

ME 24-688 – Week 7

Project 2 – Materials and Lights

1 Modifying Materials and Introduction to Lights

1.1 Modify Material Properties

ACCESS

Menu: **Appearance | Material Properties** Keyboard Shortcut: **CTRL+M**

Showcase Materials

The material properties that you can possibly modify reside in the categories of:

- Color
- Highlight
- Clear Coat Highlight
- Reflectivity
- Transparency
- Bump
- Decal



ME 24-688 – Week 7

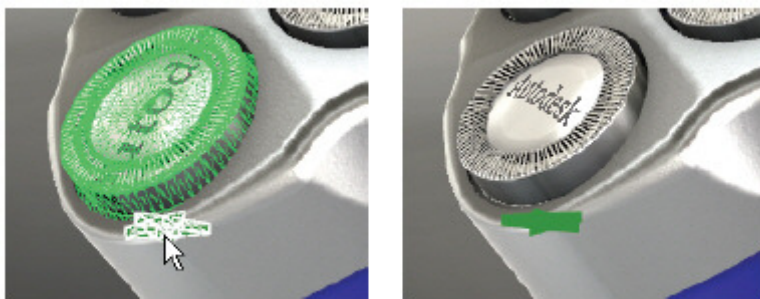
Project 2 – Materials and Lights

1.2 Decals

Modifying a Decal

To modify the properties of a decal material, you must select the decal grip. The decal grip is a star icon that you can toggle on and off. You toggle the display of all decal grips by clicking **Options menu | Show Decal Grips**.

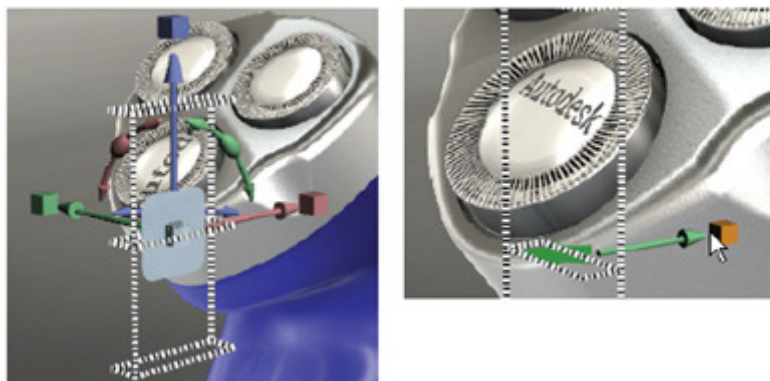
The following illustration shows the decal and decal grip selected and then again after modifying the decal's orientation and scale.



The property categories in the **Material Properties** dialog box for a decal are the same as other materials with the addition of a **Decal** category.

You can reposition and resize a decal by entering absolute values to translate, scale, and rotate the decal or you can dynamically modify it by using the handles. You access the transform handle for a decal differently than you do for model geometry. You can display the transform handle for a decal in two different ways. To access the transform handle for a decal you either select the decal and press **SHIFT+M**, or if the **Material Properties** dialog box is already open, select the decal grip and then in the **Decal** category of the dialog box click **Move Texture**.

In the following illustration, the initial handle for a decal is shown on the left. On the right, the handle is being used to change the scale of the decal in one axis direction.



ME 24-688 – Week 7

Project 2 – Materials and Lights

1.3 Lights

Adding Spot and Point Lights

To achieve the visual appearance of your design that you require, you may need to add more light from spot or point lights. You may need to make an area of the model brighter, add dramatic lighting to the design, or add emphasis to an area of the design. To add the lights and achieve the results you require, you must know how to add spot and point lights to a scene.

In the illustration above, the same scene is shown with and without the added illumination of model geometry from spot and point lights.



ME 24-688 – Week 7

Project 2 – Materials and Lights

Spot and Point Lights

Spot and point lights are added to the scene after you access the **Lights** list. After you display the Lights list, you click Create on the Lights list bar and then click the type of light that you want to add. That type of light is then added to the scene and positioned relative to the current view of the model geometry. The light is represented in the scene with a grip icon for that type of light. The light then lists in the **Lights** list and in the **Organizer**.

The following illustration identifies the different types of light grip icons and the listing of those lights in the **Lights** list and in the **Organizer**.

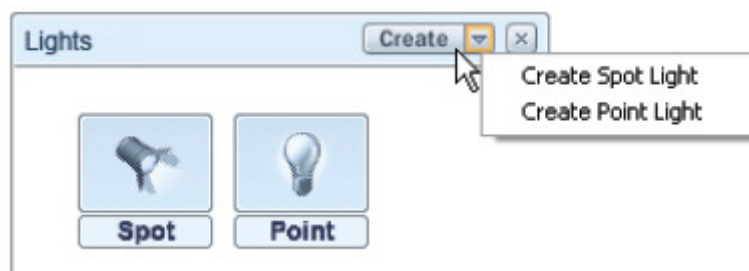


- 1 Grip for the point light.
- 2 Grip for the spot light.
- 3 Lights list with the lights listed.
- 4 Organizer with the lights listed.

ACCESS

Lights Menu: **Scene** | **Lights** Keyboard Shortcut: **L**

You access **Create Spot Light** and **Create Point Light** tools after clicking Create in the Lights list. Lights that you create display in the list with an icon to indicate their light type.



ME 24-688 – Week 7

Project 2 – Materials and Lights

1.4 Project: Modify Materials

In this portion of the project, you modify the properties of a material that is assigned to objects in the scene and adjust the alignment and scale of a decal material.

Instructions

- 1 Open *Shaver - Materials and Lights.zip*

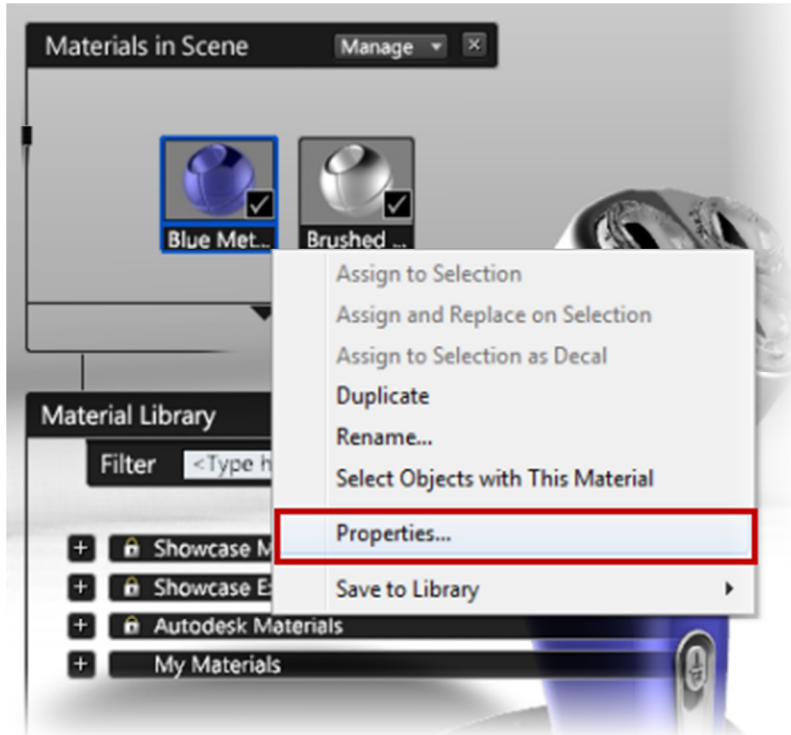


- 2 To display the **Materials** list, press **M**.

ME 24-688 – Week 7

Project 2 – Materials and Lights

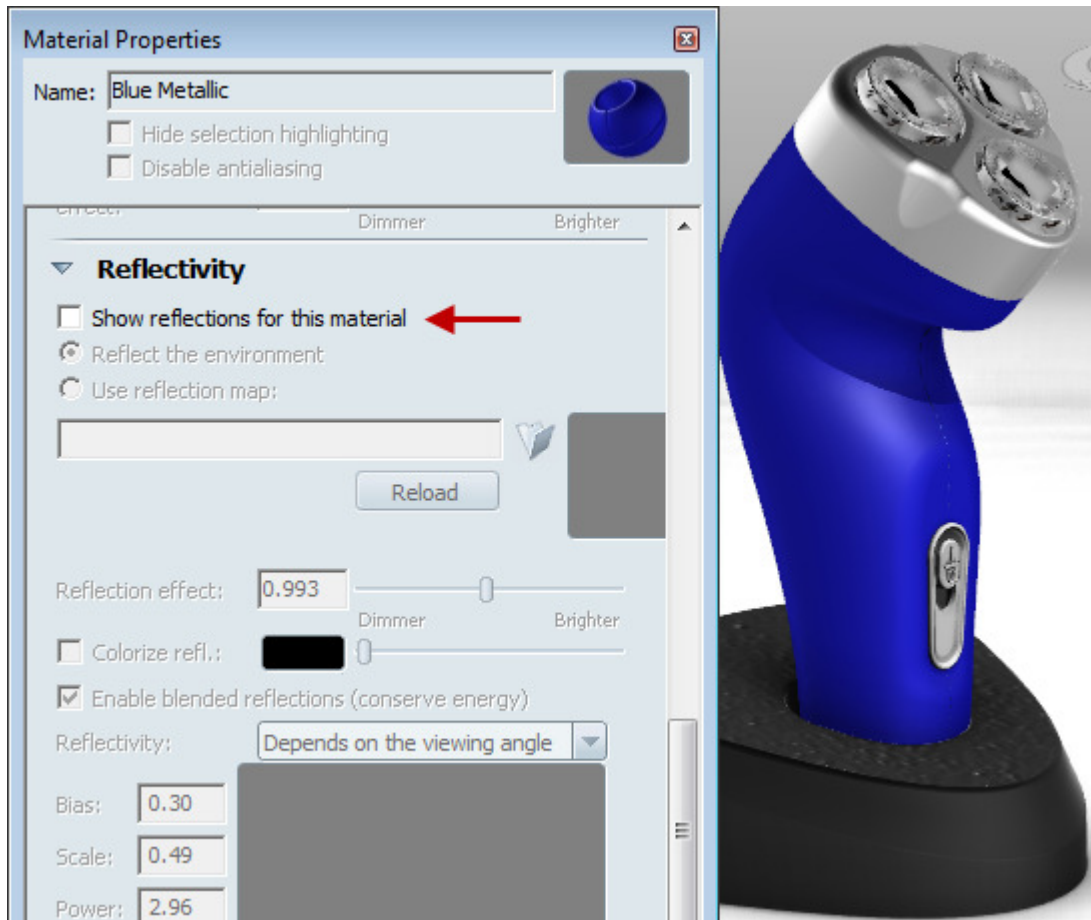
- 3 To begin modifying the color of the blue metallic material in this scene file, in the **Materials In Scene**, RIGHT-CLICK *Blue Metallic*. Click **Properties**.



ME 24-688 – Week 7

Project 2 – Materials and Lights

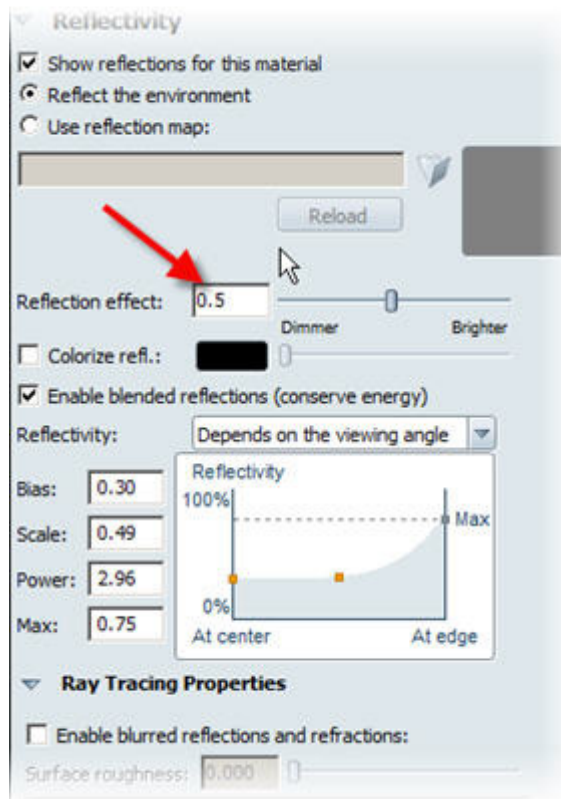
- 4 In the **Material Properties** dialog box:
 - Scroll down to the **Reflectivity** area.
 - Clear the **Show Reflections For This Material** check box to review the overall impact of the settings in this area
 - Place a check mark in the **Show Reflections For This Material** check box to turn on the reflection settings.
 -



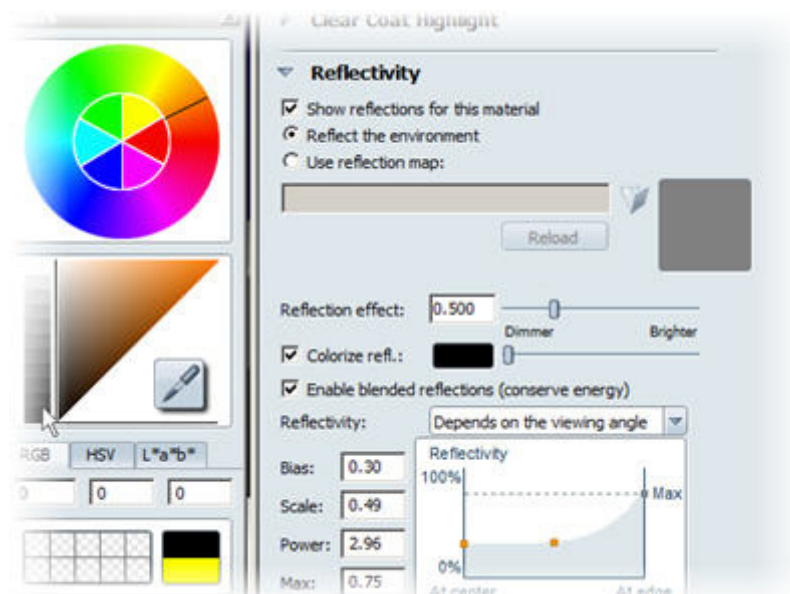
ME 24-688 – Week 7

Project 2 – Materials and Lights

- 5 To tone down the effect of the light from the active environment image, in the **Reflection Effect** field, enter **0.5**.



- 6 To begin changing the REFL. color for this material, in the **Reflectivity** area, select the **Colorize refl.** check box.
- 7 Click the color swatch for **Colorize refl.**



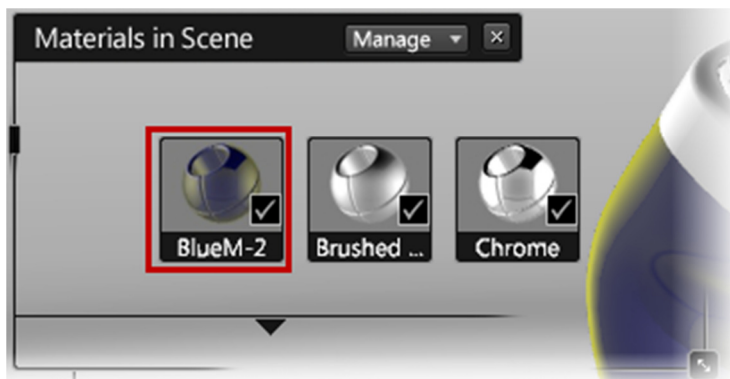
ME 24-688 – Week 7

Project 2 – Materials and Lights

- 8 In the **Colors** dialog box, click the yellow pie section as shown.



- 9 Close the **Material Properties** dialog box.
- 10 To rename this customized color, in the **Materials In This Scene** list:
- RIGHT-CLICK *Blue Metallic*. Click **Rename**.
 - Enter **BlueM-2**

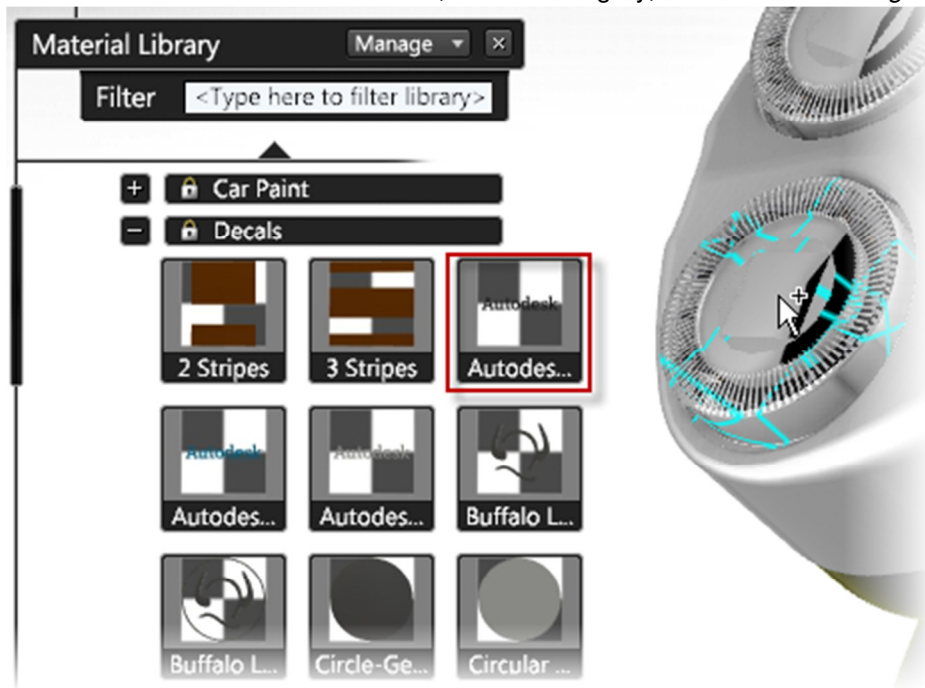


ME 24-688 – Week 7

Project 2 – Materials and Lights

11 To begin adding a decal to the cutter head:

- In the graphics window, select the bottom cutter and cover.
- In the **Material Libraries** list, **Decals** category, select *Autodesk Logo Black*



12 In the graphics window, click an open area to clear the selection of geometry. The model displays as shown.



ME 24-688 – Week 7

Project 2 – Materials and Lights

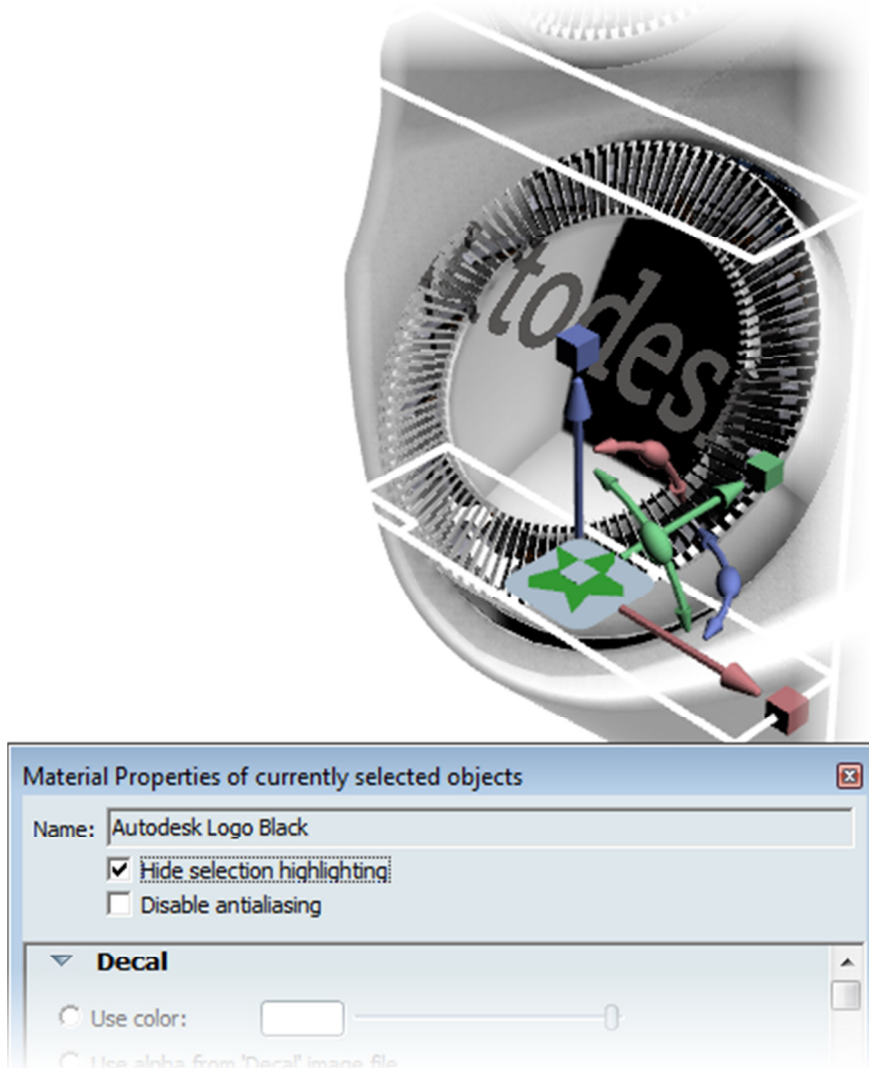
- 13 To begin modifying the applied decal material, in the graphics window, select the decal grip (star).



ME 24-688 – Week 7

Project 2 – Materials and Lights

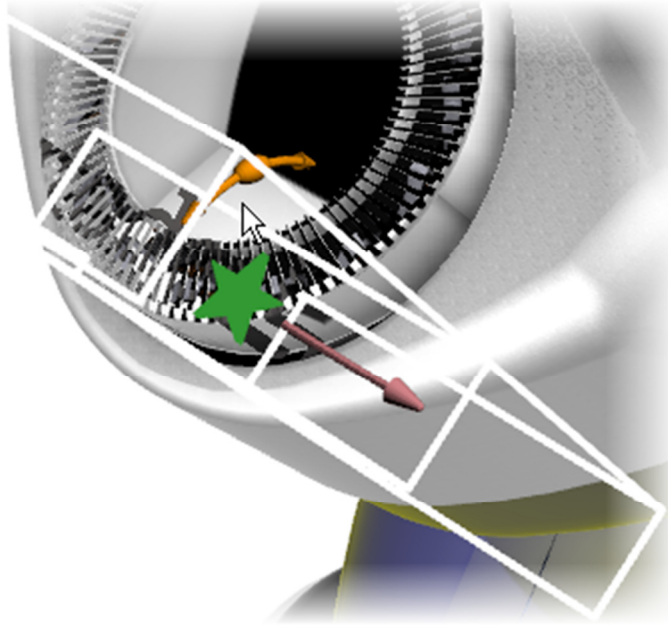
- 14 To begin resizing and realigning the decal, press **SHIFT+M**.



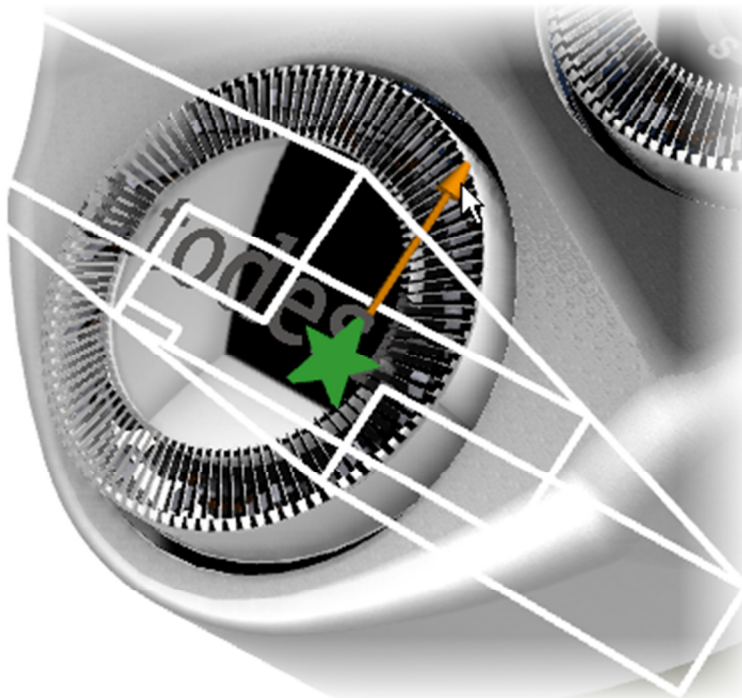
ME 24-688 – Week 7

Project 2 – Materials and Lights

- 15 On the transform handle, click and drag the Red arc handle to rotate the decal as shown.



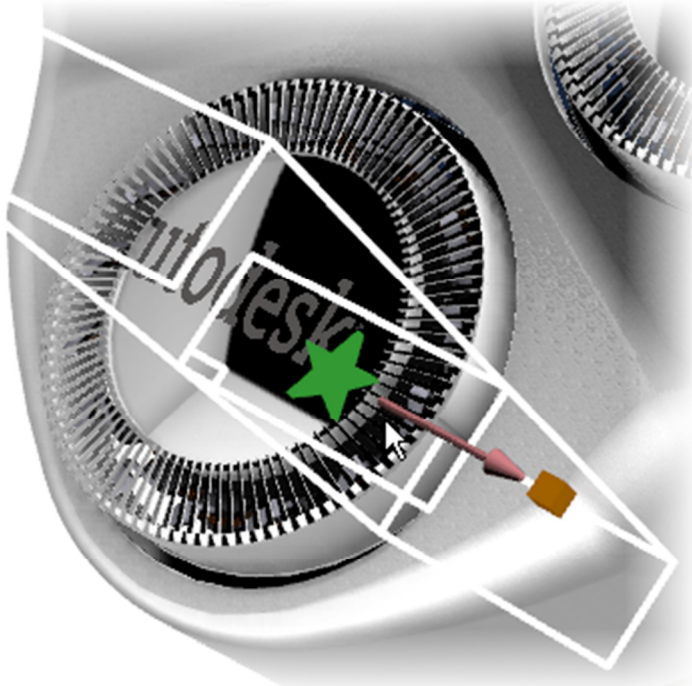
- 16 On the transform handle, click and drag the Green Arrow handle to position the decal as shown.



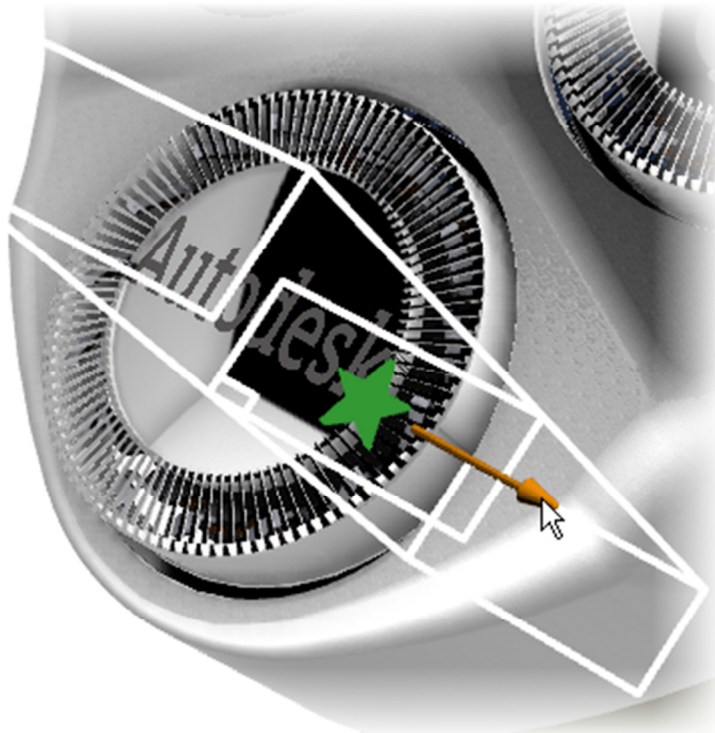
ME 24-688 – Week 7

Project 2 – Materials and Lights

- 17 To resize the decal, on the transform handle click and drag the red cube until the decal displays approximately as shown.



- 18 On the transform handle, click and drag the Red Arrow handle to position the decal as shown.



- 19 In the **Material Properties Of Currently Selected Objects** dialog box, click **Close**.

ME 24-688 – Week 7

Project 2 – Materials and Lights

- 20 In the graphics window, click an open area to clear the selection of geometry. The model displays as shown.



- 21 To toggle off the display of the decal grip, click **Options menu | Show Decal Grips** or **SHIFT+D**.



- 22 Save the scene As **Shaver 2.zip**.

ME 24-688 – Week 7

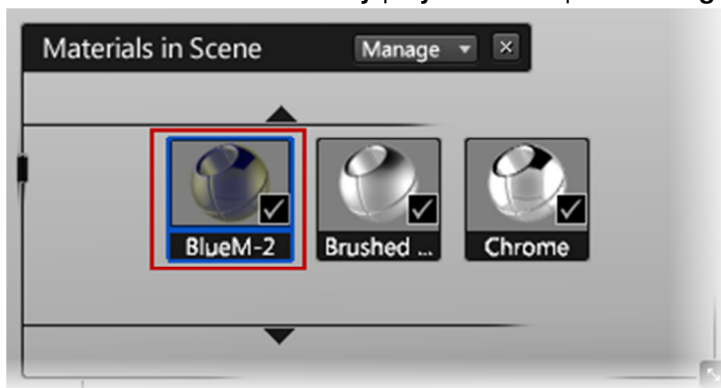
Project 2 – Materials and Lights

1.5 Project: Add Materials to the Scene

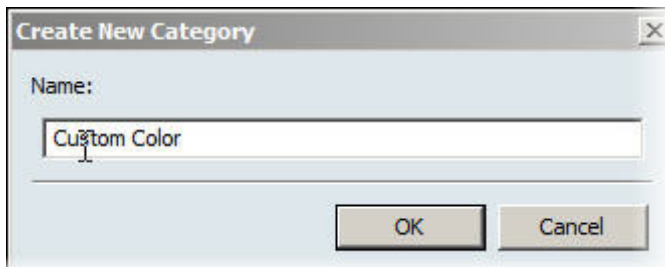
In this portion of the project, you add custom materials to a new library category, create a custom material from scratch, and import materials from another scene file.

Instructions

- 23 Continue with the *Shaver 2* scene.
- 24 To display the Add Materials to the Scene list, press **M**.
- 25 To begin adding a custom material to a custom material library:
 - In the **Materials In Scene** list, RIGHT-CLICK *BlueM-2*.
 - Click **Save To Library | My Materials | New Category**.



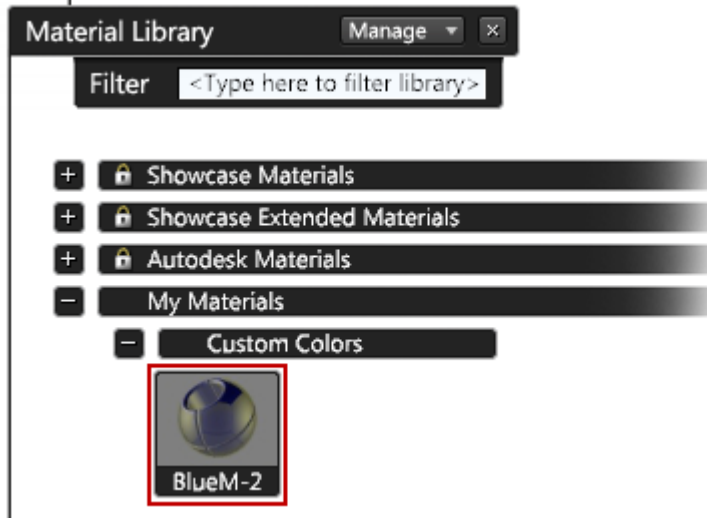
- 26 In the Name dialog box:
 - Enter **Custom Color**.
 - Click **OK**.



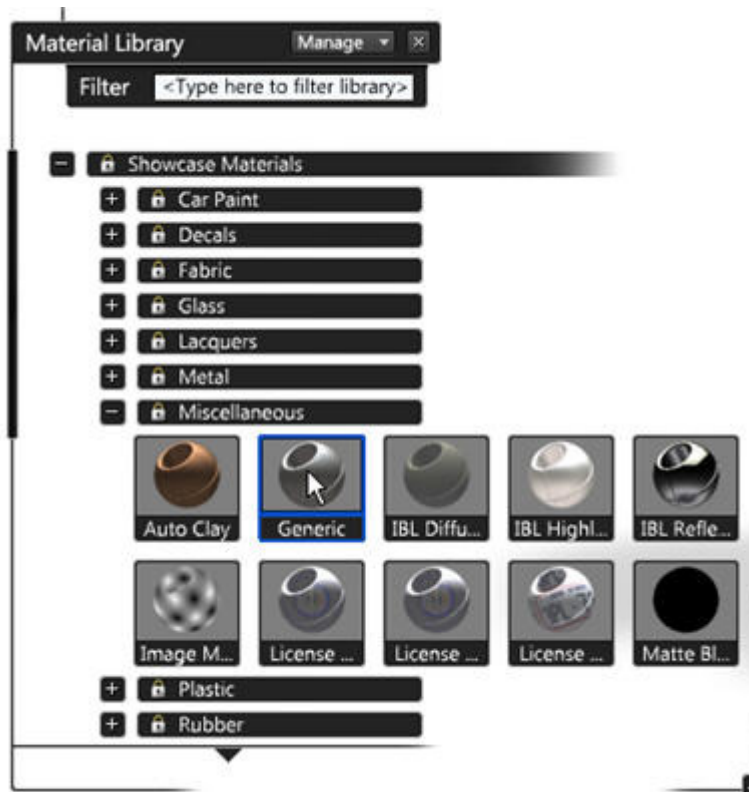
ME 24-688 – Week 7

Project 2 – Materials and Lights

- 27 In the **Material Libraries** area, expand the library **My Materials** to review its list of categories and materials.



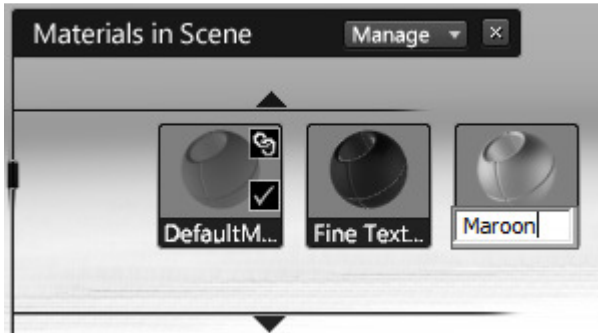
- 28 To begin creating a custom material from scratch and add it to your custom material library, in the **Miscellaneous** category in the **Showcase Materials** library, click **Generic**.



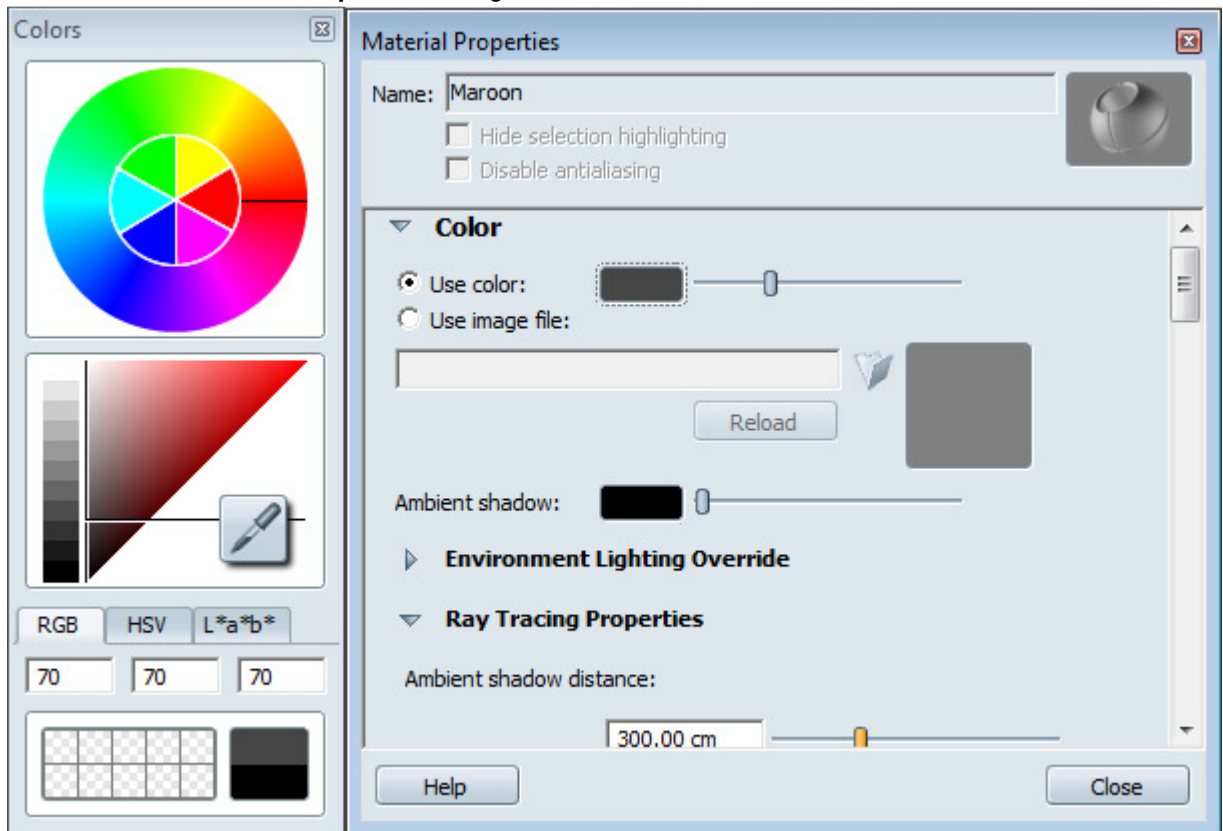
ME 24-688 – Week 7

Project 2 – Materials and Lights

- 29 In the **Materials In Scene** list, rename *Generic* to *Maroon*.



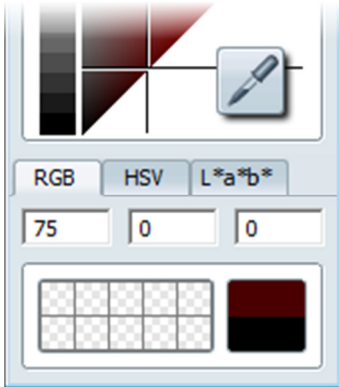
- 30 To begin changing the color of the material:
- Double-click the *Maroon* material.
 - In the **Material Properties** dialog box, **Color** area, click the **Use Color** switch.



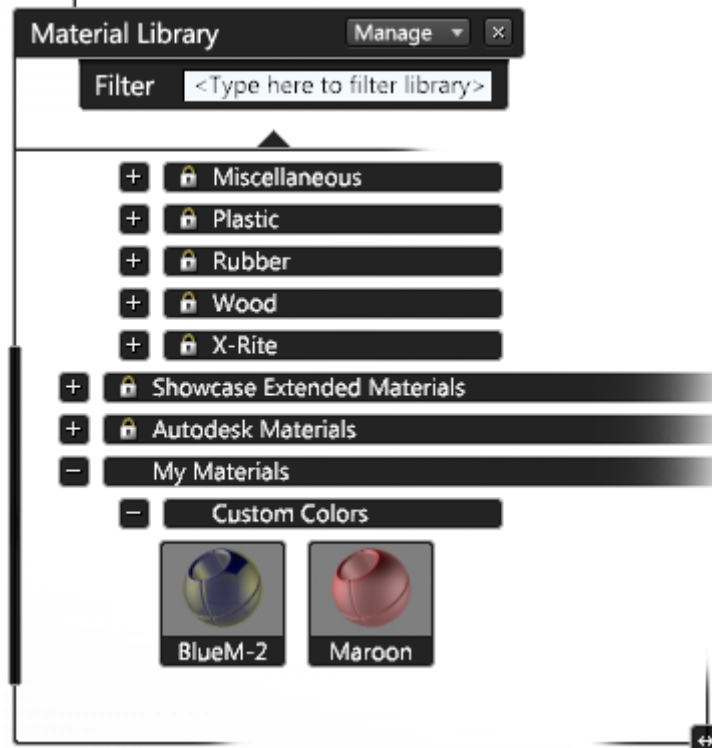
ME 24-688 – Week 7

Project 2 – Materials and Lights

- 31 In the **Colors** dialog box, RGB tab, enter **75, 0, 0** as shown.



- 32 In the **Material Properties** dialog box, click **Close**.
- 33 In the **Materials In Scene** list, RIGHT-CLICK *Maroon*. Click **Save To Library | My Materials | Custom Colors**. The custom list now displays as shown.



Project 2 – Materials and Lights

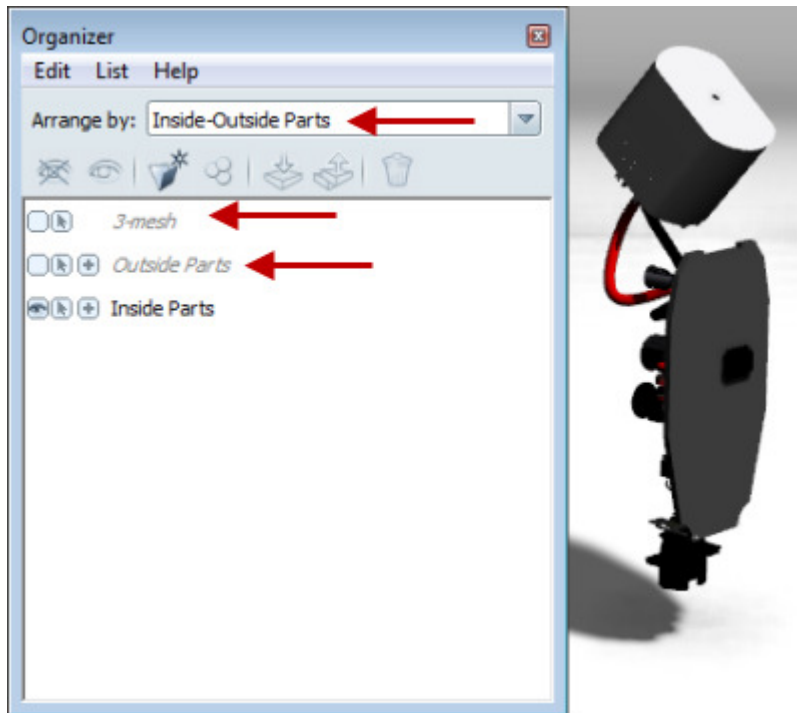
-
- Import From Scene**
- Import these scene elements:**
- ☐ Models, lights, sections and materials
 - ☒ Materials only
 - ☐ Models, lights and sections only
 - ☐ None of the above
- ☐ Arrangements
- ☐ Alternatives
- ☐ Shots
- Help Import Cancel

- [illegible]

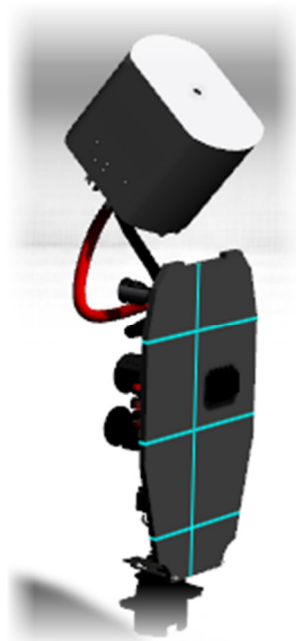
ME 24-688 – Week 7

Project 2 – Materials and Lights

- 37 To begin assigning one of the imported materials to the model geometry:
- Press **O**.
 - In the **Organizer**, set the **Arrange By** option to *Inside-Outside Parts*.
 - Hide the entries for *3-mesh* and *Outside Parts*.



- 38 In the graphics window, select the model geometry for the circuit board part as shown.

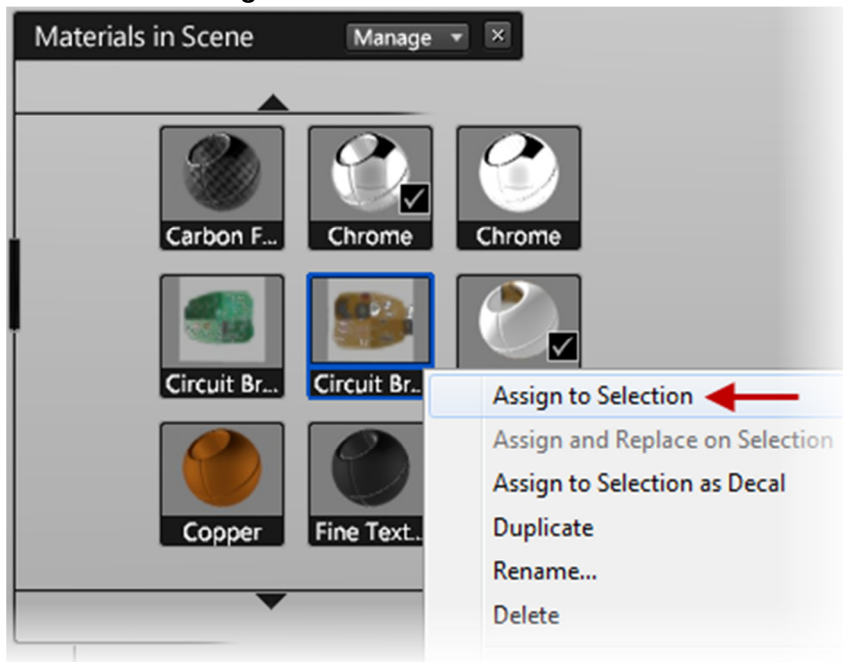


ME 24-688 – Week 7

Project 2 – Materials and Lights

39 In the **Materials In This Scene** list:

- Right-click *Circuit Brd-Top*.
- Select **Assign to Selection**



Project 2 – Materials and Lights

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- Page 23 of 43

ME 24-688 – Week 7

Project 2 – Materials and Lights

1.6 Project: Add and Adjust Point and Spot Lights

In this portion of the project, you add a point and spot light to the design, specify what geometry is to be highlighted by that light, and set additional light properties.

Instructions

- 44 Continue with the *Shaver 2* scene.
- 45 Click **Appearance menu | Lights** to display the Lights list.

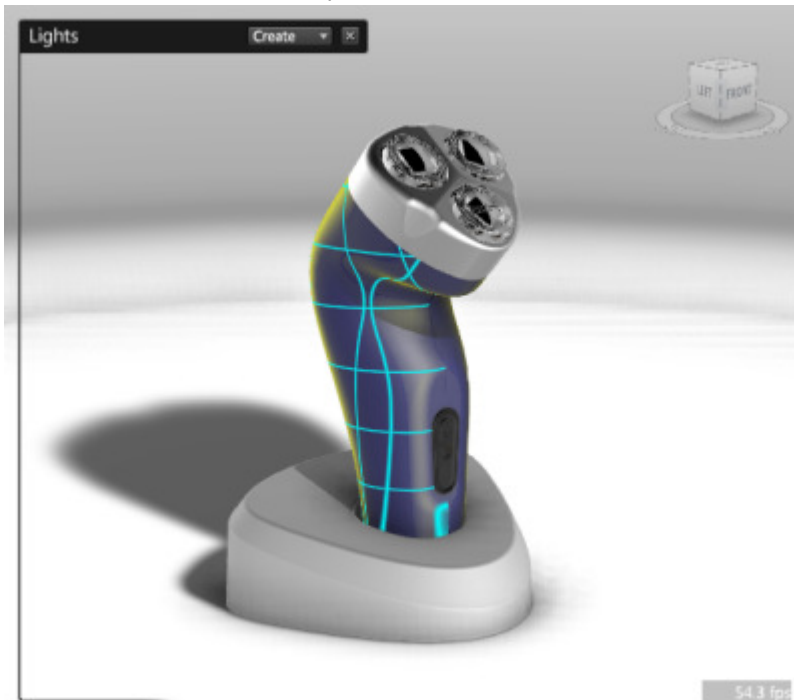


ME 24-688 – Week 7

Project 2 – Materials and Lights

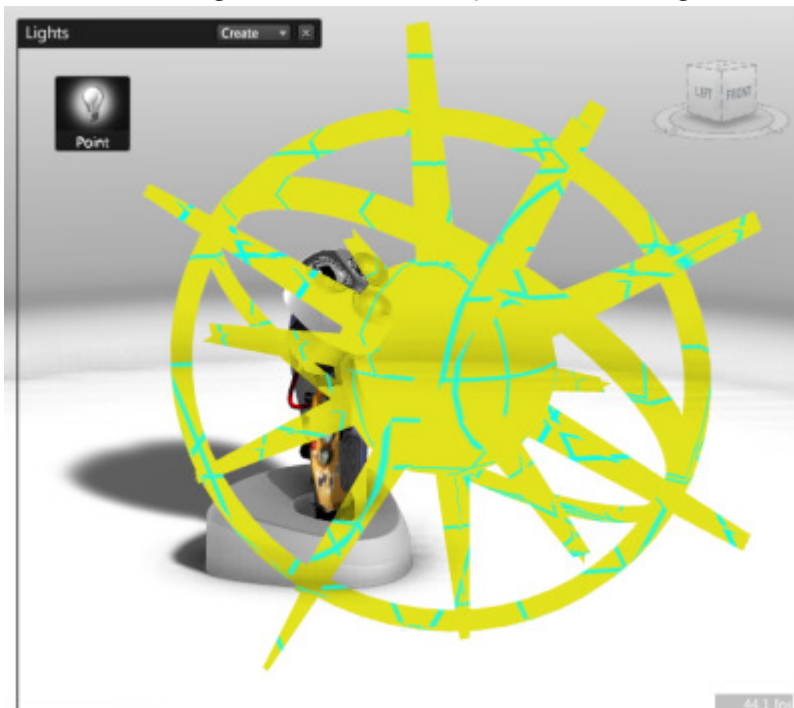
46 Hide the Left Housing.

- In the graphics window select the left housing as shown
- Click **Select** menu | **Hide**



47 To create another point light:

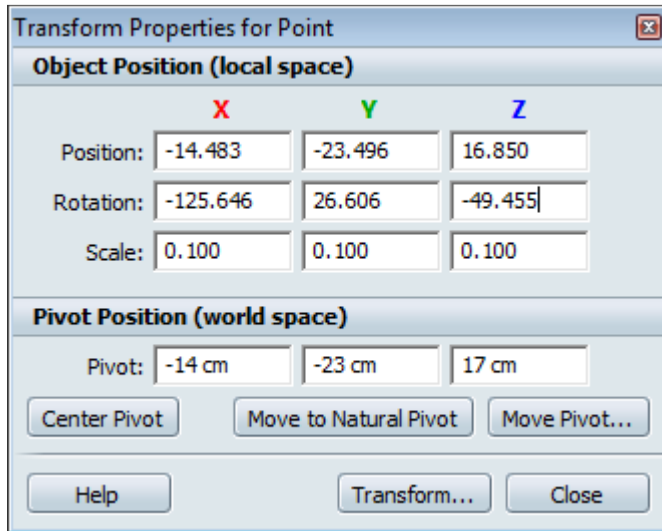
- On the **Lights** list, click **Create | Create Point Light**



ME 24-688 – Week 7

Project 2 – Materials and Lights

- 48 In the **Lights** list, RIGHT-CLICK on the *Point* light. Select **Rename** and type **Interior**.
- 49 Click **Edit menu | Transform | Transform Properties**
- 50 In the **Transform Properties** dialog box:
 - In the Scale fields for X, Y, and Z, enter **0.1**.



- 51 Click **Edit | Show Transform Handles**.

Transform handles appear on Interior point light



ME 24-688 – Week 7

Project 2 – Materials and Lights

- 52 Using the Blue, Red and Green arrows, position the light in front of the wheel hub as shown.

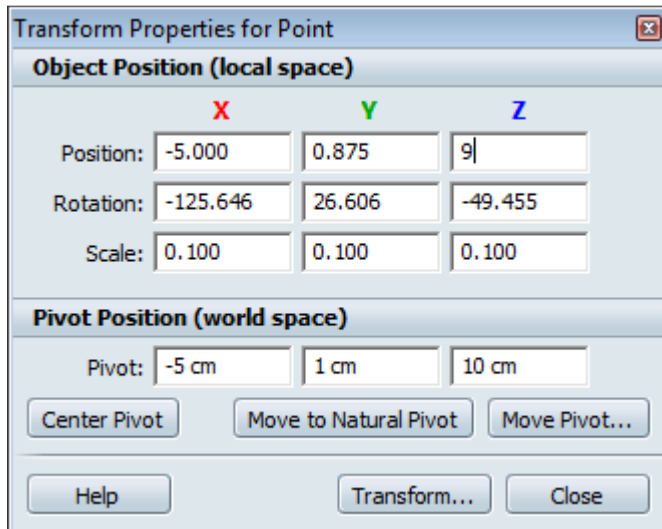


Hit the **H** key to turn off **Transform Handles**.

ME 24-688 – Week 7

Project 2 – Materials and Lights

- 53 Click **Edit menu | Transform | Transform Properties**.
- 54 In the **Transform Properties** dialog box:
 - In the Position fields for X, Y, and Z, enter **-5, 0.875, 9**.



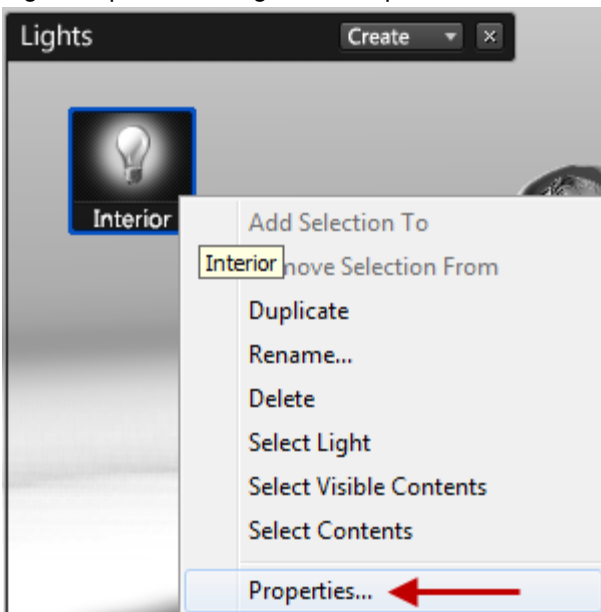
ME 24-688 – Week 7

Project 2 – Materials and Lights

- 55 In the **Transform Properties** dialog box click **Close**. The grip for the light now displays as shown.



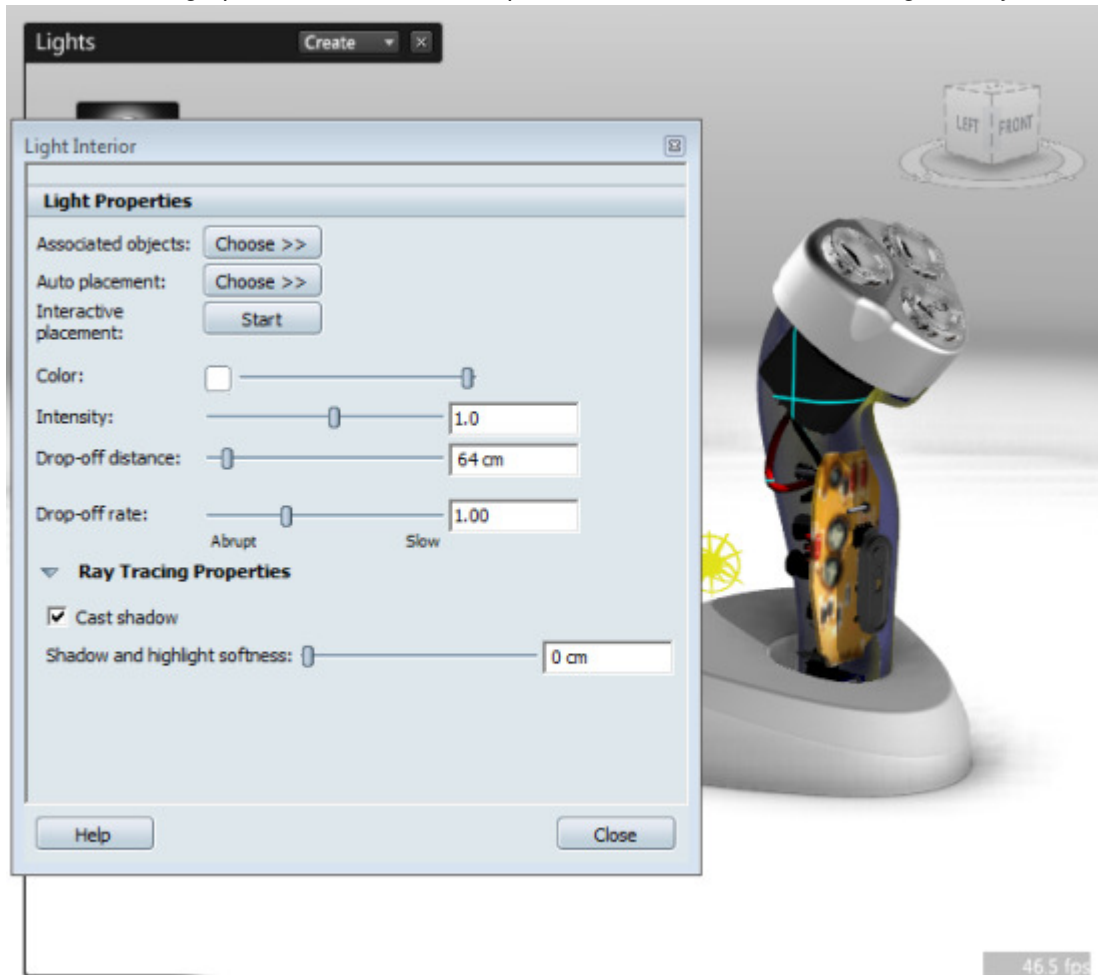
- 56 In the **Lights** list, RIGHT-CLICK the light icon for the light *Interior* and choose **Properties**. The Light Properties dialog will be exposed.



ME 24-688 – Week 7

Project 2 – Materials and Lights

- 57 To begin setting the light so that it brightens some model geometry:
- In the graphics window, select the red area of the hub.
 - In the Light *Interior* dialog box, **Light Properties** area, for **Associated Objects**, click **Choose | Add Selection To**.
 - In the graphics window, click an open area to clear the selection of geometry.

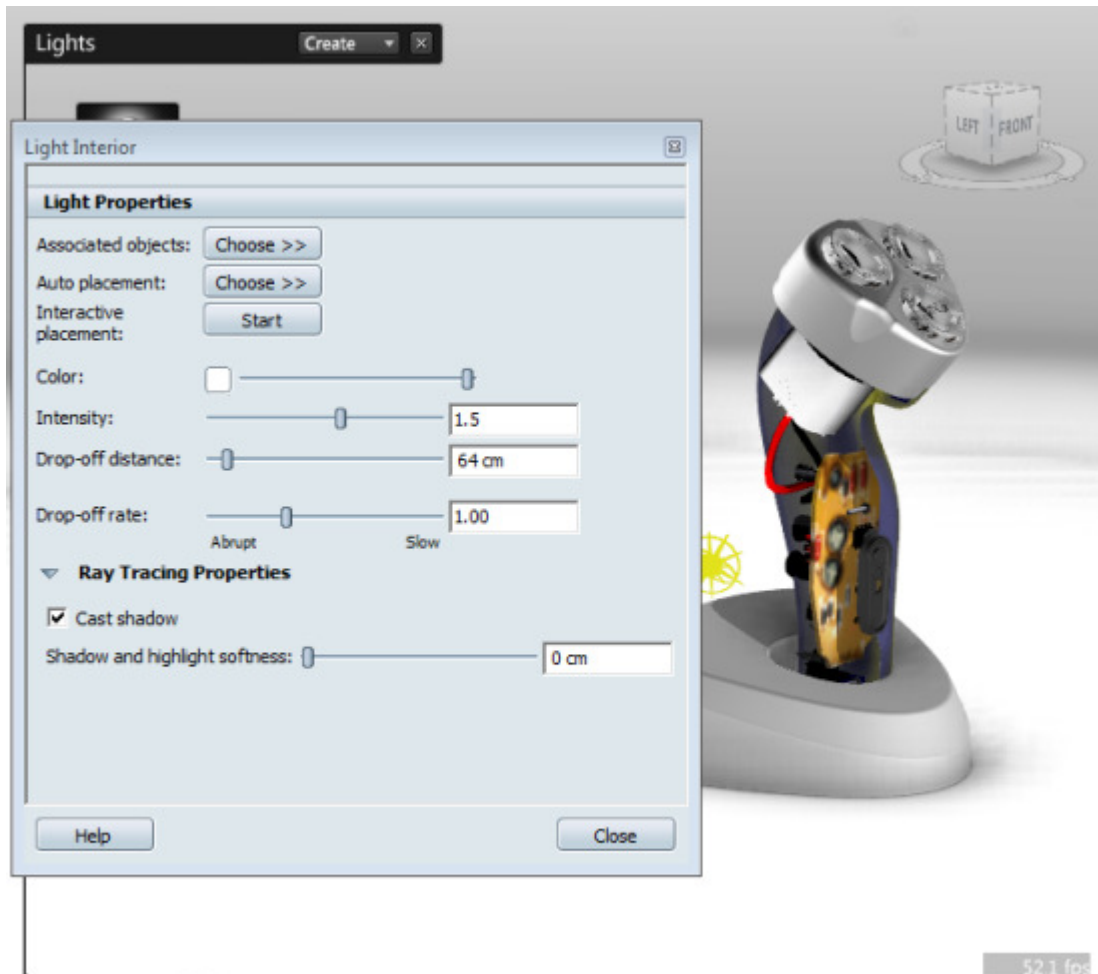


ME 24-688 – Week 7

Project 2 – Materials and Lights

58 In the Light *Interior* dialog box:

- Set Intensity to **1.5**.
- Clear the checkmark for the option **Cast Shadow In Ray Tracing**.
- Click **Close**.



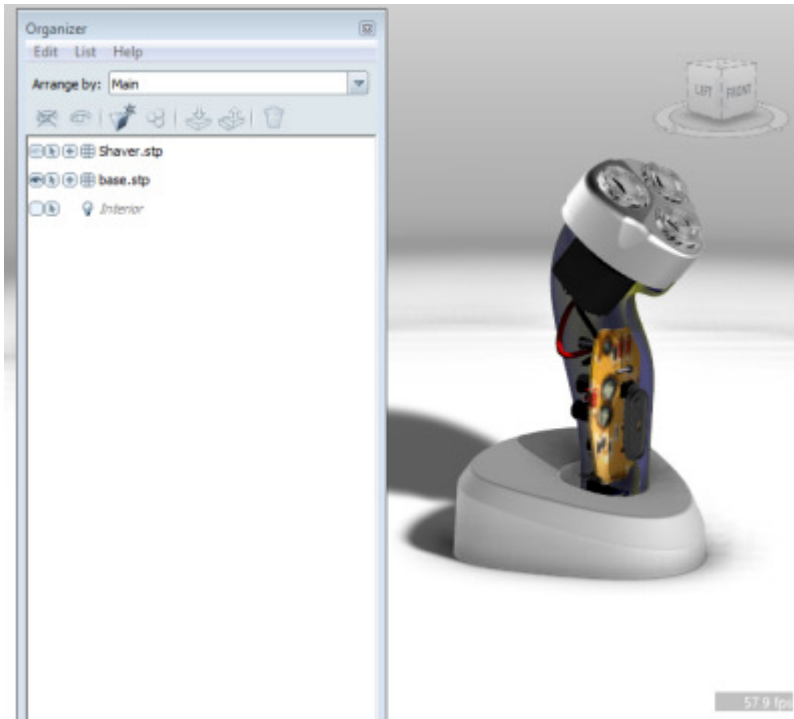
59 To ensure nothing is selected Click **Select | Deselect All**.

60 Press **O** to display the **Organizer**.

ME 24-688 – Week 7

Project 2 – Materials and Lights

- 61 To review the impact of the existing point light on the design:
- In the list in the **Organizer**, Select **Main** in the Arrange by drop down
 - RIGHT-CLICK the Point light. Click Hide.
 - In the graphics window, review the display of the model geometry.



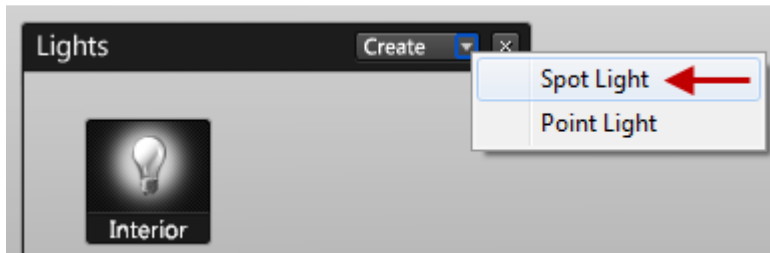
- 62 In the list in the Organizer, RIGHT-CLICK the Point light. Click **Un-Hide**.



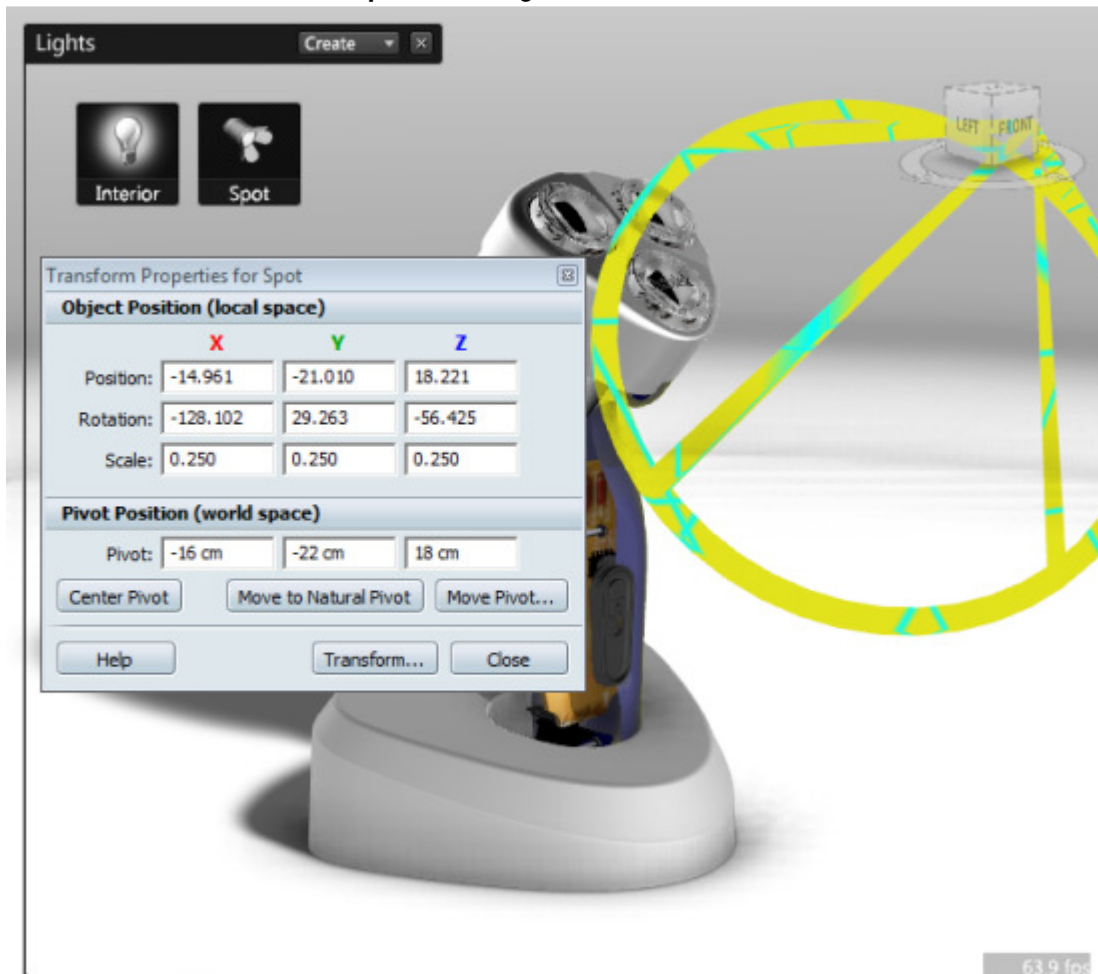
ME 24-688 – Week 7

Project 2 – Materials and Lights

- 63 On the **Lights** list, click **Create | Create Spot Light**.



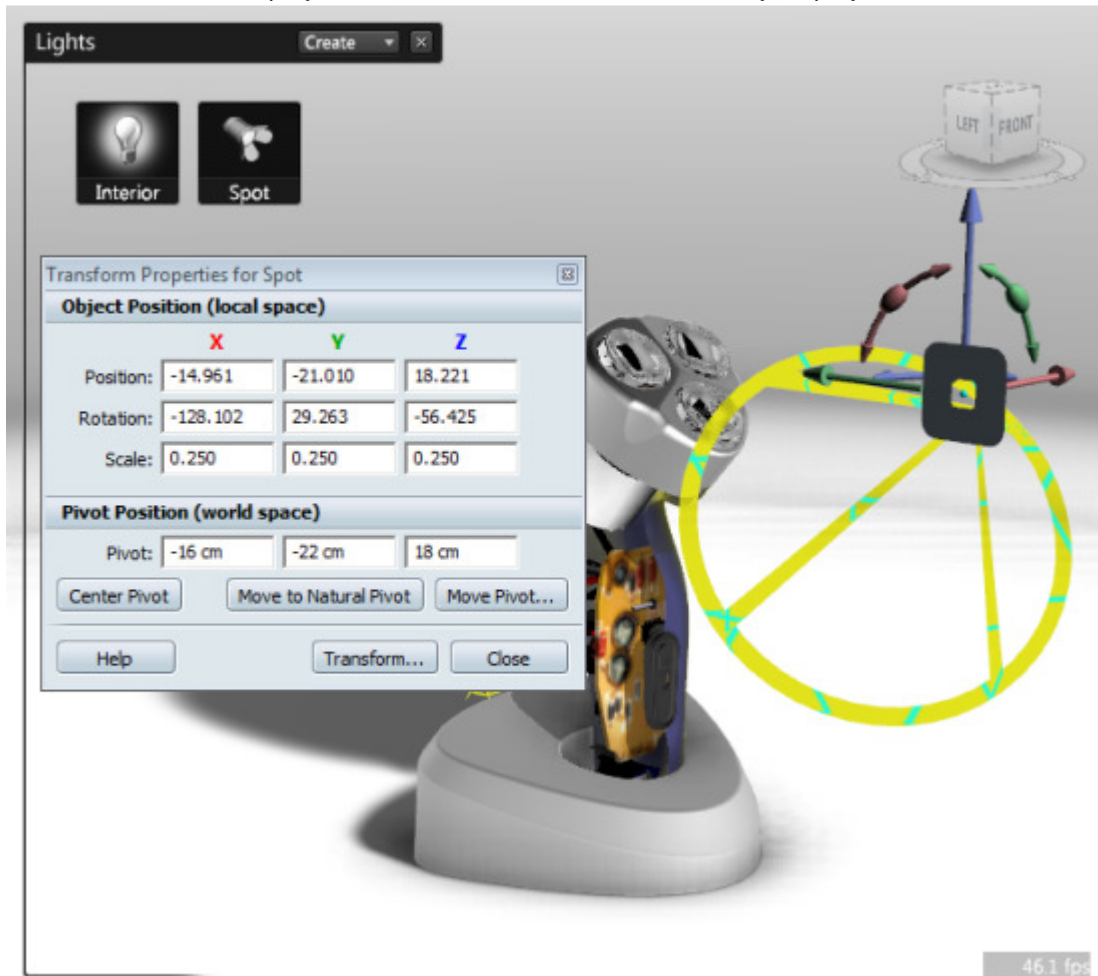
- 64 To change the display scale for the light grip and its pivot position:
- Click **Edit menu | Transform | Transform Properties**.
 - In the **Transform Properties** dialog box, Scale fields for X, Y, and Z, enter **0.25**.



ME 24-688 – Week 7

Project 2 – Materials and Lights

- 65 In the **Transform Properties** dialog box, click **Close**. The spot light displays similar as shown:
- Press **H** to display the **Transform Handles** if not already displayed



- 66 On the **View Cube**, click the side labeled **Top**. The view appears similar as shown.

ME 24-688 – Week 7

Project 2 – Materials and Lights



ME 24-688 – Week 7

Project 2 – Materials and Lights

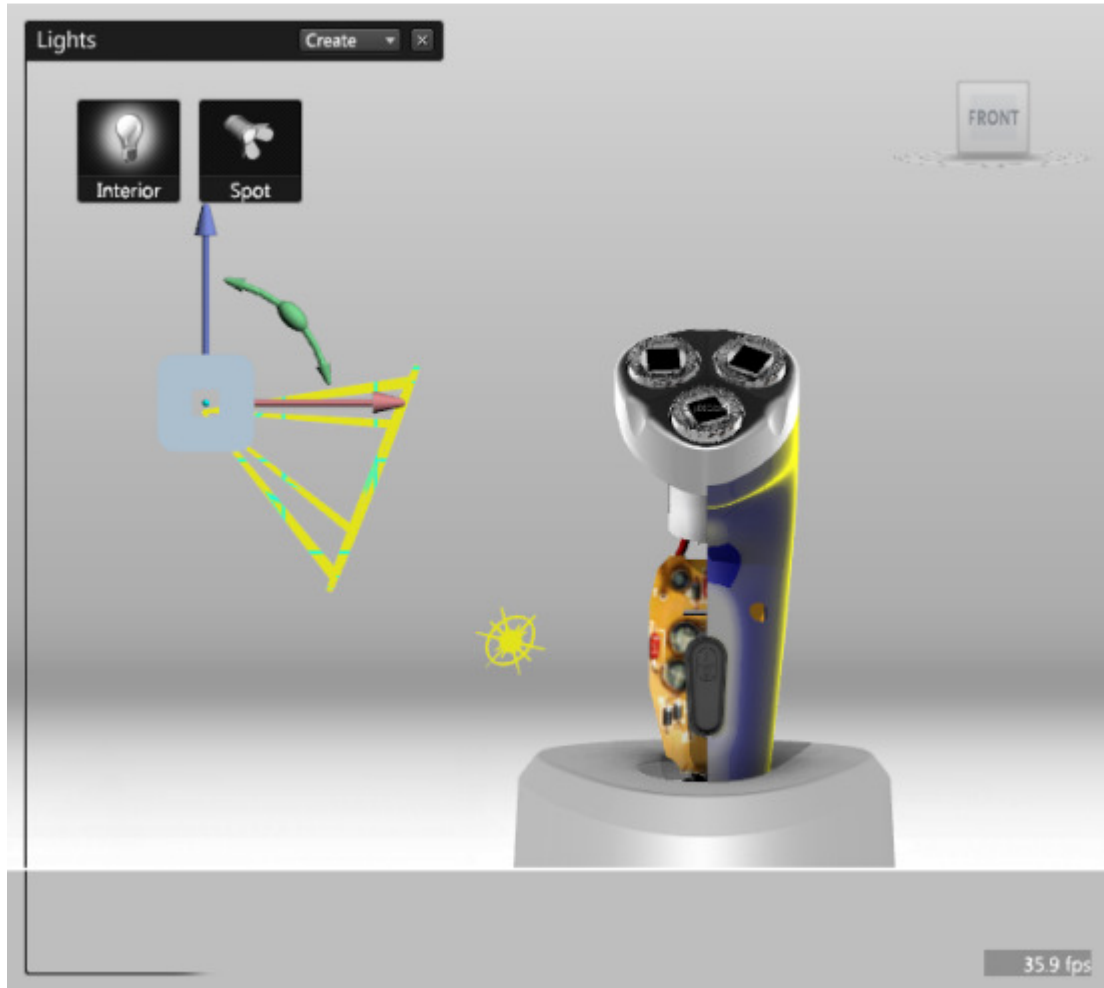
- 67 Click and drag the transform handle to position it to the left of the model geometry, then rotate using the Blue Rotation Handle as shown.



ME 24-688 – Week 7

Project 2 – Materials and Lights

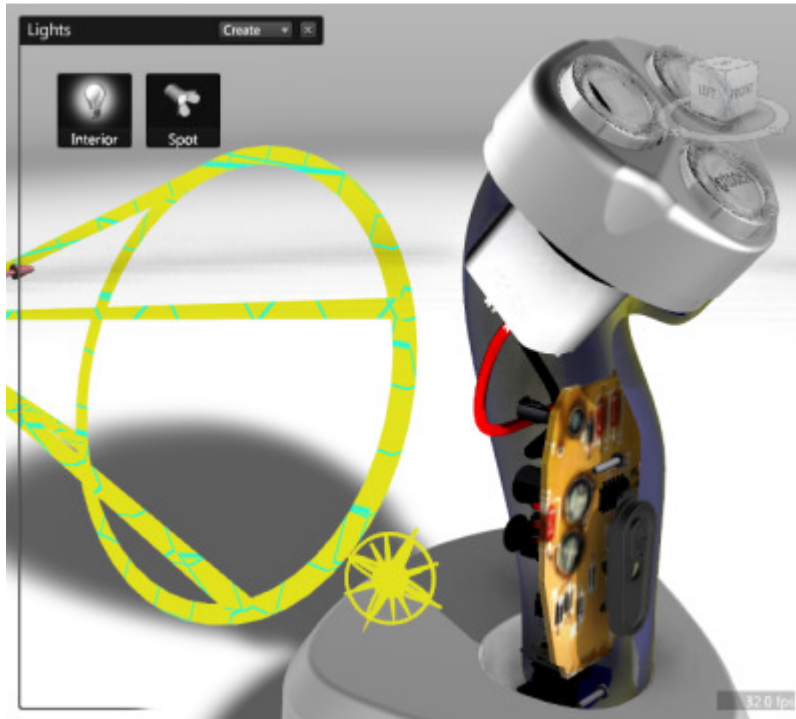
- 68 On the **View Cube**, click the right arrow to change the view direction. Use the transform handle to reposition and rotate the light grip to the approximate position and alignment as shown.



ME 24-688 – Week 7

Project 2 – Materials and Lights

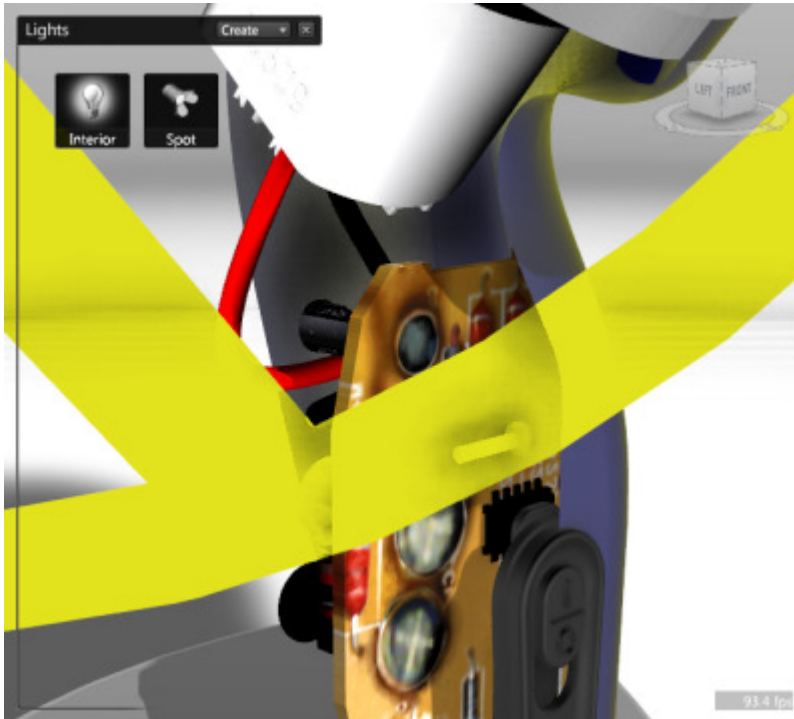
- 69 On the **View Cube**, click **Home**, then reorient the view to get a good view of the interior of the shaver.



ME 24-688 – Week 7

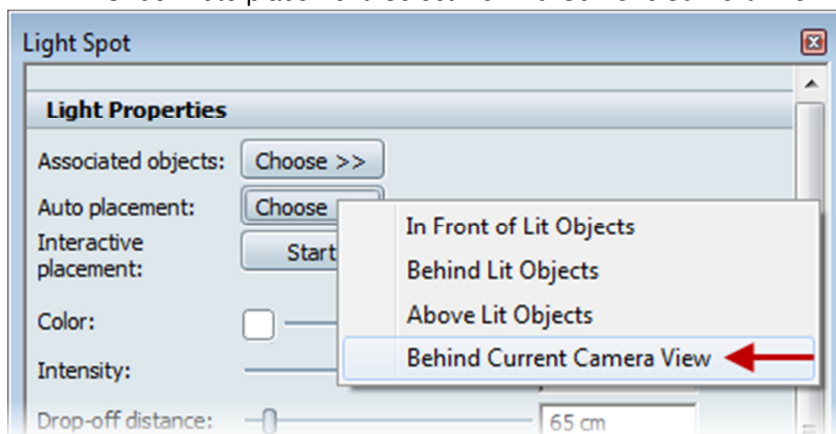
Project 2 – Materials and Lights

70 Zoom in closely to the interior as shown.



71 RIGHT-CLICK on the spot light:

- Select Properties
- Under Auto placement: select **Behind Current Camera View**



ME 24-688 – Week 7

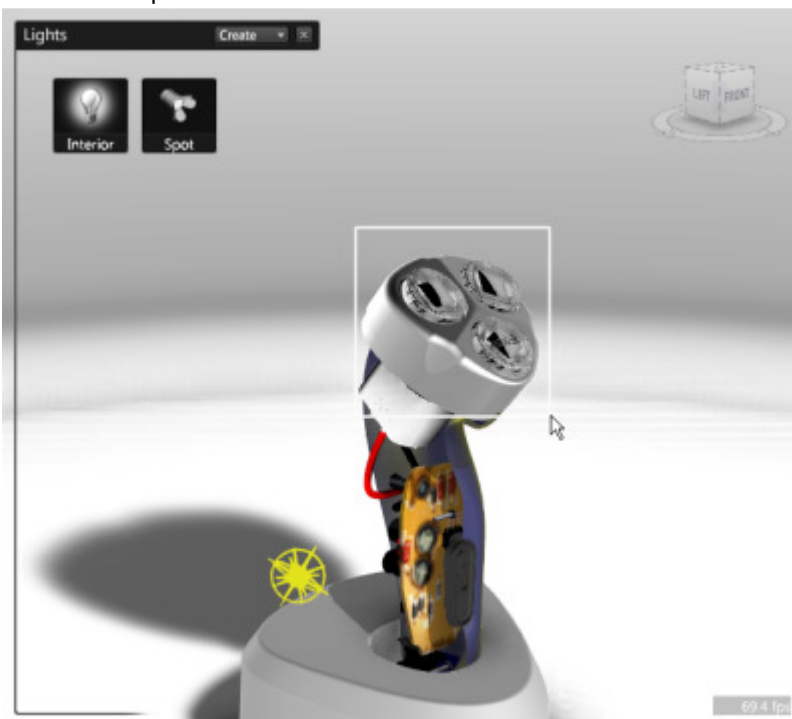
Project 2 – Materials and Lights

72 Zoom back out and review your light placement.



This process is one of the easiest methods to correctly place a light source.

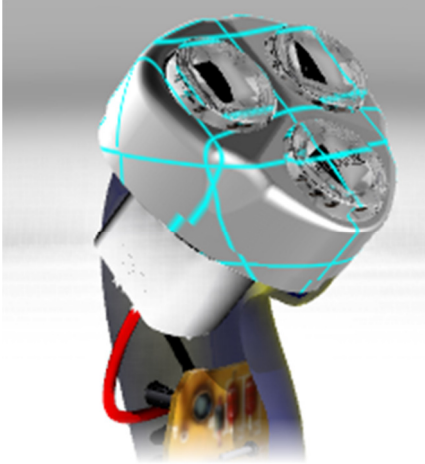
73 Select the top of the Shaver.



ME 24-688 – Week 7

Project 2 – Materials and Lights

74 De-Select everything but the top.



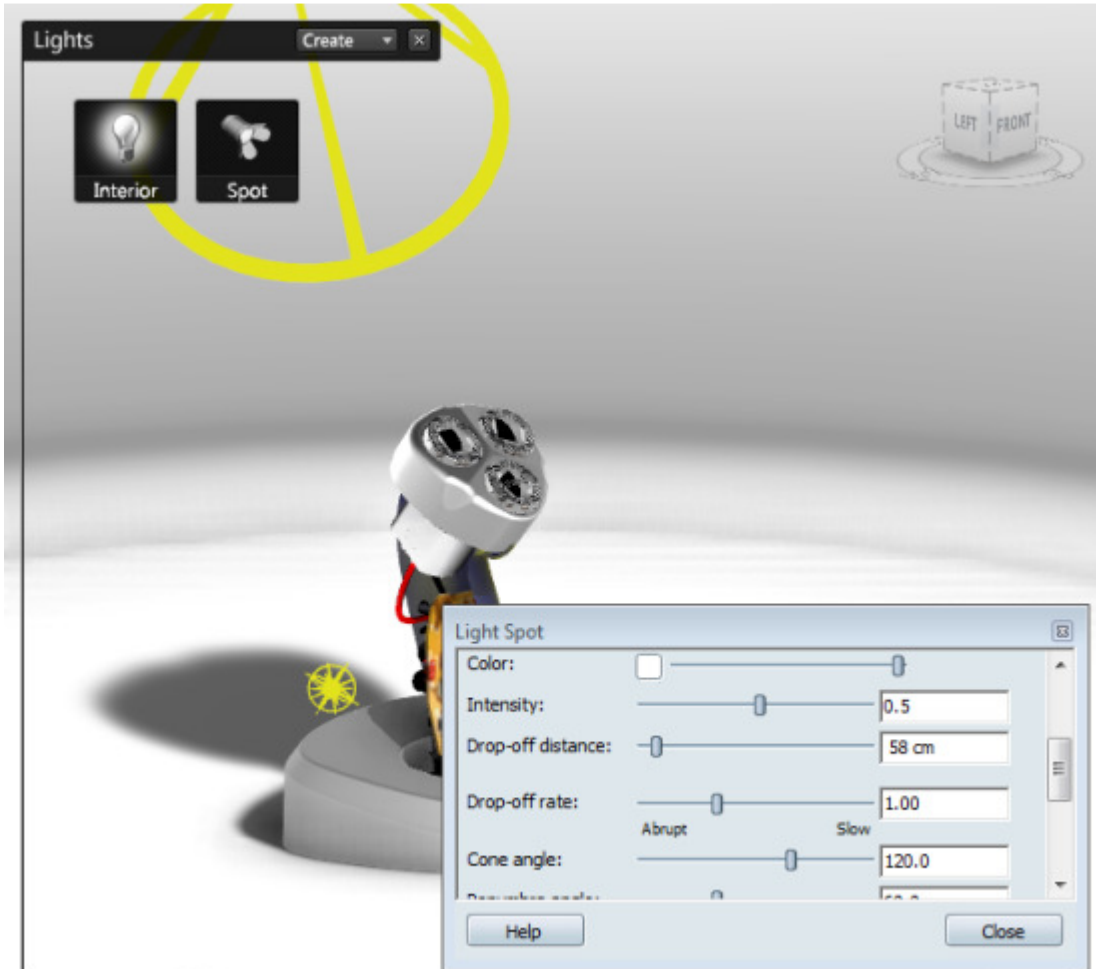
75 To associate the selected geometry to the spot light, in the **Lights** list:

- RIGHT-CLICK *Spot*. Click **Add Selection To**.

ME 24-688 – Week 7

Project 2 – Materials and Lights

- 76 Adjust the spot light's **Intensity** and **Drop-off distance** to make the light accent the shapes edges, but not overexpose the flatter surfaces.



ME 24-688 – Week 7

Project 2 – Materials and Lights

- 77 To toggle off the display of the light grips, click **Options** menu | **Show Light Grips**.



- 78 Save the Scene.