

Table of Contents

Introduction	xxi
Part I: A Quick-Start Guide to Maya	1
1 Pre-Maya: A Primer	3
In This Chapter	3
Color Basics	4
<i>Color Mixing: Subtractive and Additive</i>	5
<i>HSV and RGB</i>	5
Image Composition	6
<i>Brightness and Contrast</i>	7
<i>Negative Space</i>	8
<i>Dividing the Canvas</i>	9
Lighting 101	10
<i>Standard Lighting Model</i>	10
Cameras and Perspective	11
<i>Angle of View and Perspective</i>	12
<i>Vanishing Points and Perspective</i>	13
Directing 101	14
<i>Cutting and the “Line of Action”</i>	14
<i>Scene Motion</i>	14
<i>Camera Motion</i>	14
Computer Graphics Primer	15
<i>Vectors and Pixels</i>	15
<i>2D and 3D</i>	16
<i>Input and Output</i>	17
Your Computer	22
<i>Knowing Your Hardware</i>	22
<i>Knowing Your Operating System</i>	23
Bibliography	24
Summary	26

2	A Tour of Maya	27
	In This Chapter	27
	<i>Key Terms</i>	27
	<i>Hotkeys to Memorize</i>	28
	Maya Overview	29
	<i>Hand Positioning</i>	30
	<i>Using the Three Mouse Buttons</i>	30
	<i>Using the Spacebar</i>	30
	<i>Manipulating a View</i>	30
	<i>Saving a View</i>	31
	The Maya Interface	32
	<i>The Menu Bar</i>	34
	<i>The Option Box</i>	35
	<i>The Status Line</i>	37
	<i>Panel Menus</i>	39
	The Hotbox	47
	Summary	48
3	Maya Interaction	51
	In This Chapter	51
	<i>Key Terms</i>	52
	<i>Hotkeys to Memorize</i>	52
	Creating Objects	52
	<i>Creating Primitives</i>	53
	<i>Creating Lights</i>	54
	<i>Creating Cameras</i>	54
	Selecting Objects	54
	<i>Single Selections</i>	54
	<i>Adding and Subtracting Selections</i>	55
	<i>Edit Menu Selection Options</i>	56
	<i>Marquee Selecting Objects</i>	56
	<i>Lasso Selecting Objects</i>	56
	<i>Quick Selection</i>	56

<i>Quick Select Sets</i>	57
<i>Selection Masks</i>	58
<i>Selection from a List: The Outliner</i>	58
Transforming Objects	59
<i>Using Transforms</i>	60
<i>Rotation Snapping</i>	61
<i>Transforming Multiple Objects</i>	61
Duplicating Objects	62
<i>Advanced Duplication: Array Duplication</i>	62
<i>Duplicating Instances, Upstream Graph, or Input Connections</i>	63
Deleting Objects	63
<i>Deleting by Type</i>	63
Pivot Points	64
Temporary Snapping	64
Hierarchy	65
<i>Grouping Explained</i>	65
<i>Parenting and Unparenting Objects</i>	66
<i>Parenting and Grouping: What's the Difference?</i>	66
Displaying Objects	67
Summary	73
4 Diving In: Your First Animation	75
In This Chapter	75
<i>Key Terms</i>	76
<i>Hotkeys to Memorize</i>	77
Starting a New Project	77
<i>Organizing Your Project Folders</i>	79
Creating Scene Elements for Your Project	79
Adding More Animation to Your Scene	94
Adding Materials and Lighting Your Scene	100
Finishing the Scene	106
<i>Viewing Your Render</i>	109
Summary	109

Part II: Maya Basics	111
5 NURBS Modeling Basics	113
In This Chapter	113
<i>Key Terms</i>	114
<i>Hotkeys to Memorize</i>	114
What Are NURBS?	115
<i>Choosing NURBS as a Modeling Technique</i>	116
Marking Menus and the User Interface	117
<i>Customizing the Interface and Loading the Marking Menus</i>	118
<i>Customizing the Hotbox</i>	120
Creating the Old House	123
<i>Starting a New Project</i>	123
<i>Making the Roof</i>	124
<i>Adding to the House</i>	133
Summary	145
6 More NURBS Modeling	147
In This Chapter	147
<i>Key Terms</i>	147
<i>Hotkeys to Memorize</i>	148
<i>Custom Marking Menu Hotkeys</i>	148
More NURBS	149
<i>Refining the House</i>	149
<i>Building a Chimney for the House</i>	171
<i>Adding More Elements to Your House</i>	183
Summary	193
7 Modeling with Polygons	195
In This Chapter	195
<i>Key Terms</i>	196
<i>Hotkeys to Memorize</i>	197
Setting Up Emulation for Subdivisions	197
<i>Setting Up Cubes for Modeling</i>	201

Creating the Creature's Head	207
<i>Loading an Image for Reference</i>	207
<i>Modeling the Head</i>	210
<i>Working with the Split Polygon Tool</i>	215
Summary	240
8 Materials	241
In This Chapter	241
<i>Key Terms</i>	242
<i>Hotkeys to Memorize</i>	242
Materials Overview	243
A Tour of Hypershade	243
<i>Create Bar</i>	245
<i>The Tab Panels</i>	245
Basic Material Types	246
<i>Lambert</i>	246
<i>Phong</i>	246
<i>PhongE</i>	247
<i>Blinn</i>	247
<i>Anisotropic</i>	247
<i>The Others: Layered Shader, Shading Map, Surface Shader,</i> <i>and Use Background</i>	247
Material Settings	248
<i>The Color Chooser</i>	252
Adding Basic Materials to Your House	258
<i>Setting Up Default Lights</i>	258
Texture Mapping	266
<i>Mapping Coordinates</i>	266
<i>Maya's Interactive Texture Placement</i>	267
<i>Procedural Maps Explained: 2D Versus 3D</i>	267
Adding Texture Mapping to Base Materials	272
Bump Mapping	281
<i>Coordinating Texture and Bump Mapping</i>	282
Summary	289

9	Lighting	291
	In This Chapter	291
	<i>Key Terms</i>	292
	<i>Hotkeys to Memorize</i>	292
	Why Is Lighting Important?	293
	Available Light Types in Maya	293
	<i>Attributes for Spot Lights</i>	298
	<i>Other Light Types</i>	302
	<i>Ambient Light</i>	308
	Shadows in Maya	309
	<i>Depth Map Shadows</i>	309
	<i>Raytraced Shadows</i>	312
	Common Light Attributes	315
	<i>Intensity</i>	316
	<i>Illuminates by Default</i>	316
	<i>Emit Diffuse and Emit Specular</i>	317
	<i>Color</i>	318
	<i>Decay Rate</i>	318
	Summary	322
10	Animation	323
	In This Chapter	323
	<i>Key Terms</i>	324
	<i>Hotkeys to Memorize</i>	325
	The Animation Tools and Interface	325
	<i>Setting Up an Animation</i>	325
	Types of Animation	328
	<i>Path Animation</i>	328
	<i>Nonlinear Animation</i>	329
	<i>Keyframe Animation</i>	329
	Using the Graph Editor	331
	Playblasting Your Animation	338
	Summary	340

11	Cameras and Rendering	341
	In This Chapter	341
	<i>Key Terms</i>	342
	<i>Hotkeys to Memorize</i>	343
	Cameras	343
	<i>Creating Cameras</i>	343
	<i>Camera Settings</i>	346
	<i>Animating the Camera</i>	348
	Previewing with Playblast	352
	Rendering an Animation	352
	<i>Render Globals Settings</i>	353
	<i>Rendering a Still</i>	354
	<i>Setting Up a Render Job</i>	355
	Setup for Rendering	363
	Summary	366
Part III:	Going Further with Maya	367
12	Paint Effects	369
	In This Chapter	369
	<i>Key Terms</i>	370
	<i>Hotkeys to Memorize</i>	370
	Paint Effects Overview	370
	<i>Brushes and Strokes</i>	371
	<i>Enabling Paint Effects</i>	373
	<i>Starting Paint Effects</i>	373
	<i>Using Paint Effects</i>	373
	Working with Strokes	381
	<i>Selecting Strokes</i>	381
	<i>Creating a Paint Effects Stroke with a NURBS Curve</i>	381
	<i>Copying and Pasting Brush Settings</i>	381
	<i>Simplifying Curves and Strokes</i>	381
	Summary	396

13 Particle Systems and Dynamics	397
In This Chapter	397
<i>Key Terms</i>	398
<i>Hotkeys to Memorize</i>	398
Rigid-Body Dynamics	399
<i>Active and Passive Bodies</i>	399
<i>Fields</i>	401
<i>Constraints</i>	402
<i>Rigid-Body Setup</i>	403
Particles	407
<i>Creating Particles</i>	407
<i>Particle Types</i>	408
<i>Particle Materials and Age</i>	411
<i>Particle Influences</i>	411
Soft-Body Dynamics	420
<i>Creating a Soft-Body System</i>	420
<i>Adding Springs</i>	420
Summary	424
14 Your Next Steps: Efficiency and Artistry	425
In This Chapter	425
<i>Key Terms</i>	426
Why Is It Taking So Long to Render?	426
<i>Render Global Settings</i>	426
<i>Object Attributes</i>	427
<i>Material Types</i>	427
<i>Camera Effects</i>	428
Batch Rendering in Maya	428
<i>Batch Rendering as a Standalone with the Command Prompt</i>	429
<i>Batch Rendering with Slave Machines</i>	430
Workflow Enhancements	431
<i>Creating Your Own Marking Menu</i>	431
<i>Automating Single or Multiple Tasks:</i>	
<i>Hotkey, Marking Menu, or Shelf</i>	438
<i>Helper Objects: Organization and Control</i>	443

Compositing	448
<i>Using Compositors</i>	450
<i>Using the Use Background Material and Alpha Channels</i>	450
<i>Thinking in Layers</i>	451
<i>Maya's Render Layers</i>	451
Installing Third-Party Plug-ins, Materials, and Scripts	452
Creating Your Own Material Libraries	455
Parting Thoughts	456
<i>On Techniques</i>	456
<i>On Starting a Career in Animation</i>	457
Summary	458
Part IV: Appendixes	459
A Maya Headstart for Max Users	461
Differences in Viewport Navigation	461
Differences in the Control Interface	462
Differences in Viewport Mode and Layout	464
Differences in Working with Objects	467
Differences in Creating and Editing Models	469
Differences in Scene Organization	471
Differences in Modeling Aids	473
Differences in Lighting	474
Differences in Materials	476
Differences in Creating Animation	480
Differences in Previewing and Rendering	480
Post Effects	483
Environmental Effects	484
Scripting	484
Particles and Dynamics	484
Import/Export from Maya to Max	484
B Maya Headstart for LightWave Users	485
Global Differences	485
Differences in Viewport Navigation	487
Differences in Control Interface	487

Differences in Creating and Editing Models	487
Differences in Lighting	488
Differences in Materials	488
Differences in Creating Animation	489
Differences in Previewing and Rendering	491
Post Effects	491
Import/Export from LightWave to Maya	492
C Operating System Tips	493
Maya 4.01 for Linux	493
<i>Red Hat: Linux for Maya 4.01</i>	494
<i>Software Alternatives to Consider</i>	494
<i>How Is Maya for Linux Different?</i>	495
Maya for IRIX	496
<i>Why Choose IRIX?</i>	496
<i>IRIX Lovers Running Linux</i>	497
Maya for Macintosh	497
Maya and Windows	497
Maya File Compatibility	498