V-RAY for Rhino

Basics, Lighting, Rendering

Key Elements in the Default Settings

There are three main elements specific to VRay that are creating some of the aspects of the default render. These elements are Indirect Illumination, the V-Ray Sun and Sky, and the V-Ray Physical Camera. These elements will be explained very briefly here, and you can reference the specific chapters in the online pdf for a detailed explanation of these elements.

Indirect Illumination is simply light that does not come directly a light source. In V-Ray this typically references two types of light; Global Illumination and Bounced light. Global Illumination is simply a dome of light that is emitted around the scene, and this can make setting up lighting very quick and easy. Bounced light is simply the light energy that is bounced from a surface. This bounced light is what allows V-Ray to create high quality renderings.

The V-Ray Sun and Sky is physically accurate lighting model allowing for easy recreation of the affects of the Sun and Sky. This is an excellent tool for setting up exterior renderings with a sun. Due to the nature of the model in which the sun and sky are based off of, you will find that under standard conditions the sun and sky will be extremely bright. Because of this the V-Ray Physical Camera is used to expose the scene and brings the rendered image to a desirable level.

The V-Ray Physical Camera is modeled after a real-world camera and can be used to expose a scene. In the real world, lighting is different in many situations, and because of this a photographer will use the capabilities of the camera to properly expose the image. Proper exposure means that the image is not overly bright or too dark. When creating renderings this gives us the opportunity to set our lighting as it would be in the real world (in this case it is the Sun and Sky) and adjust our camera settings until we achieve the desired result.

Render Options to be Familiar With…

Go to the options menu of vRay and explore these options.

Global Switches

Uncheck Hidden Lights and Default Lights under the Lighting section. Hidden Lights means hiding the lights from the scene. It is used when the users don't want to see any light while modeling in the scene. When uncheck the Hidden Lights box, those hidden lights will not affect the V-Ray render. To prevent these hidden lights affect the final render output, uncheck the Hidden Lights first.
Default Lights means V-Ray built-in lights. Users can not see nor edit these lights from the scene. If one uncheck the Default Lights and does not check the GI below, the render will turn out totally black. Check the Low thread affect other program while rendering with V-Ray.

Indirect Illumination

Check "On" under Indirect Illumination on, also called Global Illumination.

Environment

Check the boxes before GI and Background. Adjust those three items then select the blue render icon on the top. You will get the image with Global Illumination. Compare to the image without the dark shadow because the objects get light from all around.

The image is in blue tone is because the default environment color of V-Ray is set in light blue of R-204, G224, B225. Check the box under GI to enter the color selections. Change the Sat from 51to 5. The color is changed to light blue of R250, G252, B255, which is very close to white. Click OK to exist then click on the blue render icon to color the image. The image color becomes very close to white like the image on the right.

Sun and Sky

The V-Ray Sun and Sky are based off of research to accurately depict the sun and sky, which allows for easy recreation of the Sun and Sky. They are intended to work together as well as react to the angle and direction of the sun.

Type in "sunlight" into the command line and bring up the Sun Angle Calculator. This will allow you to input time, day, and location. Once you've set your desired parameters, click Okay and it will ask for an insertion point. Any place is fine for the sun, so don't worry too much about where you put it. With the light selected open up the light properties and you will see all of the parameters for the V-Ray sun.

In order to properly use the sun, it is a necessity that it be used in conjunction with the Physical Camera. The Sun itself is extremely bright, and in order to maintain the characteristics of the model, the sun must be kept close to its correct intensity. To counteract the intense brightness of the sun it is important to create a proper exposure of a scene with the physical camera.

You can access the properties of the sun by selecting it then selecting Light under object properties. There you will find many different controls which change the appearance.

Lights

Rectangular Light plays a very important role in V-Ray. Despite its ease of use, it also gets a smoother final result. Unlike the Spot Light, Rectangular Light doesn't have the worry about the angle of the light. It also allows reflective material to bounce the light around the scene. Other type of lights will not be seen in a reflective object. Below are some important characters about Rectangular Light.

Applying a Rectangular Light:
Right click and hold on the Spot Light icon from toolbar above . A secondary toolbar will pop out, select the fourth one from the left (Create Rectangular Light). From Top view, follow the steps below to create Rectangular Light in the scene:
- Start from bottom left and make your second left click to the bottom right of the scene.
- To complete creating the light, make your third left click on the top left of the scene, approximately the same distance as between first and second spots.
- Select this Rectangular light you just created.
- Go to the Front view. Left click and hold right on top of the light and drag it to the top, approximately 5X of the height of the cup.
- Render it and you will get a very bright image like the one below. That's because the V-Ray's default setting of the Rectangular Light is set to No Decay.
- Select the Rectangular Light. Under the Properties, click on Object and select Light.
- Uncheck the No Decay. This will make the distance between the light and objects being considered while rendering. That means the object further away from the light will get less light and become darker.

To make the object brighter, you can either increase the intensity of the light or move the light closer to the object.

Shadow changes according to the size.
Larger Rectangular Light spreads out to a larger area, so the shadow is not as clear as you will get from a smaller Rectangular Light.

Materials
Two ways to assign materials in V-Ray
    1.   Press Ctrl+A to select all the objects in the scene then click the Object under the Properties window to select material. The objects are assigned materials by layers now. Please click Plug-in, there will show three tabs of Browse, Edit and Create below.
    2.   Now the objects are applied with materials, so the Edit button is selectable. You can click on the Edit button to open the Material Editor to apply the materials.

Diffuse Layer Color: used to apply color on material. The "m" box on the right is used to apply pat tern and arrange sequence.

Transparency: used to adjust the color transparency. Black is comp l e t e l y o p a q u e a n d w h i t e i s completely transparent.

How to add new material:
1 Right click on Scene Material, select Add new material, Add VRay Mtl .
2 Right click on Scene Material, select Import new material to import a s a v e d m a t e r i a l f i l e.
3 In the Properties window, click on Create button to add a new material .

Adjusting the Camera
Rotate the Camera
Click and hold on both **Alt** and **Shift,** then right click on the mouse to rotate the camera. This will make the image more dynamic.

Adjusting the lens
Right click on the Perspective window title and select the Viewport Properties from below. You can input desire lens length here. Smaller number for wide angle lens and larger number for telescope lens.

Quick Steps to Render

This set of rendering techniques are to b done with a file that does not really have any material distinctions AND does include lights.

Step 1. First render
1.1. Open the scene.
1.2. Assign VRay as the current renderer. (Render/Set Current Renderer/V-Ray for Rhino)
1.3. Check the Override mtl option in the Global switches rollout, click the button next to it and select a default VRayMtl material.
1.4. Set the Image sampler type to Fixed.
1.5. Set the resolution of the image to whatever is necessary.
1.6. Render to test.

Step 2. GI preview
2.1. Turn GI on from the Indirect illumination rollout.
2.2. Select Light cache as both the primary and secondary GI engine.
2.3. In the Light cache rollout, set the Subdivs to 500, since we want only a fast preview. We'll return this to 1000 for the final rendering.
2.4. Set the Interp. samples of the light map to 5 for a faster rendering.
2.4. Render.
(The result is quite noisy, but it does give a good idea of what the scene lighting is like.)

Step 3: Tweaks
3.1. The scene looks too dark, so we're going to brighten it a bit. There are several ways to do this. One is to increase the power of the lights. However, this will make the directly lit areas of the image, like any patch of sunlight, too bright while indirectly lit regions will remain relatively dark.
Instead of increasing light power, you can simply make the material brighter.
3.2. Go to the Material Editor and put the default VRayMtl in one of the slots (it shows up as being used in the "Environment" in the Material/Maps browser).
3.3. Make the diffuse color of the material RGB (200,200,200).
3.4. Render

Step 4. Better GI.
The GI settings that we used are good mostly for fast previews, while you are still adjusting the scene.
Once you have settled on the parameters of the lights, refine the GI solution.
4.1. Set the primary GI engine to Irradiance map.
4.2. Select a Medium preset for the irradiance map.
4.3. Render the scene.