The 3ds Max Interface

The Autodesk® 3ds Max® 2016 software interface is where you view and work with your scene. This chapter explains its basic operations and tools. You can use this chapter as a reference as you work through the rest of this book, although the following chapters and their exercises will orient you to the 3ds Max user interface (UI) quickly. It's important to be in front of your computer when you read this chapter, so you can try out techniques as we discuss them in the book.

In this chapter, you will learn to

► **Navigate the workspace**

► **Transform objects using gizmos**

► **Use the Graphite Modeling Tools set**

► **Use the command panel**

► **Use the time slider and track bar**

► **Manage files**

Navigating the Workspace

The following sections present a brief rundown of what you need to know about the UI and how to navigate in the 3D workspace.

User-Interface Elements

Figure 1.1 shows the 3ds Max UI. (See Table 1.1 for explanations of the UI elements.) At the top left of the application window is an icon called the Application button (); clicking it opens the Application menu, which provides access to many file operations. Running along the top is the

Quick Access toolbar, which provides access to common commands and the InfoCenter, which in turn offers to access many product-related information sources. In this version of the program, they have rolled out a new Enhanced Menus workspace that defines the look of the interface. When you first open the program, you will see the Default workspace. To switch to a different workspace, go to the Quick Access toolbar located at the top of the interface. In the Workspaces drop-down list, choose the desired workspace. Some of the most important commands in the Quick Access toolbar are file-management commands such as Save File and Open File. If you do something and then wish you hadn't, you can click the Undo Scene Operation button ( ) or press Ctrl+Z. To redo a command or action that you just undid, click the Redo Scene Operation button ( ) or press Ctrl+Y.
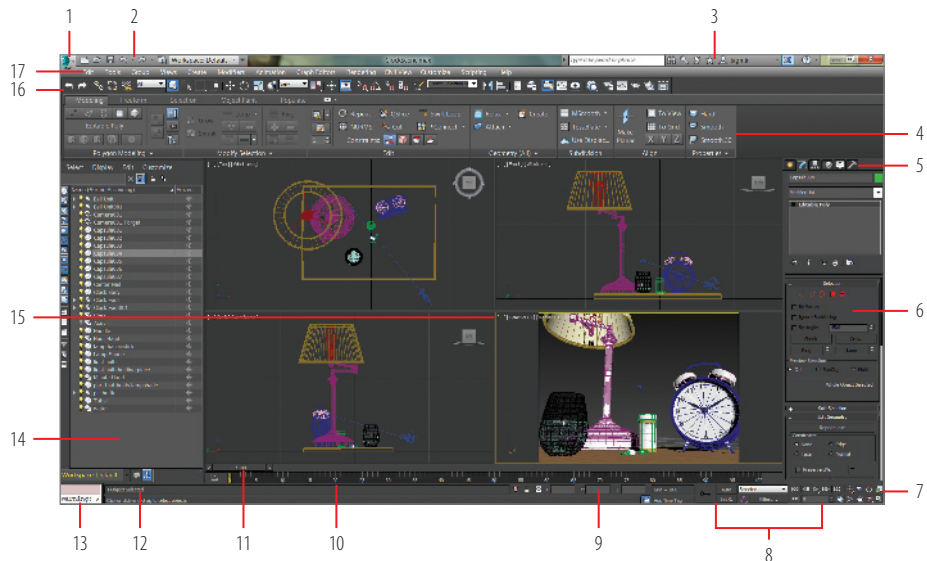
FIGURE 1.1 The 3ds Max interface elements

TABLE 1.1 The 3ds Max interface elements*

Element	Function	Description
1	Application button	Opens the Application menu, which provides file management commands.
2	Quick Access toolbar	Provides some of the most commonly used file management commands as well as Undo Scene Operation and Redo Scene Operation.

Element	Function	Description
3	InfoCenter	Provides access to 3ds Max product-related information.
4	The ribbon	Provides access to a wide range of tools to make building and editing models in 3ds Max fast and easy.
5	Command panel tabs	Where all the editing of parameters occurs; provides access to many functions and creation options; divided into tabs that access different panels, such as the Create panel, Modify panel, etc.
6	Rollout	A section of the command panel that can expand to show a listing of parameters or collapse to just its heading name.
7	Viewport navigation controls	Icons that control the display and navigation of the viewports; icons may change depending on the active viewport.
8	Animation Time/Keying controls	Controls for animation keyframing and animation playback controls.
9	Coordinate display area	Allows you to enter transformation values.
10	Track bar	Provides a timeline showing the frame numbers; select an object to view its animation keys on the track bar.
11	Time slider	Shows the current frame and allows for changing the current frame by moving (or scrubbing) the time bar.
12	Prompt line and status bar controls	Prompt and status information about your scene and the active command.
13	MAXScript Mini Listener	A command prompt window for the MAXScript language. The window is useful for performing interactive work and developing small code fragments.
14	Scene Explorer	Scene Explorer is a dialog for viewing, sorting, filtering, and selecting objects. This dialog can also rename, delete, hide, and freeze objects. It can create and modify object hierarchies and access object properties.

T A B L E   1 . 1   *(Continued)*

Element	Function	Description
15	Viewports	You can choose different views to display in these four viewports, as well as different layouts from the viewport label menus.
16	Main toolbar	Provides quick access to tools and dialog boxes for many of the most common tasks.
17	Menu bar	Provides access to commands grouped by category.

*The numerals in the first column refer to labels in Figure 1.1.

Just below the Quick Access toolbar is the menu bar, which runs across the top of the interface. The menus give you access to a ton of commands—from basic scene operations, such as Duplicate and Group under the Edit menu, to advanced tools such as those found under the Modifiers menu. Immediately below the menu bar is the main toolbar. It contains several icons for functions, such as the four transform tools: Select and Move, Select and Rotate, Select and Uniform Scale, and Select and Place (⊹ ○ 🔳 ⊕). The Select and Place tool is a new tool available in 3ds Max 2016. Use the Select and Place tool to position an object accurately on the surface of another object.

When you first open 3ds Max, the workspace has many UI elements. Each is designed to help you work with your models, access tools, and edit object parameters.
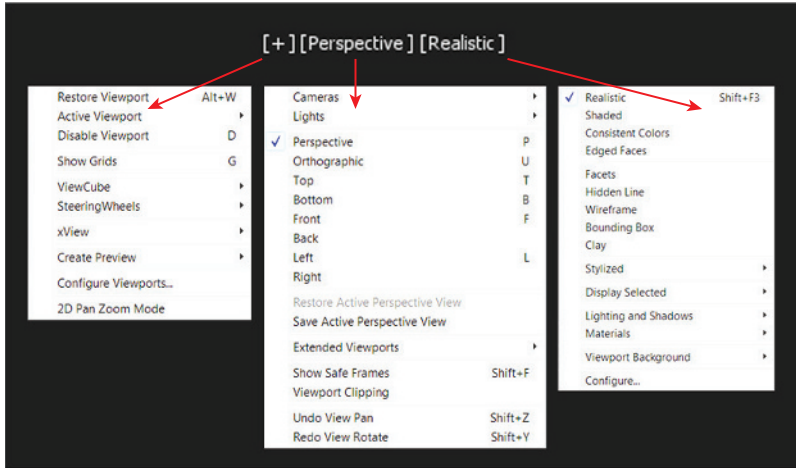
Viewports

You'll be doing most of your work in the viewports. These windows represent 3D space using a system based on Cartesian coordinates. That is a fancy way of saying "space on the X-, Y-, and Z-axes."

You can visualize X as left-right, Y as in-out (into and out of the screen from the Top viewport), and Z as up-down within the Perspective and Camera viewports. In the orthographic viewports, you visualize Y as up-down and Z as in-out. The coordinates are expressed as a set of three numbers, such as (0, 3, –7). These coordinates represent a point that is at 0 on the X-axis, three units up on the Y-axis, and seven units back on the Z-axis.

Viewport label menus contain commands that let you change what is shown in the viewports. These are shortcut menus for easy access to tools such as overall viewport display, changing what is displayed in a viewport, and viewport shading.

The General Viewport menu ([+]), in the upper-left corner of each viewport, provides options for overall viewport display or activation, as shown in Figure 1.2. It also gives you access to the Viewport Configuration dialog box, which gives further access to viewport layout commands.

FIGURE 1.2 Viewport label menus showing the General Viewport, Point-of-View, and Shading Viewport menus

The Point-of-View (POV) viewport menu ([Perspective]) contains options that change what is displayed in the viewport. For example, you can choose to dock the graph or Material Editor into the viewport for ease of use during a project.

The Shading label menu ([Realistic]) contains commands for how objects are displayed in the viewports. By default, three of the viewports (Top, Front, and Left) are set to Wireframe, which displays the wire mesh. The Perspective viewport is set to Realistic, which is a shading style that shows realistic texturing, shading, and lighting.

The Perspective viewport displays objects in 3D space using perspective, which shows the distant objects getting smaller in the distance. In actuality, they are the same size, as you can see in the Orthographic viewports. The Perspective viewport gives you the best representation of what your output will be.

To make a viewport active, click in a blank part of the viewport (not on an object). If you do have something selected, it will be deselected when you click in the blank space.
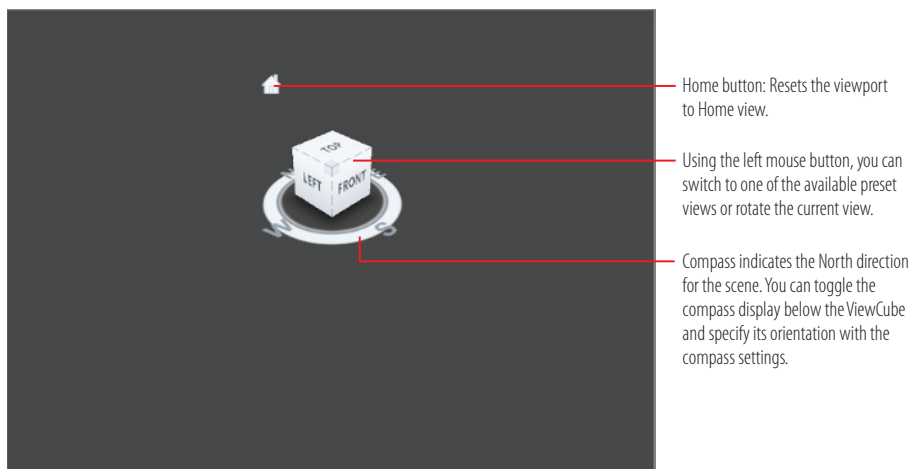
You can also right-click anywhere in an inactive viewport to activate it without selecting or deselecting anything.

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When active, the viewport will have a highlighted border around it. If you right-click in an already active viewport, you will get a pop-up context menu called the quad menu. You can use the quad menu to access some basic commands for a faster workflow. We will cover this topic in the "Quad Menus" section later in this chapter.

ViewCube

The ViewCube® 3D navigation control, shown in Figure 1.3, provides visual feedback of the current orientation of a viewport; it lets you adjust the view orientation and allows you to switch between standard and isometric views.
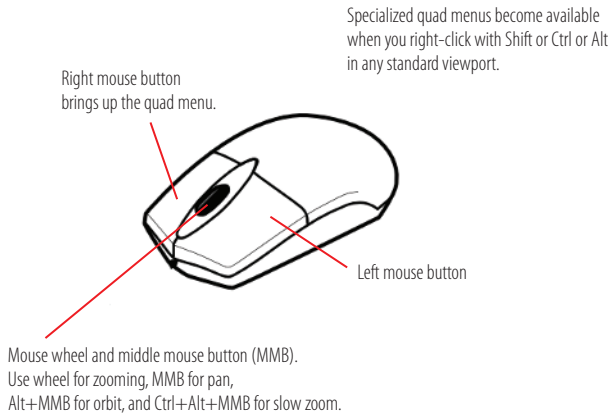

Home button: Resets the viewport to Home view.

Using the left mouse button, you can switch to one of the available preset views or rotate the current view.

Compass indicates the North direction for the scene. You can toggle the compass display below the ViewCube and specify its orientation with the compass settings.

F I G U R E 1 . 3 **The ViewCube navigation tool**

The ViewCube is displayed by default in the upper-right corner of the active viewport; it is superimposed over the scene in an inactive state to show the orientation of the scene. It does not appear in Camera or Light view. When you position your cursor over the ViewCube, it becomes active. Using the left mouse button, you can switch to one of the available preset views, rotate the current view, or change to the Home view of the model. Right-clicking over the ViewCube opens a context menu with additional options.

Mouse Buttons

Each of the three buttons on your mouse plays a slightly different role when manipulating viewports in the workspace. When used with modifiers such as the Alt key, they are used to navigate your scene, as shown in Figure 1.4.
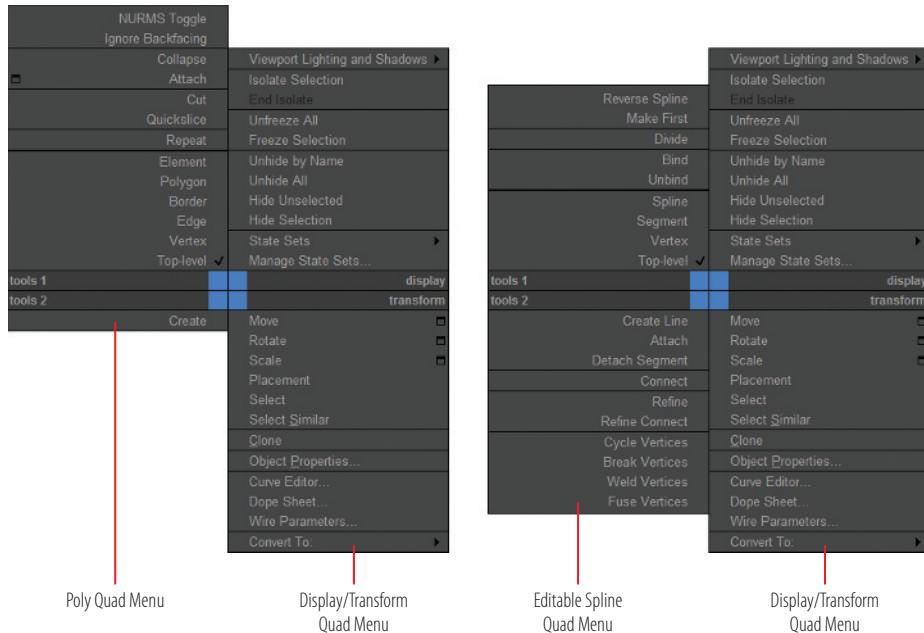
Specialized quad menus become available
when you right-click with Shift or Ctrl or Alt
in any standard viewport.

Right mouse button
brings up the quad menu.

Left mouse button

Mouse wheel and middle mouse button (MMB).
Use wheel for zooming, MMB for pan,
Alt+MMB for orbit, and Ctrl+Alt+MMB for slow zoom.

F I G U R E   1 . 4   Breakdown of the three mouse buttons

Quad Menus

When you click the right mouse button anywhere in an active viewport, except on
the Viewport label menus and the ViewCube, a quad menu is displayed at the loca-
tion of the mouse cursor, as shown in Figure 1.5. The quad menu can display up
to four quadrant areas with various commands without you having to travel back
and forth between the viewport and rollouts on the command panel (the area of
the interface to the right—more on this later in the section "Command Panel").

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Some of the selections
in the quad menu have
a small icon next to
them. Clicking this
icon opens a dialog
box where you can set
parameters for the
command.

Poly Quad Menu   Display/Transform   Editable Spline   Display/Transform
                        Quad Menu   Quad Menu   Quad Menu

F I G U R E   1 . 5   Quad menus

When you activate the quad menu (right mouse click), the default quad menu displays generic commands, which are shared among all objects. When you're working in certain modes (polygon or spline editing), quadrant menus contain context-specific commands, such as mesh tools and editing commands. You can also repeat your last quad menu command by clicking the title of the quadrant.

The quad menu's contents depend on what is selected. The menus are set up to display only the commands that are available for the current selection; therefore, selecting different types of objects displays different commands in the quadrants. Consequently, if no object is selected, all of the object-specific commands will be hidden. If all of the commands for one quadrant are hidden, the quadrant will not be displayed.

Cascading menus display submenus in the same manner as a right-click menu. The menu item that contains submenus is highlighted when expanded. The submenus are highlighted when you move the mouse cursor over them.

To close the menu, right-click anywhere on the screen or move the mouse cursor away from the menu and click the left mouse button. The last menu item selected is highlighted when the quadrant is displayed.

Displaying Objects in a Viewport

Viewports can display your scene objects in a few ways. If you click the viewport's name, you can switch that panel to any other viewport angle or point of view. If you click the Shading label menu, a menu appears to allow you to change the display driver. The display driver names differ, depending on the graphics drive mode you selected when you first started the program. This book uses the default display mode Nitrous. Other display modes include:

Wireframe mode   Wireframe mode displays the edges of the object, as shown on the left in Figure 1.6. It is the fastest to use because it requires less computation on your video card.

Realistic mode   The Realistic mode is a shaded view in which the objects in the scene appear solid. It shows realistic textures with shading and lighting, as shown in the middle in Figure 1.6.

Edged Faces mode   In Edged Faces mode, the wireframe edges of objects appear along with the shaded surfaces, as shown on the right in Figure 1.6.
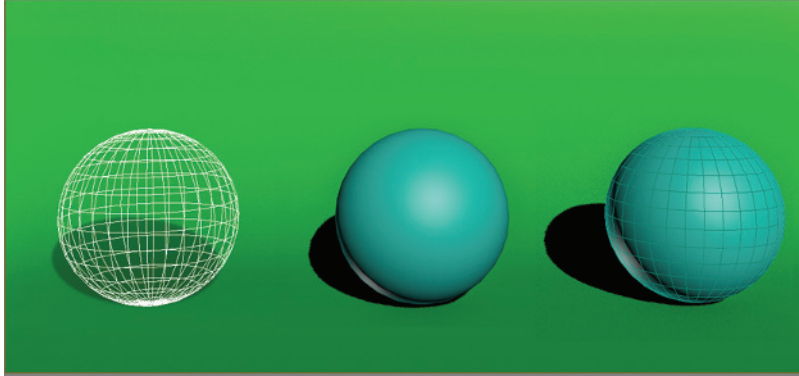
FIGURE 1.6   Viewport rendering options with the default Nitrous driver modes

Each viewport displays a ground plane grid, called the *home grid*. This is the basic 3D-space reference system where the X-axis is red, the Y-axis is green, and the Z-axis is blue. It's defined by three fixed planes on the coordinate axes (X, Y, Z). The center of all three axes is called the *origin*, where the coordinates are (0, 0, 0). The home grid is visible by default, but it can be turned on and off in the right-click General Viewport menu or by pressing the G key.

Selecting Objects in a Viewport

Click an object to select it in a viewport. If the object is displayed in Wireframe mode, its wireframe turns white while it is selected. When the cursor is passed over an object in the scene, a yellow edge highlight appears around the object. When the object is selected, a blue edge highlight appears around the object.

To select multiple objects, hold down the Ctrl key as you click additional objects to add to your selection. If you Alt+click an active object, you will deselect it. You can clear all your active selections by clicking in an empty area of the viewport.

Changing/Maximizing the Viewports

To change the view in any given viewport—for example, to go from a Perspective view to a Front view—click the current viewport's name. From the menu, select the view you want to have in the selected viewport. You can also use keyboard shortcuts. To switch from one view to another, press the appropriate key on the keyboard, as shown in Table 1.2.

If you want to have a larger view of the active viewport than is provided by the default four-viewport layout, click the Maximize Viewport Toggle icon (⬛) in the lower-right corner of the 3ds Max window.

T A B L E   1 . 2   Viewport shortcuts

Viewport	Keyboard shortcut
Top view	T
Bottom view	B
Front view	F
Left view	L
Camera view	C
Orthographic view	U
Perspective view	P

Viewport Navigation

3ds Max allows you to move around its viewports by using either key/mouse combinations, which are highly preferable, or the viewport controls found in the lower-right corner of the 3ds Max UI. The navigation icons for the Top viewport are shown in Figure 1.7, although it's best to become familiar with the key/mouse combinations.

F I G U R E   1 . 7   Viewport navigation controls are handy, but the key/mouse combinations are much faster to use for navigation in viewports.

Open a new, empty scene in 3ds Max. Experiment with the following controls to get a feel for moving around in 3D space. If you are new to 3D, using these controls may seem odd at first, but it will become easier as you gain experience and should become second nature in no time.

Pan   Panning a viewport slides the view around the screen. Using the middle mouse button (MMB), click in the viewport and drag the mouse pointer to pan the view.

Zoom   Zooming moves your view closer to or farther away from your objects. To zoom, press Ctrl+Alt and MMB+click in your viewport and then drag the mouse up or down to zoom in or out. The zoom will occur around the cursor location. You may also use the scroll wheel to zoom.
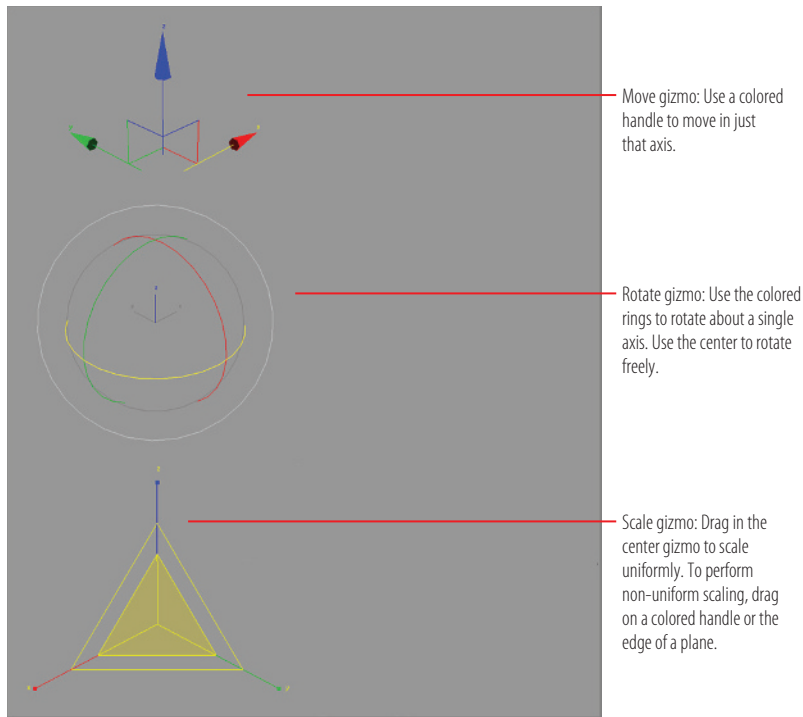
Orbit   Orbit will rotate your view around your objects. To orbit, press Alt and MMB+click and drag in the viewport. When no object is selected, the viewport camera will rotate about the center of the viewport; when an object is selected, the viewport camera will orbit around the object.

Transforming Objects Using Gizmos

Using gizmos is a fast and effective way to transform (move, rotate, and/or scale) your objects with interactive feedback. When you select a transform tool such as Move, a gizmo appears on the selected object. Gizmos let you manipulate objects in your viewports interactively to transform them. Coordinate display boxes at the bottom of the screen display coordinate, angular, or percentage information on the position, rotation, and scale of your object as you transform it. The gizmos appear in the viewport on the selected object at their pivot point as soon as you invoke one of the transform tools, as shown in Figure 1.8.

You can select the transform tools by clicking the icons in the main toolbar's Transform toolset (⊹ ○ ⬚) or by invoking shortcut keys: W for Move, E for Rotate, R for Scale.

In a new scene, create a sphere by choosing Create ➢ Standard Primitives ➢ Sphere. In a viewport, click and drag to create the Sphere object. Follow along as we explain the transform tools next.

Move gizmo: Use a colored handle to move in just that axis.

Rotate gizmo: Use the colored rings to rotate about a single axis. Use the center to rotate freely.

Scale gizmo: Drag in the center gizmo to scale uniformly. To perform non-uniform scaling, drag on a colored handle or the edge of a plane.

**F I G U R E   1 . 8** Gizmos for the transform tools

Move Invoke the Move tool by pressing W (or accessing it through the main toolbar), and your gizmo should look like the top image in Figure 1.8. Dragging the X-, Y-, or Z-axis handle moves an object on a specific axis. You can also click on the plane handle, the box between two axes, to move the object in that two-axis plane.

Rotate Invoke the Rotate tool by pressing E, and your gizmo will turn into three circles, as shown in the middle image in Figure 1.8. You can click on one of the colored circles to rotate the object on the axis only, or you can click anywhere between the circles to freely rotate the selected object in all three axes. The gray circle is for rotating perpendicularly in the viewport.

Scale Invoke the Scale tool by pressing the R key, and your gizmo will turn into a triangle, as shown in the bottom image of Figure 1.8. Clicking and dragging anywhere inside the yellow triangle will scale the object uniformly on all three axes. By selecting the red, green, or blue handle for the appropriate axis, you can scale along one axis only. You can also scale an object on a plane between two axes by selecting the side of the yellow triangle between two axes.

Graphite Modeling Tools Set

The ribbon interface is a toolbar containing these tabs: Modeling, Freeform, Selection, Object Paint, and Populate. Each tab comprises a number of panels and tools whose availability depends on the context. The ribbon can be oriented horizontally or vertically. The default for the ribbon is horizontal, docked immediately below the main toolbar, as shown earlier in Figure 1.1. The Modeling tab provides you with a wide range of modeling tools to make building and editing models in 3ds Max fast and easy. All the available tools are organized into separate panels for convenient access. In the following chapters, you will make copious use of the Modeling tab, which is shown in Figure 1.9.
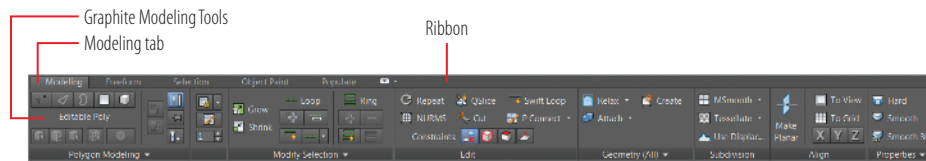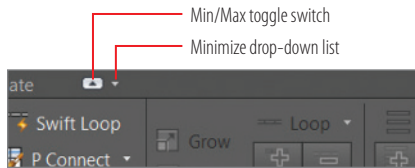

FIGURE 1.9 The Modeling tab found in the ribbon

The following panels are found in the Graphite Modeling Tool set:

► Polygon Modeling panel

► Modify Selection panel

► Edit panel

► Geometry (All) panel

► [Sub-Object] panel

► Loops panel

► Additional panels

One easy way to customize the ribbon is by using the Minimum/Maximum toggle switch, as shown in Figure 1.10. By clicking on the button, you toggle the minimum/maximum options; when you maximize the ribbon, you are able to view most of the controls. The Minimize drop-down list, which is the small arrow next to the Minimum/Maximum toggle switch, gives access to different ribbon states.

FIGURE 1.10   The Minimum/Maximum toggle for the Graphite Modeling Tools set

Command Panel

Everything you need to create, manipulate, and animate objects can be found in the command panel running vertically on the right side of the UI (Figure 1.1). The command panel is divided into tabs according to function. The function or toolset you need to access will determine which tab you need to click. When you encounter a panel that is longer than your screen, 3ds Max displays a thin vertical scroll bar on the right side. Your cursor also turns into a hand you can use to click and drag the panel up and down.

You will be exposed to more panels as you progress through this book. Table 1.3 is a rundown of the command panel functions and what they do.

TABLE 1.3   Command panel functions

| Icon	Name	Function
	Create panel	Create objects, lights, cameras, etc.
	Modify panel	Apply and edit modifiers to objects
	Hierarchy panel	Adjust the hierarchy for objects and adjust their pivot points
	Motion panel	Access animation tools and functions
	Display panel	Access display options for scene objects
	Utilities panel	Access several functions of 3ds Max, such as motion capture utilities and the Asset Browser

Object Parameters and Values

The command panel and all its tabs give you access to an object's parameters. *Parameters* are the values that define a specific attribute of or for an object.

For example, when an object is selected in a viewport, its parameters are shown in the Modify panel, where you can adjust them. When you create an object, that object's creation parameters are shown (and editable) in the Create panel.

Modifier Stack

In the Modify panel, you'll find the modifier stack, as shown in Figure 1.11. This UI element lists all the modifiers that are active on any selected object. Modifiers are actions applied to an object that change it somehow, such as bending or warping. You can stack modifiers on top of each other when creating an object and then go back and edit any of the modifiers in the stack (for the most part) to adjust the object at any point in its creation. You will see this in practice in the following chapters.
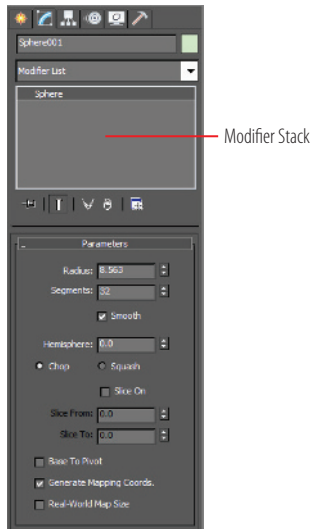
Modifier Stack

F I G U R E   1 . 1 1   The modifier stack in the Modify panel

Objects and Sub-Objects

An object or mesh in 3ds Max is composed of polygons that define the surface. For example, the facets or small rectangles on a sphere are *polygons*, all connected at common edges at the correct angles and in the proper arrangement to make a sphere. The points that generate a polygon are called *vertices*. The lines that connect the points are called *edges*. Polygons, vertices, and edges are examples of sub-objects and are all editable so that you can fashion any sort of surface or mesh shape you wish.

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To edit a sub-object, you have to convert it to an editable poly object, which you will learn how to do in the following chapters.

Time Slider and Track Bar

Running across the bottom of the 3ds Max UI are the time slider and the track bar, as shown earlier in Figure 1.1. The time slider allows you to move through any frame in your scene by *scrubbing* (moving the slider back and forth). You can move through your animation one frame at a time by clicking the previous-frame and next-frame arrows on either side of the time slider.

You can also use the time slider to animate objects by setting keyframes. With an object selected, right-click the time slider to open the Create Key dialog box, which allows you to create transform keyframes for the selected object.

The track bar is directly below the time slider. The track bar is the timeline that displays the timeline format for your scene. More often than not, the track bar is displayed in frames, with the gap between each tick mark representing frames. On the track bar, you can move and edit your animation properties for the selected object. When a keyframe is present, right-click it to open a context menu where you can delete keyframes, edit individual transform values, and filter the track bar display.

The Animation Playback controls in the lower right of the 3ds Max UI (⏮ ◀ ▶ ⏸ ⏭) are similar to the ones you would find on a VCR or DVD player.

File Management

Designating a specific place on your PC or server for all your project files is important, as is having an established naming convention for the project's files and folder.
▶

Different kinds of files are saved in categorized folders under the project folder. For example, scene files are saved in a scenes folder, and rendered images are saved in a renderoutput folder within the project folder. The projects are set up according to the types of files you are working on, so everything is neat and organized from the get-go.

The conventions followed in this book and on the accompanying web page (www.sybex.com/go/3dsmax2016essentials) follow this project-based system so that you can grow accustomed to it and make it a part of your own workflow. It pays to stay organized.

Setting a Project

The exercises in this book are organized into specific projects, such as the Clock project that you will tackle in the next chapter. The Clock project will be on your hard drive, and the folders for your scene files and rendered images will be

in that project layout. Once you copy the appropriate projects to your hard drive, you can tell 3ds Max which project to work on by clicking the Application button and choosing Manage ➢ Set Project Folder. Doing so will send the current project to that project folder. For example, when you save your scene, 3ds Max will automatically take you to the scenes folder of the current project.

For example, if you are working on a project about a castle, begin by setting a new project called Castle. Click the Application button and choose Manage ➢ Set Project Folder, as shown in Figure 1.12. In the dialog box that opens, click Make New Folder to create a folder named Castle on your hard drive. 3ds Max will automatically create the project and its folders.
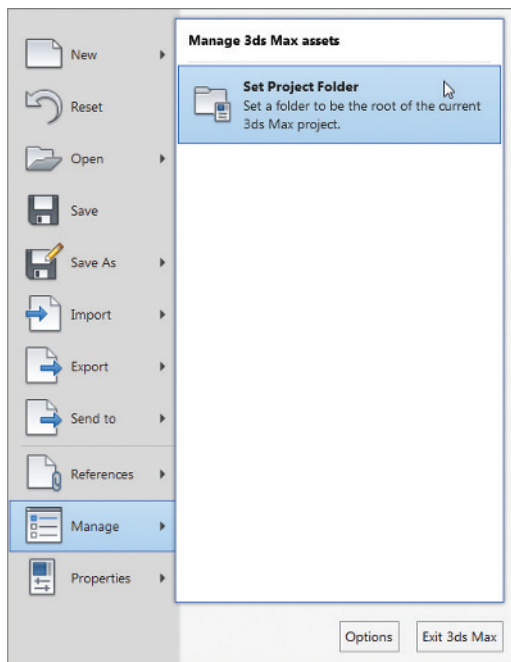
F I G U R E　1.12　Choosing Set Project Folder

Once you save a scene, one of your scene filenames should look like this: Castle_GateModel_v05.max. This tells you right away that it's a scene from your Castle project and that it is a model of the gate. The version number tells you that it's the fifth iteration of the model and possibly the most recent version. Following a naming convention will save you oodles of time and aggravation.

Version Up!

After you've spent a significant amount of time working on your scene, you will want to *version up*. This means you save your file using the same name, but you increase the version number by 1. Saving often and using version numbers are useful for keeping track of your progress and protecting yourself from mistakes and from losing your work.

To version up, you can save by clicking the Application button, choosing Save As, and manually changing the version number appended to the end of the filename. 3ds Max also lets you do this automatically by using an increment feature in the Save As dialog box. Name your scene file and click the Increment button (the + icon) to the right of the filename text. Clicking the Increment button appends the filename with 01, then 02, then 03, and so on as you keep saving your work using Save As and the Increment button.

Now You Know

In this chapter, you learned the basic operation of the 3D workspace and user interface, starting with a tour of the UI. Then you saw how to access the Graphite Modeling Tools set and how a scene can be controlled with the command panel. Next, you learned how the time slider and track bar work, and lastly, you saw how to best manage files for a clean workflow using projects.

As you continue with the following chapters, you will gain experience and confidence with the UI, and many of the features that seem daunting to you now will become second nature. Meanwhile, use this chapter as a reference to help you navigate the UI as you progress in your knowledge of the 3ds Max workflow.