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Intro to Lights & Rendering

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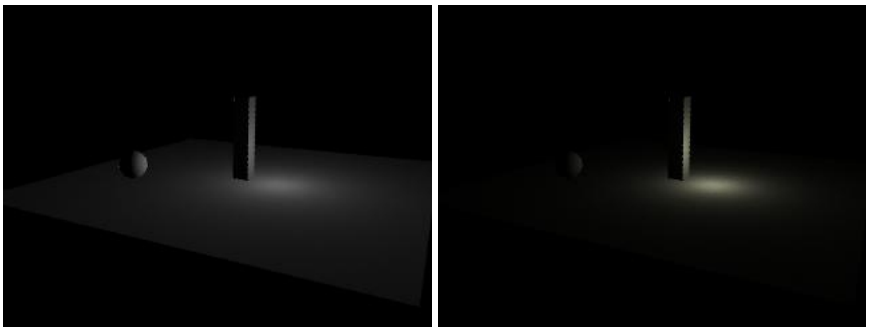


Concepts

- You must define lights in order for your scene/models to be visible
  - Same as the real world – if there is zero light, you can't see anything
  - Maya provides a default lighting set up,
    - (This is what you used throughout the Modeling tutorials)
  - This is good enough to see your models' shapes,
    - but not refined enough for most scenes

- Lighting a CG scene usually involves defining several lights,
  - Lights can be of different types,
    - with each type having many parameters to set

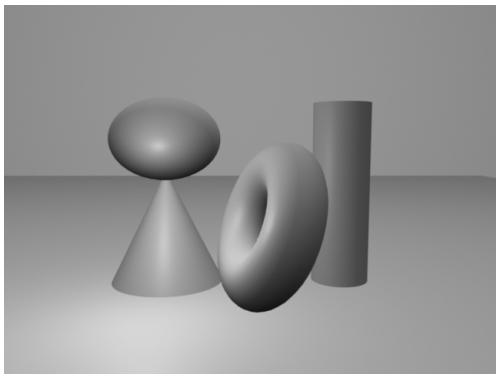
Hardware Rendering

- Create a simple scene consisting of:
  - a large plane for a ground/floor
  - a few primitives or other simple objects on and above the floor

- To see a rough real-time approximation of the default light setup,
  - click in the Perspective window, then…
    - >Shading >Smooth Shade All
      - (Also, the **5** key)
    - You see a hardware rendering of Maya's default light setup
  - Still in the Perspective window,
    - >Lighting >Use All Lights
      - Your models all go black!

- This is because you have not defined any lights yet

Point Light



- A point light is like a bare light bulb hanging from a wire
  - It emits light equally in all directions
- >Create >Lights >Point Light

- Hit the **w** key to translate the light
  - In the Perspective window,
    - make sure >Lighting >Use All Lights is still on
  - As you translate the light,
    - the hardware shaded rendering updates in real time

- **WARNING**: This hardware rendering is only *very* approximate
  - It does not match very closely the final rendering
    - that you will get when you do your final, software rendering
    - so it is used only for a rough setup

Software Rendering

- To see a final rendering of your scene, you must use the software renderer

- >**Rendering** module
  - (Far upper left of screen, little pull-down menu)

- Click in the Perspective window to select that window
- In the top menu bar,
- >Render
  - >Test Resolution >Render Settings

        - to set the size of your test rendering image
        - (We will examine the Render Settings menu later in the *Raycast Rendering* tutorial)
    - >Render >Render Current Frame
        - A Render View window opens up,
            - and your scene is rendered in that window
        - Notice how different is the software rendering in the Render View window
            - from the hardware rendering in the Persp window
    - **TIP**: A shortcut for the Render window is
        - The little film-clapper icon in the top menu bar
            - that says "Render the current frame…"

Edit the Point Light

- Make sure the point light is still selected
- >Window >Attribute Editor
    - Make sure you are in the *pointLightShape1* tab
    - >Point Light Attributes
        - Increase *Intensity* to 2.0
            - to make it twice as bright
        - Next to *Color*, click the white swatch
            - This opens the Color Chooser
                - Drag in the color field to select a very slightly yellowish color,
                    - like incandescent light
- Back in the Render View window,
    - >Render >Redo Previous Render
        - to see the changes you made
- Back in the light's Attribute Editor,
        - Decay Rate = how quickly the light fades with distance
            - By default, Decay Rate = No Decay
                - This causes the light to travel infinitely far
                    - This is easier & faster for the software to calculate,

- but is not very realistic
- Set Decay Rate to Linear
- to make the light fade with distance,

- Re-render in your Render View window
  - If your image renders extremely dark (or black),
    - you need to greatly increase the light's intensity,
      - since the light is now fading with distance

Interactive Photorealistic Renderer (IPR)

- **Concept**:
  - Maya's IPR rendering saves additional information about your scene
  - Once the IPR rendering information is saved,
    - any changes you make to the lighting
      - are updated immediately in the IPR rendering
  - Because of the additional information it saves,
    - an IPR rendering usually takes longer to make the initial rendering
    - But once the initial rendering is done,
      - the updates are immediate
        - and automatic

- Click to select the Perspective window
- >Render >IPR Render Current Frame
- In the Render View window,
  - Maya IPR renders the scene
- Still in the Render View window,
  - Click and drag to select a region
    - The region is outlined in red
    - This is the region that will be automatically updated

- In the Channel Box or Attribute Editor:
  - Change the value of *Intensity*
    - The selected IPR region is immediately re-rendered
  - Translate the point light
    - The selected IPR region is immediately updated

- In the IPR Render window,

        - Drag to create a new selection area
            - It is updated immediately
- **WARNING**:
    - There are a few rendering functions
        - which the IPR renderer cannot handle
        - More about those in later tutorials
    - Also, if you change your camera angle,
        - you must re-calculate the IPR render
            - with >IPR >Redo Previous IPR Render