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	
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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.



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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.





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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**.



Grip for the point light.
 Grip for the spot light.

3 Lights list with the lights listed.

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.



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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



80.6 lps

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

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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**.



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- 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.

Materia	al Properties		X	
Name:	Blue Metallic			11 11
	Hide selectio	n highlighting liasing		
CITE	-cc, ·	Dimmer	Brighter	
▽	Reflectivity			
	Show reflections f Reflect the enviro Use reflection map	ror this material	¥	
Refi	ection effect:	0.993 0	Brighter	
	Enable blended re	flections (conserve energy)	
Refl	ectivity:	Depends on the viewing an	igle 🔽 🗍	
Bias	; 0.30 e; 0.49		E	
Pow	er: 2.96			

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.**

	 Reflectivity Show reflections Reflect the envil Use reflection m 	s for this material ronment ap:	
	Reflection effect:	Retoad	ghaer
	Reflectivity:	Depends on the viewing angle	•
GB HSV L*a*b*	Bias: 0.30 Scale: 0.49	Reflectivity	ax
	Power: 2.96 Max: 0.75	0%	

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**



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- 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.



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



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

Material Properties of currently selected objects	
Name: Autodesk Logo Black	
Hide selection highlighting	
Disable antialiasing	
▼ Decal	~

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.



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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.

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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.

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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.

Create New Category	/	×
Name:		
Cuștom Color		
- L		
	ОК	Cancel

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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**.



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 swatch.

Colors	Material Properties
	Name: Maroon Hide selection highlighting Disable antialiasing
	Color Use color: Use image file:
	Reload Multiple Control Contro
RGB HSV L*a*b*	 Environment Lighting Override Ray Tracing Properties
70 70 70	Ambient shadow distance:
	300.00 cm Image: Close

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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.

Material Library	Manage 💌 🗙
Filter <type here<="" th=""><th>to filter library></th></type>	to filter library>
	
+ 🔒 Miscellane	ous
+ 🔒 Plastic	
+ 🔒 Rubber	
+ 🔒 Wood	
+ 🔒 X-Rite	
+ 🔒 Showcase Exten	ded Materials
+ 🖬 Autodesk Mater	ials
- My Materials	
- Custom Co	biors
BlueM-2	Maroon

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- 34 To import materials from another scene file into this scene file:
 - Click File | Import | Import From Scene.
 - In the Import From Scene dialog box, select Shaver-Electronics.zip.
 - Click **Open**.
- 35 In the Import From Scene dialog box:
 - Click Materials Only.
 - Clear the **Shots** check box.
 - Click Import.

Import From Scene
Import these scene elements:
 Models, lights, sections and materials Materials only
C Models, lights and sections only
O None of the above
Arrangements
Shots
Help Import Cancel

36 Click and drag to resize the Materials In Scene list.



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- 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.



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39 In the Materials In This Scene list:

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



40 Orbit the view to review the decal material that was assigned to the selected model geometry.



- 41 To remove all materials from the scene that are not being used in the scene:
 - On the Materials In This Scene title bar
 - Click Manage | Delete Unused Materials.
 - The list now displays as shown.

	Materials in Scene	Manage									
	Black Ma.	BlueM-2	Brushed	Chrome	Circuit Br	Lambert	Lambert	Lambert	Lambert	Lambert	
	Lambert	Lambert	Lambert	Lambert	Lambert	Lambert	Lambert	Lambert	Lambert	Lambert	
	Lambert	Metal-St	White M								
l	1										

- 42 Click Select | Un-hide All
- 43 Save the Scene.

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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.



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- 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



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- 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.						
Transform Pr	Transform Properties for Point 🛛 🛛 🛛 🔊					
Object Pos	Object Position (local space)					
	X	Y	Z			
Position:	-14.483	-23.496	16.850			
Rotation:	-125.646	26.606	-49.455			
Scale:	0.100	0.100	0.100			
Pivot Position (world space)						
Pivot:	-14 cm	-23 cm	17 cm			
Center Pivot Move to Natural Pivot Move Pivot						
Help	Help Transform Close					

51 Click Edit | Show Transform Handles.

Transform handles appear on Interior point light



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**.

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- 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.

Transform Properties for Point 🛛 🛛 🛛 🔊						
Object Pos	Object Position (local space)					
	х	Y	Z			
Position:	-5.000	0.875	9			
Rotation:	-125.646	26.606	-49.455			
Scale:	0.100	0.100	0.100			
Pivot Position (world space)						
Pivot:	-5 cm	1 cm	10 cm			
Center Pivo	t Move	to Natural Pivo	Move Pivot			
Help		Transform	Close			

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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.



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- 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.

ight Interior				8	LEFT
Light Properties					
Associated objects: Auto placement: Interactive placement: Color: Intensity:	Choose >> Choose >> Start	0			
Drop-off distance: Drop-off rate: Ray Tracing P Cast shadow Shadow and highligh	-0	5low 64 cm	— 0 cm		
Help			Close		

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- 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.

Lights	Create	X	8	LEFT FRONT
Light Properties				
Associated objects: Auto placement: Interactive placement: Color: Intensity: Drop-off distance: Drop-off rate: Ray Tracing Cast shadow Shadow and highlight	Choose >> Choose >> Start Start O Abrupt Properties ght softness: ()	0 1.5 64 cm 1.00 Słow	0 cm	
Help			Close	
				52.1 fps

- 59 To ensure nothing is selected Click Select | Deselect All.
- 60 Press **O** to display the **Organizer**.

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- 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**.



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

Lights	Create -	
		Spot Light 🔶
		Point Light
Interior		

- 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.

				all /	Serie -	
sform Pr	operties for	Spot		8	A.A.	
oject Pos	sition (local :	space)				
Position:	-14.961	-21.010	18.221		1	
Rotation:	-128.102	29.263	-56.425			
Scale:	0.250	0.250	0.250			
vot Posil	tion (world s	space)			K	
Pivot:	-16 cm	-22 cm	18 cm			
enter Pivo	ot Mor	ve to Natural Pi	ivot Move Pivo			
Help		Transfo	Close			
nep	_	Inansio	Close			
Help		Transfo	rm) Close			

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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

nstorm Pr	operties for	Spot		8			-	1
bject Pos	ition (local :	space)		6			1	1
Position:	-14.961	-21.010	18.221	13	Der C	-	-	
Rotation:	-128,102	29.263	-56.425		10	And in case of	-	S (
Scale:	0.250	0.250	0.250		19			
ivot Posit Pivot:	ion (world s	space)	18 cm			/		
Help		ve to Natural Pi	rm Close					J

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

ghts Ø	y Spo	Create					Į	W	TOP	
Fransform Pi	operties for	Spot		8						
Object Pos	sition (local	space)								
	x	Y	z							
Position:	-14.961	-21.010	18.221	5		- A 1342	11			
Rotation:	-128.102	29.263	-56.425		11	00	//			
Scale:	0.250	0.250	0.250		/	Ser.				
Pivot Posi	tion (world s	space)								
Pivot:	-16 cm	-22 cm	18 cm							
Center Pivo	ot Mo	ve to Natural P	ivot Move Pivol							
		2								

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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.



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.



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





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

Light Spot			
Light Properties			Â
Associated objects:	Choose >>		
Auto placement: Interactive placement:	Choose Start	In Front of Lit Objects Behind Lit Objects	1
Color:		Above Lit Objects	
Intensity:		Behind Current Camera View 🔶	
Drop-off distance:	-0	65 cm	=

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.



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.

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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.



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



40.8 lps

78 Save the Scene.