Using Color, Mist and Images

Blender Internal Render Engine

You’ve created a nice scene for your lighthouse, but we’re missing a really nice background. Depending on which release of Blender you’re running, you will either have a black, gray or blue background. Most newer releases start with a blue or gray background (a basic world set-up). Blender gives you some basic options in the World settings. You can control the colors of the top and bottom (Zenith and Horizon), fog or mist, clouds and, of course, loading JPEG images. In order to create a new world, select the World button. If a world has not already been placed in your scene, click the “New”. This will give you a basic world with a horizon and a zenith color. Press the “F12” button to render your scene. You have some basic options that you can set in the world buttons. Here’s what you see:

- **Preview Window:** Sample of your world settings
- **Mapping Options:** You can flatten (Paper), Blend (Horizon/Zenith colors), or Real Sky (gives true horizon)
- **Color Settings:** Horizon (bottom), Zenith (top), and Ambient (reflected light). Ambient supplies global illumination.
- **Ambient Occlusion:** Another way to simulate ambient lighting.
- **Environmental Lighting:** Global lighting settings.
- **Indirect Lighting:** Used to simulate light bouncing off objects. More accurate lighting effects.
- **Gather:** Raytrace or Approximate. Approx. will allow for indirect lighting effects. (discussed in the lighting chapter)
- **Mist:** 3D fog settings.

**Mist Settings:**

When setting just a straight gradient color for your world, Select the “Blend” option above the color swatches and set the Horizon and Zenith colors.

When using Mist, You will need to set both the Zenith and Horizon colors to the color of the mist you desire (middle gray for a real fog), turn on the Mist button, then adjust the **Start** (start from camera distance) and **Depth** (depth of mist). You also have a **Height** setting to vary fog height (like fog at the ground level). The **Minimum Intensity** slide can adjust intensity. Depth and Intensity work together for the best effects.

I can’t see through my fog! Your Depth setting is too low or Min. Intensity set too high–the fog is too thick!
Chapter 6- Setting Up a World

Creating a 3D Cloud Backgrounds:

There are several ways to create clouds, but the easiest is to use a texture in the world settings. To set up a scene with clouds, create a world as described previously. Set the Zenith color to blue and the Horizon to a white color (check the Blend option). Now, go to the texture buttons and create a new texture using “Clouds” (you will notice that the texture will be linking to the world and not a material). Go down to the Mapping panel and adjust the Size X and Y sliders (try a low X and a higher Y) to get the effects that you want. Press F12 to check your results. If you plan on moving the camera in your scene, you may want to hit the “Real” button in the World panel. Try a different Noise Basis like Voronoi F1 or F2 for a puffer look. Clouds can also be animated which will be discussed in a later chapter.

Using Cloud Textures With World Mist Settings:

If you want to simulate a puffy fog, use the cloud back-ground settings as mentioned above, but adjust your colors to match the foggy environment you want. Back in the World properties, turn on mist and adjust the settings to get the density for your scene. As mentioned earlier, we will discuss how to animated cloud settings in a later chapter to obtain a flowing effect.
Creating a Star Field:

Blender once had a stars world settings panel, like mist, but decided to remove the feature for some reason. This was a great tool and a way to set up a 3D star field quickly. Here is a simple alternative to that setting.

To begin, go to the Textures panel, making sure to check the world button so the texture you create is tied to the world settings. Choose Stucci for the texture type. Also, adjust the following:

Enable Ramp in the Colors panel. We will be making some adjustments here shortly.

Under the Stucci panel, change from Plastic to Wall In and set the size to .001.

Under the Influence panel, uncheck Blend and check Horizon.

If you press F12 at this point, you should have a heavily spotted background scene. To fix this, go back to the color ramp and pull the left slider to the right on the ramp until the preview displays the star field you want.

Go back to the World settings, check both the “Blend Sky” and “Real Sky” buttons. Adjust the Horizon and Zenith colors to match the output you want. Press F12 to render your results.
Chapter 6- Setting Up a World

Using an Image in the Background:

If you plan to use an image in your world settings, use one that is large and high quality. Low resolution images have a tendency to be grainy and unrealistic. To use an image, create a world as described before, then go to the Texture settings. This time, select the “Image or Movie” type option and select your image (described in the Materials and Textures chapter). If you press the Both button in the Preview window, you will notice the image does not display (same as pressing F12).

In order to display the image, go to the Influence panel. You will notice that Blend is already checked, but you will need to check the Horizon, Zenith Up and Zenith Down button. This will cause the image to influence both the horizon and zenith world settings, taking the place of the colors. If you press F12, you will see the image in the rendered view, but it will be zoomed in.

To see the entire image in rendered view, go back to the world settings and check the Paper button to flatten and fit the image.

RoboDude Asks: How do use an image that moves when I move the camera?
If you want to animate movement in your scene and want the background to move as you move the camera, these world settings won’t work for you. You will need to find a panoramic image that you can wrap around a sphere or cylinder and scale it larger than your scene. You can also use a large plane, like standing in front of a billboard.
Cycles World Settings

Just like using material settings, setting up a world in Cycles is very different than setting up a world in the internal renderer.

After selecting Cycles from the drop down renderer menu, go to the World buttons. To set just a basic color, you can do that without having to use nodes.

Setting Up a Simple Sky:

To set up a simple sky with horizon and zenith, enable Nodes. The surface shader will automatically be set to Background since you are in the world settings. By pressing the small dot button in Color, you can change it to use a Sky Texture.

Some of the setting options include changing the type, sun direction, and intensity through Turbidity, Ground Albedo, and Strength.
Chapter 1- The Blender Interface

Mist in Cycles:
Like many things in Cycles, setting up a mist can be more difficult than in the classic render engine, but can give you more realistic results. There are many ways to create a mist, but here is one of the more simple ways.

First, set the render engine to Cycles in the top menu bar, then go into the Render Layers properties settings. Check "Mist" under the Passes panel. This will enable the mist settings in the World properties.

Now go to the World property setting, use nodes to set a Background surface and using a Sky Texture for the color.

The Mist Pass can be set with a Start and Depth to match how close you wish the mist to start from the camera and how deep it projects into your scene.

Press F12 to render an image. Now that we have a basic setup, it’s time to move over to the Node Window and add the following:

RoboDude Says:
The Mist options won’t be visible unless you enable Mist in the Pass panel in the Render Layers properties.

Add a Viewer node from the Add-Output node menu. Connect to the Render Layers panel to render a backdrop image.

Switch to Composting nodes.
Check Use Nodes, Backdrop, and Auto Render.
Temporarily connect the Mist output of the Render Layers panel to the Viewer’s Image port. This will allow you to focus on the mist’s settings for the next several steps. The darker an object is in this view, the less it is effected by the mist.

Now it’s time to add two more nodes—A Mix node from the Color menu and a Map Value node from Vector menu. Connect the Mist to the Map Value input with the Map Value output connected to the Factor Mix input. Connect the Render Layers Image output to the Mix Image input. The Mix Image output connects to both the Composite renderer and the Viewer output. You can now adjust the color of the mist using the color swatch in the Mix node. You can also adjust the density of the fog using the offset and size settings in the Map Value node. You can also experiment by checking and adjusting the Use Minimum and Maximum settings.

An internet search will turn up a dozen more ways to set up a mist, but this will give you a good, basic result.
Chapter 6 - Setting Up a World

Using a Background Image in Cycles:

Background images can work much better in Cycles than in the internal render engine. When using the Rendered view port display in your 3D window, you can view the background through the camera and watch it move as you move the camera.

In the World properties panel, add a world, set the surface to Background, color to Image Texture and select an image to use. Panoramic images can work best. For vector, set to Generated. This will give you an initial setup that should display when rendered with F12 or in the view port set to rendered shading. In order to make adjustments, switch over to the Node Editor window. Add the following nodes and adjustments shown below:

1. In the Texture Coordinates node, set to Camera, Window, or Object and set the object to Camera.
2. Add a Mapping node from the Vector node group. Adjust the Location, Rotation, and Scale for a desired look.
3. Adjust the Image Texture node (typically set flat) settings.
4. Set Shader Nodes to World.
Stars in Cycles:

Like everything else in Cycles, there are easier and more difficult ways to create stars. Here is a relatively simple way to create stars. Start by making sure you are in the Cycles renderer and add a world using nodes. Switch to the Node Editor window to add and set the following nodes:

**Noise Texture** (from Texture nodes)- Basic setting:
- Scale: 300-500
- Detail: 5-15
- Distortion: 0.05

**Color Ramp** (from Converter nodes)- Controls the size and number of stars. Set the ends of the ramp like shown.

**Bright/Contrast** (from Color nodes)- Can be used to fine adjust results. Keep changes small.

**MixRGB** (from Color nodes)- Colors 1 & 2 represent the sky and star colors. Connect to Factor.

**Background** (from Shader nodes)- Process for the world output.

Continue making adjustments until you get the results you desire. Pressing F12 will probably give you better results than the view port rendering.

As people keep coming up with new and unique ways to use nodes, Blender Cycles will continue to evolve with new features. The Blender forums and YouTube are great resources for finding new applications and new node combinations.
Chapter 1- The Blender Interface

It is now time to add a world to your lighthouse scene. Start by opening up your “Lighthouse/Landscape” scene for the internal renderer. We will add a world using the traditional render engine for this activity. Feel free to experiment with any of the settings, but we are actually looking for a “dark and stormy night”, say, at late day or dusk. I imagining it being foggy, with a billowing effect.

Since we want a fog, set the Horizon and Zenith colors to 2 slightly different shades of gray. To do this, you can click on the color swatch and pick the gray from the menu blocks. Press the “Blend” button as well if not already set.

Turn on the Mist button and start with a Depth setting of about 23; Intensity at 0; Start at 0; and Height at 0. Render the image and make adjustments as needed. Your goal is to be able to see the lighthouse, but be a bit foggy.

You should try for something like the render below:
This foggy scene looks good, but it would be nice to see some depth. Many times, a fog can appear “billowy” with varying density. For this, we will add a Cloud Texture. Go to the Texture buttons and add a Cloud texture. Make sure World is selected by the preview. Try different Noise Basis settings to get the look you want.

At this point, go back to the World buttons, render an image and make adjustments as needed. You can adjust the sizes of the cloud texture, adjust the colors, work with the mist settings (Depth and Intensity). You may also want to go back to the texture settings and adjust the Noise Basis. We will animate this fog rolling by in a later chapter.

The settings used for the render below are:

- Texture Settings:
  - Basis: Voronoi F1 - Size 0.05
  - Mist Settings:
    - Intensity 0.100; Depth 23.00

**Call the instructor when finished**
Remember the sculpture you made in unit 3? It is now time to add an environment to that scene to make your sculpture look like it is standing in a prominent place in nature using Cycles. Experiment with the various Cycles world settings to get a scene you like.

Remember to switch to the Cycles renderer at the top of the screen, create a Cycles emission lamp, and set the camera in a desirable location. Determine if you plan to use an image, like the example displayed below. Add some materials to your sculpture as discussed in the materials chapter. Feel free to explore the internet for other material and world settings that others have tried.

** Call the instructor when finished**

Chapter 6 Reflection and Wrap-up:

Creating a World

You have experimented with the internal renderer and Cycles to create environments for your scenes. Answer the following questions:

1. How has your view of 3D animated movies changed now that you have a basic understanding of 3D modeling, texturing, and world settings? Specifically, what has changed your perception of these movies? Explain.

2. Conduct some internet research. We have examined basic sky scenes in this unit, but how would you create an underwater scene? How about a space scene with planets or a sunset? Explore the internet to find information about one of these and report your findings. How difficult are these scenes to create?