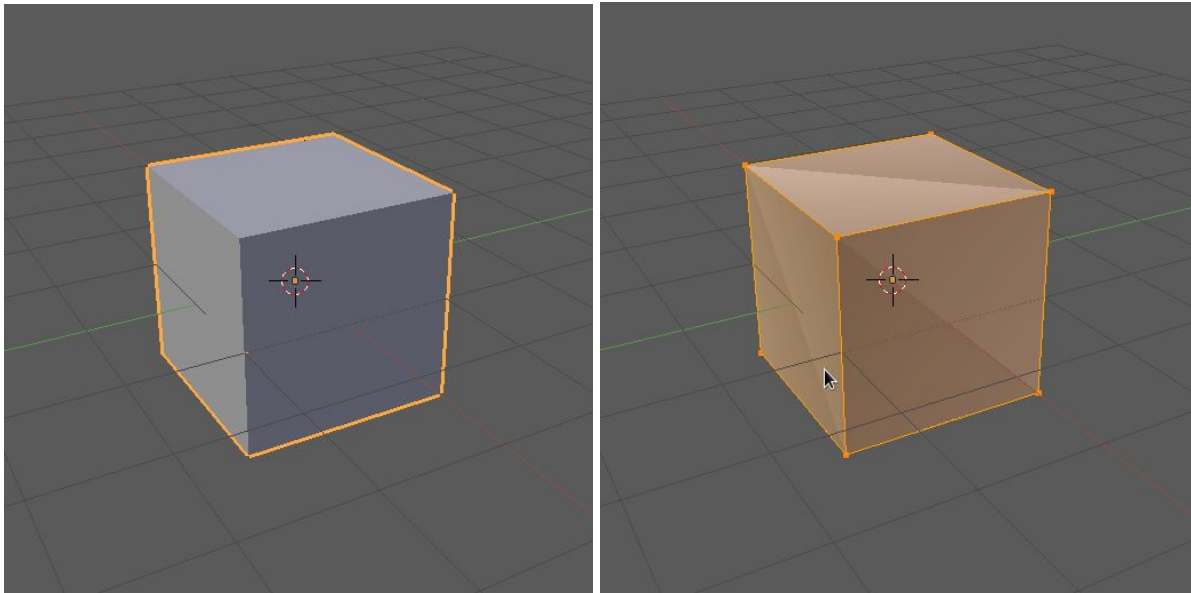

click **this** button on the left and watch those red, green and blue arrows on the right disappear (dats one helluva magic trick)
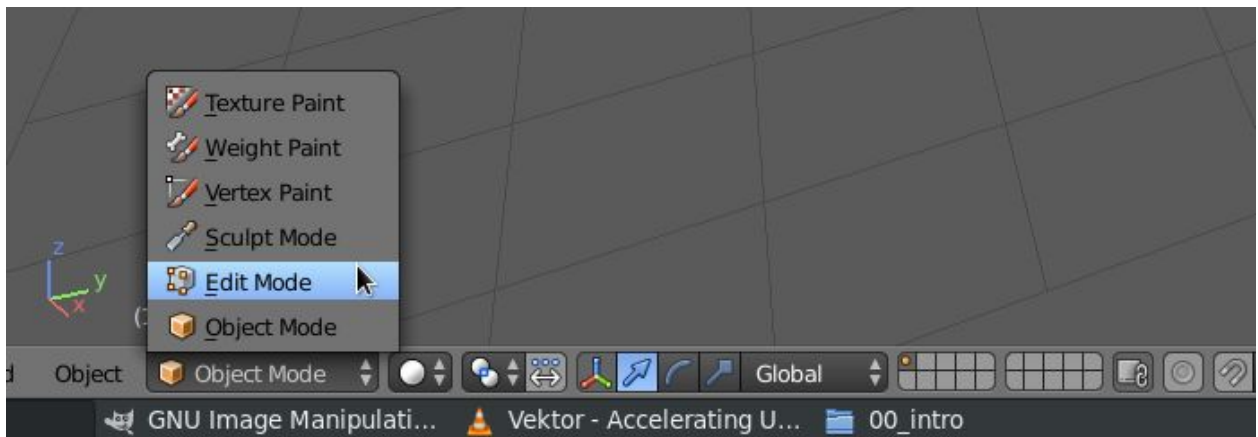
> > `right-click` = select an object
> > `rightclicking` while holding `shift` = select multiple objects

> select the **camera** and the **point light**

> then press `X`

> then inside confirmation pop-up - `left mouse button`
or `enter` to **delete them**

> then select the cube and press

> `tab` - switch between **edit mode** and **object mode**

// that's about how it's supposed to look
// except for this weird triangulation in edit mode - I guess the rezun for
it is my GPU that is as old as I am, along with the rest of my fossil of a
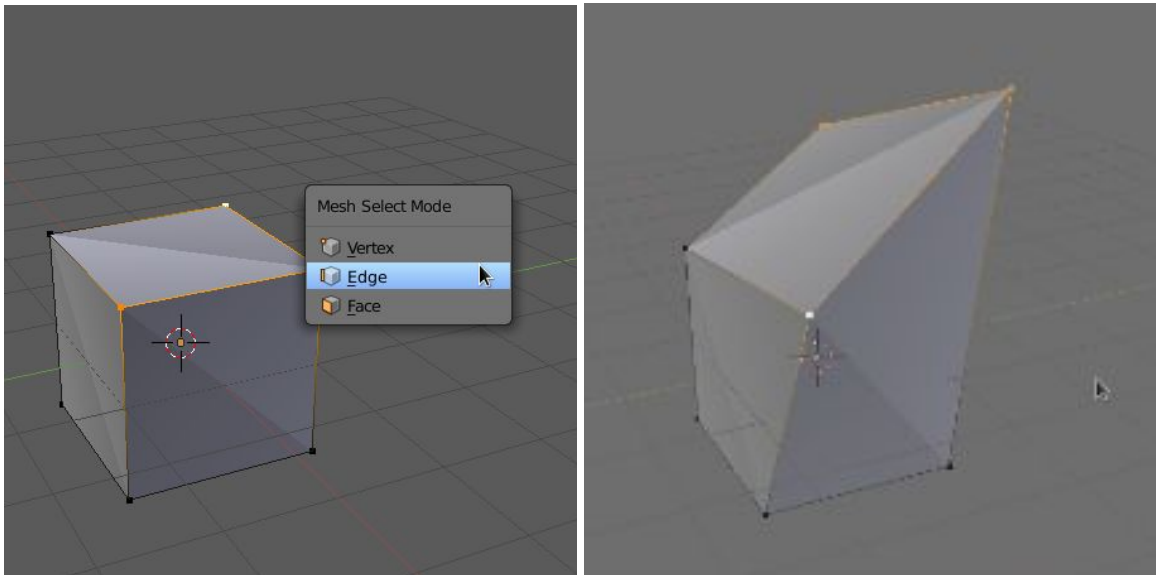computah

// blender remembers the last mode you were in; pressing `tab` switches you
between it and the edit mode;
// (I guess)
// you'll need only **Edit Mode** and **Object Mode** for now

> okay, now `tab` into the **edit mode**
> pressing `A` selects/deselects all vertices
> deselect all
> `Right-click` to select a vertex,
> while holding `shift`, select couple more
// S = scale, R = rotate, G ??? Translate ???
// any of these three is a type of **transformation**
// (do not confuse **translate** and **transform**)
> `G`, `R`, `S` - press one of these three keys and
> drag the mouse around (without holding any keys!)

> **right-click** to cancel the transformation = mesh goes back to place
> **left-click** to accept transformation
//scale and rotate won't produce any visible results, when only one vertex is selected, and pivot point is set to median point (and that's by default)
//just in case you tried it and it "didn't work"; I will explain pivot points later in this tutorial

//on the right - result of successive translate, rotate and scale transformations on three selected vertices

> while in active transformation
> (right after pressing G, S or R, while selected elements respond to dragging the mouse)
> press **X** - restrict the transformation to the **x-axis**
> **Shift + X** - restrict to two axes, excluding **x-axis**
> obvjrtsly, werks for **y-** and **z- axes** the same way
> you can Ctrl+Z by repeatedly pressing Ctrl+Z

> **Ctrl + Tab** to open **mesh select mode** menu
// demonstrating all three options and manually filming this on screenshots would be a huge pain, so just try it for yourself without guidance from a guy who has nothing better to do than stay awake until 7am making tutorials in Google Docs
> yeah, so for every option in **mesh selection mode** menu
> click it
> select something
> (or shift-select multiple somethings)
> do some transformations
> ctrl+z back out of them if you messed it up

A NOTE OF MULTIPLE LEVELS OF IMPORTANCE
a great way to accidentally lose your work:
    > after working on mesh in edit mode
    > switch to object mode
    > Ctrl+Z
    > that will **undo all changes** that happened **since the last
    time you've switched to edit mode**
    > then do something else
    > blender doesn't remember anymore what was that that you
ctrlzded
    > so you can't `Ctrl+Y` to **redo**

So pay attention, and save often, and for complex projects
save various stages of work into separate files.

2. dafaq is polygonal modeling?

You need to somehow represent a three-dimensional object as
data that can be stored inside a computah, manipulated as
needed, and projected onto 2d plane (e.g. screen or image
file). One way to do that is building a mesh of triangles that
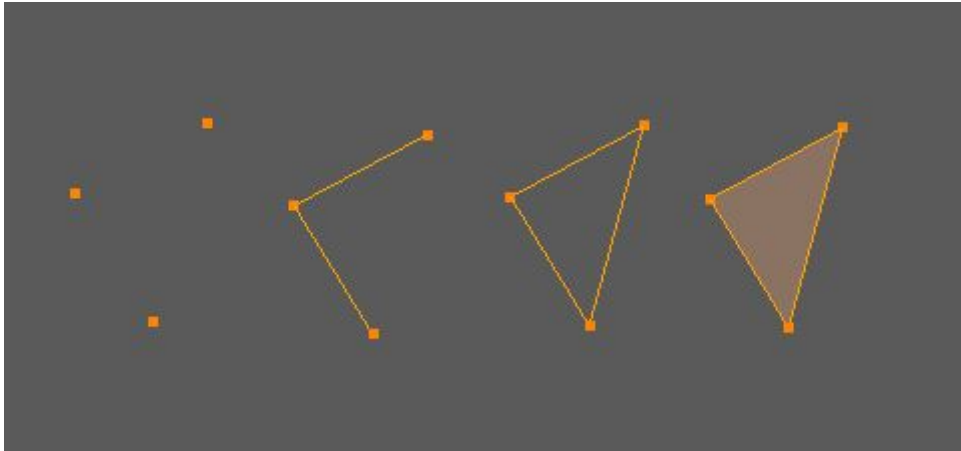approximately represents the object's surface.
Number of triangles used depends on desired level of detail,
and is limited by available computational power, and time you
are willing to spend working on the project.

The most basic element of polygonal mesh is a vertex - a point
in space defined by three numbers - its x, y and z
coordinates.
Line segment that connects two vertices is an edge.
And portion of a plane bounded by three or more edges is a
face.
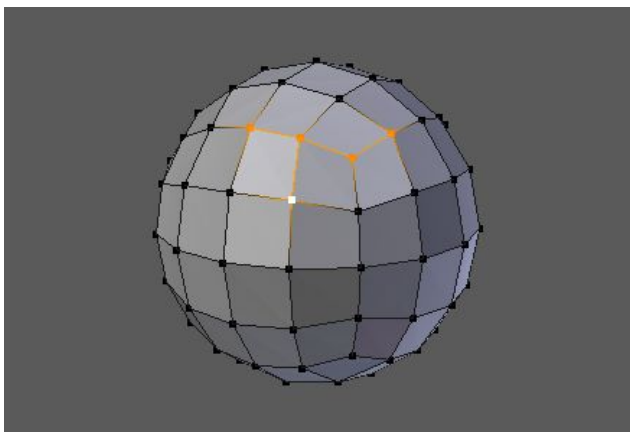A polygon is n vertices + n edges + one face, as a whole.

A polygon with four sides is a **quad**, a triangle is a **triangle**,
and if the number of edges is anything greater than 4, it is
referred to as an **N-gon**.

A polygon has no thickness, and can face either of two
directions,

rules of modeling in a nutshell

// This is neither 100% accurate explanation, nor a particularly detailed
one. But it is more than you will need for now.

Computer hardware works only with triangles, humans mostly
want to work with quads, and nobody wants to be friends with
you, or work with N-gons.

In most cases, 3 or 4 edges should be converging at one
vertex. Sometimes you would want 5 to converge.

4. navigation inside 3d viewport

scroll wheel up, down - zoom in, zoom out
hold scroll wheel + drag the maus - rotate the view
shift + drag the maus = pan the view
ctrl + drag maus = another way to zoom in/out

numpad
1, 3, 7 - front, right and top views
Ctrl + 1, 3, or 7 - opposite
5 - switch viewport between orthographic/perspective
projection
2, 4, 6, 8 - just try pressing them by themselves first, and
then combined with Ctrl or Shift

5. most used mesh editing tools

pivot point
extrude
loop, cut and slide
fill, join
vertex, edge, face menus
w-menu

6. various ways of mesh selecting

Alt+right-click
Ctrl + L
Ctrl + +/-
Box Select
Circle Select

7. 3d cursor explained

simply a point in space
left-clicking is one way to place it, but it is rarely used

8. customizing window layout

Blender consists of multiple editors designed for various
specific purposes (modeling, texturing, animating, object

properties, filesystem browser, etc.). You can divide Blender
window into panels, and show any editor in any panel, however
it is convenient for your current work.

9. pointless chant

```
/*
yeah, selection is right click. Many people find it very weird and
inconsistent with the rest of the world, and in the list of rezuns for
'blender-vs-any-other-piece-of-software' wars this one is definitely in top
3. But developers go with right click for a reason. You can try and stick
with it, and it will become a no-brainer, or you can change it in the
settings later if you are religious or something.
*/


//cheatshit on panel management and sheat watch p.N
// most of the buttons in Blendah exist solely so you could hover your mouse
around them, watch for the help pop-up with the keyboard shortcut for that
command, and never use this button again until the rest of your days
```