Tutorials:
Getting Started—
Animated Battle
Scene

Autodesk®
3ds Max®

2010

Autodesk® 3ds® Max 2010 Software

Getting Started: Animated
Battle Scene

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This tutorial, intended for those new to 3ds Max, offers a quick introduction to the world of 3D.

Using basic features of the program, you'll create a simple battlefield scene made up of a cannon, a rock, a tree, and a windmill. You'll also add a camera and use it to view the scene from different angles.

The final steps show you how to add some basic animation, then turn the results into a multimedia file.

The battlefield

In this tutorial, you will learn how to:

■ Open a scene

■ View a scene from different angles and perspectives

■ Model objects and apply realistic materials

■ Move and animate objects

■ Render the scene and save it as a multimedia file

Skill level: Beginner

Time to complete: 20 minutes

Navigating a Scene

In this lesson, you'll open a partially-completed scene of a battlefield and learn how to adjust the view and navigate the viewports.

Navigating the scene:

1   On the Quick Access toolbar, click the Open File button.

2   From the *\scenes\startup* folder, highlight *battlefield_start.max*, then click Open.
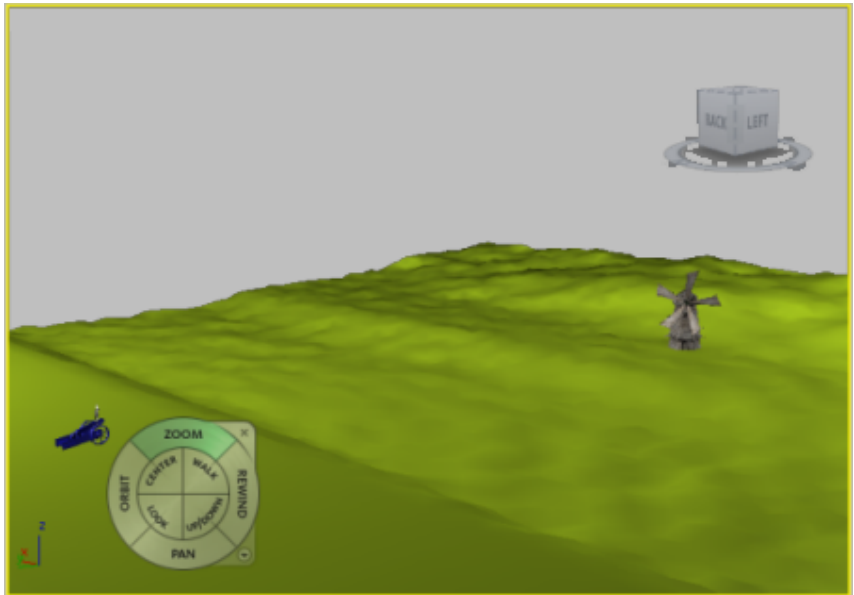
Perspective viewport

The Perspective viewport should be active, indicated by a yellow border. If no border is visible, click anywhere within the viewport to activate it.

3   Depending on how your system is currently being used, you may have up to two navigation tools displayed in the viewport. The ViewCube™

displays in the top right corner and the SteeringWheels™ 3D navigation controls display in the lower left.

4 You will first take a look at the ViewCube. If the SteeringWheels is visible, hide it by clicking the X at the top right of the corner of the wheel.

NOTE If this is the first time you are using SteeringWheels, you will need to click on its icon to activate it.

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5 In the Views menu > Viewport Configuration > ViewCube panel > Display Options group, turn on Show The ViewCube if it is not already on.
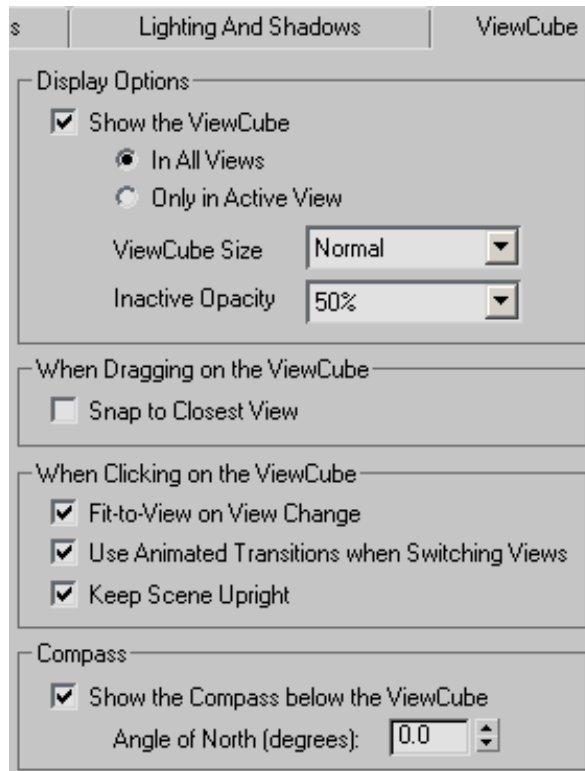
6 In the When Clicking On The ViewCube group, make sure Fit-To-View On View Change and Keep Scene Upright are on, and click OK.

7 In the Perspective viewport, right-click the ViewCube and choose Set Current View As Home.
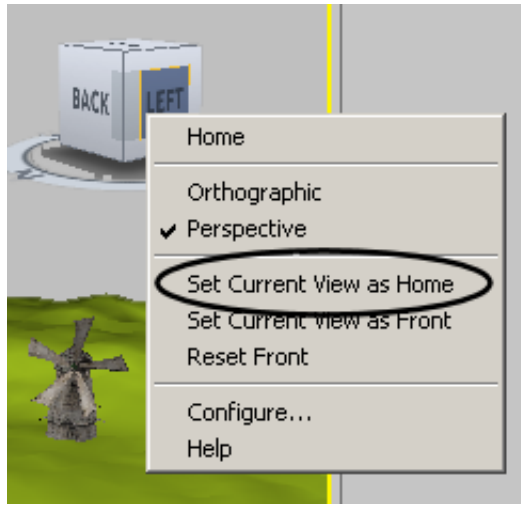
8 Click the Left face of the ViewCube to view the scene from the left.

As you can see, the ViewCube lets you view the scene from alternative viewpoints with a simple click of a mouse.

Notice how the viewport zooms in to a default scene magnification as it switches to the left perspective. The change in zoom factor is not something we want in this tutorial however, so you'll change it.

9 Right-click the ViewCube and choose Configure from the menu.

The ViewCube tab is automatically selected.

10 In the When Clicking On The ViewCube group, turn off Fit-To-View On View Change and click OK.

It is important to keep this setting off if you want to maintain the same zoom factor when switching between viewpoints.

11 In the Perspective viewport, click the Home icon to the upper left of the ViewCube.

The Perspective viewport returns to its initial viewpoint.

> **NOTE** You can reset the Home viewpoint to the current view at any time by right-clicking the ViewCube and choosing Set Current View As Home.

12 Click the Zoom button in the viewport navigation controls at the lower-right corner of the 3ds Max interface.

To show that this control is now active, the button appears pressed in, with a yellow background.

13 With the mouse, drag downward in the Perspective viewport.

Your view zooms out so you can see the scene from a distance.

> **NOTE** You can also zoom in or out by rotating the mouse wheel forward or backward.

14 In the viewport navigation controls click Orbit, which is below and to the right of the Zoom button. The button highlights when active.

A yellow navigation circle appears in the viewport.

15 Position the cursor *inside* the yellow circle. Press and hold the left mouse button and move the mouse. This action is called dragging.

The point of view orbits around the scene.

> **TIP** Avoid dragging outside the yellow navigation circle, unless you want to roll the entire viewport.

16 Use a combination of the Orbit and mouse wheel to zoom in on the windmill.
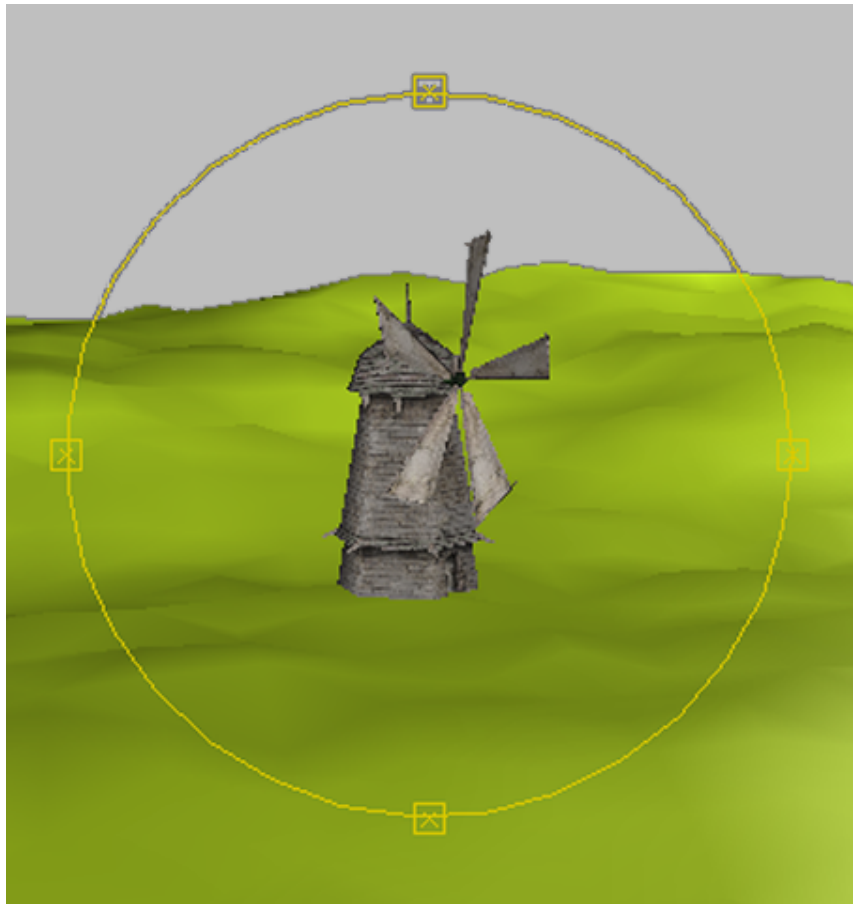
17 Orbit your view by dragging to the left or right until you can see the cannon in the opposite direction.

18 Right-click the viewport to exit Orbit mode.

19 Click Pan in the viewport navigation controls and move the mouse in the viewport.

The viewport view now follows the movement of your mouse.

NOTE You can also start a pan operation by holding down the mouse button or wheel as you pan.

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20 Return the viewport to its original orientation by clicking the Home icon.

21 Press Shift+W to display the SteeringWheels controls, if theyare not already visible.

NOTE In this instruction, "**Shift+W**" is outlined with a rectangle to indicate that you must press this key combination on the computer keyboard. We use this style consistently in the help and tutorials for both single keypresses and key combinations, so that it's always clear when an instruction involves using the physical keyboard as opposed to using the mouse with the software interface on the screen.

The SteeringWheels controls offer an alternative way to navigate a scene.
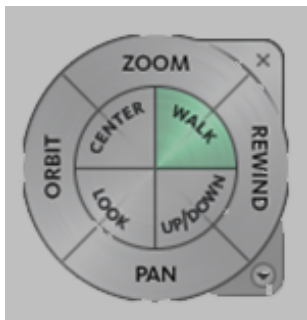
22 Click and drag each of the Zoom, Pan and Orbit controls in turn, and experiment with how they can be used to navigate the scene.

23 When you're done, click the Rewind button and drag to the left.

24 The Rewind tool passes over a strip of thumbnails, each of which represents a previously selected navigation point. Release the mouse on any thumbnail. The viewport rewinds to that point.

Rewind Tool
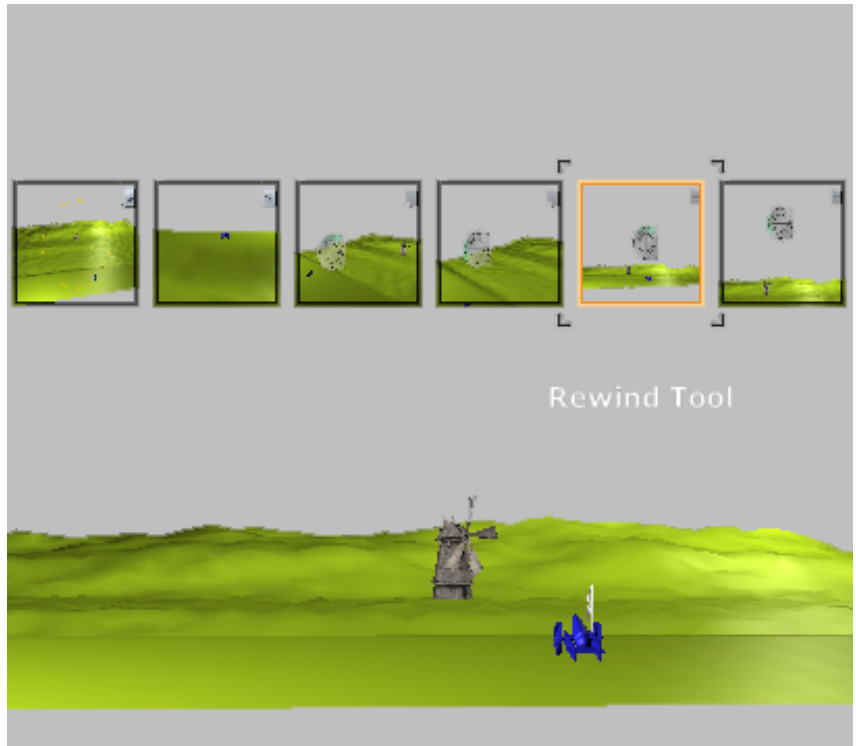
25

Experiment with the Center, Walk, Look and Up/Down controls in the center of the SteerWheels icon. When you are done, click the arrow in the bottom right of the wheel and choose Go Home. This repositions the viewport view to the Home viewpoint.

26 Click the small "X" in the top right of the wheel to hide the SteeringWheels widget.

TIP Press Shift + W to redisplay the SteeringWheels controls.

Next, you'll create a camera and a Camera viewport. The Camera viewport is similar to the Perspective viewport but with different functionality. It can be animated, and effects added.

Creating a camera:

1 Right-click the Top viewport to activate it.

The viewport is outlined in yellow.

2 On the Create panel, click the Cameras tab, then click Target.

3 In the Top viewport, click behind and slightly to the right of the cannon, then drag down to a point just left of the windmill (as shown in the following illustration). Don't worry about the exact camera placement yet: you will adjust this later.
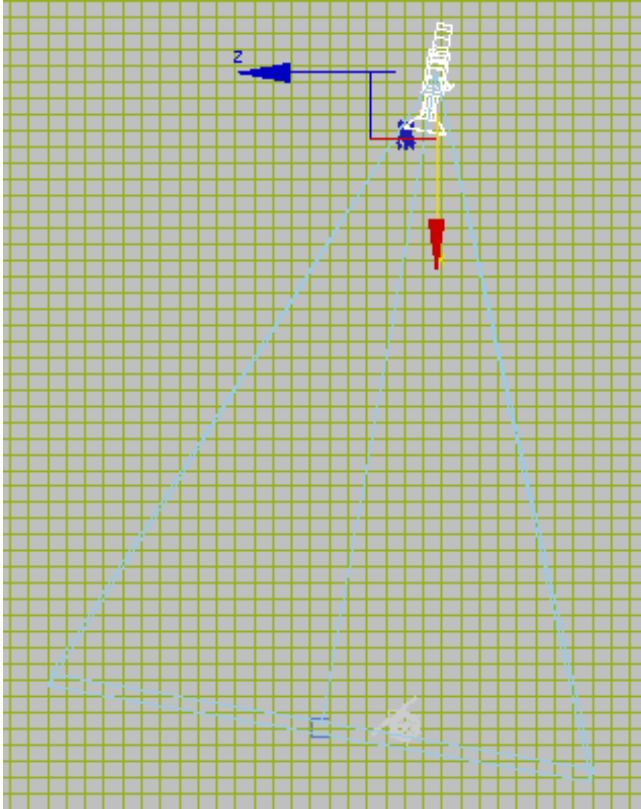
To see what the camera sees, you now need to display one of the viewports as a Camera viewport.

4 Right-click the Perspective viewport to activate it, then press C.

Right-clicking a viewport activates it and keeps any objects in other viewports in a selected state (in this case, our camera object). Left-clicking a viewport deselects previously-selected objects.

5 On the main toolbar, click the Select And Move button.

A tripod of red, blue, and green arrows appears in the Top viewport. This is the transform gizmo. As you move your cursor over the arrows, each axis label and arrow stem turn yellow. When one is yellow, you can press and drag to move the object in a single direction. If you move your cursor over the inner corners of the transform gizmo, the plane turns yellow. This lets you move in a single plane.

6 Right-click the Left viewport, click the camera's Y axis manipulator, and drag it slightly upward so you can see more of the horizon in the Camera viewport.
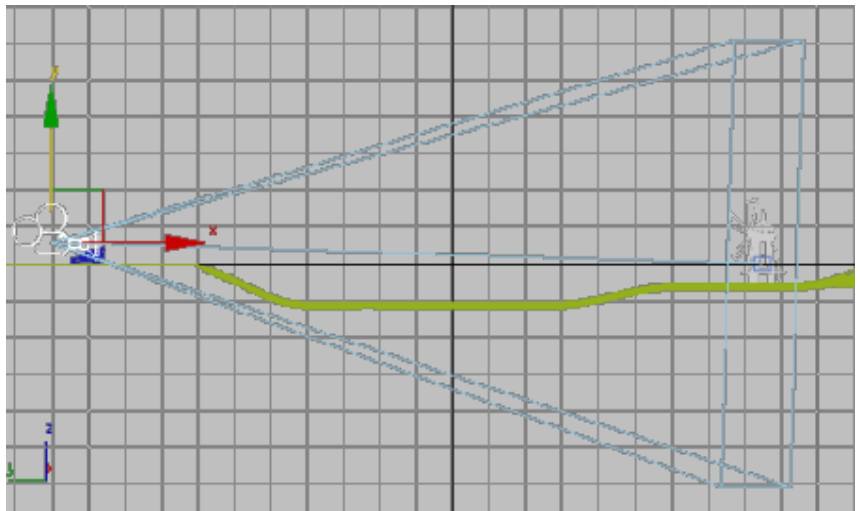
7 If the cannon is not visible, in the Left viewport drag the camera to the right on its X axis until the front of the cannon comes into view in the Camera viewport (as shown in the next illustration).
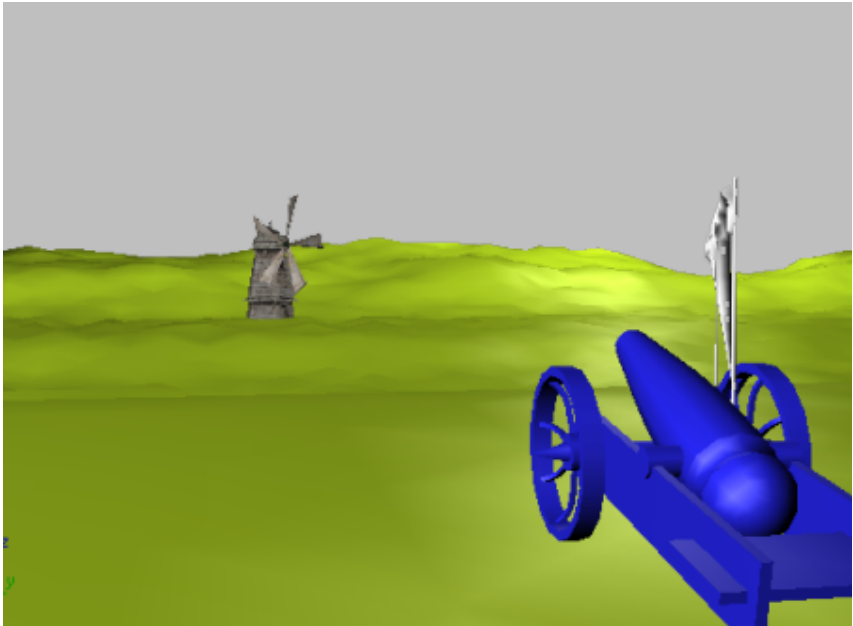
Next, you'll create a rock and a tree, then add them to the scene.

Creating a Rock and a Tree

In this lesson, you'll create two primitive objects, then modify their parameters so they take on the appearance of a rock and a tree.

Create a rock:

1 On the Create panel, click the Geometry tab, then in the Object Type rollout, click Sphere.

The button highlights to show that it is active and ready to use.
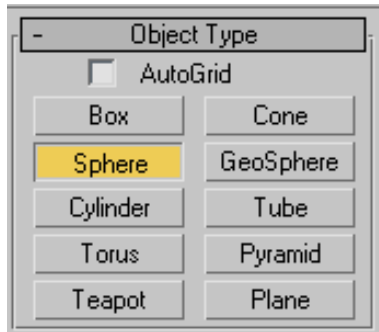
2 Create a sphere in the Top viewport by pressing down on the left mouse button anywhere to the front-left of the cannon (see next illustration) and dragging away from where you started. As long as you hold the mouse button down, you can adjust the size of the sphere. When you release the mouse button, the sphere is complete.

TIP Your sphere might be a different color from the one in the illustration.
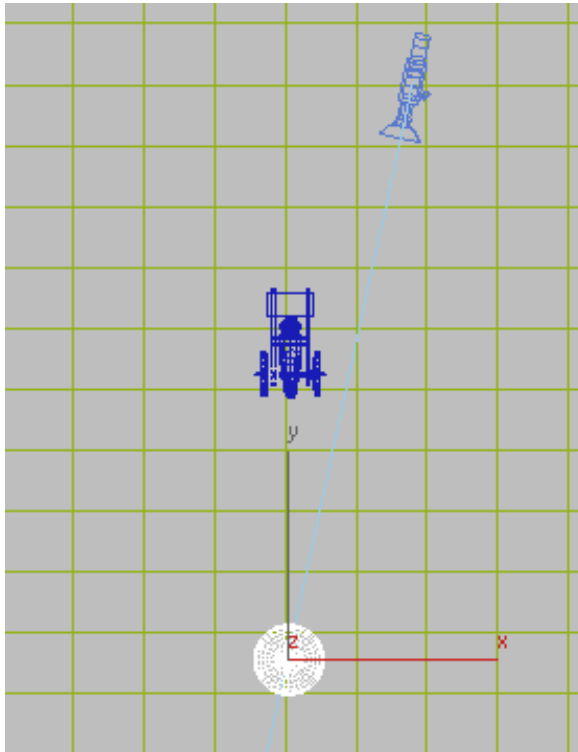
Create a sphere.
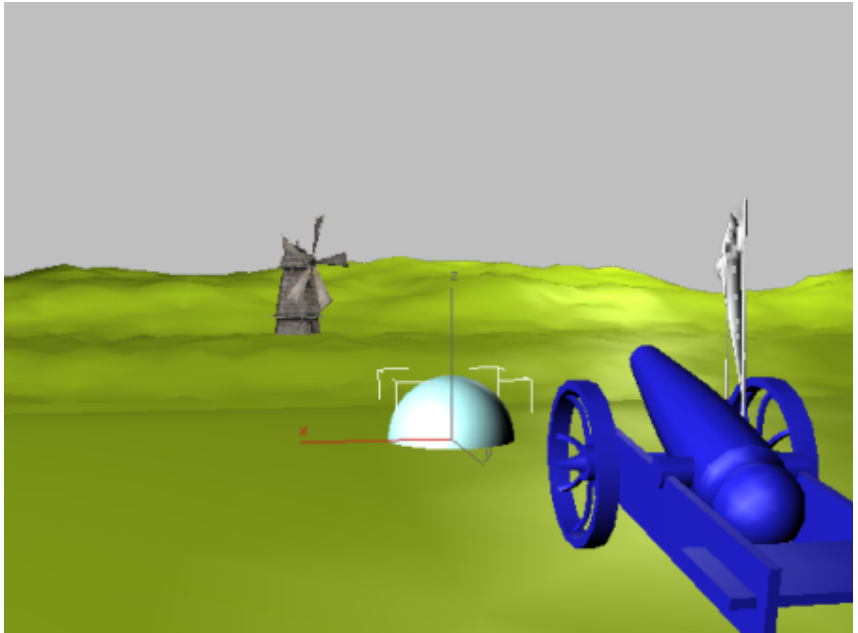
The sphere in the camera viewport

3 On the Modify panel > Parameters rollout, change the Radius setting to **25** and press Enter.
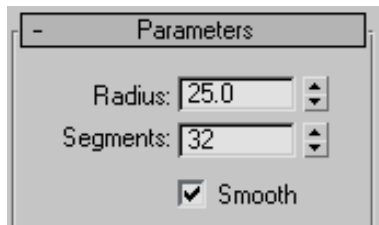
The sphere changes size in the viewport. In 3ds Max, it's typical practice to rough out an object with the mouse, then refine it on a rollout.

4 Click the Modifier List drop-down and choose the Noise modifier.
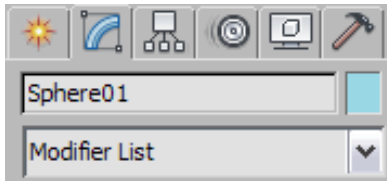
5 In the Noise group, turn on Fractal and in the Strength group, set X, Y, and Z to **30.0**.
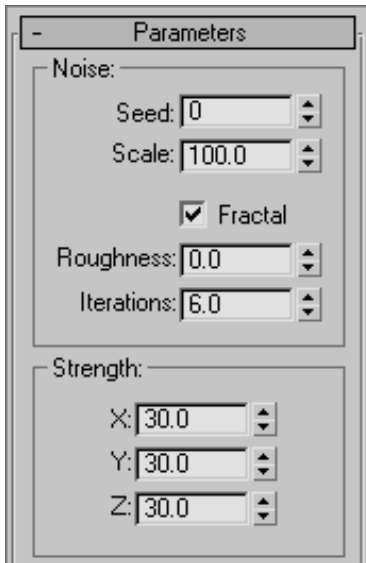
The rock is taking shape, but it could be flatter.

6 On the main toolbar, click the Select and Uniform Scale button.

7 In Camera view, drag the gizmo Z axis downward until the rock object is about two-thirds its original height.
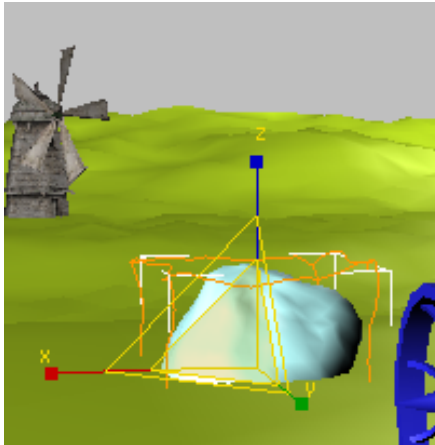
Change the name of the sphere:

1 In the Modify panel object name field, double-click the name *Sphere01* to highlight it.

2 Type in **rock** to change the name of the sphere. Press Enter to set the new name.

NOTE Pressing Enter is an explicit way to change a parameter. 3ds Max also accepts the change as soon as you click anywhere on the screen.

Create a tree:

1 On the Create panel, click the Geometry button, then from the Standard Primitives drop-down list, choose AEC Extended.
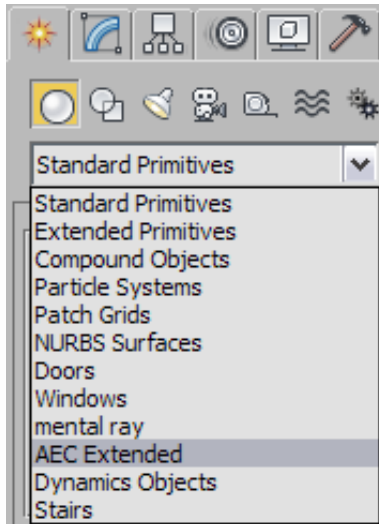
AEC Extended objects are pre-built geometry, including railings, fences and plants. They are a fast way to add realistic details to a scene.

2 On the Object Type rollout, click Foliage.

3 On the Favorite Plants rollout, choose Generic Oak as the species of tree.

Favorite Plants

Big Yucca

Japanese Flowering
Cherry, Spring

Generic Oak

4 Right-click the Top viewport to activate it, and add the tree to the scene
by clicking a point slightly below and to the left of the rock.
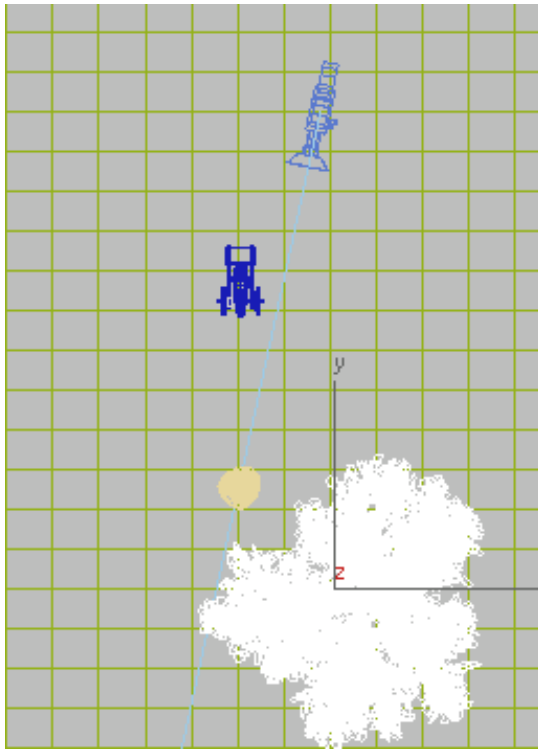
Create a tree

To give the scene some atmosphere, we'll make the tree appear stunted and battle-scarred.

5 With the tree still selected, on the Modify panel > Parameters rollout, set Height to **150**.
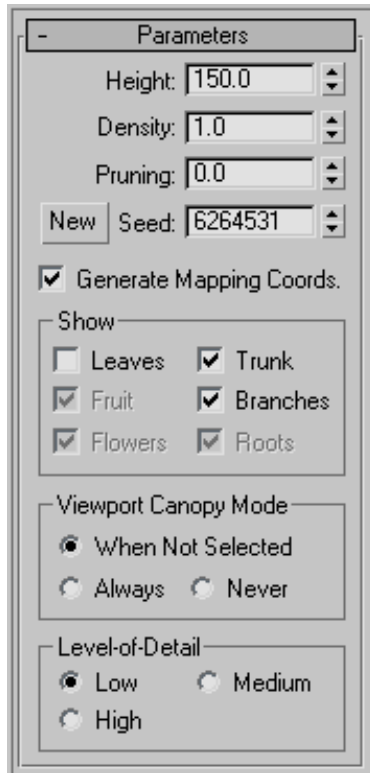
6   In the Show group, turn Leaves off and in the Level-Of-Detail group, turn on Low to reduce the number of branches.

7   If you are not yet satisfied with the appearance of the tree, on the Parameters rollout click New.

    Each time you click this button, the Seed value is changed, causing the tree to undergo a random re-configuration.

8   When you are satisfied with the appearance of the tree, re-name the object in the Foliage01 field using the same procedure you followed for the rock. Call this object **oak_tree**.

9   If the tree is obscuring your view of the windmill, feel free to move it aside using the Select And Move tool on the main tool bar.

Next you'll apply a material to your rock using the Material Editor.

Adding Material to Objects In the Scene

You add realism to scene objects by adding materials to their surfaces. Material texture can include information from bitmap images, as well as bump maps for a 3D effect. In this tutorial the battlefield terrain, as well as the tree, rock, cannon and windmill, all get their appearance from bitmap texture mapping.

Cannon texture

Rock texture

Add a battlefield material:

1 On the main toolbar, click Material Editor.

> **TIP** You can also press M to launch the Material Editor.

The Material Editor opens as a floating window.
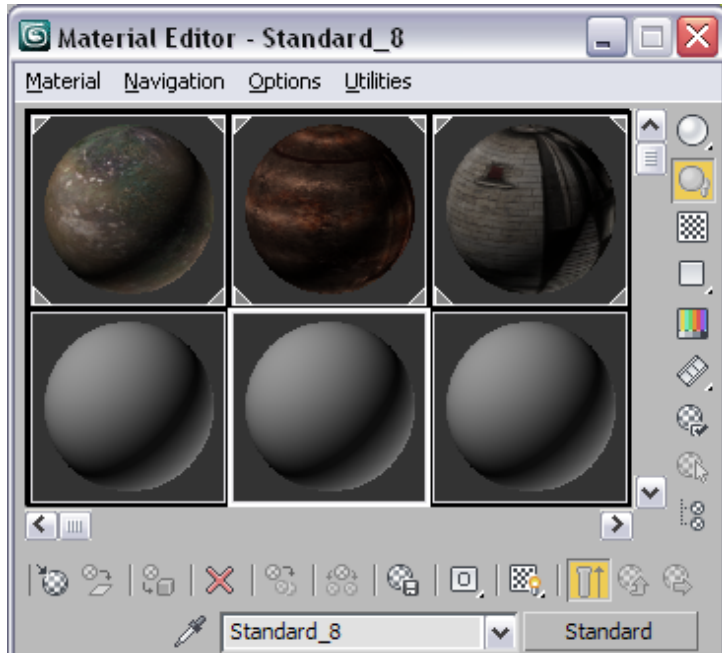
By default, the Material Editor shows six sample slots, each of which is capable of holding a material. Typically, you would have multiple materials to choose from, so you may prefer to expand the number of sample slots selectable from the editor.

2 Click any sample slot to select it. A white outline shows the slot is active. Right-click and from the list, choose 5 x 3 Sample Windows. You now have 15 sample slots for future use.

3 Locate the battlefield material sample slot and click it.

Notice that the name *Battlefield* appears in the Material Name field below the sample slots.

This material has already been constructed for you. It uses a bitmap as a texture and includes a bump map.
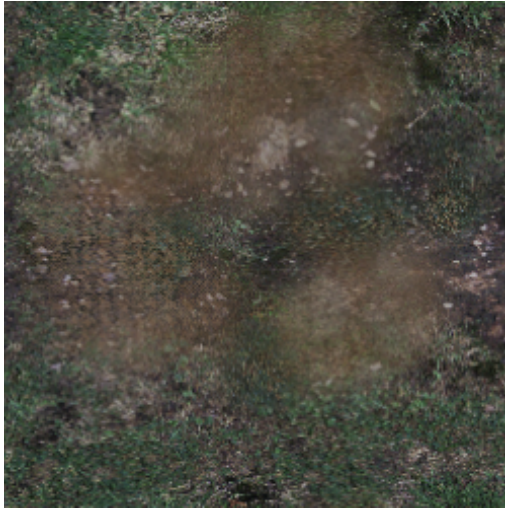
Field texture

4 Drag the *Battlefield* material from its sample slot onto the field object in the Camera viewport.

The viewport now displays a grass and dirt covered landscape.
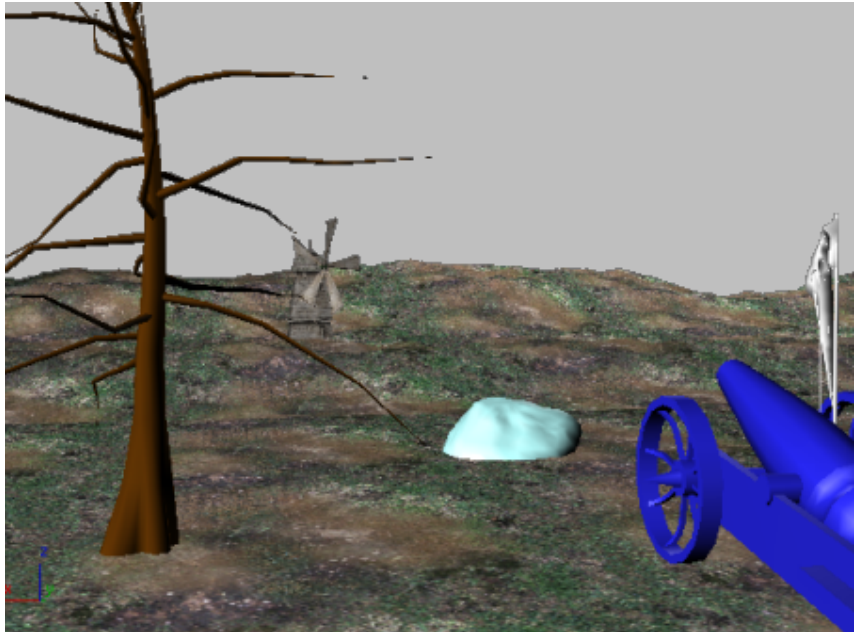
5 Drag the *Stone* material from its sample slot onto the rock object in the viewport. The stone surface updates to a realistic texture.

Next, you will apply a material to the cannon.

All parts of the cannon were previously grouped together into a single entity, called a *selection set*. This way, when you choose a material, it is applied to all components in the selection set in a single action.

6 From the main menu Named Selection Sets drop-down list, choose Cannon.
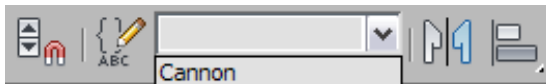
7 On the Material Editor, click the cannon sample slot and click Assign Material To Selection.

This method is another way to apply materials to selected objects.

The oak tree and windmill already have materials applied to them, so we're now ready to begin animating the scene.

8 Save your scene to your local folder as **my_battlefield_scene.max**.

Animating the Scene

In this lesson, you'll bring the battlefield scene to life by animating scene objects.

You'll do this with keyframe animation. The Auto Key tool in 3ds Max lets you record the physical characteristics of an object at any given point in time. This state in time is called a *keyframe*. The software then figures out all the in-between states from one keyframe to the next, for a smooth transition of the object.

The following procedure consists of two animations. Between frames 0 to 120, you will advance the cannon to its firing position, next to the rock. Between frames 120 and frame 160, you will raise the cannon barrel in preparation for the first shot.

3ds Max gives you three different ways to create keyframes. One is to turn on the Auto Key button, move to any point in time, and transform (move, rotate, or scale) the object. A second method is to right-click the time slider and then set keys using the Create Key dialog. There is also a Set Key animation mode, designed for professional character animators.

You'll use the Auto Key button in this exercise.

Animate the position of the cannon:

1 Continue with your own scene, or open *battlefield_scene.max*.

2 Right-click the Top viewport, then zoom in and pan the scene so that the cannon and rock are clearly in view.

3 On the main toolbar, click Select And Move, then hover your mouse over the rear portion of the cannon.

After a moment, a tooltip appears that says *frame*.

The tooltip indicates your selection tool is hovering over the *frame* object. In this scene, frame is the parent object of the cannon, meaning that if it moves, the rest of the cannon assembly moves with it.
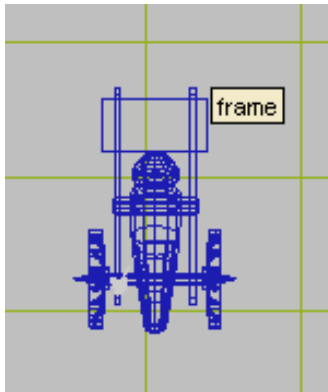
4 Click the frame object to select it.

5 The time slider is the wide button located directly above the time scale display below the viewports. Move the time slider to frame 120 (to create a 4-second animation when played back at 30 frames a second).
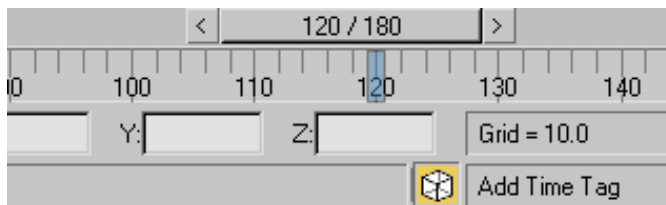
6 Click the Auto Key button to turn it on.

The button turns red. You are now in automatic animation mode.

TIP The time slider bar also turns red, and the active viewport is outlined in red to remind you that you are in Auto Key mode.

7 In the Top viewport, select the frame object and drag it on its Y axis until the cannon is lined up next to the rock.

Autokey interpolates, or averages out, the cannon position at each frame from its start position at frame 0 to its final resting place at frame 120.

8 Turn off Auto Key.

> **TIP** To avoid accidentally creating unwanted animation, develop the habit of turning Auto Key off after animating each movement.

9 Move the time slider back and forth from frame 0 to frame 120, and watch the cannon move forward.

Note how animation has already been applied to the windmill in the background.

Add a second animated movement:

1 Turn on Auto Key and advance to frame 160.

2 Press H on the keyboard.

The Select From Scene dialog opens.

3 Choose the *barrel* object from the list and click OK.

Select From Scene

Select   Display

Find: [   ]   Selection Set: [▾] 🗎 🗎 🗎

Display: [icons row]

Name	Type	Color	Faces
⊟ ● sails	Geometry	▭	
● sail1	Geometry	▭	
● sail2	Geometry	▭	
● sail3	Geometry	▭	
● sail4	Geometry	▭	
● sail5	Geometry	▭	
● Field	Geometry	▭	40
✖ Omni01	Light	▭	
✖ Omni02	Light	▭	
⊟ ● frame	Geometry	▭	
⊟ ● Flagpole	Geometry	▭	
● flag	Geometry	▭	4
● wheel_left	Geometry	▭	2
● wheel_right	Geometry	▭	2
● barrel	Geometry	▭	2
🎥 Camera01	Camera	▭	
🎥 Camera01.Target	Camera Target	▭	
● Sphere01	Geometry	▭	9
● oak_tree	Geometry	▭	9

[OK]   [Cancel]

4 On the main toolbar, click Rotate.

5 In the Camera viewport, rotate the barrel on its X axis by **–10** degrees.
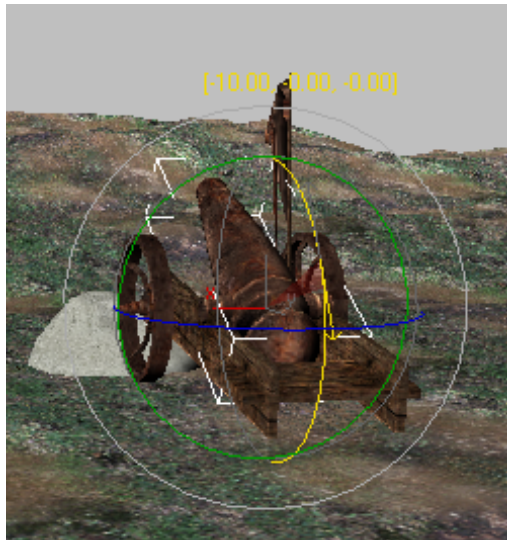
As you modify the barrel rotation, the axis values update in yellow.

6 Drag the start keyframe at frame 0 to frame 130.

7 Turn off Auto Key.

8   In the animation playback controls, click Go To Start, then click Play Animation.

Watch the animated cannon prepare its deadly attack on the windmill.

9 Save your scene to your local folder, this time as **my_battlefield_attack.max**.

Rendering the Animation

Rendering multiple frames for a complete animation can be time consuming, even on a fast machine, because each frame is individually processed. Realistic materials, shadow casting, and other factors can slow the process as well. This scene is relatively simple however, so it shouldn't take that long to render.

Render your animation:

To complete this tutorial, render the animation you made earlier. The rendering time is probably under 15 minutes, depending on the speed of your machine.

1   On the Quick Access toolbar, click the Open File button and open your saved animation, *my_battlefield attack.max*. Or, open *battlefield_attack.max*, located in the *\scene\startup* folder.

> **NOTE** If you saved your completed files to a folder other than *\scenes\startup*, when you open one of your files you might encounter messages about missing files. If you run into this problem, click the Browse button on the Missing External Files dialog. This opens the Configure External File Paths dialog. Click the Add button. Use the Choose New External Files Path dialog to navigate to the folder where you loaded the original file, and then click Use Path. Click OK, and then click Continue.
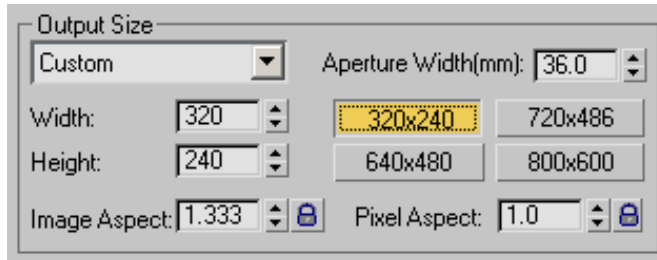
2   On the main toolbar, click Render Setup.

The Render Setup dialog displays.

3   In the Time Output group, choose Active Time Segment. (If you left the setting at Single, just the currently displayed frame would render.)
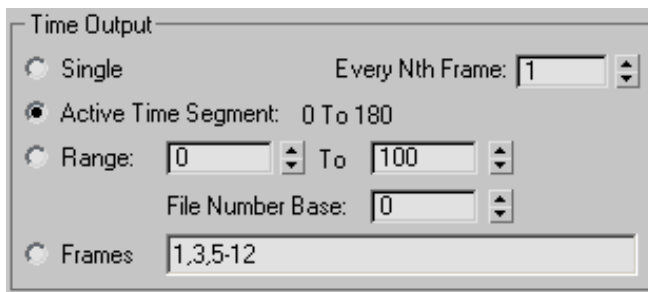
> **TIP** If your computer is fast, you may skip the next step.

4   In the Output Size group, change the default (640 x 480) to 320 x 240.

This smaller size has only one-quarter the area of the default, making it much faster to render.

5   In the Render Output group, click the Files button. (You might have to scroll down in order to see this control.)

6   On the Render Output File dialog, name your animation **mybattlefield_attack.avi**. Click Save to save the animation to the default folder (usually *renderoutput*).

> **WARNING** You must either add the extension *.avi* in the file name, or else select AVI as the file type. If you don't tell the program what type of animation format to save in, the rendering won't work.

7   On the AVI File Compression Setup dialog, do the following:
   - If necessary, change the compressor to Cinepak Codec. There are many different codecs to choose from. Cinepak generally gives satisfactory results and is commonly installed on Windows machines, meaning your compressed AVI file can be read by wide audience.

   - Set Quality to high, between **90** and **100**.

   - When you're finished, click OK.

   On the Render Setup dialog, Save File is now on and the output field shows the location of *mybattlefield_attack.avi*.

8   At the bottom of the Render Setup dialog > View list, choose Camera01.
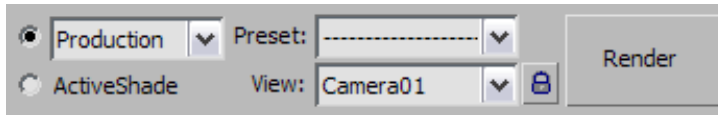
Always check to be sure you're rendering the right viewport.

TIP In most cases, you will render in the camera viewport.

9 Click Render to begin the rendering process.

Watch a few frames to make sure that the rendering gets off to a good start. The Time Remaining estimate gives you an idea of how long the rendering will take.

Play the rendered animation:

1 When your animation is finished rendering, choose Rendering menu > View Image File.

By default, the View File dialog opens in the *renderoutput* subfolder.

2 Highlight *mybattlefield_scene.avi* and click Open to display the Media Player.

3 Play your animation from the Media Player.

Summary

You have learned how to find your way around the 3ds Max user interface while creating an animated scene. You now know how to navigate the viewports, create simple objects using primitives, and assign materials to them. You've also learned how to move objects as well as animate and render your animation.