Job No: 12   **Duration:** 8H

Job Title: Add Camera

Objective:

To understand the concept very similar to target and free lights; The target cameras are usually fairly stationary and pointed at a particular object or in a particular direction, whereas free cameras are best for animating freely along a path.

Students should be able to understand the usage of the following:

- Add a target camera
- Add a free camera
- Position Camera Viewport Controls

Introduction:

Cameras in 3Ds Max are based on traditional 35mm photography. For example, a "normal" lens for a 35mm camera is considered to have a 50mm focal length. This creates a perspective that most closely represents what humans see from one eye. Focal lengths that are less than 50mm are considered to be wide-angle, whereas focal lengths greater than 50mm are telephoto lenses.

Camera:
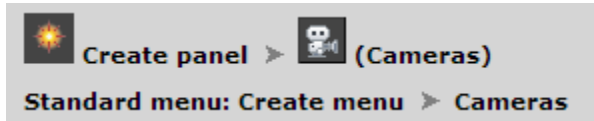
Cameras present a scene from a particular point of view. Camera objects simulate still-image, motion picture, or video cameras in the real world.

With a Camera viewport you can adjust the camera as if you were looking through its lens. Camera viewports can be useful for editing geometry as well as setting up a scene for rendering. Multiple cameras can give different views of the same scene.

The Camera Correction modifier lets you correct a camera view to 2-point perspective, in which vertical lines remain vertical.

If you want to animate the point of view, you can create a camera and animate its position. For example, you might want to fly over a landscape or walk through a building. You can animate other camera parameters as well. For example, you can animate the camera's field of view to give the effect of zooming in on a scene.

The Display panel's Hide By Category rollout has a toggle that lets you turn the display of camera objects on and off.

A convenient way to control the display of camera objects is to create them on a separate layer. You can hide them quickly by turning off the layer.
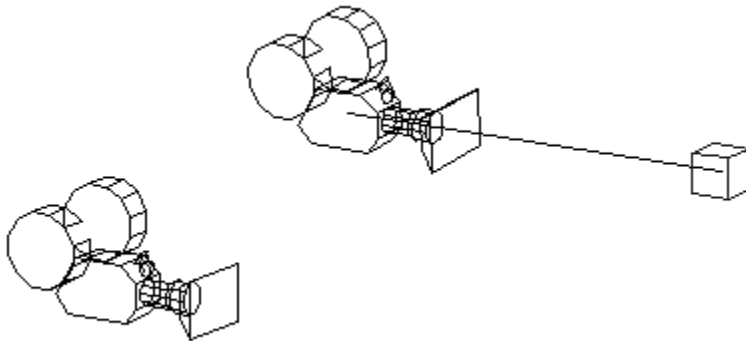
There are two kinds of camera objects:

- A Target camera views the area around a target object. When you create a target camera, you see a two-part icon representing the camera and its target (a white box). The camera and the camera target can be animated independently, so target cameras are easier to use when the camera does not move along a path.

- A Free camera views the area in the direction the camera is aimed. When you create a free camera, you see a single icon representing the camera and its field of view. The camera icon appears the same as a target camera icon, but there is no separate target icon to animate. Free cameras are easier to use when the camera's position is animated along a path.
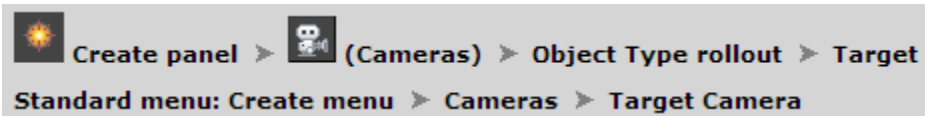
Camera Object Icons

Camera objects are visible in viewports unless you choose not to display them. However, the geometry that appears in the viewport is only an icon meant to show you where the camera is located and how it is oriented.

Target cameras create a double icon, representing the camera (a blue box intersecting a blue triangle) and the camera target (a blue box). Free cameras create a single icon, representing the camera and its field of view.

A free camera has no target. A target camera has a target sub-object.

Target Camera:

Create panel ➤ (Cameras) ➤ Object Type rollout ➤ Target
Standard menu: Create menu ➤ Cameras ➤ Target Camera

A target camera "views" the area around the target icon that you place when you create the camera. A target camera is easier to aim than a free camera because you simply position the target object at the center of interest.

You can animate both the target camera and its target to create interesting effects. To animate both the target and camera along a path, it is best to link them both to a dummy object, then animate the dummy.
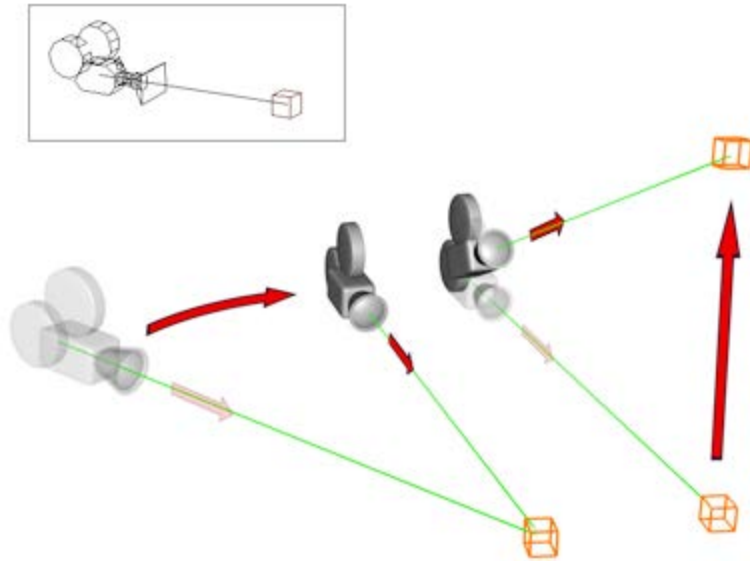
Target cameras always face their target.

Procedure for Target Camera:

To create a target camera:

1. Do one of the following:

    -   On the [icon] Create panel, click [icon] (Cameras), then on the Object Type rollout, turn on Target.

   -   Choose Create menu ➤ Cameras ➤ Target Camera.

2. Drag in a viewport. The initial point of the drag is the location of the camera, and the point where you release the mouse is the location of the target.

    The camera is now part of the scene. It is aimed at the target, which is a separate object.

3. Set the creation parameters.

Free Camera:
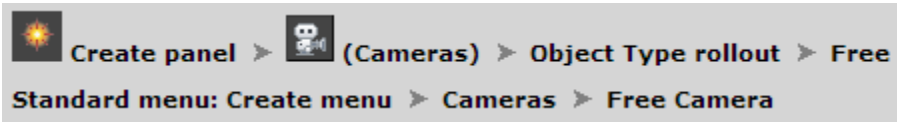
Free cameras view the area in the direction where the camera is aimed. Unlike target cameras, which have two independent icons for the target and the camera, free cameras are represented by a single icon, making them easier to animate. Free cameras can be used when the camera's position is animated along a trajectory, as in a walkthrough of a building or when the camera is attached to a moving vehicle. The free camera can bank as it travels along the path. If the camera needs to be directly overhead in a scene, use a free camera to prevent it from spinning.
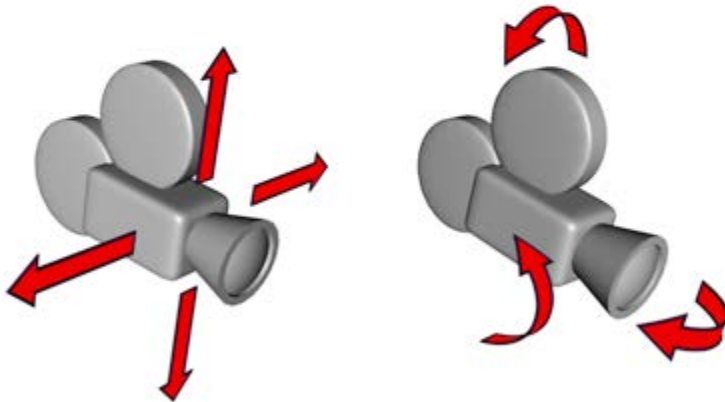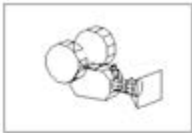
A free camera can move and be oriented without restrictions.

Initial Direction of a Free Camera:

A free camera's initial direction is along the negative Z axis of the active construction grid of the viewport you click.

In other words, if you click in an orthographic viewport, the initial camera direction is directly away from you. Clicking the Top viewport aims the camera downward, clicking the Front viewport aims the camera at the scene from the front, and so on.

Clicking in a Perspective, User, Light, or Camera viewport aims the free camera downward, along the negative Z axis of the World Coordinate System.

Because the camera is created on the active construction plane, where you also create geometry, you might have to move the camera before you can see objects in its Camera viewport. Check the camera's position from several viewports to correct.

Procedure for Free Camera:

To create a free camera:

1. Do one of the following:

    -   Choose Create menu ➤ Cameras ➤ Free Camera.

    -   On the Create panel, click (Cameras), then on the Object Type rollout, turn on Free.

2. Click the viewport location where you want the camera to be.

    The kind of viewport you click determines the free camera's initial direction: the initial direction is along the negative Z axis of the active construction grid of the viewport you click.

    The camera is now part of the scene.

3. Set the creation parameters.

4.   Rotate and move the camera to adjust the point of view.

Camera Viewport Control:

Click or right-click the Point-Of-View (POV) viewport label. ➤ POV viewport label menu ➤ Cameras ➤ Cameras submenu ➤ Choose a camera.

Keyboard ➤ C

A Camera viewport shows the view from a camera, looking in the direction the camera is aimed.

Dolly Camera, Target, or Both:

Activate a Camera viewport. ➤ Viewport navigation controls ➤ (Dolly Camera) or (Dolly Target) or (Dolly Camera + Target)

The buttons on this flyout replace the Zoom button when a Camera viewport is active. Use them to move the camera and/or its target along the camera's main axis, toward or away from what the camera is pointing at.
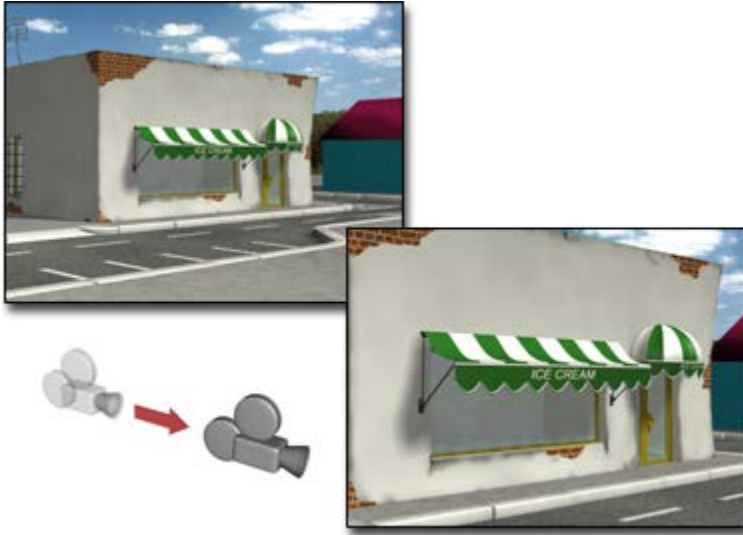
Dollying a camera

A free camera moves along its depth axis in the direction its lens is pointing. Unlike a target camera, its target distance remains fixed, no matter how far you dolly.

To dolly a camera:

1. Activate a Camera viewport.

2. Click (Dolly Camera) or one of the other buttons on the same flyout.

3. Drag to move the camera.

    *   Drag up to move the camera forward along its line of sight.

    *   Drag down to move the camera backward along its line of sight.

4. Press Esc or right-click to turn off the button.

Interface:

 The Dolly Camera flyout consists of the following individual buttons:

Dolly Camera

Moves only the camera to and from its target. If you go past the target, the camera flips 180 degrees and moves away from its target.

Dolly Target

Moves only the target to and from the camera. You see no visual change in the camera viewport, unless you dolly the target to where it passes through the camera to the other side, at which point the camera view is reversed. However, changing the relative position of the target to the camera affects other adjustments, such as Orbit Camera, which uses the target as its rotational pivot.

This option is available only if the viewport's camera is a target camera.

Dolly Camera + Target

Moves both the target and the camera to and from the camera.

This option is available only if the viewport's camera is a target camera.

Perspective:

Activate a Camera viewport. ➤ Viewport navigation controls ➤ (Perspective)

Perspective performs a combination of FOV and Dolly for target cameras and free cameras. It increases the amount of perspective flare, while maintaining the composition of the scene.
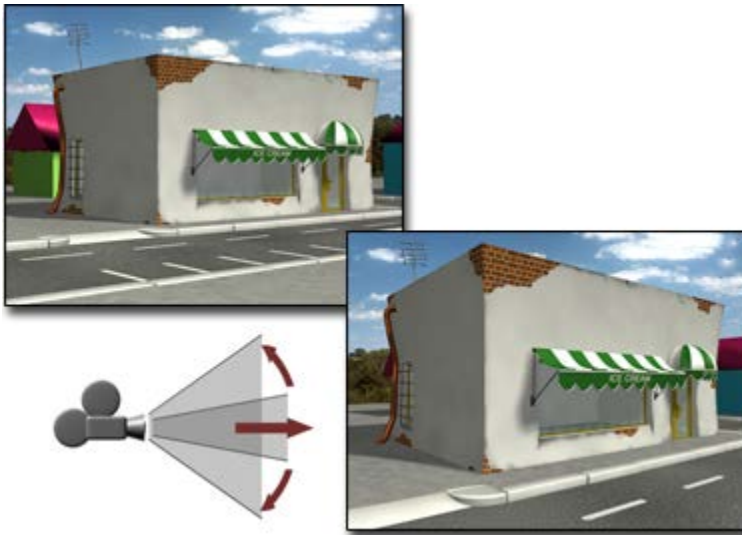
Adjusting perspective

A target camera can pass through its target object while you are using Perspective. When this happens, the FOV reaches its maximum angle of 180 degrees at the target location and cursor motion is reversed until you release the drag.

A free camera continues moving along an infinite path but uses an implied target position to control the FOV change rate. This implied target is defined as a point specified by the Target Distance field in the Parameters rollout for the free camera.

To change perspective for a camera:

1. Activate a Camera viewport.

2. Click [icon] (Perspective).

    The button highlights when it is on.

3. Drag to change FOV and dolly simultaneously.

    -   Drag up to move the camera closer to its target, widen the FOV, and increase perspective flare.

    -   Drag down to move the camera away from its target, narrow the FOV, and decrease perspective flare.

4. Press Esc or right-click to turn off the button.

Roll Camera:

Activate a Camera viewport. ➢ Viewport navigation controls ➢ (Roll Camera)

Roll Camera rotates a target camera about its line of sight, and rotates a free camera about its local Z axis.
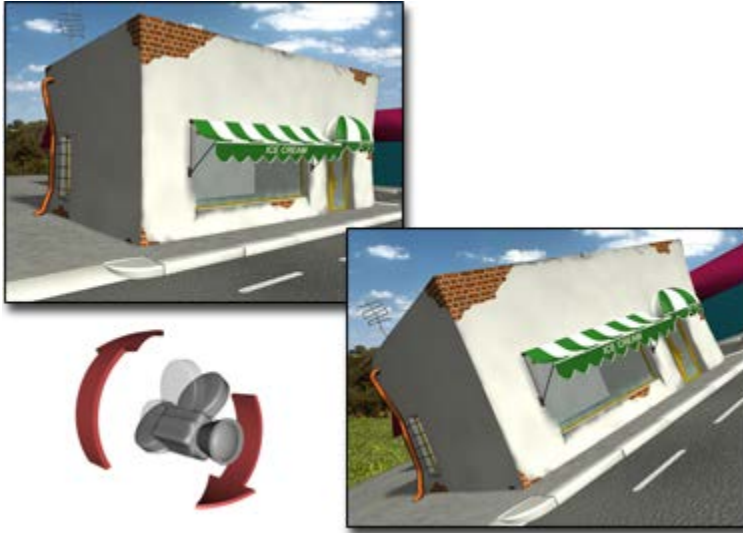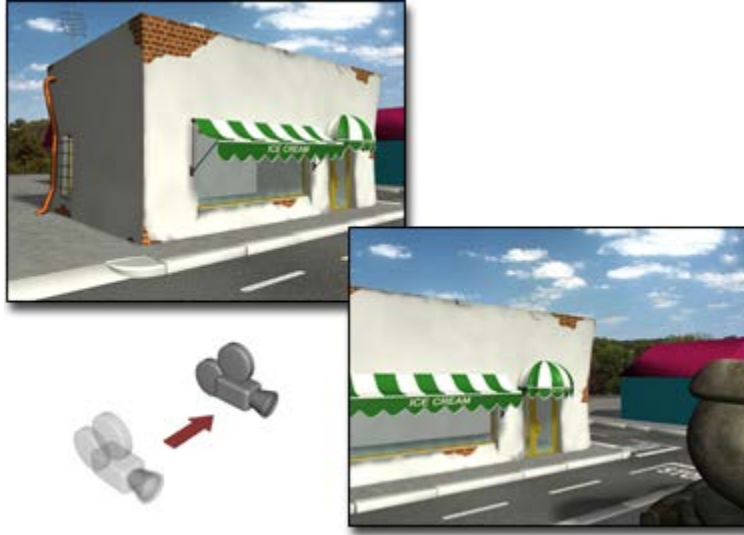

Rolling a camera

To roll a camera:

1. Activate a Camera viewport.

2. Click (Roll Camera).

    The button highlights when it is on.

3. Drag horizontally to roll the view.

4. Press Esc or right-click to turn off the button.

Truck Camera:

Activate a Camera viewport. ➤ Viewport navigation controls ➤ 🖐 (Truck Camera)

Truck Camera moves the camera parallel to the view plane.

Trucking a camera

For a target camera, dragging the mouse moves both the camera and its target parallel to the Camera view.

This button replaces the Pan button when a Camera viewport is active.

To truck a camera:

1. Activate a Camera viewport.

2. Click 🖐 (Truck Camera).

    The button highlights when it is on.

3. Drag to move the camera and its target.

    The camera and its target move parallel to the view plane, which is perpendicular to the camera's line of sight.

4. Press Esc or right-click to turn off the button.

To truck with the middle mouse button:

*   Hold down the middle mouse button and drag.

To constrain trucking to a single axis:

- Hold down the Shift key.

  The truck is constrained to the first axis you move while the Shift key is down.
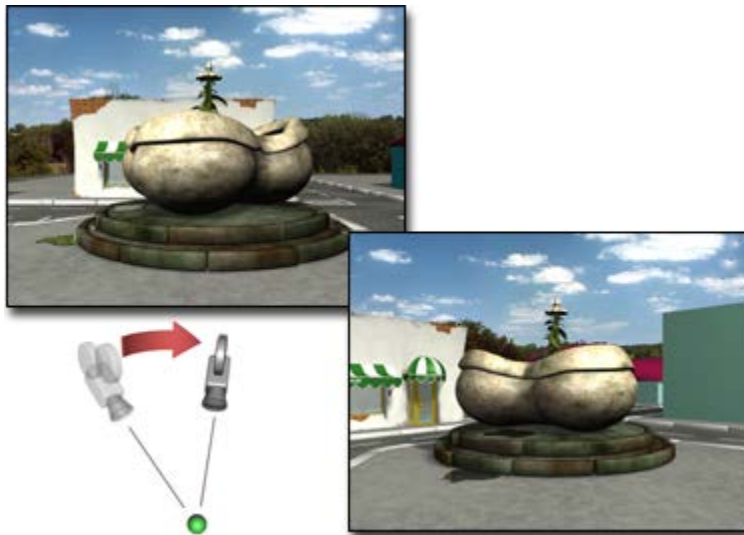
To accelerate trucking:
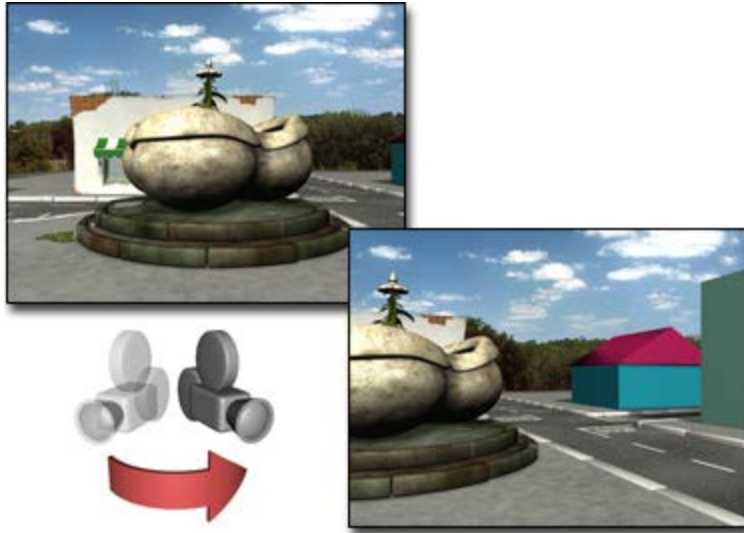
- Hold down the Ctrl key.

Orbit/Pan Camera:

Orbit Camera rotates a camera about the target. Pan Camera rotates the target about the camera.

Orbiting a camera

Panning a camera

You can constrain the rotation to a single axis by first pressing Shift before beginning the rotation. The rotation is constrained to the axis you begin rotating about.

To accelerate panning, hold down the Ctrl key before you pan

To pan a camera:

1. Activate a Camera viewport.

2. Click (Pan Camera).

    The button highlights when it is on.

3. Drag to rotate the view about the camera.

    -   Dragging rotates the view freely using the world X and Y axes.

    -   Press Shift and drag horizontally to lock view rotation about the world Y axis. This produces a horizontal pan.

    -   Press Shift and drag vertically to lock rotation about the world X axis. This produces a vertical pan.

4. Press Esc or right-click to turn off the button.

To orbit a camera:

1.   Activate a Camera viewport.

2.   Click (Orbit Camera).

3.   Drag to rotate the view around the target.

- Dragging rotates the view freely using the world X and Y axes.

- Press Shift and drag horizontally to lock view rotation about the world Y axis. This produces a horizontal orbit.

- Press Shift and drag vertically to lock rotation about the world X axis. This produces a vertical orbit.

4.   Press Esc or right-click to turn off the button.

Interface:

 Orbit Camera

Rotates a target camera about its target. Free cameras use the invisible target, set to the target distance specified in the camera Parameters rollout.

 Pan Camera

Rotates the target about a target camera. For a free camera, rotates the camera about its local axes.