

# Autodesk 3ds Max Certified User Skills



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Autodesk®

Welcome to the *Autodesk® 3ds Max® Certified User Digital Skills*. This document was designed to help educators and educational institutions teach Autodesk® 3ds Max® software skills. Created using valuable input from respected educators and designers, it sets forth important skill standards for developing a high-quality user certification exam and curriculum resources.

The Autodesk® 3ds Max® Certified User Skills serves to standardize the core competencies for fundamental-level instruction with Autodesk® 3ds Max® for a two-semester class and provides a content framework and reference guide for the Autodesk Digital STEAM Workshop.

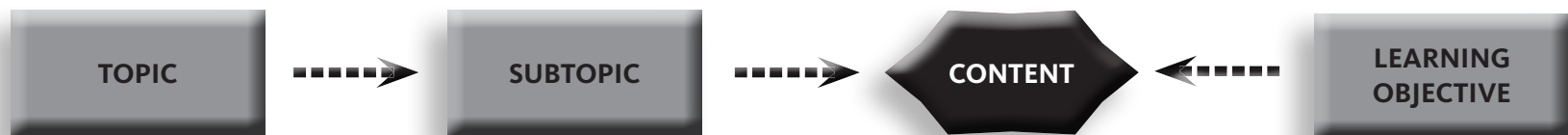


**TIP:** Although this document is designed to facilitate teacher-led courses and lessons, it may also be referenced for self-paced learning through the use of the Autodesk® Digital STEAM Workshop and the Autodesk® 3ds Max® Certified User Digital Study Packet.

### Using This Document

This easy-to-read document lists industry-specific topics pertaining to a function or feature set of Autodesk 3ds Max software. Topics are organized into three substructures logically sequenced for classroom presentation:

- **Topic:** A standard functional subject area and/or feature set available in Autodesk 3ds Max software.  
Example: Sketching and Modeling.
- **Subtopic:** A subtopic provides more detail on the topics and what the topics support.  
Example: 2D Sketching with Transforming Objects.
- **Content:** The content provides more detail about the subtopic and what should be taught and learned.  
Example: Select, Move, Rotate, Scale.
- **Learning Objective:** The learning objective exemplifies what the student is expected to understand.  
Example: Demonstration these specific functions and their hot keys.



## Autodesk 3ds Max Certified User Digital Study Packet

The Autodesk 3ds Max Certified User Digital Study Packet is a digital learning resource that provides students with a library of short videos based on the Autodesk 3ds Max Certified User Skills . The study packet covers the basic techniques required to become familiar with the software and get hands-on quickly.



**TIP:** Teachers can leverage the study packets in conjunction with the Autodesk Digital STEAM Workshop or their own curriculum to help their students build their software skill.

## Autodesk Digital STEAM Workshop

The Autodesk Digital STEAM Workshop provides teachers and students with a highly visual story-based curriculum created to promote design innovation and creative problem-solving through science, technology, engineering, arts, and math (STEAM). The curriculum is structured as a framework for learning software through project-based content based on engaging real-world industry projects that build gradually in difficulty, offering students a chance to achieve small successes as they build their technical skills.



**TIP:** Using the 3ds Max Certified User Skills as benchmarks, teachers can measure a student's progress as they work through the skills-building projects offered in the Autodesk Digital STEAM Workshop.

## Feedback

We welcome your feedback on the *3ds Max Certified User Skills*. Please email us at [digitalSTEAM@autodesk.com](mailto:digitalSTEAM@autodesk.com).

# Autodesk 3ds Max Certified User Skills



Image courtesy of Autodesk Gallery

Industry Specific Topic	Sub-Topic	Content	Examples of Learning Objective	Reference
<b>UI/Scene Management</b>				
<b>Definitions</b>				
		Labeling UI Elements i.e. Menu bar, Command panels, etc	Identify major UI components such as the Time	<a href="#">3ds Max User Interface Overview</a>
		Coordinate system	Discuss the different systems, highlighting their unique features	<a href="#">3ds Max Transforming Objects</a>
		Orthographic/Perspective	Discuss the differences between both views	<a href="#">3ds Max Viewport Navigation Display</a>
<b>Viewport Navigation Control</b>				
		Alt + MMB - Rotate	Demonstrate the ability to orbit viewports with Alt+MMB	<a href="#">3ds Max Viewport Navigation Display</a>
<b>Viewport Display</b>				
		Smooth + Highlights	Using a simple 3ds Max scene, show how the F3 hotkey changes the display mode. Describe the features and limitations of the Smooth + Highlights display mode.	<a href="#">3ds Max Viewport Navigation Display</a>
		Wireframe	Using a simple 3ds Max scene, show how the F3 hotkey changes the display mode. Describe the features and limitations of the Wireframe display mode.	<a href="#">3ds Max Viewport Navigation Display</a>
		Hidden Line	Using a simple 3ds Max scene, show how to access the Viewport Label to change the display mode. Describe the features and limitations of the Hidden Line display mode.	<a href="#">3ds Max Viewport Navigation Display</a>
		Edged Faces	Using a simple 3ds Max scene, show how the F4 hotkey changes the display mode. Describe the features and limitations of the Edged Faces display mode.	<a href="#">3ds Max Viewport Navigation Display</a>
<b>Viewport Display Preferences</b>				
		Undo	Demonstrate the ability to increase/decrease the amount of undos and the impact on performance	<a href="#">3ds Max Scene Management</a>

Industry Specific Topic	Sub-Topic	Content	Examples of Learning Objective	Reference
<b>UI/Scene Management</b>				
<b>Viewport Display Preferences</b>				
	AutoBack		Explain the AutoBack feature and how to change it's settings	<a href="#">3ds Max Scene Management</a>
<b>Selection of Objects</b>				
	Click and drag- window/ crossing		Differentiate between the two selection types, and demonstrate their uses	<a href="#">3ds Max Transforming Objects</a>
	Lock Selection		Demonstrate the benefits of locking a selection, and show how to do so using the Spacebar	<a href="#">3ds Max Transforming Objects</a>
	Selection Filters		Demonstrate the ability to filter the type of object you wish to select	<a href="#">3ds Max Transforming Objects</a>
	Named Selection		In a 3ds Max scene, demonstrate how to use the Named Selection to quickly find and select objects	<a href="#">3ds Max Transforming Objects</a>
<b>Transforms</b>				
	Axis Constraints		Demonstrate the benefits of constraining Transforms to a certain Axis	<a href="#">3ds Max Transforming Objects</a>
	Rgb=xyz=uvw		Explain how rgb=xyz=uvw correspond to each other	<a href="#">3ds Max Transforming Objects</a>
	Transform type- in fields		Demonstrate the ability to produce accurate transforms by typing them in, showing both Absolute World and Screen Offset input	<a href="#">3ds Max Transforming Objects</a>
	Align Tool		Demonstrate the Align Tool and its benefits	<a href="#">3ds Max Align &amp; Pivot</a>
	Pivot point		Demonstrate and discuss the Pivot Point's ability to change how Transforms affect the object	<a href="#">3ds Max Align &amp; Pivot</a>
	Right-click spinner zero		Highlight this functionality as a time saving function	<a href="#">3ds Max Align &amp; Pivot</a>

Industry Specific Topic	Sub-Topic	Content	Examples of Learning Objective	Reference
<b>UI/Scene Management</b>				
	<b>Organization of Objects</b>			
		Named Selection sets	Demonstrate the ability to name selections and how this can increase productivity	<a href="#">3ds Max Scene Management</a>
		Layers Hide/Freeze	Demonstrate and explain how layers can aid in the organization of a scene	<a href="#">3ds Max Scene Management</a>
		Isolation Mode	Demonstrate Isolation Mode and explain how it can simplify interactions in complex scenes	<a href="#">3ds Max Scene Management</a>
	<b>Project Folder</b>			
		Overview	Explain the organization and importance of the project folder, and list the most common sub-folders and their roles	<a href="#">3ds Max Project Folder &amp; Custom UI</a>
<b>Custom UI</b>				
	Save and Load	Demonstrate the ability to Save and Load custom UI settings	<a href="#">3ds Max Project Folder &amp; Custom UI</a>	
<b>Modeling</b>				
	<b>Transforming Objects</b>			
		Select Tool	Use the q Hotkey, and demonstrate the use of the Select tool	<a href="#">3ds Max Transforming Objects</a>
		Move Tool	Use the w Hotkey, and demonstrate the use of the Move tool	<a href="#">3ds Max Transforming Objects</a>
		Rotate Tool	Use the e Hotkey, and demonstrate the use of the Rotate tool	<a href="#">3ds Max Transforming Objects</a>
		Scale Tool	Use the r Hotkey, and demonstrate the use of the Scale tool	<a href="#">3ds Max Transforming Objects</a>
	<b>Creating and Modifying Objects</b>			
		Basics of Creating and Modifying Objects	Give an overview of the Create and Modify panels on the Command Panel, explaining the hierarchy	<a href="#">3ds Max Modifying objects &amp; Modifier Stack</a>
	Modifier Stack	Explain how the Modifier Stack functions	<a href="#">3ds Max Modifying objects &amp; Modifier Stack</a>	

Industry Specific Topic	Sub-Topic	Content	Examples of Learning Objective	Reference
<b>Modeling</b>				
<b>Geometry</b>				
	Standard Primitives		Create examples of Standard Primitives, and explain parametric creation	<a href="#">3ds Max Primitives</a>
	Extended Primitives		Create examples of Extended Primitives, and explain parametric creation	<a href="#">3ds Max Primitives</a>
<b>Splines</b>				
	Standard Splines		Create examples of Standard Splines, and show how to change common properties	<a href="#">3ds Max Splines</a>
	Extended Splines		Create examples of Extended Splines, and show how to change common properties	<a href="#">3ds Max Splines</a>
<b>Surface Modeling</b>				
	Sub-Object Selection		Identify the sub-objects of splines, and show how to select and manipulate them	<a href="#">3ds Max Sub Object Selections</a>
	Editable Mesh Surface		Demonstrate how to create this type of object and its sub-object tools. Explain the basic unit of the Editable Mesh and it's features	<a href="#">3ds Max Polygon Modeling</a>
	Editable Poly Surface		Demonstrate how to create this type of object and its sub-object tools. Explain the basic unit of the Editable Poly and it's limitations	<a href="#">3ds Max Polygon Modeling</a>
	Editable Spline		Demonstrate how to create this type of object and its sub-object tools.	<a href="#">3ds Max 2D Sub-Object Editing</a>
	Nurbs Surfaces		Demonstrate how to create this Surface and its sub-object tools	<a href="#">3ds Max 2D Sub-Object Editing</a>
<b>Object Cloning</b>				
	Copy		Define cloning as a Copy as differentiated from Instance and Reference	<a href="#">3ds Max Object Cloning</a>



Industry Specific Topic	Sub-Topic	Content	Examples of Learning Objective	Reference
<b>Modeling</b>				
	<b>Object Cloning</b>			
	Instance	Define cloning as an Instance as differentiated from Copy and Reference	Define cloning as an Instance as differentiated from Copy and Reference	<a href="#">3ds Max Object Cloning</a>
	Reference	Define cloning as a Reference as differentiated from Copy and Instance	Define cloning as a Reference as differentiated from Copy and Instance	<a href="#">3ds Max Object Cloning</a>
	Make Unique	Describe the function of the Make Unique button and demonstrate it's use	Describe the function of the Make Unique button and demonstrate it's use	<a href="#">3ds Max Object Cloning</a>
	Array	Create an Array and explain key parameters	Create an Array and explain key parameters	<a href="#">3ds Max Array &amp; Mirror</a>
	Mirror	Create and mirror an object using the Mirror tool	Create and mirror an object using the Mirror tool	<a href="#">3ds Max Array &amp; Mirror</a>
	<b>Create Shape, turn off Start New Shape, Create 2nd Shape</b>			
	Nesting shapes for compound shape	Show how multiple shapes can be nested inside one another for modeling purposes	Show how multiple shapes can be nested inside one another for modeling purposes	<a href="#">3ds Max Splines</a>
	<b>Interpolation/Rendering</b>			
	Splines	Demonstrate the interpolation and rendering features for splines	Demonstrate the interpolation and rendering features for splines	<a href="#">3ds Max Splines</a>
	<b>2D Sub- Object Editing</b>			
	Vertex tangency types	Demonstrate the different tangent types in the vertex sub--object mode	Demonstrate the different tangent types in the vertex sub--object mode	<a href="#">3ds Max 2D Sub-Object Editing</a>
	Segment tangency type	Demonstrate the different tangent types in the segment sub--object mode	Demonstrate the different tangent types in the segment sub--object mode	<a href="#">3ds Max 2D Sub-Object Editing</a>
	Create Line tool	Demonstrate the Create Line tool, explaining the vertex tangency options	Demonstrate the Create Line tool, explaining the vertex tangency options	<a href="#">3ds Max 2D Sub-Object Editing</a>
	Refine	Demonstrate how Refine can be used for spline editing	Demonstrate how Refine can be used for spline editing	<a href="#">3ds Max 2D Sub-Object Editing</a>
	Make First/Reverse	Demonstrate how Make First and Reverse can be useful in different scenarios	Demonstrate how Make First and Reverse can be useful in different scenarios	<a href="#">3ds Max Splines</a>
	Shift key for straight line creation	Demonstrate the use of shift while making splines	Demonstrate the use of shift while making splines	<a href="#">3ds Max Splines</a>

Industry Specific Topic	Sub-Topic	Content	Examples of Learning Objective	Reference
<b>Modeling</b>				
	<b>2D procedural modifiers</b>			
		Extrude	Demonstrate the extrude modifier on a spline	<a href="#">3ds Max Procedural Modifiers</a>
		Bevel	Demonstrate the bevel modifier	<a href="#">3ds Max Procedural Modifiers</a>
		Bevel Profile	Demonstrate the bevel profile modifier using a custom spline profile	<a href="#">3ds Max Procedural Modifiers</a>
		Lathe (flip normals)	Demonstrate the lathe modifier on a simple object, such as a wine glass, explaining the importance of pivot points and showing how to modify the shape after creation	<a href="#">3ds Max Procedural Modifiers</a>
	<b>Lofting</b>			
		Definition shape+path=3D Object	Explain the concept of shape + path for lofting	<a href="#">3ds Max Lofting</a>
		Compound object	Demonstrate common Compound Objects and explain their uses	
		Pivot point location	Demonstate the concept of the importance of pivot points	<a href="#">3ds Max ProBoolean</a>
		Multiple shapes on path	Demonstrate how multiple shapes can be lofted on a path	<a href="#">3ds Max Lofting</a>
	<b>Compound Objects</b>			
		ProBoolean	Examine the basic parameters and demonstrate common operations, such as creating the inside of a sink	<a href="#">3ds Max ProBoolean</a>
	<b>3D Procedural Modeling</b>			
		Bend	Examine the basic parameters and demonstrate common operations	<a href="#">3ds Procedural Modeling</a>
		Taper	Examine the basic parameters and demonstrate common operations	<a href="#">3ds Procedural Modeling</a>
		Twist	Examine the basic parameters and demonstrate common operations	<a href="#">3ds Procedural Modeling</a>

Industry Specific Topic	Sub-Topic	Content	Examples of Learning Objective	Reference
<b>Modeling</b>				
	<b>Sub-Object Tools</b>			
		Attach	Demonstrate how to attach multiple objects together as one object, including using a Named Selection	<a href="#">3ds Max Polygon Modeling</a>
		Bevel	Demonstrate how to bevel polygons, including using the caddy interface	<a href="#">3ds Max Polygon Modeling</a>
		Chamfer	Demonstrate how to chamfer edges and vertices including the using caddy interface	<a href="#">3ds Max Polygon Modeling</a>
		Cut	Demonstrate how to use the cut tool to subdivide geometry and redirect edge flow	<a href="#">3ds Max Polygon Modeling</a>
		Detach	Demonstrate how to detach sub-objects and explain where this is useful	<a href="#">3ds Max Polygon Modeling</a>
		Extrude	Demonstrate how to extrude sub-objects in a modeling workflow, including using the caddy interface	<a href="#">3ds Max Polygon Modeling</a>
	Graphite Modeling Toolbar	Give an overview of the Graphite Modeling tools and how to access them	<a href="#">3ds Max Polygon Modeling</a>	
<b>Rigging</b>				
	<b>Bones</b>			
		Systems Panel	Demonstrate the creation of basic bones for a rig, including resizing and displaying fins	<a href="#">3ds Max Rigging Bones</a>
		Animation menu	Demonstrate applying Inverse Kinematic solvers to bone chains in a rig	<a href="#">3ds Max IK Solvers</a>
	<b>Character Studio</b>			
		Biped	Demonstrate the creation of a Biped, including resizing and adjusting structure	<a href="#">3ds Max Character Studio</a>
		Show basic Character Studio animation techniques	<a href="#">3ds Max Character Studio</a>	

Industry Specific Topic	Sub-Topic	Content	Examples of Learning Objective	Reference
<b>Rigging</b>				
	<b>CAT</b>			
		CAT	Give an overview of the CAT rigs included with 3ds Max, and illustrate the workflow for creating and resizing	<a href="#">3ds Max CAT</a>
		CAT	Introduce the animation layers and keyframing techniques for a CAT rig	<a href="#">3ds Max CAT</a>
	<b>Skinning</b>			
		Skin modifier	Show how to skin a mesh to a rig, and adjust the skin weighting using envelopes	<a href="#">3ds Max Skinning</a>
		Skin modifier	Show how to fine tune skin weighting using the Weight Tool and Weight Table	<a href="#">3ds Max Skinning</a>
<b>Camera</b>				
	<b>Camera Types</b>			
		Target Camera	Differentiate between the types of Cameras available	<a href="#">3ds Max Camera Types</a>
		Free Camera	Differentiate between the types of Cameras available	<a href="#">3ds Max Camera Types</a>
		Dolly Camera, Target, or Both	Demonstrate how to dolly a camera or target	
		Perspective	Explain how the Perspective is different from a camera	<a href="#">3ds Max Camera Viewport Controls</a>
		Roll Camera	Show how to Roll a camera, explaining what axis this is using	<a href="#">3ds Max Camera Viewport Controls</a>
	<b>Camera Viewport Controls</b>			
		Truck Camera	Demonstrate the difference between the 3 types of Dolly	<a href="#">3ds Max Camera Viewport Controls</a>
		Orbit/Pan Camera	Demonstrate how to orbit/pan a camera, and the controls available, including the use of the Shift key	<a href="#">3ds Max Camera Viewport Controls</a>
		Field-of-view	Demonstrate how Align Camera Works	<a href="#">3ds Max Camera Viewport Controls</a>

Industry Specific Topic	Sub-Topic	Content	Examples of Learning Objective	Reference
<b>Camera</b>				
	<b>Camera Parameters</b>			
		Safe Frames	Show how to toggle the Safe Frame using the Shift + f hotkey, and explain what the Safe Frame is.	<a href="#">3ds Max Camera Viewport Controls</a>
		Field of View	Demonstrate the effect of changing the FOV	<a href="#">3ds Max Camera Viewport Controls</a>
<b>Lighting</b>				
	<b>Standard Light Types</b>			
		Omni Light	Explore each type of Light, taking note of each Light's unique features	<a href="#">3ds Max Light Types</a>
		Target Spotlight	Explore each type of Light, taking note of each Light's unique features	<a href="#">3ds Max Light Types</a>
		Free Spotlight	Explore each type of Light, taking note of each Light's unique features	<a href="#">3ds Max Light Types</a>
		Target Directional Light	Explore each type of Light, taking note of each Light's unique features	<a href="#">3ds Max Light Types</a>
		Free Directional Light	Explore each type of Light, taking note of each Light's unique features	<a href="#">3ds Max Light Types</a>
		Light Include/Exclude Tool	Show how to exclude objects from receiving light from lights	<a href="#">3ds Max Managing Lights</a>
		Light Lister	Explain the differences between Natural (Outdoor) and Artificial (Indoor) lighting	<a href="#">3ds Max Managing Lights</a>
	<b>Managing Lights</b>			
		Shadow Parameters	Demonstrate how to adjust the look of a shadow	<a href="#">3ds Max Managing Lights</a>
	<b>Tools</b>			
		Shadow Types and Shadow Controls	Differentiate the types of shadows available, comparing and contrasting their strengths and limitations	<a href="#">3ds Max Managing Lights</a>

Industry Specific Topic	Sub-Topic	Content	Examples of Learning Objective	Reference
<b>Materials</b>				
<b>Material Editor</b>				
		Material Editor/Slate Material Editor	Illustrate the Slate and Compact Material Editors, comparing and contrasting their workflow and features	<a href="#">3ds Max Material Editor</a>
<b>Shaders</b>				
		Blinn Shader	Define material with a real world example	<a href="#">3ds Max Shaders</a>
		Metal Shader	Define material with a real world example	<a href="#">3ds Max Shaders</a>
		Shader Basic Parameters	Explain the basics of Shaders	<a href="#">3ds Max Shaders</a>
		Shader Parameters	Explain basic shader parameters and their real-world applications	<a href="#">3ds Max Shaders</a>
<b>Standard Materials</b>				
		Standard Material	Explain each Material and their unique properties and appearance	<a href="#">3ds Max Materials</a>
		Double Sided	Explain each Material and their unique properties and appearance	<a href="#">3ds Max Materials</a>
		Top/Bottom	Explain each Material and their unique properties and appearance	<a href="#">3ds Max Materials</a>
		Blend	Explain each Material and their unique properties and appearance	<a href="#">3ds Max Materials</a>
		Ink 'n Paint Material	Explain each Material and their unique properties and appearance	<a href="#">3ds Max Materials</a>
		Multi/Sub-Object	Explain each Material and their unique properties and appearance	<a href="#">3ds Max Materials</a>
		Blend	Explain each Material and their unique properties and appearance	<a href="#">3ds Max Materials</a>

Industry Specific Topic	Sub-Topic	Content	Examples of Learning Objective	Reference
<b>Animation</b>				
	<b>Animation</b>			
		Time Configuration	Explain in detail the options in the Time Configuration window	<a href="#">3ds Max Animation</a>
		Auto Key	Explain the process of Auto Key animation	<a href="#">3ds Max Animation</a>
		Set Key	Explain the process of Set Key animation	<a href="#">3ds Max Animation</a>
		Track Bar / Timeline	Show how to adjust the Track Bar and Timeline for an animation workflow	<a href="#">3ds Max Animation</a>
		Time Slider	Show how to scrub on the Time Slider, and setp forward and backward in an animation	<a href="#">3ds Max Animation</a>
	<b>Editing Animation</b>			
		Motion Panel>Trajectories	Demonstrate how to show Trajectories, and adjust animation in the viewport	<a href="#">3ds Max Editing Animation</a>
		Curve Editor	Illustrate basic Curve Editor functions such as adjusting tangents and moving keys	<a href="#">3ds Max Editing Animation</a>
		Dope Sheet	Differentiate between the Curve Editor and the Dope Sheet, highlighting the Dope Sheet's unique workflow	<a href="#">3ds Max Editing Animation</a>
		Motion Panel	Show how to access animation controllers and adjust them in the Motion Panel	<a href="#">3ds Max Editing Animation</a>
	<b>Preview/Render Animation</b>			
		Make Preview	Show how to create an animation preview, including specifying a codec	<a href="#">3ds Max Animation Preview</a>
		RAM Player	Show the ram player for a sequence of images	<a href="#">3ds Max Animation Preview</a>
	<b>Controllers &amp; Constraints</b>			
		Noise Controller	Apply parameter animation for a basic Object-Space Modifier (i.e. Bend Modifier)	<a href="#">3ds Max Controllers &amp; Constraints</a>
		Look At Constraint	Demonstrate how to create and apply a Look At Constraint, and describe it's uses	<a href="#">3ds Max Controllers &amp; Constraints</a>

Industry Specific Topic	Sub-Topic	Content	Examples of Learning Objective	Reference
<b>Animation</b>				
	<b>Controllers &amp; Constraints</b>			
		Look At Constraint	Demonstrate how to create and apply a Path Constraint, and describe it's uses	<a href="#">3ds Max Controllers &amp; Constraints</a>
		Timeline navigation	Demonstrate the hotkey Home and describe it's use	<a href="#">3ds Max Editing Animation</a>
		Timeline navigation	Demonstrate the hotkey End and describe it's use	<a href="#">3ds Max Editing Animation</a>
<b>Rendering</b>				
	<b>Common Render Setup Dialogs</b>			
		Assign Renderer	Demonstrate how to assign a renderer	<a href="#">3ds Max Render Setup</a>
		Renderer - AntiAliasing	Change the antialiasing settings for the chosen renderer	<a href="#">3ds Max Render Setup</a>
	<b>Quick Render</b>			
		Render	Show how to render the current frame, and use the F9 hotkey	<a href="#">3ds Max Render Setup</a>
		Render Setup	Show the Render Setup, and use the F10 hotkey	
			Demonstrate how Active Shade can speed up production	<a href="#">3ds Max Render Setup</a>
	<b>iRay</b>			
			Describe the iRay renderer, and explain it's uses and limitations	<a href="#">3ds Max Render Setup</a>
	<b>mental ray</b>			
			Give an overview of the mental ray rendering engine, highlighting bounced lighting features	<a href="#">3ds Max Render Setup</a>



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