

## Lighting in Rendering

Of all the factors that affect the quality of finished renderings, lighting is the most important. This article will help you understand the available lighting options and how to use them to your advantage when rendering to maximize the impact of a presentation drawing.

### Lighting Factors

Light comes from a number of different sources. The following factors affect the amount of light in a scene:

**Light Fixtures.** Consider the number of light fixtures in the room, and the way in which the fixtures cast light. You can turn a light off if needed, or change its light bulb.

**Light Sources.** Each light fixture has a light source (a bulb) with a specific wattage, intensity and color. You can change a light fixture's bulb and customize light sources to suit your needs.

**Time of Day.** Your global location and time of day determine how much daylight is in a scene. If the time of day is set to a time when the sun is below the horizon, there will be less daylight in the scene.

**Rendering Options.** Certain rendering options control the amount of light in a scene. These include *Quality Level*, *Number of Steps*, *Image Brightness*, *Enable Daylight*, and *Sky Conditions*.

### Examples

Below are three renderings of the same room. Compare them to see the effects of different lighting options.



### Light Fixtures

Light fixtures are easy to insert — just point and click. In our office example above we have inserted a desk lamp and an overhead light.

**To insert a light fixture in your plan:**

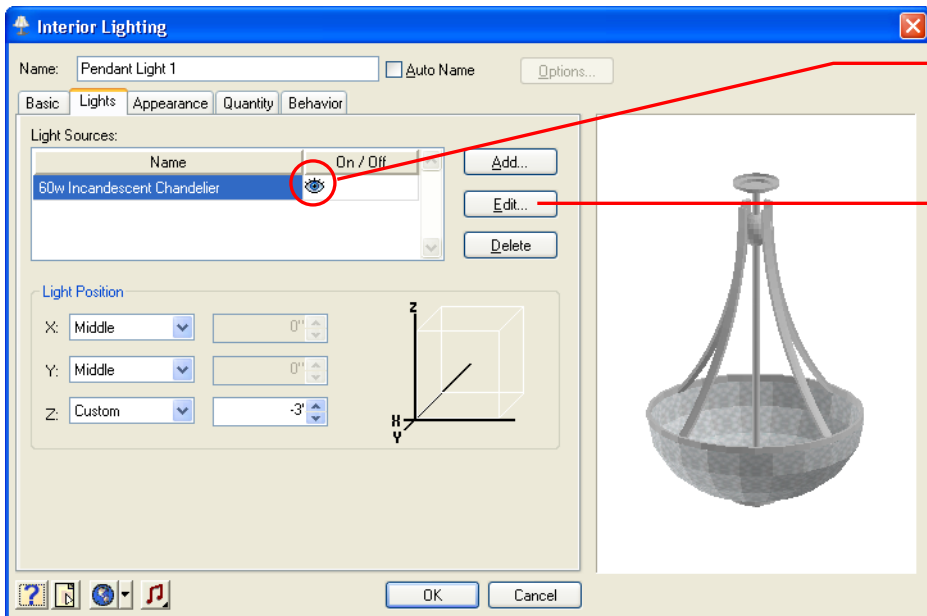
1. Select **Insert > Interiors > Interior Lighting**.
2. In the catalog, select the light that you want to insert.
3. Click to insert the light fixture where you want it in your drawing.
4. Right-click and select **Finish**.

## Light Sources (Bulbs)

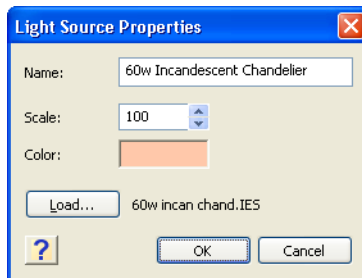
Every light fixture has a light source (bulb) with a specific wattage, intensity and color. You can change a fixture's light source, or customize light sources to suit your needs.

### To edit a fixture's light source:

1. Click on a light that you have inserted.
2. Right-click and select **Properties**.
3. In the **Lighting** dialog, select the **Lights** tab. The Lights page displays the light sources (i.e. light bulbs) associated with the fixture.



4. To turn the light on or off, click the eye icon next to the light source.
5. To select a different light source or edit the light source, click **Edit**.
6. In the **Light Sources** dialog you can choose the type of bulb you want to use. To edit a bulb's properties, right-click it in the list and select **Edit Light**.



7. To change the intensity of the bulb, edit the percentage value in the **Scale** edit box.
8. To change the color of the bulb, click the **Color** swatch and make a selection from the **Color** dialog. You can experiment with the color of lights to change the look of a rendering. A yellow or orange bulb will cast an evening glow in the room. A white bulb will provide a bright daytime light.

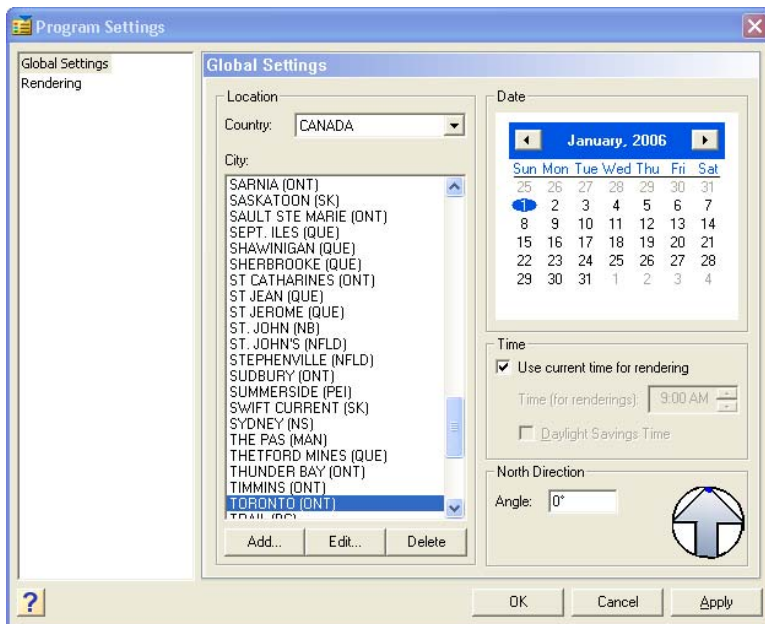
9. In the **Light Sources** dialog you can also import IES files from lighting companies by clicking the **Load** button. IES files hold wattage information for light sources.
10. Click **OK** to retain your changes.

### Time of Day

You can define where your model is located in the world, as well as set the time of day. This determines how much daylight there will be in the scene. For example, there would be more light in the scene at noon than in the evening.

**To define your location and time of day:**

1. Select **Settings > Program Settings**, or click the **Options** button in the **3D Real View** dialog.
2. In the **Program Settings** dialog, select **Global Settings** in the left pane.



3. Select a country and city from the appropriate drop boxes.
4. To set the month and day, select a month by clicking the arrows on the month bar at the top of the calendar, then click a number on the calendar.
5. By default, the time used for renderings is the current time set on your computer, defaulted to the next smallest 5-minute increment of time. For example, 12:04 becomes 12:00. If you want to set a specific time of day for your rendering rather than use the current time, disable the **Use current time for rendering** check box.
6. To set a time of day for your rendering, click on the hour or minute value in the **Time (for renderings)** edit box, then type the desired value for the hour or minute. To switch from AM to PM, select the AM setting and type **p**. To switch from PM to AM, select the PM setting, then type **a**. You can also use the arrow buttons to scroll through numbers and switch between AM and PM.
7. To keep track of changes in time due to daylight savings, enable the **Daylight Savings Time** check box.
8. To set the angle from true north, enter a value in the **Angle from True North** edit box, or simply click and drag the arrow indicator to rotate it.

9. Click **OK**.

### **Rendering Options**

A number of different rendering options are available to help you control the amount of light in a scene. These need to be set prior to rendering.

#### **To set rendering options:**

1. In the **3D Real View** dialog, click the **Options** button. Or, select **Settings > Program Settings** and select **Rendering** in the left column.
2. Below is a description of each rendering option that controls light.

**Quality Level.** You can choose from five levels of rendering quality. A higher quality rendering takes longer to generate because it involves more lighting calculations. Choosing a lower quality will decrease rendering time, but since the lighting calculation is not as involved, the finished image may be darker. Choosing a higher quality level may be worth the wait.

**Number of Steps.** When the program performs radiosity calculations, each "step" in the process represents a bounce of light in the scene. Each quality level has a default number of steps associated with it. If you are rendering at the lowest quality level, for example, the radiosity process will take 200 steps. If the solution converges before the 200 steps have been performed, the solution will stop at the time of convergence. If, however, the solution does not converge before the 200 steps have been performed, the solution will stop at 200 steps and will not be converged. The result may be a rendering that looks too dark because there were not as many bounces of light as there could have been (i.e. the solution was stopped short). Increasing this number may improve the lighting conditions in your rendered image, as well as its overall quality.

**Image Brightness.** The program's "virtual camera" works in a manner similar to actual point-and-shoot cameras. It automatically calculates the correct "exposure" for the lighting situation and produces a view with infinite depth of field (i.e. everything is in focus). However if, in exceptional circumstances, you want to brighten or darken a rendering, you can use the Image Brightness option to manually override the automatic exposure. Brightness can be increased or decreased.

**Enable Daylight.** If disabled, this omits daylight from the lighting calculations, and can speed up rendering. Daylight is included in radiosity calculations, even for indoor scenes (light can come through a window). This setting should always remain on for exterior daytime shots. If your time of day is set to a time when the sun is below the horizon (i.e. it is night time), you must turn daylight off as well.

**Sky Conditions.** This setting helps to control the amount of light being cast onto a scene. Choices are *Clear Sky*, *Partly Cloudy Sky*, and *Overcast Sky*. For example, if your rendered image looks overexposed, you can select a partly cloudy or overcast sky to reduce the amount of light coming through.