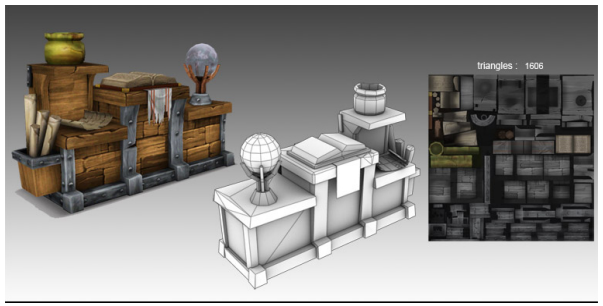
Introduction to Maya & 3D Production

Welcome to Maya!! ☺

General



- Maya is an industry standard for 3D in many production houses.
    - 3D Studio Max is the other predominant software and is also owned by Autodesk (often used in the gaming industry and by smaller production houses).

    - Most 3D packages share the same capabilities interfaced by very different controls, however, after you've learned one package it is a lot easier to learn others because the theories and principles remain the same it's just a matter of finding the buttons to click to do what you want.

- Maya's learning curve is quite steep! Do your part to further your learning by spending time with the program and seeking answers to your questions. Don't be afraid to ask questions of me and your peers and seek answers via the web. If you're stuck, be proactive in learning and try to find solutions!!

- **There are many different <u>specializations</u> in 3D production Maya supports a number of them**

    - **Modeling:** The art of creating identifiable objects and characters in 3D.
    - **Lighting &Texturing**: The art of creating artistic or simulating real world lighting and the art of creating materials for geometry can be it stylized or realistic.
    - **Rigging**: The art of creating internal skeletons for characters to create realistic movement or creating contr
    - **Animation**: The art of making things move and characters act. Just about everything you can think of is key-able or can be animated even lights and textures.
    - **Special effects** or Dynamics: The art of creating effects such as fire, explosions, fluids, hair and fur and the physics of colliding objects.

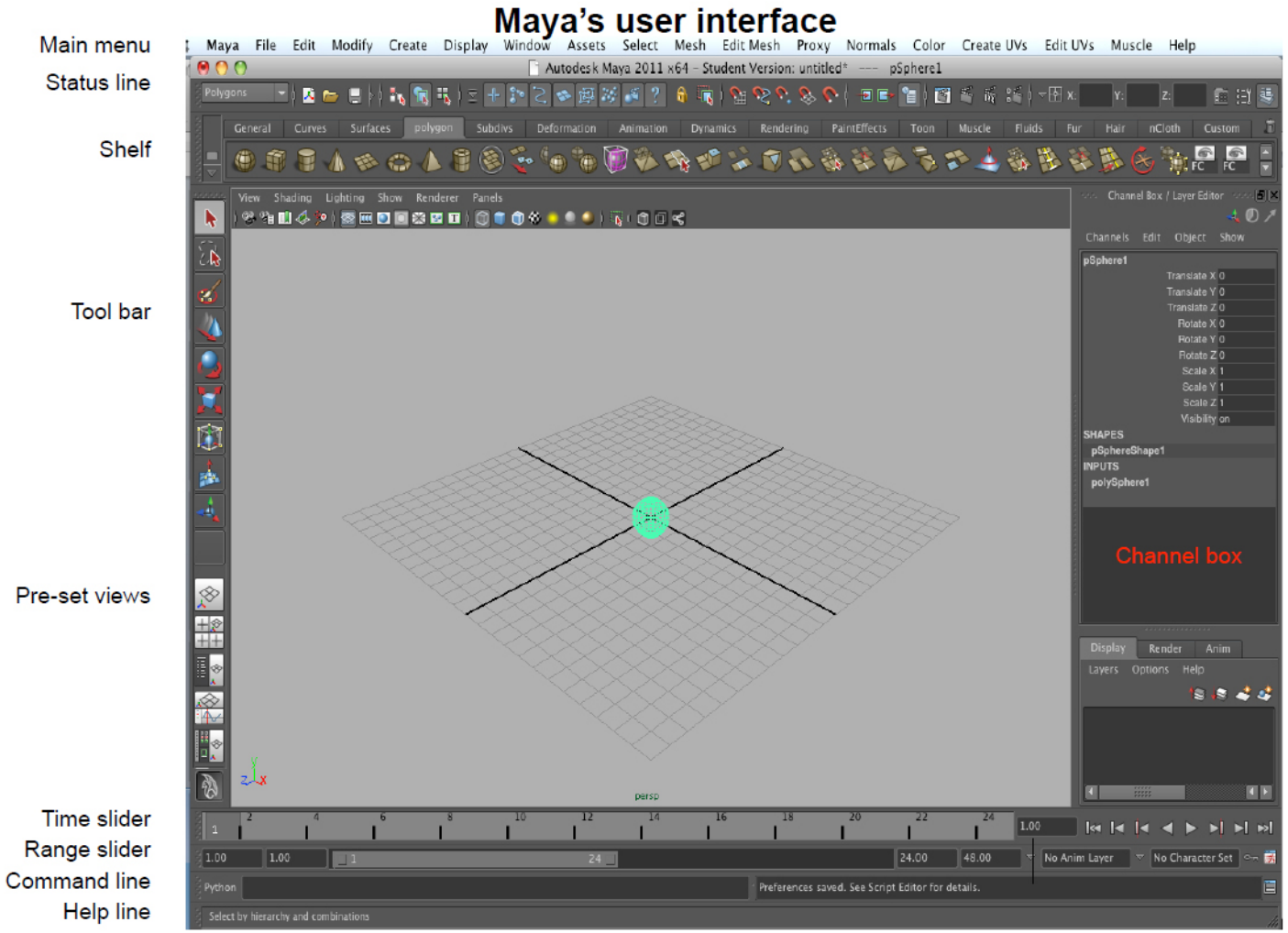
    We will be focusing on **Modeling and Texturing**

- **There are two primary types of modeling:**
    - **Polygons** and **NURBS** are different object types that use different techniques and modeling tools. Each has its own strengths, and different artists prefer working with different types.

        - **Polygons** let you model a surface by building up and reshaping a number of simple surface *facets or polygons*.
        - **NURBS** let you easily create smooth, *curving surfaces* with high-level control. NURBS uses curves rather than polygons.

    For games, we will focus on **Polygon modeling**

Interface Overview

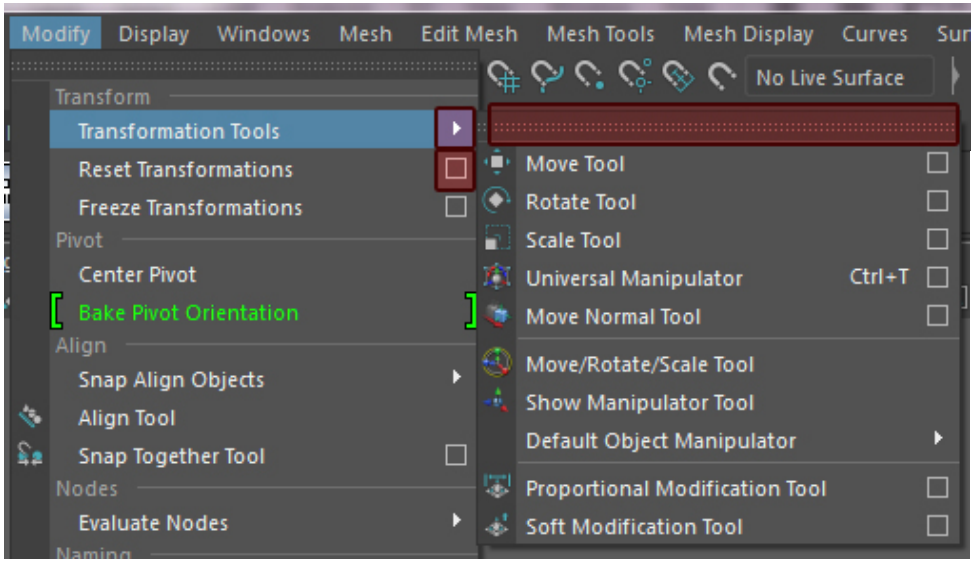


- **In Maya the origin is represented by two thick black lines that intersect on a grid.**

- **The main menu**

We will be using **Modeling** during this course. **Always be aware which main menu is active because it will dictate which menu tool set you see.**

- **Pull down menus and options**

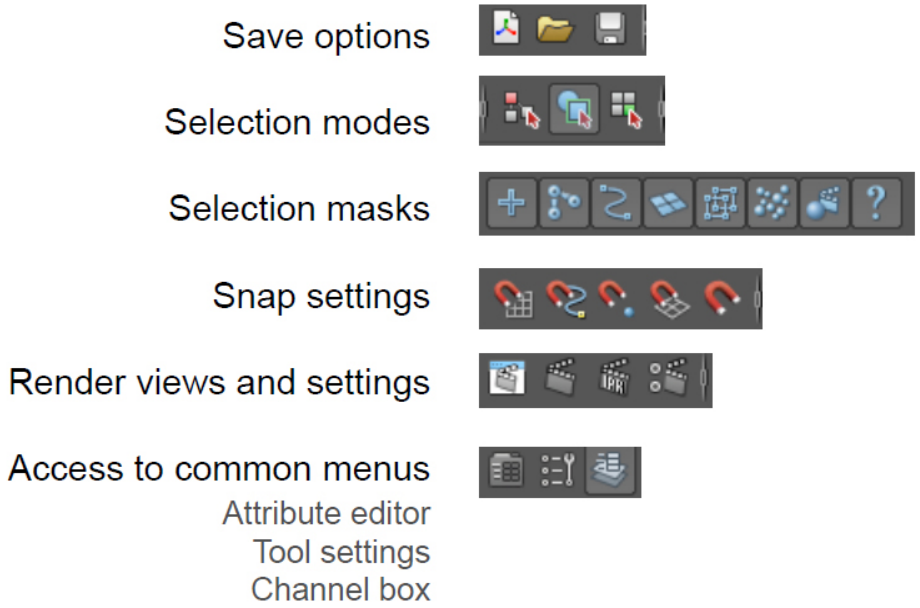


A black arrow in Maya indicates a pull down menu is available.

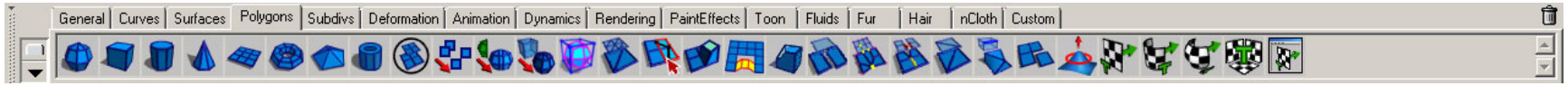
A box indicates that options are available.

The two gray lines at the top of the pull down menus can be clicked to make a floating menu.

- **The Status Line**



- **The Shelf**
  - Shelves: Along top of the interface, below status line/bar



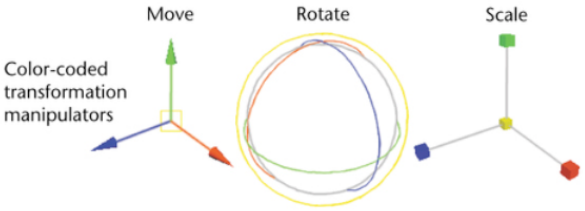
  - Shelves provide quick and easy access to <u>commonly</u> used menu items.
  - They are divided into tabs based on their function
  - They are Highly customizable (*see notes on CustomizingTheInterface*)
  - Small black arrow (or circular gear depending on maya version) on left opens menu for adjusting shelves and shelf bar.
  - We will be creating custom shelves during this course.

- **The Tool Bar**

Select (q)
Select with marquee
Pain select
Move tool (w)
Rotate (e)
Scale (r)
Universal
Soft modification
Show manipulator (t)

Select, move, rotate, scale can be quickly accessed through hot keys.

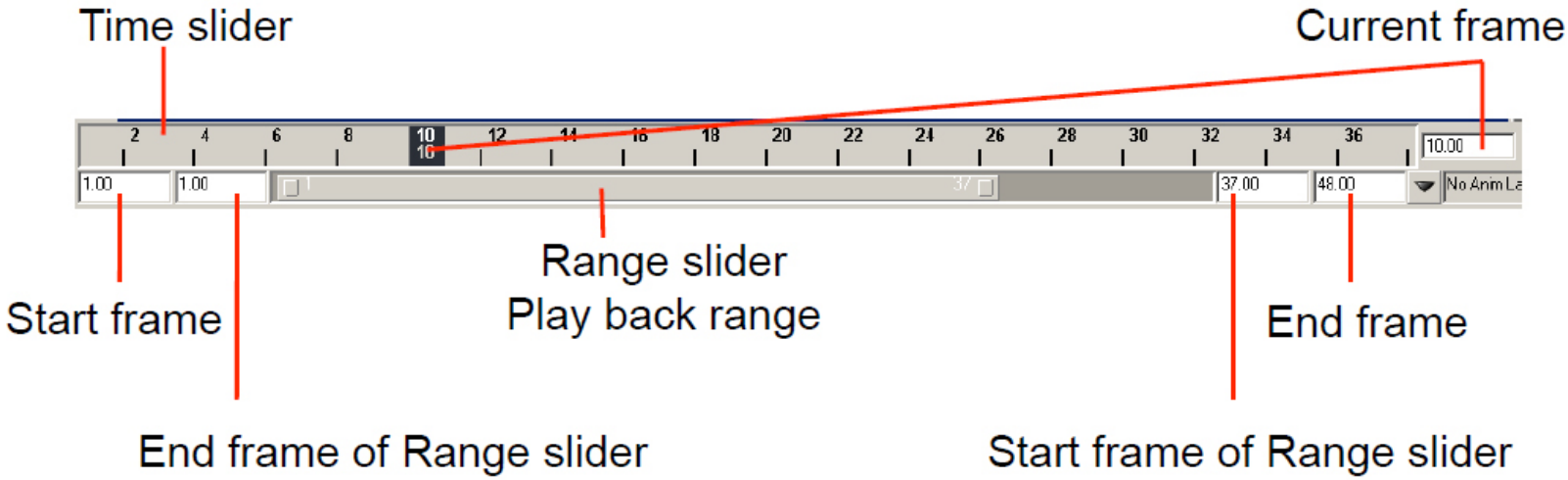
- q = select
- w = move or *translate*
- e = rotate
- r = scale



Perspective
Four view
Outliner/Perspective
Perspective/Graph editor
Hypershade/Perspective
Persp/ Hypergraph/ Graph editor

Note – You can move in multiple axis's at once by grabbing the manipulator in the middle (yellow), however it's good practice to only move, rotate and scale on a specific axis at one time to ensure you're getting the result that you want. Notice that this is the same as Unity! Y is up!

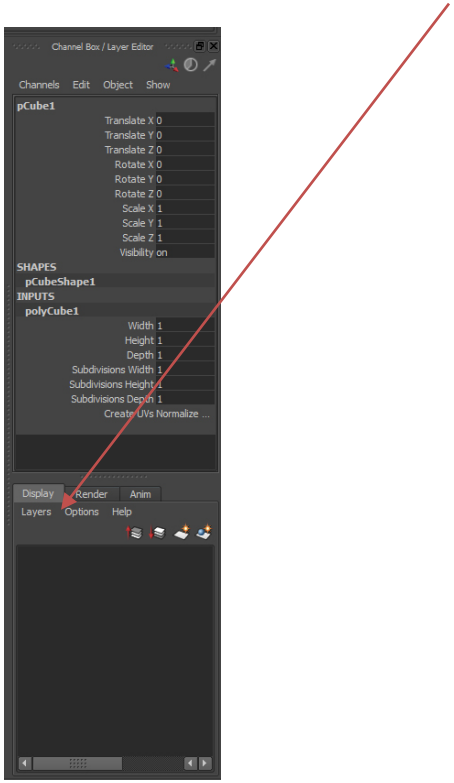
- **The Time Slider**
  - Although we will not use this for this course, it's good to know what it is.
  - If you Left mouse click & hold you can drag from one frame to another. This technique is called **scrubbing.**
  - Moving the **range slider**. The range slider allows you to play only a small section of an animation.



  - Contains command lines for scripting
  - Also holds buttons for both the Script Editor and Animation Preferences (main Maya Settings)
  - Contains a help line that gives descriptions of buttons as you roll over them

- **Channel Box**
  - On the right-hand side. Pertains to nearly all 3D objects you will work with.
  - Select Channel and MM drag or manually enter data
  - Is the default menu set of the Maya interface. This can (and will) be replaced by both Tool Settings and the Attribute Editor at times.
    - The buttons above the channel box will switch the menu to the desired option or back to the Channel Box.

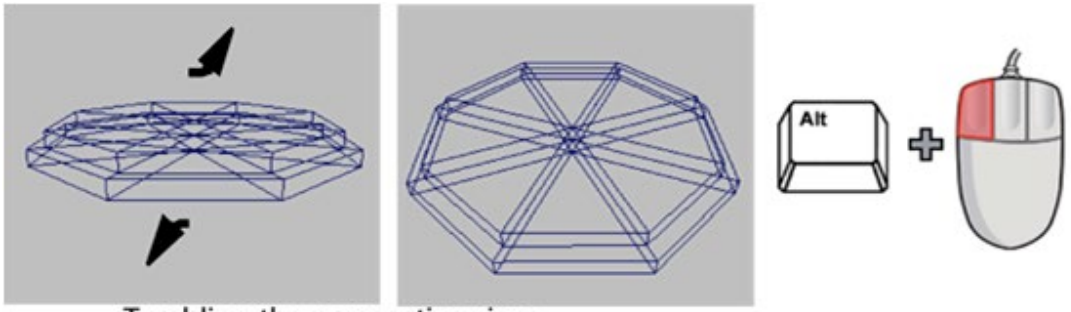
    - Attribute Editor: Ctrl a
    - Layer Editor at the bottom: you can use the layer system under the Display Tab, to store objects and freeze them as references or hide them (similar to Photoshop in a way).



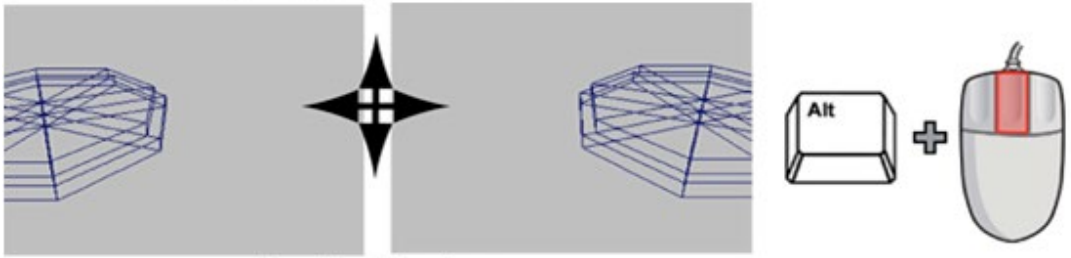
Navigating – Moving Maya's cameras/views

When you move around in your scene, you're actually looking through & moving Maya's default cameras. As you hold down alt and move your view, you are moving the camera.

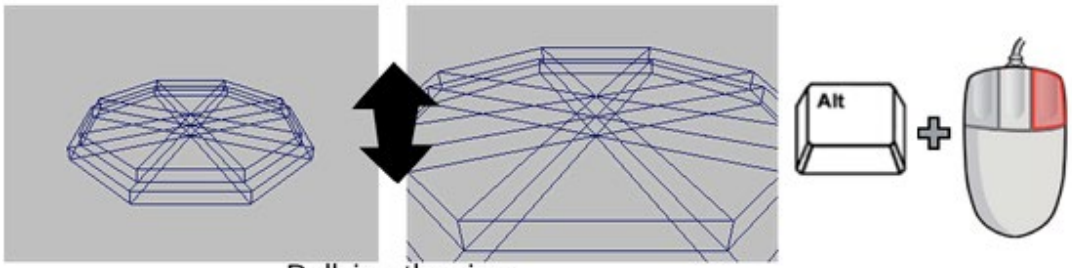
*Alt + M mouse, R mouse can also be used to navigate in other Maya windows such as the graph editor, hypergraph and hypershade.



Tumbling the perspective view



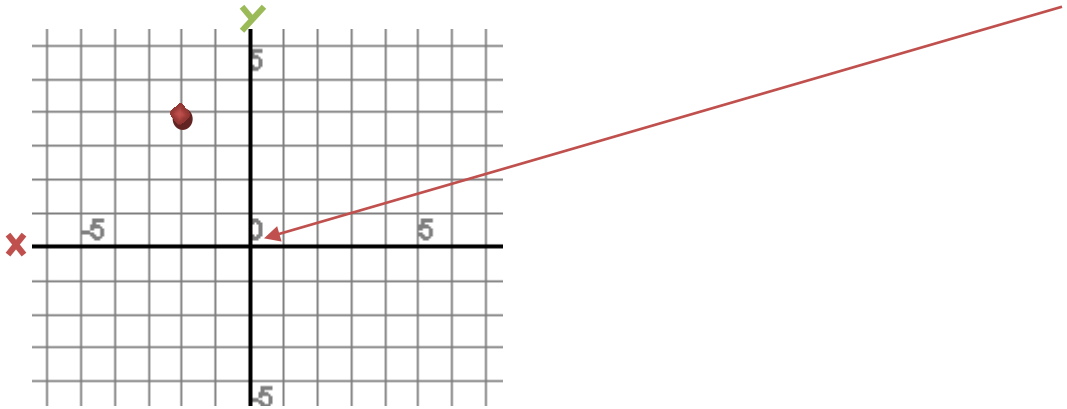
Tracking the view



Dollying the view

- **You are already familiar with the 2D coordinate system** (via your math classes hopefully)

In a 2D coordinate system X is expressed first and Y second. The origin is 0,0 where x and y cross.

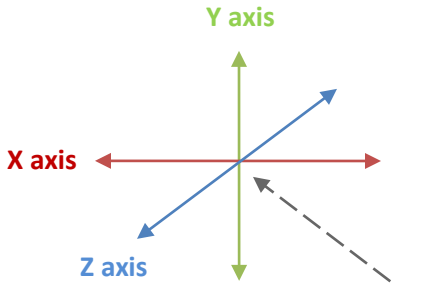


The location of the red point above would be expressed as -3, 4.

X is -2

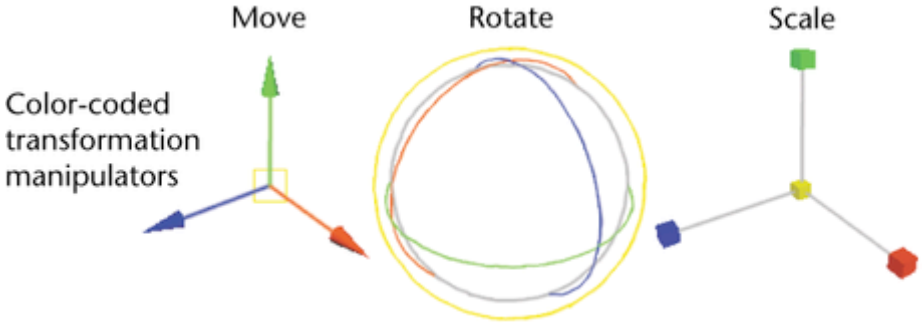
Y is 4

- **The 3D Coordinate System: X,Y, Z** (always expressed in that order)



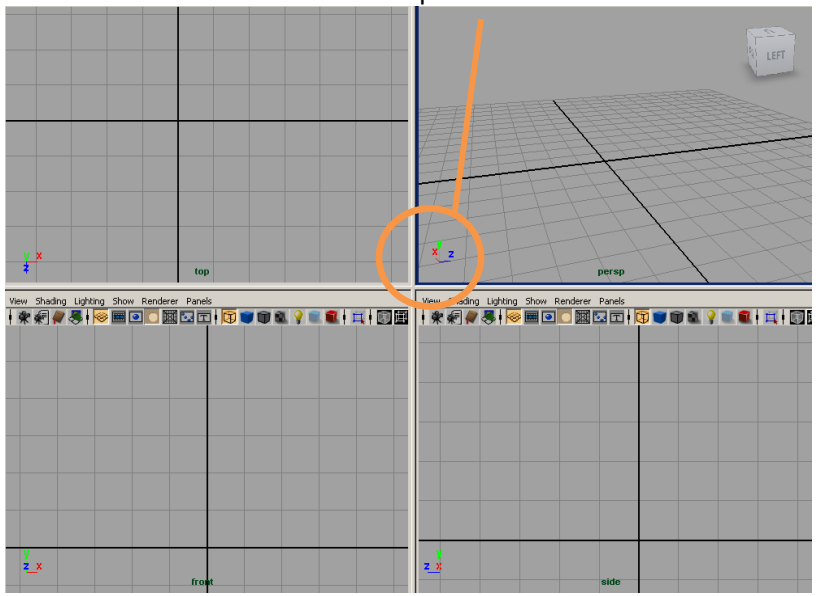
The Origin is where X,Y and Z intersect (0,0,0). The origin is mathematically expressed as 0,0,0. It is the center of your Maya scene!

- **Maya's tool sets are color coordinated**
  - X is always red
  - Y is always green
  - Z is always blue

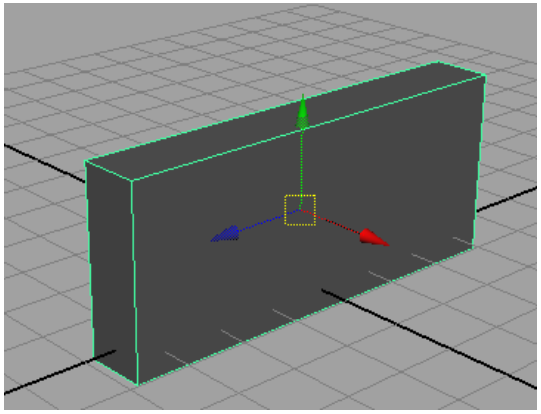


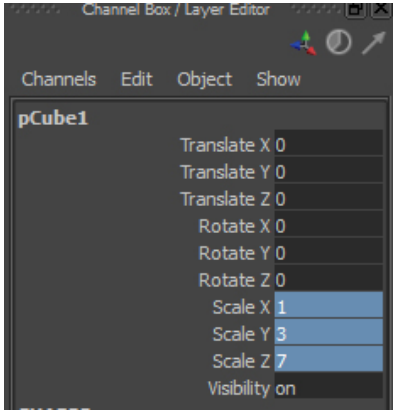
It is important to know which axis we are moving, rotating or scaling on

- A color coded compass used to indicate direction

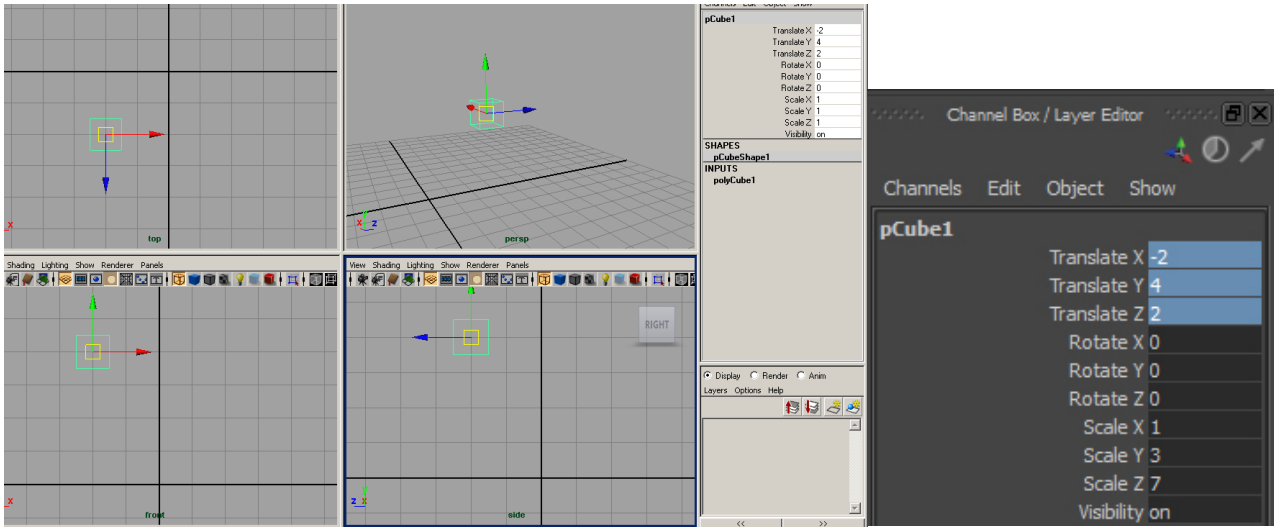


- **If an object has a <u>Scale</u> of 1,3,7.**
  - It is 1 unit wide, 3 units tall and 7 units deep. **X = 1, Y = 3, Z = 7 → (1,3,7)**

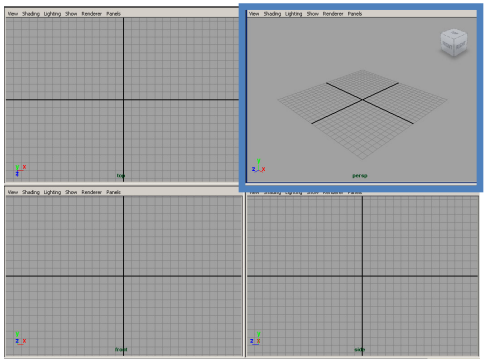




- **If an object's location (<u>Translate</u>) is -2,4,2. X = -2, Y = 4, Z = 2 → (-2,4,2)**
  - An objects position is based on the location of its center pivot relative to the origin.

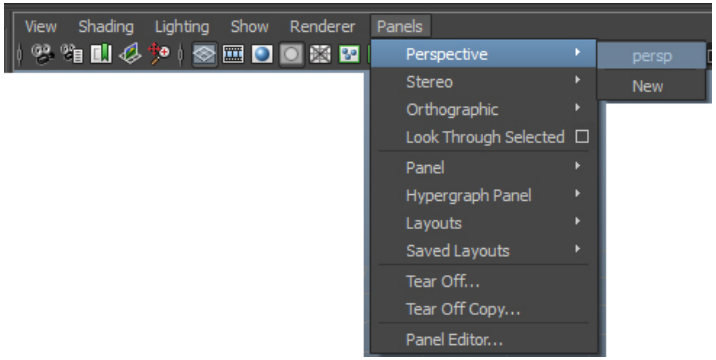


- For every view in Maya, there is a camera attached. 4 cameras/ 4 Views (viewports). You are literally looking at your scene through a camera. To move in and out of these cameras, use the hotkey: Spacebar (while your curser is in the view square you want to move



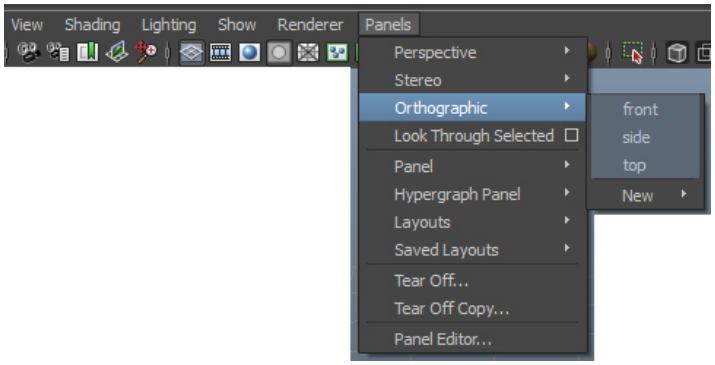
to). There are 4 default cameras in Maya, they are the following:

1. Perspective
    a. Panels (upper left corner of your viewport) →perspective →persp



    b. Note – This is your '3D' camera where you can navigate around your objects and scene while seeing accurate perspective, similar to if you were physically in your scene walking around the things you make.
    c. Note – you will never make final renders from this camera. This is strictly your default, editing camera. You will always create a camera to generate your final renders from. Reasons for this:
        i. Locking the camera for framing purposes (consistency and composition)
        ii. Camera animation

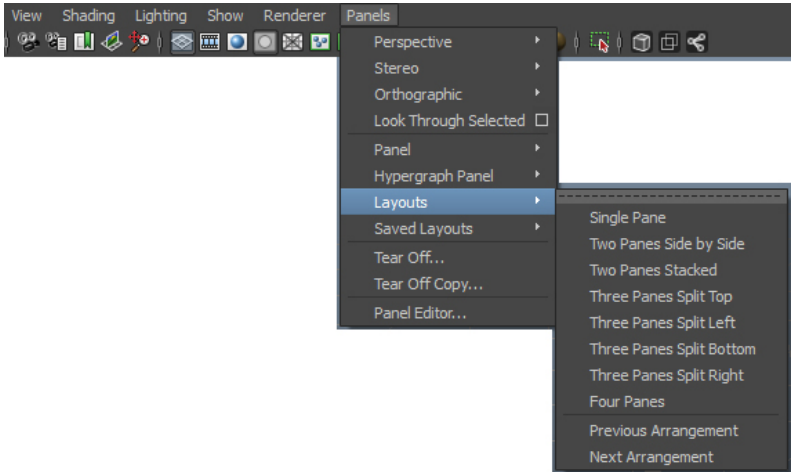
2. Orthographic (accounts for the last 3 options)
    a. Panels (upper left corner of your viewport) →orthographic → Front/Side/Top



    b. Note – These views take the 'perspective' out of what you're looking at, showing you a 'flat' version of what you're working on. These views are ideal for measuring and getting a sense for accurate proportion, moving in increments, making complex selections that would be hard to do in perspective mode etc.

Changing the panel view/formation:

By default, Maya starts in a 'four panes' layout. But you do have the ability to change that if desired.

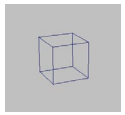


- **Viewport Options**

  - Show the **grid**:

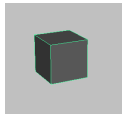
  - Show the **resolution gate**: This helps us frame our shot using the sizing setup in our render settings. This will show us what will get rendered and what won't. Once you get ready to render your scene, you will turn this on to compose your image. We won't use this a ton for this class as our end goal is to export our models and use them in a game engine. But this is nice to know about if you are rendering objects for portfolio work.

  - **Wireframe**: Hotkey – 4



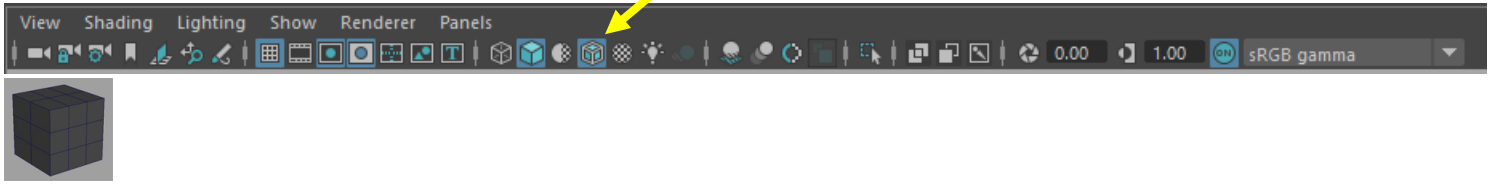
Note – when your object is selected, it will appear in green.

  - **Smooth Shaded**: Hotkey – 5



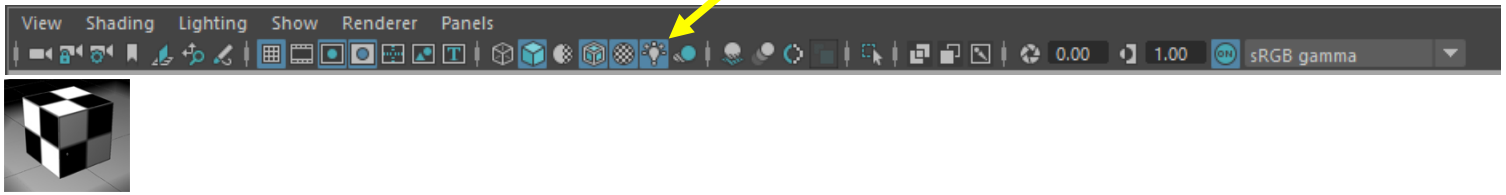
Note – when your object is selected, it will appear in green.

- **Wireframe on Smooth Shaded** (this combines our wireframe and shaded views):



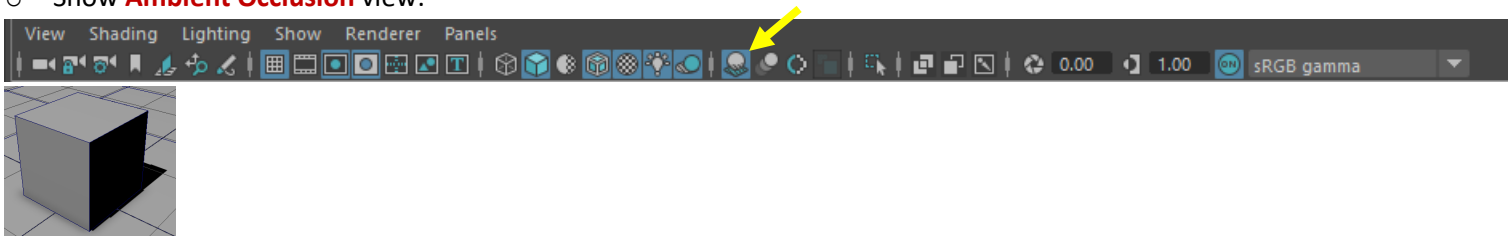
- Show **Textures**: Hotkey – 6

- Show **Lighting**: Hotkey – 7



- Show **Shadows**:

- Show **Ambient Occlusion** view:



- **Isolate** your current selection:

- **Xray**: This will allow us to see through our shaded object. It's kind of like wireframe, but we can still see the shaded shell of our object.