The Coordinate and Viewing System

- Right-handed coordinate system
- X = Red
- Y = Green
- Z = Blue
- Middle mouse button (MMB) – orbit
- Shift MMB – pan
- Scroll wheel – zoom
- View → Left, Right, ...
- View → Toggle Quad View
- View → View Persp/Ortho

The Create and Add Menus

- Right-mouse button (RMB)
- Add Primitive...
- Mesh:
  - Plane
  - Cube
  - Circle
  - UV Sphere
  - Ice Sphere
  - Cylinder
  - Cone
  - Torus
  - Grid
  - Monkey
- Stick Add:
  - Sphere
  - Lattice
  - Empty
  - Camera
  - Lamp
  - Carve
  - Node
  - Meta Object
  - Text
  - Metaball
  - Surface
  - Curve
  - Mesh

Selecting an Object to Work On

- RMB-click on the object you want to select. It will then be highlighted with an orange outline.
Moving Things By Clicking and Dragging

- Use the click-and-drag icons
- Translate ("grab")
- Rotate
- Scale
- Use Global or Local Coordinate System

Saying How to Move Things by Using the Keyboard

- RMB click to select an object
- Grab 'g'
- Rotate 'r'
- Scale 's'
- Pick global axis 'g' → 'x', etc.
- Show global vs. local coordinates
- Pick local axis: 'g' → 'x' → 'x'
- Pick all but a particular axis 'g' → 'X', 'g' → 'X' → 'X', etc.
- Transform a specific distance, angle, or scale 'r' → 'x' → 45 <return>

Making the Mesh Objects Look Nicer

Blender is able to play a graphics trick to make your curved geometry look better. Go to the Object Tools tabs and select Tools.

Select and edit:
- A vertex
- An edge
- A face

Click here, or hit the Tab key, to get into Edit Mode

This doesn't actually change any geometry – it's just a really good computer graphics display trick.
Editing a Vertex

Be sure you are in vertex-editing mode

Right click on a vertex
Hit ‘g’ (grab) and move the mouse

You can also hit ‘x’, ‘y’, or ‘z’ to restrict motion

The Button Properties Menu

Clicking one of these brings up a color-selection dialog box
The Modifiers Menu

Subdivision Surface Modifier

Fun: try it on a cube!

This controls how much to subdivide

Rendering

"Rendering" is Blender’s process for creating really high-quality images

The view that is rendered is not the same orientation that you see on the screen. It is from the Camera position, which needs to be set separately.
**Aligning The Camera to Your Current Screen View**

But, if you like your current screen view and want to move the camera there, just do this:

View → Align View → Align Active Camera to View

**Lighting**

The answer is that Solid Shading Mode doesn't require your scene to be lit, but Rendering does. Texture Shading mode does want your scene to be lit, but if it isn't, even that won't let you know how bad your rendering is going to turn out:

**Lighting**

There are five types of Lamps that you can Add:

1. **Point** Lamp shines light in all directions. The light is local to the scene. This is usually the best type of light to start out with.

2. **Sun** Lamp appears to come from a single direction and its rays are parallel. This acts as if the light is very far away.

3. **Spot** Lamp is like a Point Lamp, but only shines in one particular direction.

4. **Hemi** Lamp is meant to emulate a cloudy day – light is coming from a glowing dome.

5. **Area** Lamp is light coming from a finite surface, like most lights really are.
Quick Physics Cheats

Original Scene

Quick Explode

Importing Objects from Other Places

Select File → Import

Collada = export format from game modeling systems
Stl = 3D printer format
3ds = format from Autodesk 3D Studio
Obj = Probably world’s most common export format (there are a ton of .obj models for free on the Internet!)

.obj files are also pretty straightforward to create. So, if you have a shape in mind and can write a computer program to generate it, you can write your own .obj file and import it into Blender.

File = dino.obj
As-is, flat shaded

Subdivision surfaced
Smooth shaded