HOW TO CHEAT IN 3ds Max 2010
HOW TO cheat IN 3ds Max 2010

Get spectacular results fast

Michele Bousquet
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How to cheat, and why

The truth about cheating

The word cheat has an interesting history. In its original meaning, it described the passing of an inheritance to someone other than one’s heirs. This definition has come up through the ages to mean getting something dishonestly, or getting things by tricks or good luck.

In this book, you’ll learn shortcuts to make 3ds Max do amazing things without having to learn it all from scratch, and thus make your own good luck as an artist. There are some very thick books out there that cover every possible tool in 3ds Max—in fact, I've written a few of them myself—but this is not one of them. If you want to get the job done in the least possible time while making your clients (or your boss) happy, then this is the book for you.

The "cheats" in this book were all gleaned from real-world jobs and projects, where the client wanted something done in three days, not three months or even three weeks. I learned most of this through trial and error, and eventually developed my own bag of tricks. With this book, I've opened the bag and spilled out the contents.

Enjoy your inheritance.

Workthroughs and examples

Each workthrough in this book is designed as a double page spread. This allows you to prop the book up next to your monitor as you work with the files on the CD. Many of the examples pertain to real-world companies, and show techniques used for a recent job.

At the end of nearly every chapter is an Interlude with a discussion of a relevant topic. Think of it as advice from the shopworn.
What's on the CD?

On the CD are starter scenes and maps for many of the cheats in this book so you can try them out yourself. I've also included final scenes and animation so you can see the final result. The corresponding scene and animation file names appear under the CD icon on the right page of the spread. You'll find them in the folder for that chapter.

When you load a scene file for the first time, you'll get a message telling you that 3ds Max can't find the maps. Just browse to the maps folder for that chapter and add the path, and all the maps for that chapter should load without further messages.

There are a few images and scenes that couldn't be included on the CD due to copyright constraints. In most cases, you can visit the website of the company that provided the imagery and see plenty of their work there.
Acknowledgments

Although I'm no stranger to authoring, this book is a departure from my usual style. I am grateful to my Series Editor, Steve Caplin, for developing the Cheat Series and making it so easy to create such a lively book.

I had a wonderful team of people to assist me in creating this revision. Input from Beau Perschall, my technical editor (and my boss at TurboSquid.com), was invaluable to the quality of the information presented. Proofreader Monica Mendoza cleaned it all up at the end with her attention to spelling, grammar, and layout.

Many individuals and companies allowed me to include photos and samples of their work, and each of them are credited on the appropriate page. I am especially proud of my CGSociety.org students whose work is featured in the Challenges section in the Appendix.

Of course, no book would exist without its editors. Laura Lewin at Elsevier somehow got me through the first edition of this book, and Katy Spencer got me to cough up the revision. I don’t know how these amazing people put up with authors like me, but they do, and always with a smile. Thanks, guys.

Michele Bousquet
I’d be surprised if anyone read this book by starting at the beginning and going through to the end. This is the kind of book you should be able to just dip into and extract the information you need.

Still, I’d like to make a couple of recommendations. The first chapter deals with the basics of using 3ds Max, so if you’re new to the program, you should start there. In general, you can’t do anything else until you do a bit of modeling, so I recommend that you look through that chapter before tackling some of the more advanced topics like character animation and parameter wiring.

Although the book is designed for users of 3ds Max 2010, most topics apply to 3ds Max 2009 and many apply to earlier versions as well. The MAX files on the CD are in 3ds Max 2010 format, but all the bitmaps will work with any version.

The techniques in each chapter build up as you progress through the workthroughs. Frequently, we’ll use a technique that’s been discussed in more detail earlier in the same chapter, so it may be worth going through the pages in each chapter in order, even if you don’t read every chapter in the book.

The CD icon, when it appears on a tutorial page, indicates that file(s) listed below the icon are available on the CD. These files are the same ones used to create the images for that topic. You can use these files immediately to try out the cheat, or use your own instead.
Using 3ds Max is an adventure that begins with a few important steps.
THE TECHNIQUES DESCRIBED in this book assume a basic grasp of 3ds Max. But with so many options to choose from, it's easy to get lost in all the tools, buttons, and menus.

Not all features are created equal. This chapter goes over the fundamentals of 3ds Max with an eye toward the most important tools and how you can use them to create beautiful scenes as quickly as possible.
Before you load 3ds Max, gather up a few pictures with lighting, materials, and composition that approximate your vision of the final rendering. You won’t be copying these images, but having them handy for reference will be invaluable as you create the scene.

If animation is part of your scene, get a rough animation in place before working with lights and rendering. Test renderings and previews will give you a quick approximation of the final result. See the Animation chapter.

HERE IS A MYTH that you should spend most of your time modeling, and then cram all the lighting, texturing, and animation into whatever time remains in the schedule. This so-called wisdom stems from the early 1990’s when computer graphics were new, modeling was a rare skill, and any rendering at all was impressive.

Nowadays, clients expect decent materials, lighting, and animation, if not outright realism. To achieve this goal, the best approach is to take time at the front end to gather reference materials such as photos, drawings, videos, and textures. Each hour spent on preparation can reduce scene creation time by five or even ten times, in addition to providing a strong direction for modeling, materials, and lighting.

Gather up or create your textures and reference images. See the Modeling chapter to find out how to create reference images and textures from photographs and the Materials and Mapping chapter for creating tileable textures.
Sketch out the scene with all major elements. This step can be as elaborate as a color storyboard or as simple as a quick line drawing on a slip of paper. Even if you’re using a detailed architectural plan, consider items that aren’t noted such as trees, cars, and people.

In 3ds Max, block out the scene with primitives as placeholders for the final objects. This will enable you to place a camera and see which objects need to be the most detailed. You can also place a few representative lights to get an idea of how they’ll work with the scene.

Place lights in the scene to simulate “real” lighting, such as near an indoor lamp or in the sky to simulate the sun. Shadows are a key element in adding dimension. See the Lighting and Shadow chapters for more details.

Test renderings show you how the scene is shaping up. This is the time to compare your rendering with sample photos and pick out details that will improve realism. See the Reflections and Rendering chapters.

Now you can start modeling. Use the reference images and textures liberally to guide the process. The best tool for modeling is the Editable Poly. See the Modeling chapter for tips on speedy modeling using your maps.

Materials and mapping are next. Avoid spending a lot of time tweaking colors and reflections as materials will change appearance when lighting is added or changed. See the Materials and Mapping chapter for tips on quick mapping.

Photographs coupled with a bit of work in Photoshop can provide you with all the reference material you need.

HOT TIP
The ability to select objects at will is an important skill for working quickly with 3ds Max. Just about every operation you perform will start with the selection of one or more objects or sub-objects.

Conversely, there’s nothing more frustrating than knowing exactly what you need to select, but not knowing how to select it or get at it.

Every possible type of selection can be done with the tools at hand. It’s just a matter of knowing them so you can mix ‘n’ match when needed.

To select multiple objects, hold down **L** while clicking. Clicking an already selected object while pressing **L** will unselect it. To specifically unselect an object, hold down **A** while clicking. These tools also work with bounding regions.

To select multiple objects or select by name, click the Select by Name button on the toolbar. You can also press the **H** key as a shortcut. This tool is useful only if your objects have been named intelligently.
How to Cheat in 3ds Max

2 Click an object’s wireframe to select it. In a wireframe view, you will need to click an actual line. The axis tripod appears, the object wireframe changes color, and the object name appears on the panel at the right of the screen.

3 If objects are on top of one another in the view you’re working with, you can hold the cursor still and click multiple times to cycle through the objects. Watch for the object name to appear on the panel.

4 The Window/Crossing toggle on the toolbar determines how the bounding region works. When Window is turned on, only objects that are completely within the bounding region are selected. When Crossing is on, all objects touched by the bounding area are selected.

5 You can also select multiple objects by drawing a bounding region around them. Start by clicking in a blank area of the viewport, and then drag in any direction. The shape of the region is determined by the Selection Region currently chosen on the toolbar.

6 The Selection Filter can limit your selections to specific object types. This tool is particularly useful for selecting lights and cameras in a complex scene. Be sure to reset the selection to All or Geometry to select objects again.

7 HOT TIP
Pressing the space bar locks and unlocks the selection.

8 When the object is at a sub-object level, you can only select sub-objects that correspond to that level for that object. To select other objects, you will need to return to the base level of the object by exiting the sub-object level.

9 The Selection Filter can limit your selections to specific object types. This tool is particularly useful for selecting lights and cameras in a complex scene. Be sure to reset the selection to All or Geometry to select objects again.
OVER THE COURSE of your work with 3ds Max, you will need to zoom, pan, and rotate the scene many times to get the job done. Learning how to use the tools available will save you a great deal of time in the long run.

A mouse with a middle wheel can speed up your work in 3ds Max by many times, allowing you to zoom, pan, and rotate the scene quickly and easily.

You will also need to change the display to wireframe or shaded to be able to see what's going on in the scene.

The zoom controls are at the lower right of the screen. The Zoom Extents buttons are useful for getting objects back into view. The Maximize Viewport Toggle switches between smaller views larger views.

If you have a middle mouse wheel, hold down **Ctrl** and the wheel at the same time and drag to rotate the view.

You can also use the View Cube to rotate the viewport or change to a different view. Click a view on the cube itself, or click a rotation arrow to rotate the view by 90 degrees. Drag any part of the cube display to change the view to a custom view. **Ctrl**, **Alt**, **V** toggles the View Cube on and off.
1 Use **F3** to toggle wireframe and shaded displays in any viewport, and **F4** to toggle edge display when in shaded mode.

4 If your mouse has a middle wheel, you can zoom in and out by rolling the wheel, or pan by pressing the wheel and dragging. This method of viewport navigation means you don’t have to keep clicking different viewport navigation buttons to move around your scene. If your mouse doesn’t have a middle wheel, please get a new mouse as soon as possible. This inexpensive investment will speed up your viewport navigation by many times.

7 If you prefer a different viewport arrangement, use Views > Viewport Configuration > Layout tab to set them up differently. You can also drag viewport dividers right on the screen to change a viewport’s dimensions.

8 To quickly isolate one or more objects in viewports, select the objects and choose Tools > Isolate Selection (or **Ctrl+I**).
VEN A TRUE ARTISTE needs to get organized once in a while. Object names, layers, and selection sets are all part of keeping your scene neat and tidy so your work will be as fast as possible.

Keeping the scene organized is especially important when you need to pass it on to someone else. On the receiving end, there's nothing worse than getting a scene full of Box01 and Box02 with no layers or selection sets in sight.

Be kind to your fellow artists (and to yourself!) and take a few moments to get your scene in order. You'll be glad you did.

Organizing your objects into layers can also help keep things under control. In 3ds Max, layers refer to sets of objects, not physical layers. In other words, layer order has no effect on the appearance of a rendering. In the Layer dialog, you can also hide, freeze, and select objects. To open the Layer Manager, click the Layer Manager button on the toolbar or choose Tools > Manage Layers.
3. If you have numerous similar objects that need to be renamed, you can use Tools > Rename Objects to automate the process. Enter the number of digits (letters) to remove, and enter a new prefix to replace the letters removed. Here, a selection of toruses (Torus01, Torus02, etc.) is renamed while keeping the numbering.

4. You can temporarily hide objects to unclutter your viewports, or freeze them to make them impossible to select by accident. Right-click the screen and choose a Hide or Freeze tool from the quad menu.

6. A Selection Set is a name given to a selection of objects, providing quick selection of object sets from a dropdown menu on the toolbar.

7. Be sure to name your materials, too. If you have a lot of complex materials, consider naming your maps as well. You'll be glad you did.

8. Use Group > Group to group objects into one single selectable entity. While this is a common practice for architectural scenes, grouping makes animation difficult to control, so I don't recommend it.
The MOVE, ROTATE, AND SCALE buttons on the toolbar are called transforms. The Select and Move transform is your primary tool for lining up objects in a scene.

Coordinate systems work hand-in-hand with transforms. A coordinate system determines what 3ds Max considers to be the X, Y, and Z directions at any given moment. While you can choose a variety of coordinate systems from the dropdown menu on the toolbar, the ones you’ll use most often are View, World, and Local.

A different coordinate system can be assigned to each transform. When you want to change the coordinate system, be sure to choose the transform first. If you choose the coordinate system first, when you click the transform you might get a different coordinate system.

The default coordinate system for orthographic viewports (straight-on views) is the View coordinate system. In the Top, Front, and Left views, X always points to the right and Y always points up in whichever viewport is active at the moment.

The Pick coordinate system uses a specific object’s pivot point as the center for transforms on all objects in the scene. After you pick the object to use as the center, choose the Use Transform Coordinate Center button from the flyout. This type of coordinate system is most useful for rotating one object around another.
2. The default coordinate system for the Perspective view is called World. Here, Z always points in the up direction. The coordinate system is still listed as View on the toolbar because having the World system in the Perspective view is part of the View coordinate system’s definition.

3. The Local coordinate system is aligned with the selected object’s pivot point. Each object you create is automatically assigned its own XYZ pivot point. If the object has been rotated, the Local coordinate system allows you to easily move the object in the direction in which it’s rotated.

5. The pivot center button next to the coordinate system dropdown menu determines whether the object will be transformed around itself (Use Pivot Point Center), the center of the selection (Use Selection Center), or some other object (Use Transform Coordinate Center).

7. To transform an object by a specific amount, you can enter a value on the status bar, or right-click the transform button to bring up a type-in entry dialog.

8. If you want all the benefits of a modifier for a transform, apply an XForm modifier to the object. At the Gizmo sub-object level, transform the object as you like.

**HOT TIP**

Avoid using the scale transform on an object whenever possible. Instead, adjust the object’s parameters if it’s a primitive. For an Editable Poly or Editable Mesh, scale the object at the Vertex or Polygon sub-object level. Changing an object’s dimensions with parameters or sub-object scaling has no negative effects on the scene.

The `f12` hotkey brings up the Transform Type-In dialog for the currently selected transform.
Organizing objects: a matter of choice

WITH A CHOICE OF SO MANY TOOLS in 3ds Max for organizing objects, you have many options for managing your scene. Layers, for example, are not necessarily better or worse than selection sets. It’s a matter of what works best for your purposes.

A selection set is simply a selection of objects that you give a name to. It’s the easiest one to use, and I still have a soft spot for it. Select, enter a name on the toolbar, done. In the early days of 3ds Max, before layers were introduced, this was the primary tool artists used to organize objects. It wasn’t uncommon for me to send a scene back to an artist with a note to rename the objects (please!) and then put them into selection sets so I could work with the scene.

Grouping has been available for just as long. This type of tool is common in 2D graphics and layout programs such as Illustrator and InDesign. While it works very well in 2D for just about anything, grouping has specific, limited uses in 3D.

For objects that won’t be animated, grouping is fine. Architectural artists, for example, find it useful to group together all the furniture so they can move it around easily. This works because the furniture isn’t going to be animated to fly around the scene (or so one would presume). The camera might be animated, but that won’t have any effect on grouped objects just sitting there.

If the object is going to be animated, grouping becomes something that we in the 3D industry call A Bad Idea. If you animate the group to make it fly around, the animation keys are on the group itself as an object. If you later ungroup the objects, you will lose the animation keys. And if you open the group and animate individual objects within the group, and then ungroup the object, you get what we in the industry call A Big Mess. So for static objects, group away. For animated objects, use Dummy objects to keep it all together (covered in the Animation chapter).

Layers are a new thing in more recent versions of 3ds Max. Architectural artists love them because layers are a mainstay of AutoCAD, a technical design
program used by most of the known universe, and many architectural artists got their start with AutoCAD. I’ve made do with selection sets for so long that I don’t use layers very often, but they do come in handy for large scenes. And yes, I sometimes get a scene sent back to me with a note to please put everything in layers because that’s what the folks at the other end are accustomed to using.

If you model something made up of several separate objects, for example, a chair made up of numerous bits of metal and wood, you can use the Attach tool (available with Editable Poly and Editable Mesh objects) to put them all together into one object. Each object will become an Element sub-object, which makes it easy to select the piece and move it around or assign it a different material.

In short, no one method for scene organization does it all. Try them out and use what works best for a particular set of objects, a specific scene, or you personally.
Roger’s top 10 reasons why you can’t select your object

MY GOOD FRIEND Roger Cusson is, like me, a longtime instructor on 3ds Max. One day we got to talking about the challenges of teaching such a large and complex program, and we agreed that the biggest barrier new students have is confusion about selecting objects.

Roger proposed that since we go over these pitfalls in every class, he should publish a list of Roger’s Top 10 Reasons Why You Can’t Select Your Object. The list never actually got published until now. As a bonus, I’ve included a cutout reminder list that you can tape to your laptop or computer case for easy reference. So here is the list, for the first time ever in print:

1. The current selection is locked, preventing you from making a new selection. You can tell if this is the problem by checking the Selection Lock Toggle on the status bar to see if the button is turned on. Click the button to turn it off, or press the space bar.

2. You are attempting to select an object in a wireframe view by clicking in its volume area rather than on the wireframe. Click the wireframe, or change to a shaded viewport and click the volume.

3. The object is frozen. Right-click anywhere in the viewport and choose Unfreeze All, or use the unfreeze options on the Display panel.

4. A creation button, such as Box or Sphere on the Create panel, is still clicked, and a selection tool (such as Select Object) is not currently selected. Right-click a couple of times to turn off the creation tool, or click a selection tool.

5. You are still at the sub-object level for one object. At a sub-object level, you can select only sub-objects of that object. Return to the base level of the object by turning off the sub-object level.

6. The Window/Crossing toggle on the toolbar is set to Window, and you are making a Crossing selection. Click the button to toggle to Crossing.
7 You are clicking the back side of a one-sided object such as a Plane. Rotate the view and click the other side.

8 You are currently using a tool that’s expecting a selection for that specific tool. For example, if you click Select and Link then click Select by Name, you will pick an object to link to rather than simply selecting an object. Click Select Object to turn off the other tool and enable selection.

9 The Selection Filter is limiting your selection. Set the Selection Filter to All.

10 You are trying to use Shift or Alt instead of Ctrl to add to the selection. Use Ctrl to add to the selection, and Alt to remove from the selection.