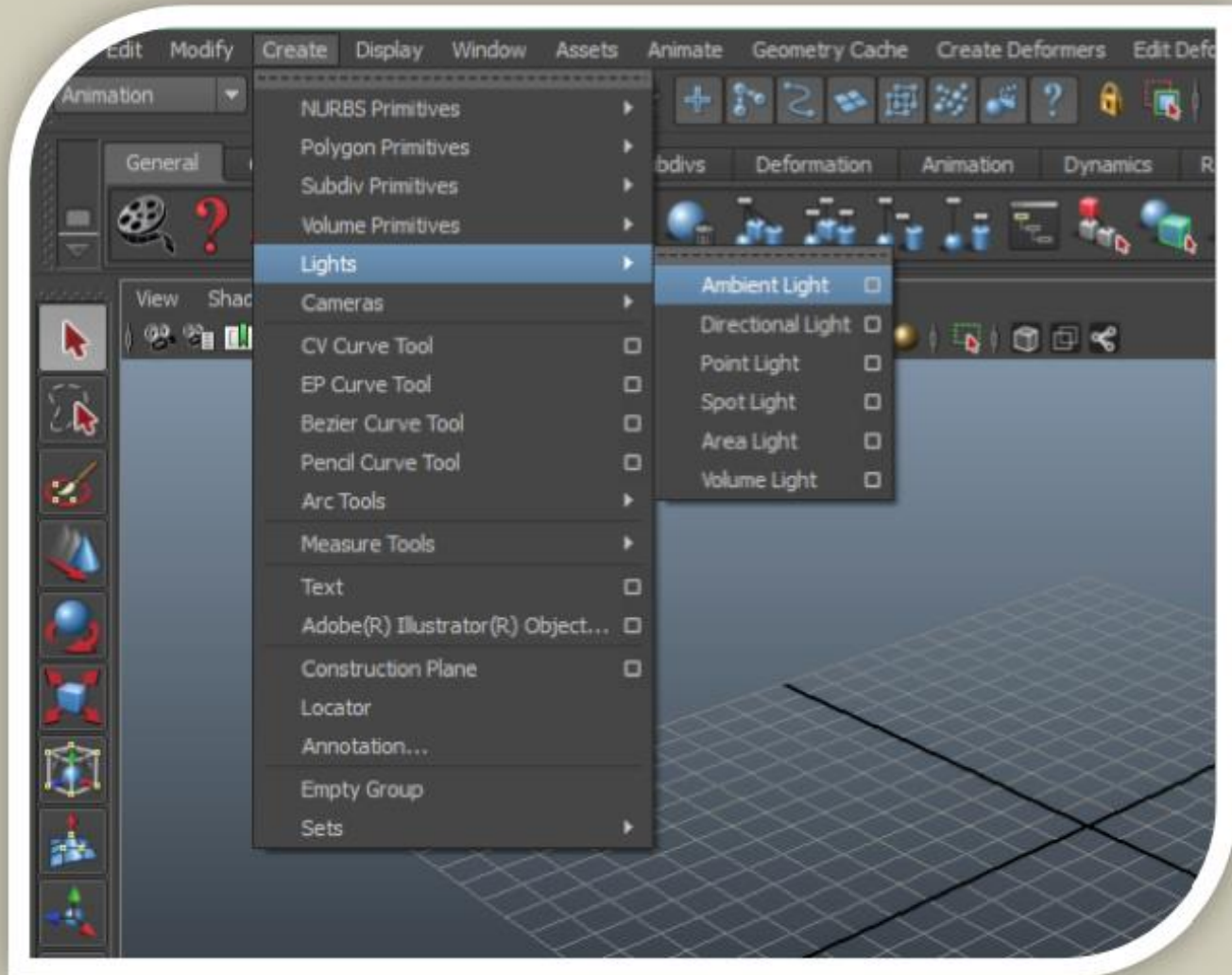


- **Six Types of Light Sources**
- **Attributes of Lights**
- **Shadows**
- **Shading**
- **Lighting Tips and Tricks**

SIX TYPES OF LIGHT SOURCES

- Ambient
- Directional
- Point
- Spot
- Area
- Volume

CREATING A NEW LIGHT



SIX TYPES OF LIGHT SOURCES

■ **Ambient**

■ Directional

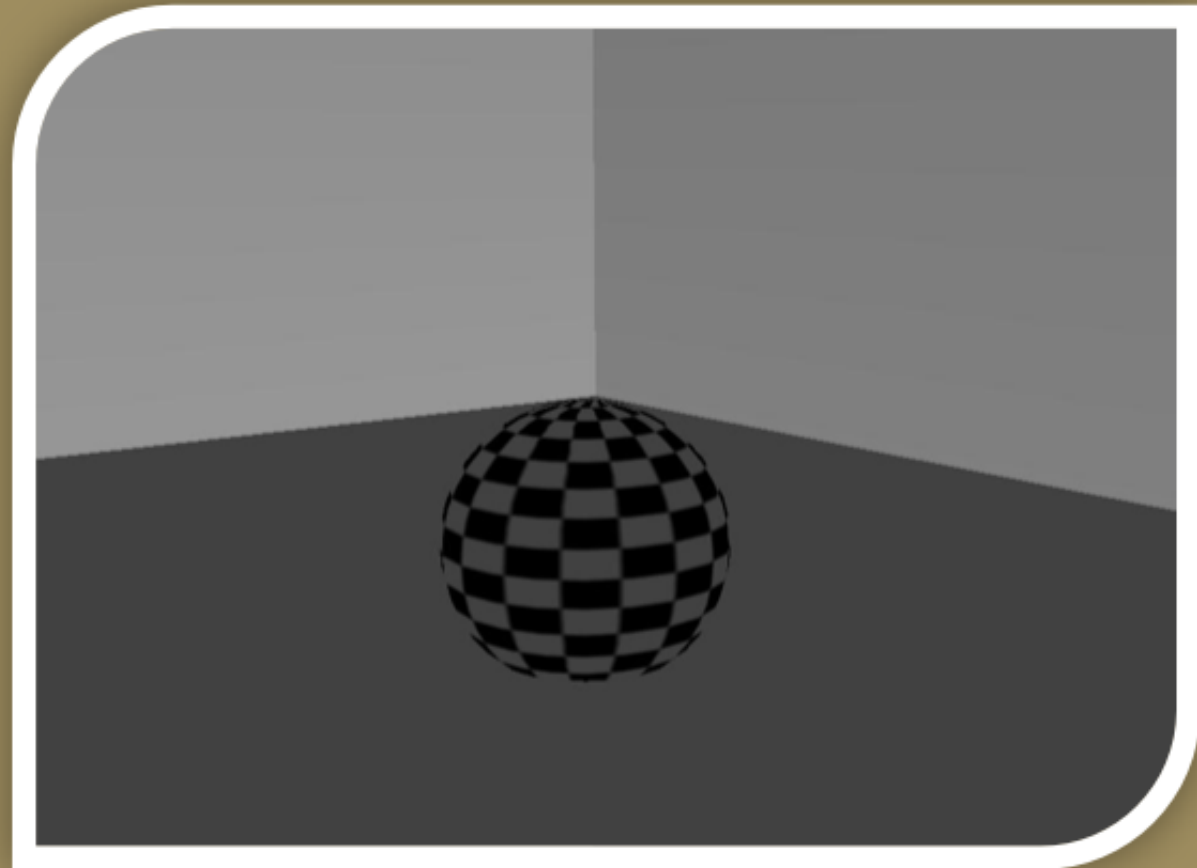
■ Point

■ Spot

■ Area

■ Volume

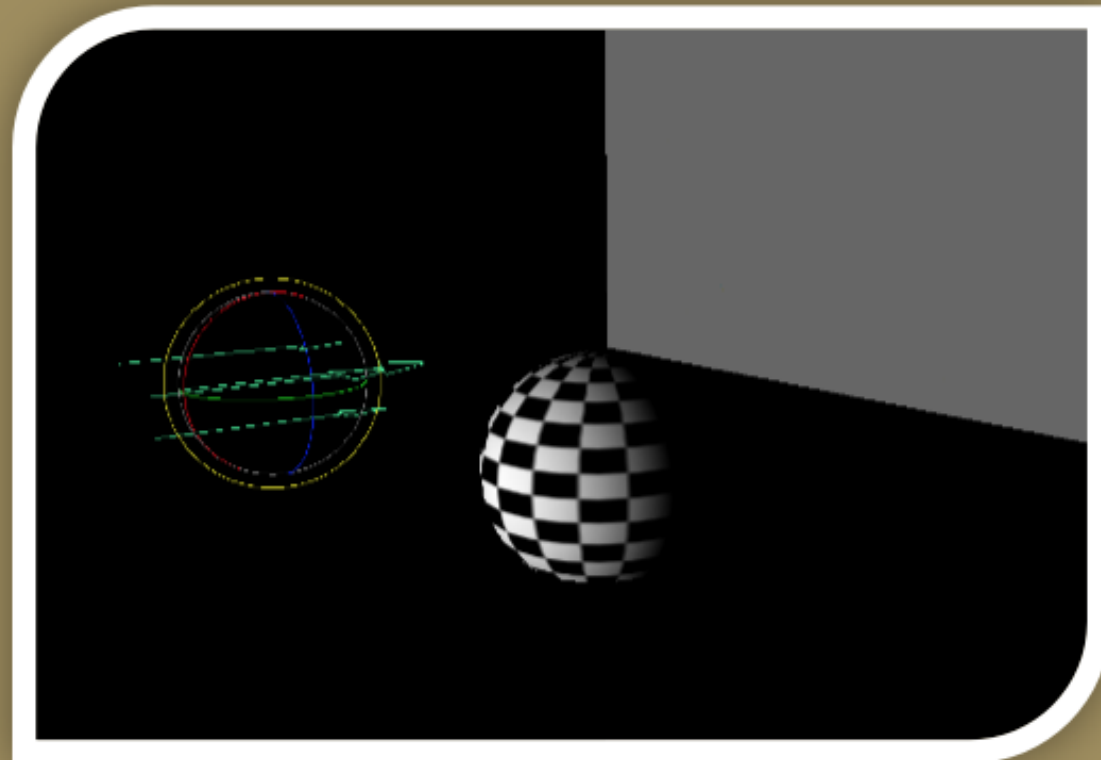
- Brightens all parts of the scene uniformly
- Useful for: Simulating a combination of direct and indirect lighting



SIX TYPES OF LIGHT SOURCES

- Ambient
- **Directional**
- Point
- Spot
- Area
- Volume

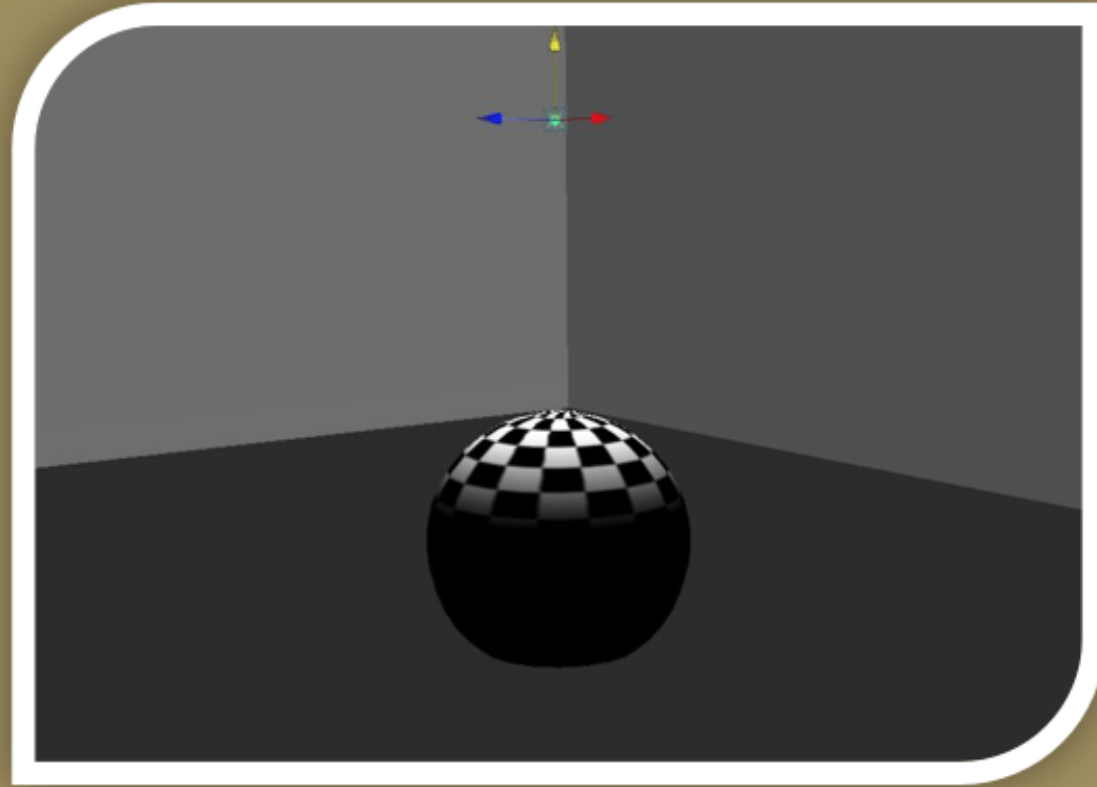
- Even illumination of a scene using parallel rays of light
- Useful for: Extremely far away sources
- Ex. Sunlight



SIX TYPES OF LIGHT SOURCES

- Ambient
- Directional
- **Point**
- Spot
- Area
- Volume

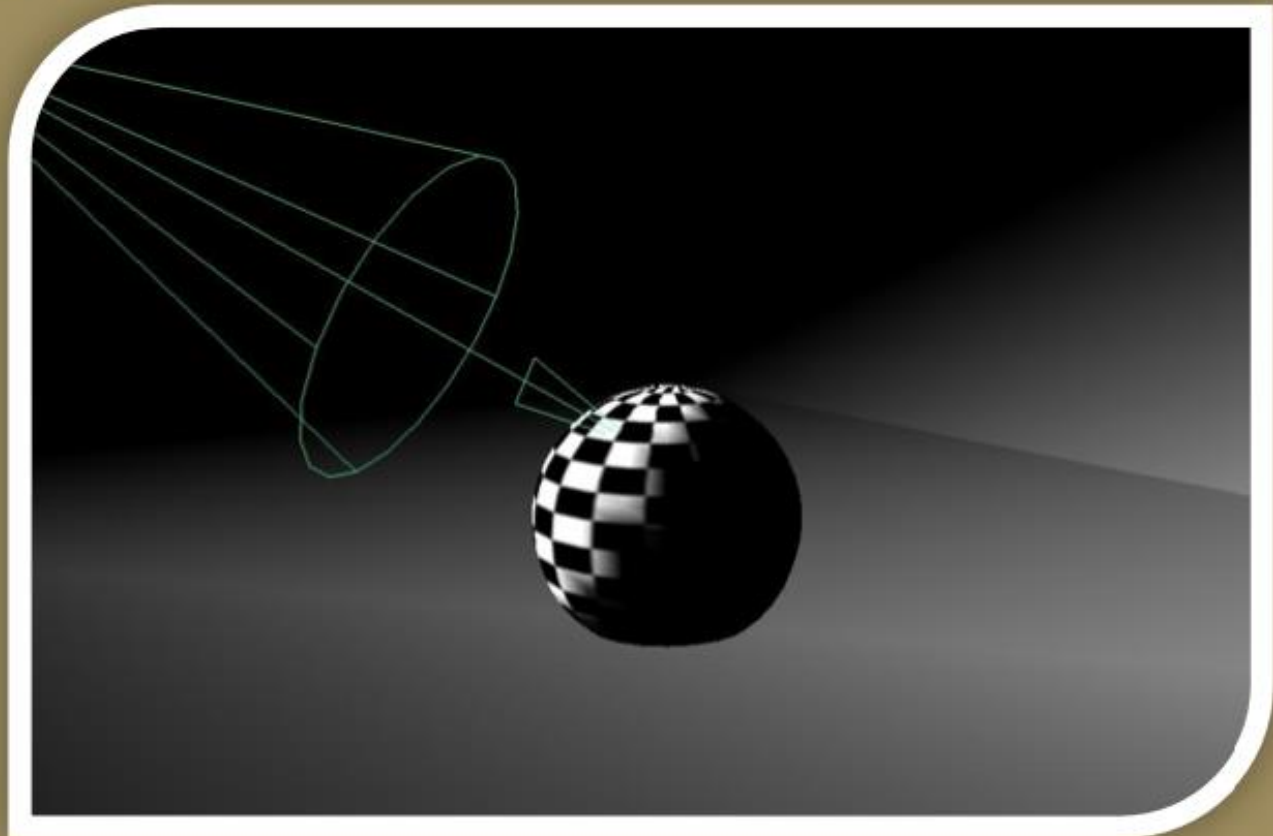
- Light radiates in all directions from a single point
- Ideal for: Omni-directional sources
- Ex. Lightbulb



SIX TYPES OF LIGHT SOURCES

- Ambient
- Directional
- Point
- **Spot**
- Area
- Volume

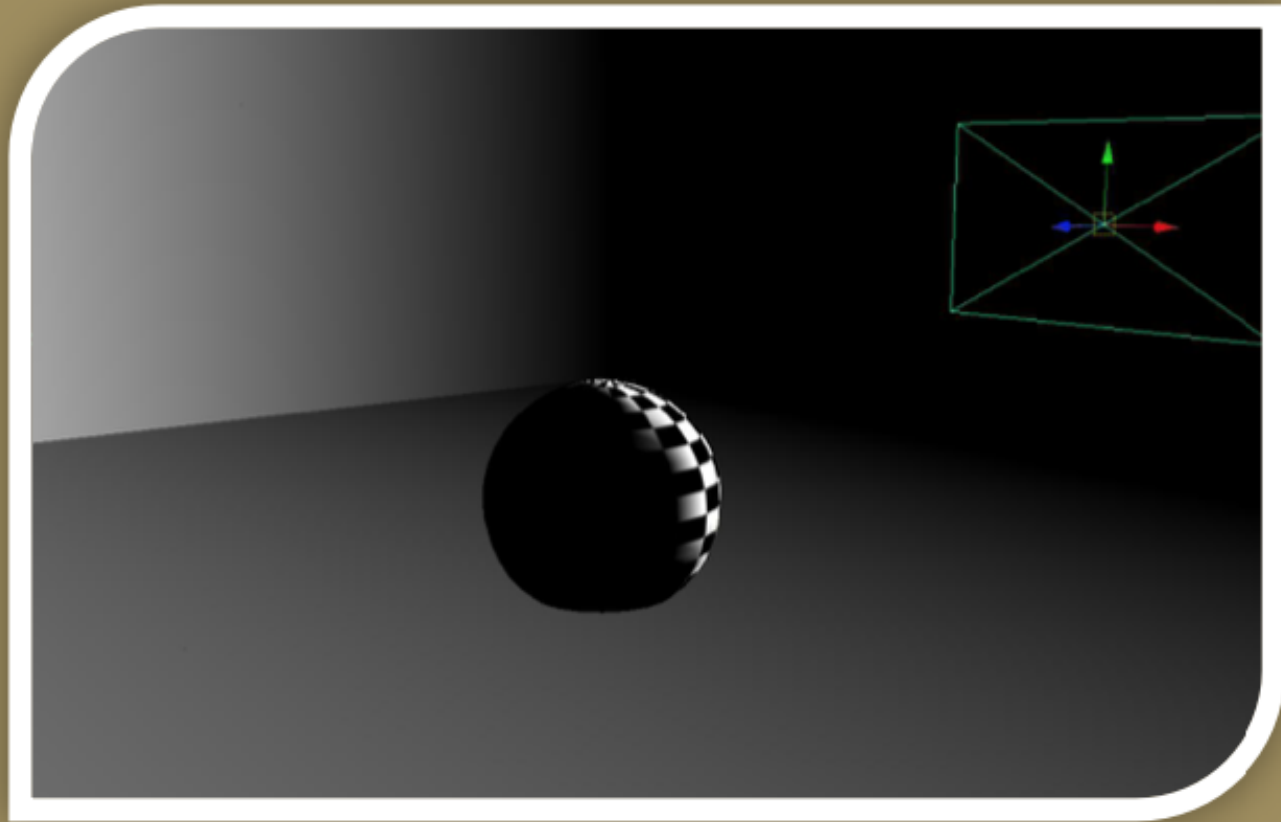
- Creates a cone of light in one direction
- Useful for: Beams of light
- Ex. Flashlight, Lighthouse



SIX TYPES OF LIGHT SOURCES

- Ambient
- Directional
- Point
- Spot
- **Area**
- Volume

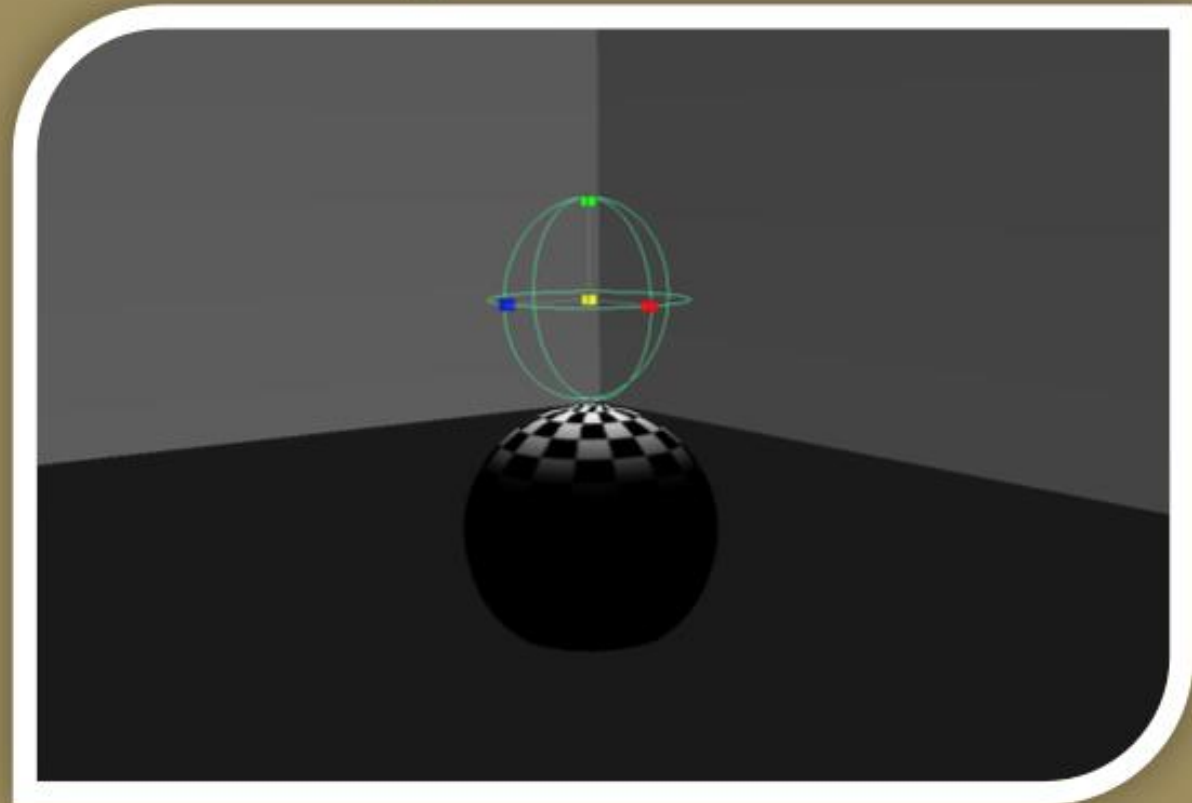
- 2D rectangular light sources
- Useful for: Windows, Ceiling Lights
- Longer render time



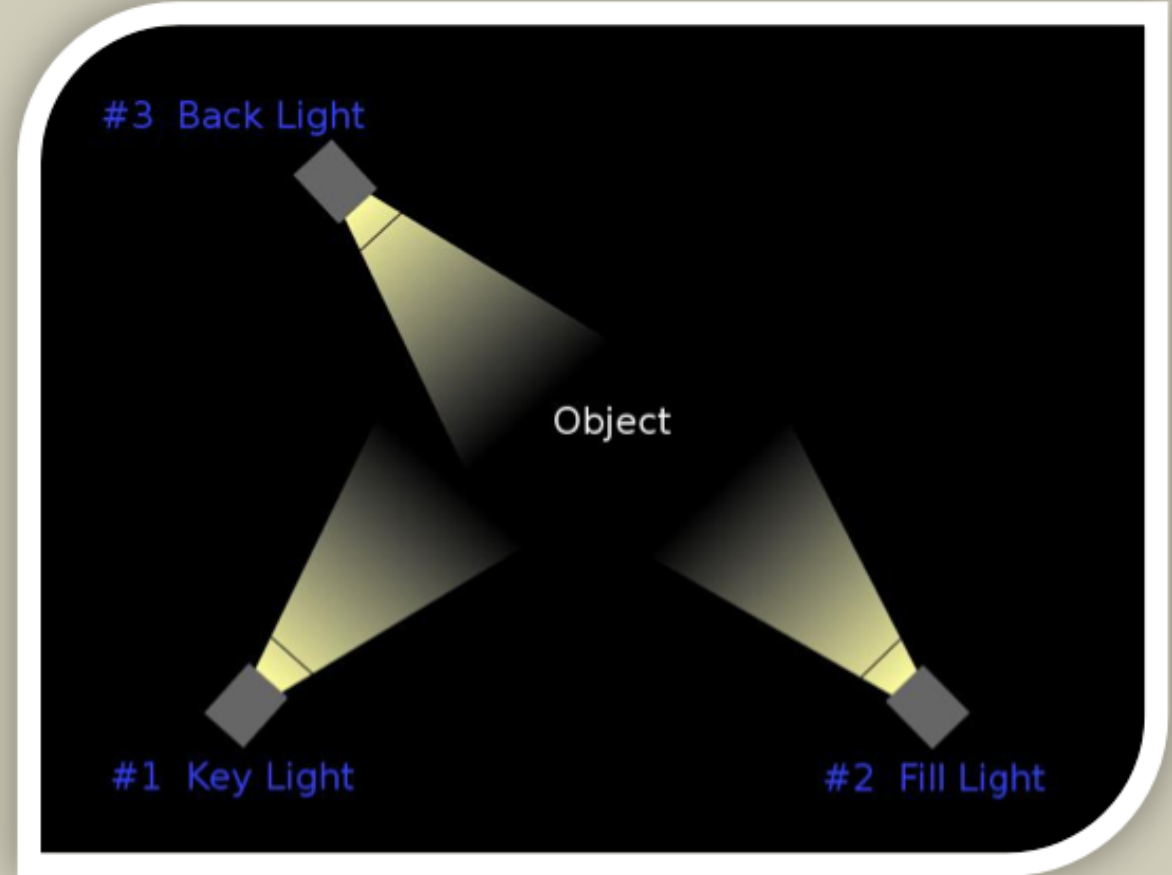
SIX TYPES OF LIGHT SOURCES

- Ambient
- Directional
- Point
- Spot
- Area
- **Volume**

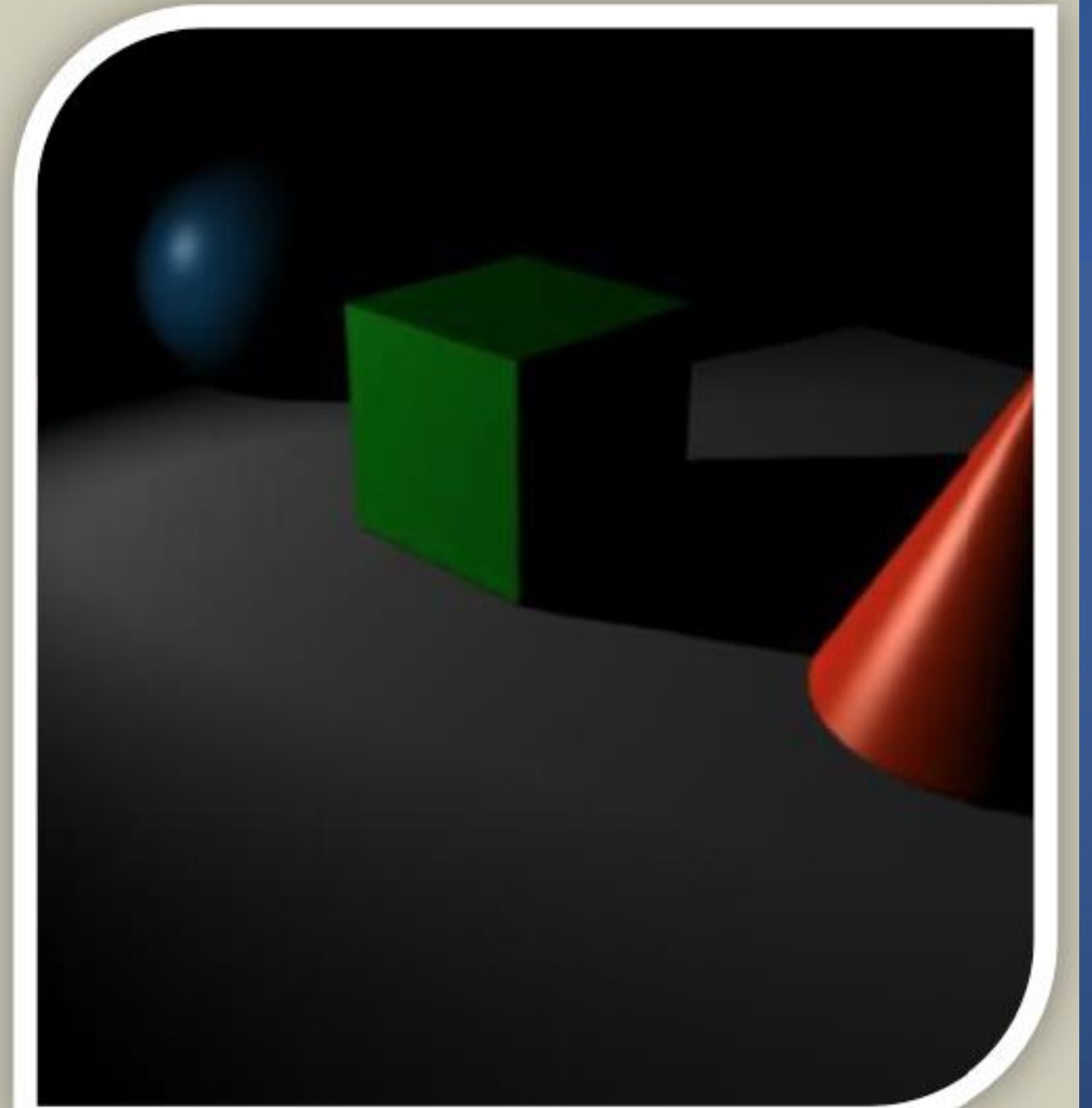
- Light fills a 3D shape (sphere, cylinder, etc.)
- Useful for: A visual representation of the extent of the light



- **Key Light** – main source illuminating the object
- **Secondary (Fill) Light** – highlights details of the object
- **Back Light** – distinguishes the object from the background



- **Intensity**
- **Fall-off/decay**
- **Cone Angle**
- **Penumbra Angle**
- **Drop-off**
- **Color**



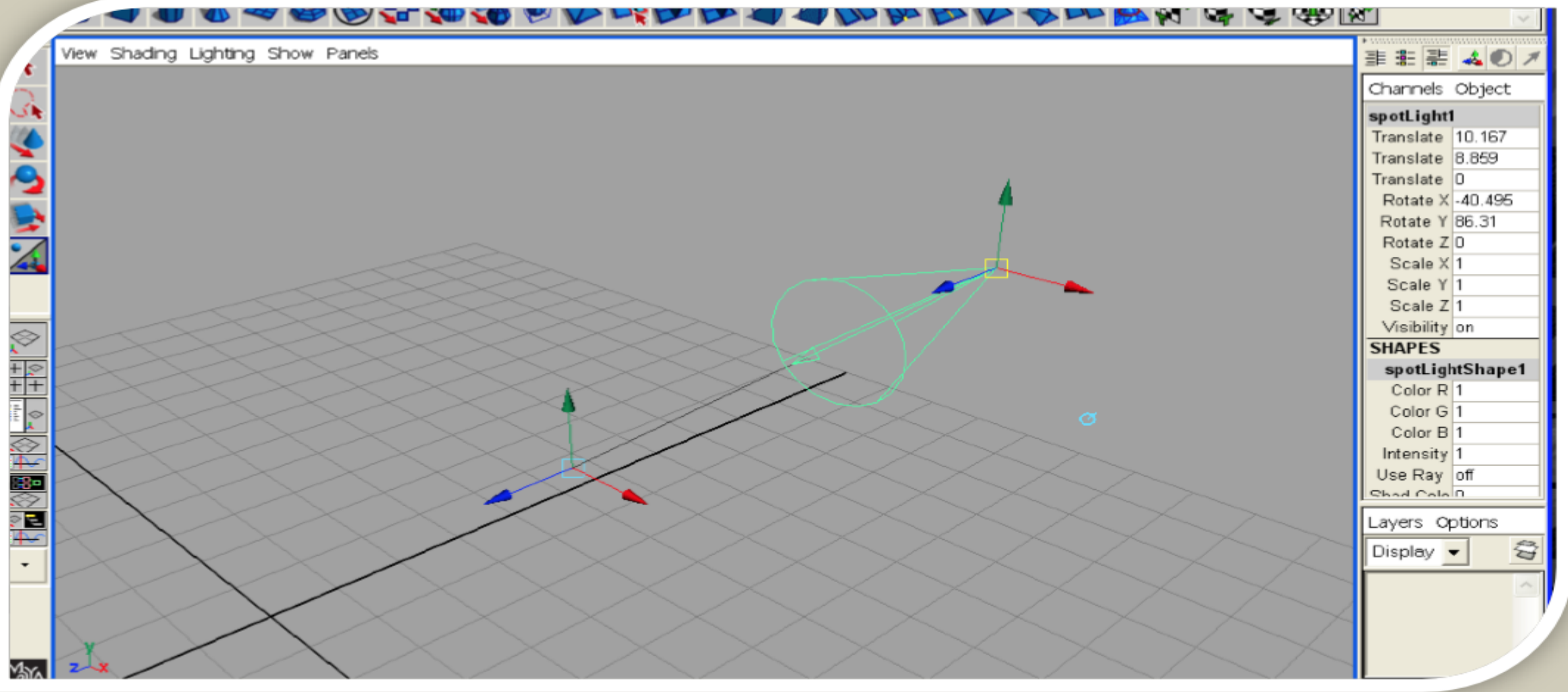
ATTRIBUTES OF LIGHTS

- **Intensity** - how much light emitted from the light source.
- **Decay** - how much light diminishes away from the source light (fall -off)
- **Cone Angle** - width of the lights cone of influence - area outside cone not illuminated
- **Penumbra Angle** - fall off at edge of cone angle - more gives a softer edge to the light cone
- **Drop-off** - how much the light diminishes at the outer

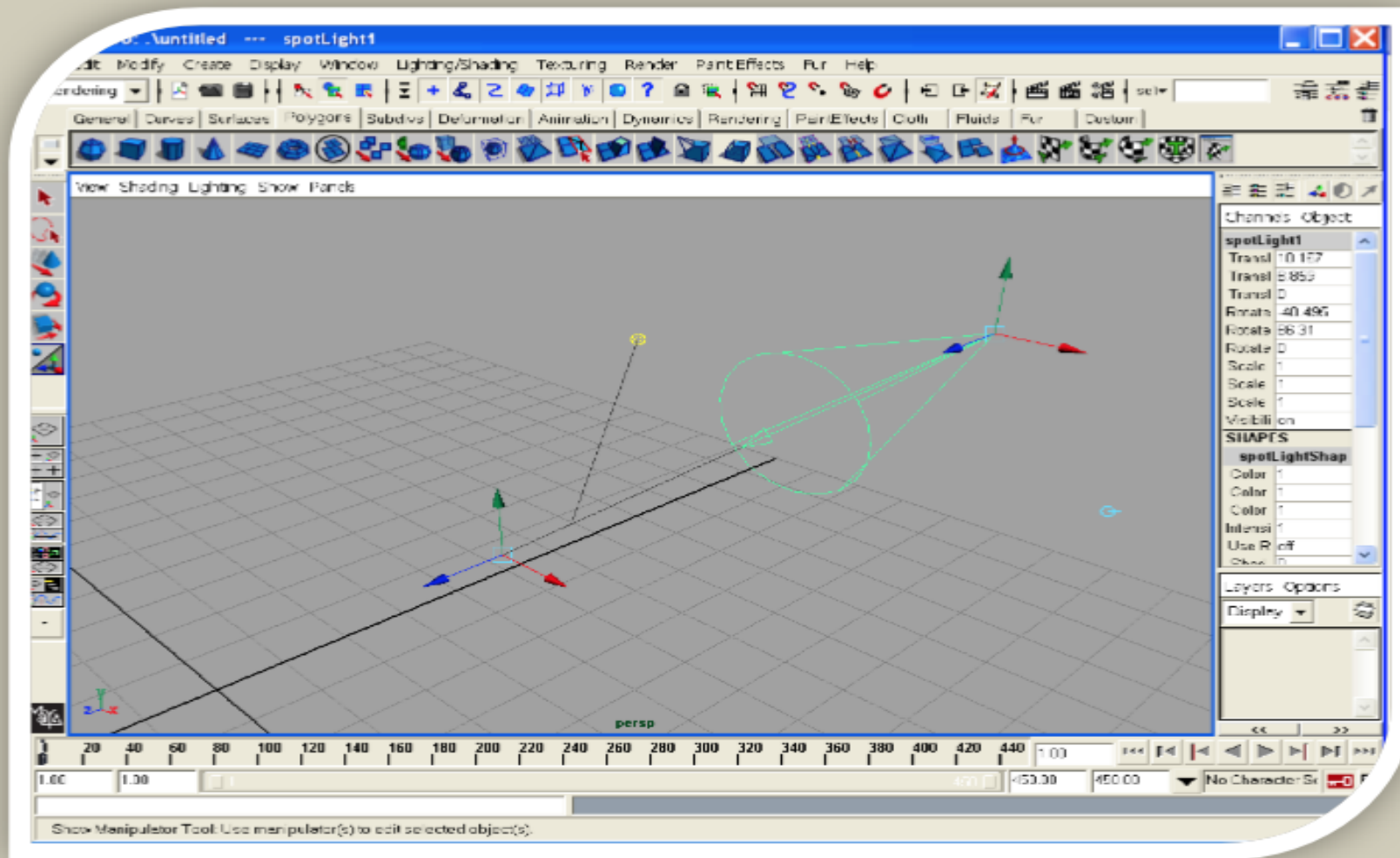
LIGHT CONTROLS

- Aim From/Aim At
- Fall-off Rate
- Cone Radius
- Penumbra/Umbra control
- Non-linear fall-off
- All In One Control

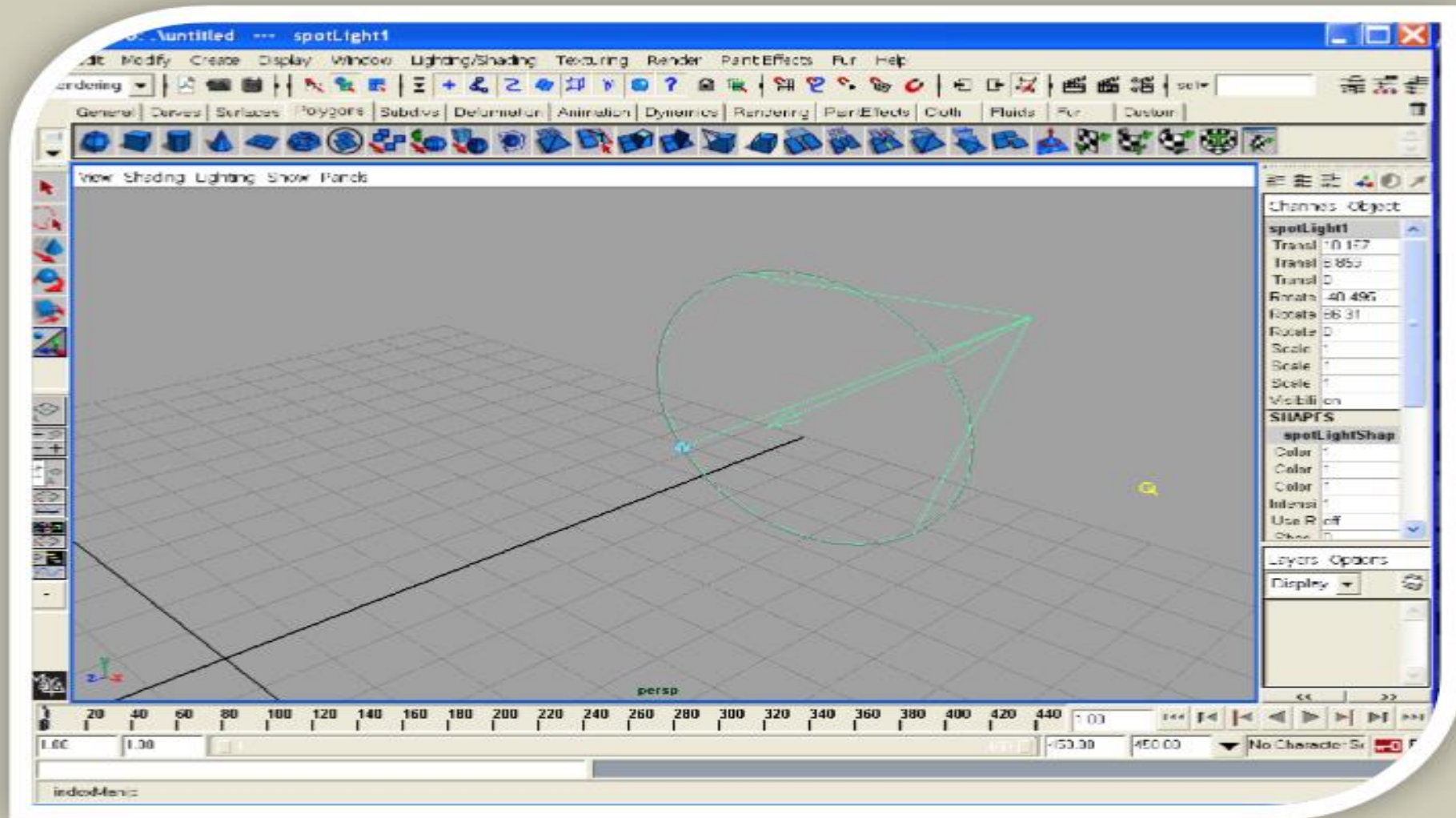
AIM FROM/AIM AT



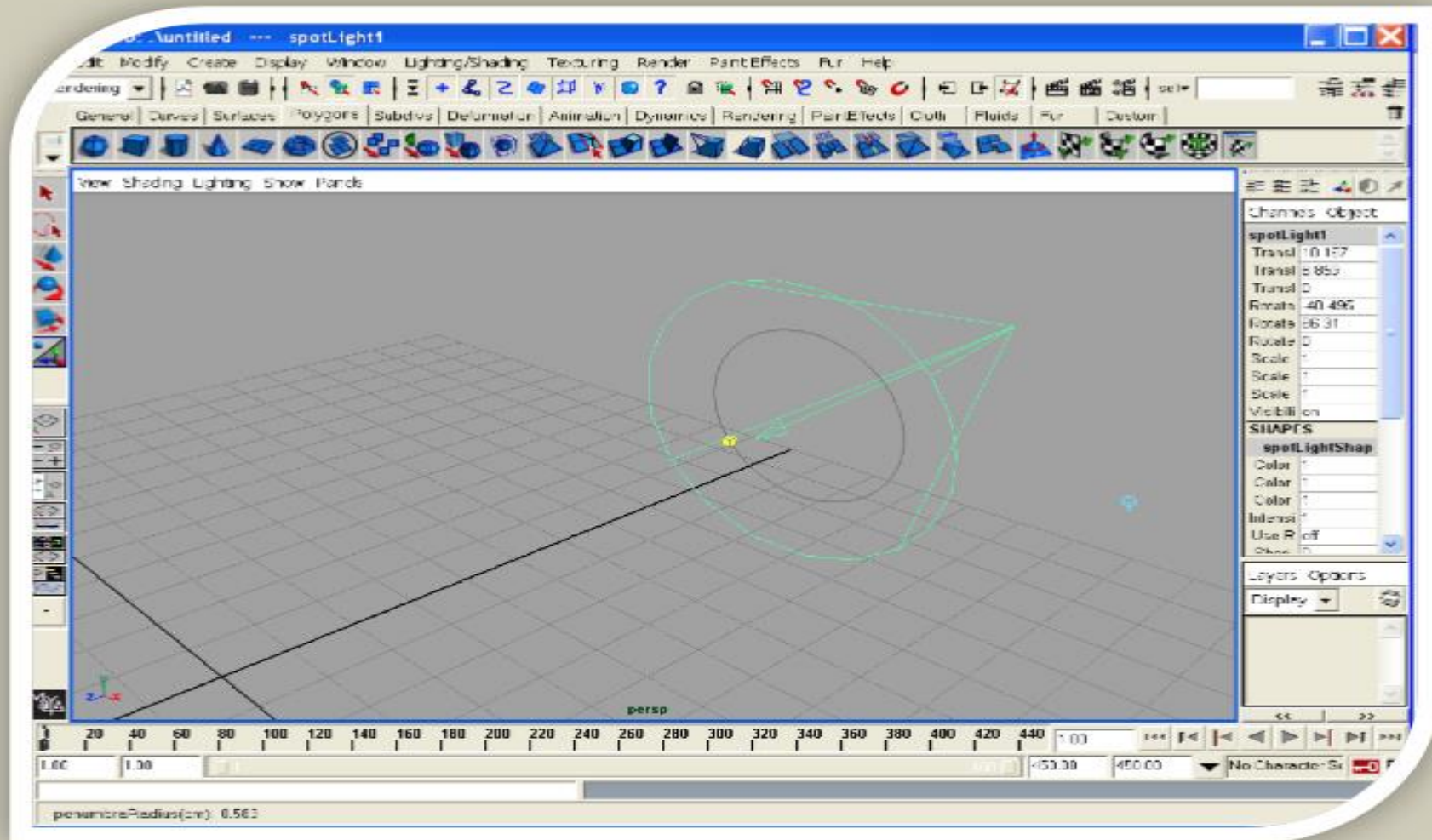
FALL-OFF RATE



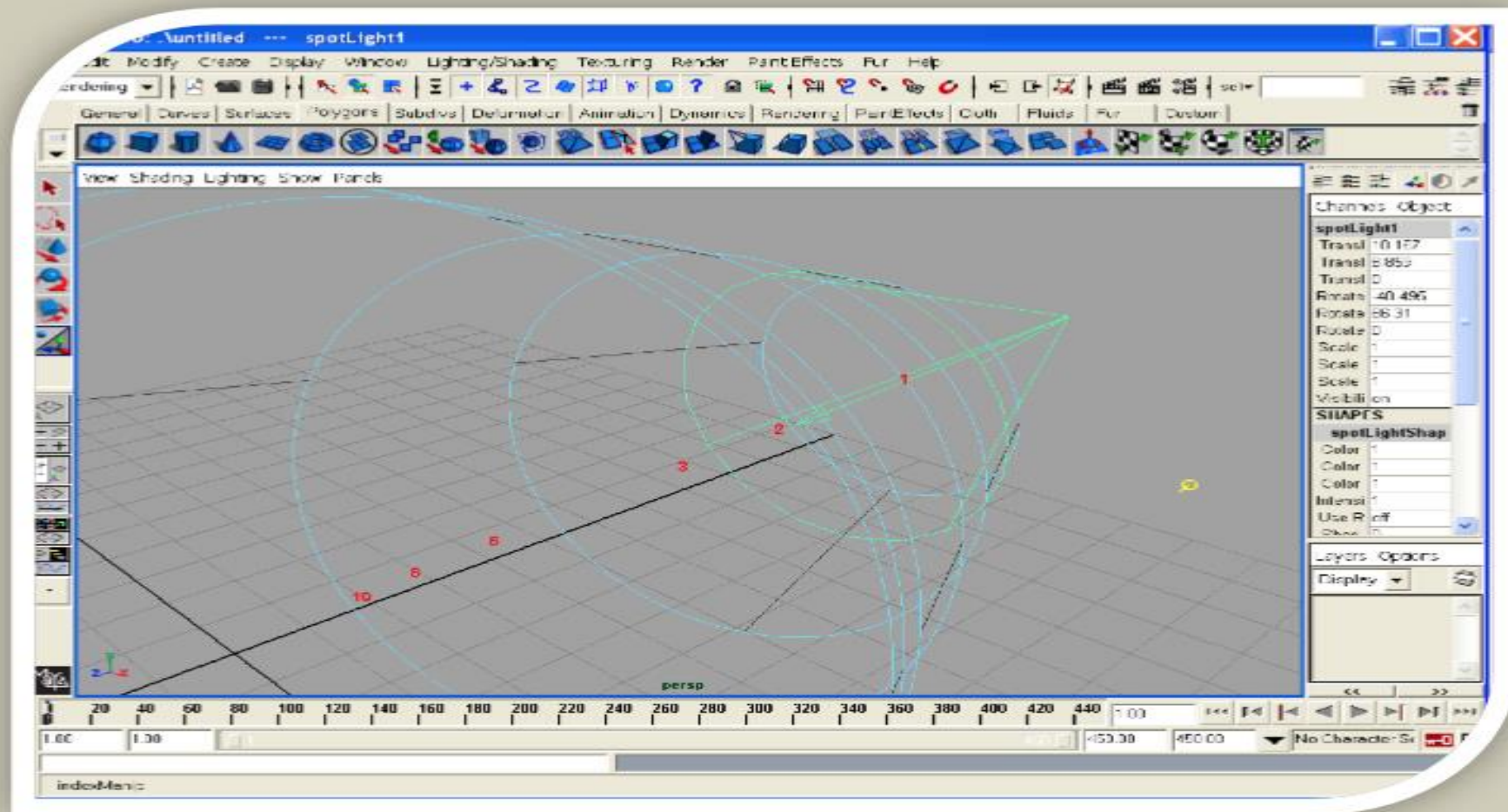
CONE RADIUS



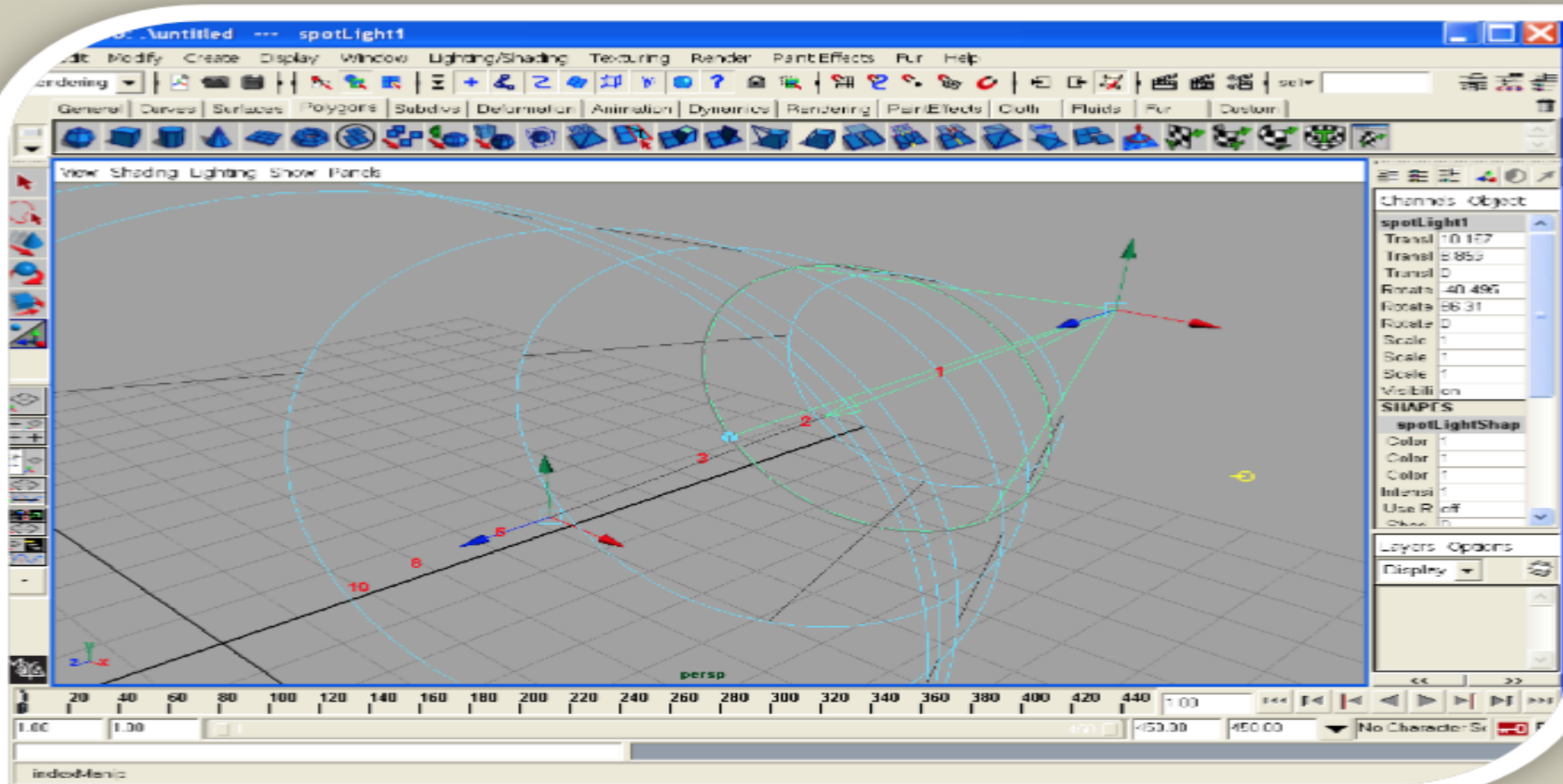
PENUMBRA/UMBRA CONTROL



NON-LINEAR FALL-OFF



ALL IN ONE CONTROL



GOOD WAYS TO USE LIGHTS

- **Look to photographers for good techniques**
- **Think in terms of balance.**
- **Avoid the overly dramatic.**
- **Look at natural lighting.**
- **Avoid saturated lights and hues**
- **Normally only need a few lights.**
- **Avoid disco colors and effects.**



<http://warpedspace.org/lightingT/Images/Renders/LightIntensity/IV6.jpg>



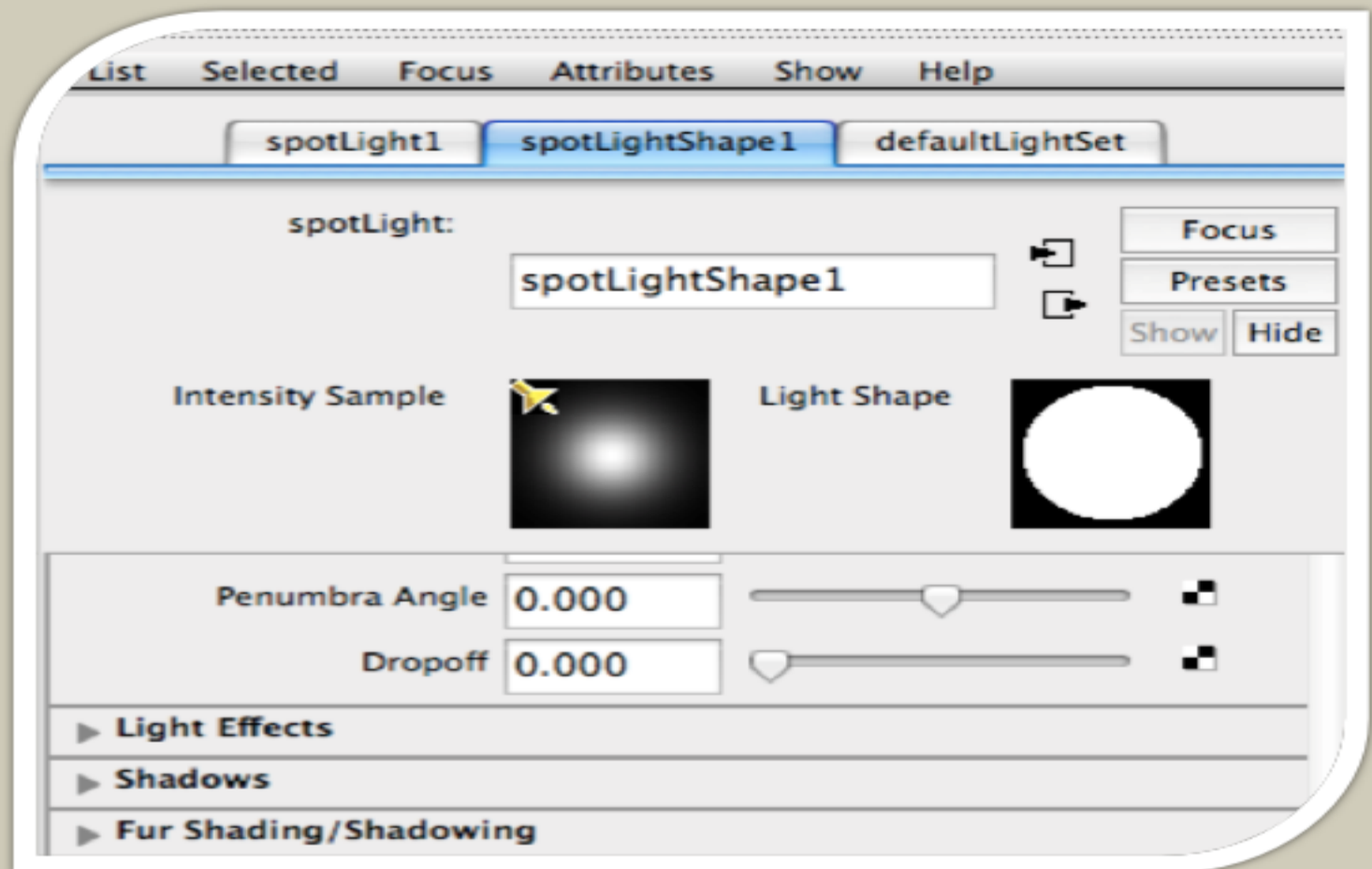
**Light Intensity from too
Dark to too bright.**

SHADOWS

TWO TYPES OF SHADOWS

- Depth Map
- Raytrace

CHANGING LIGHT ATTRIBUTES

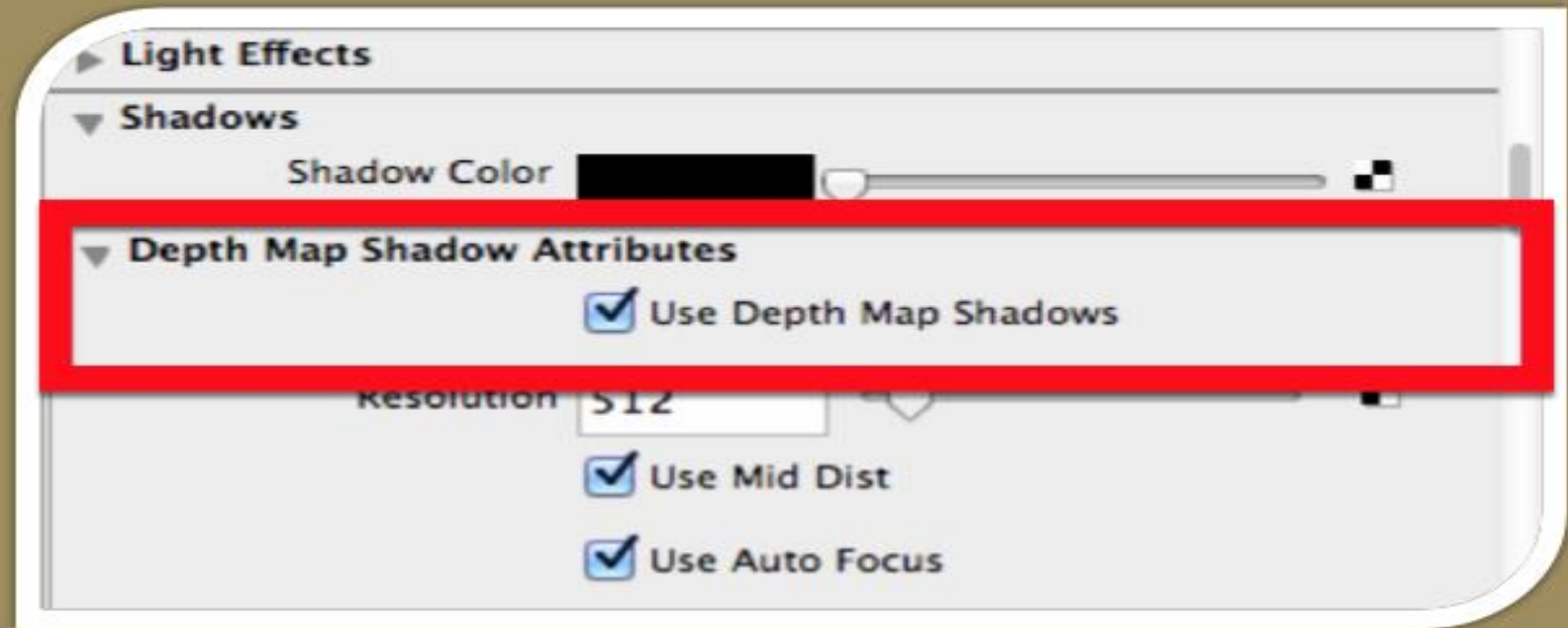


SHADOWS

TWO TYPES OF SHADOWS

- **Depth Map**
- Raytrace

- Under light shape attribute editor
- Less accurate shadows
- Faster render time

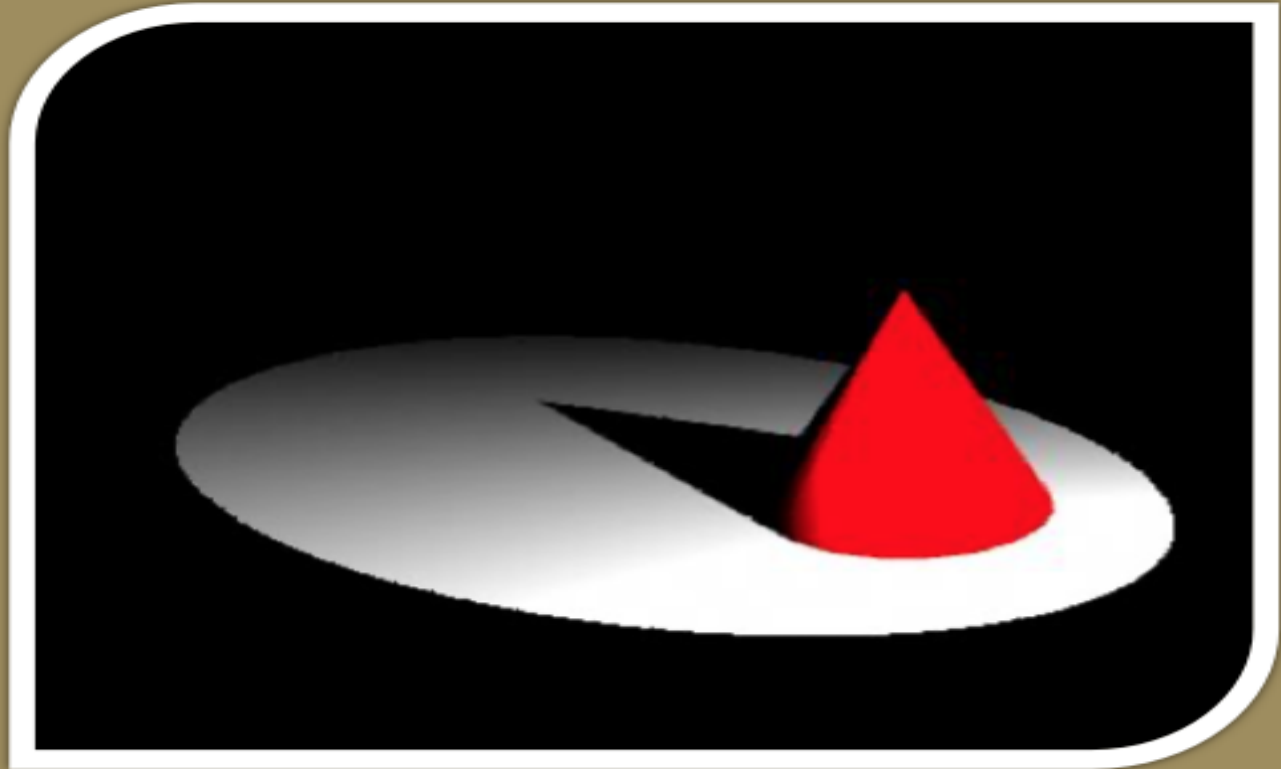


SHADOWS

TWO TYPES OF SHADOWS

- **Depth Map**
- Raytrace

- Less accurate shadows
- Faster render time

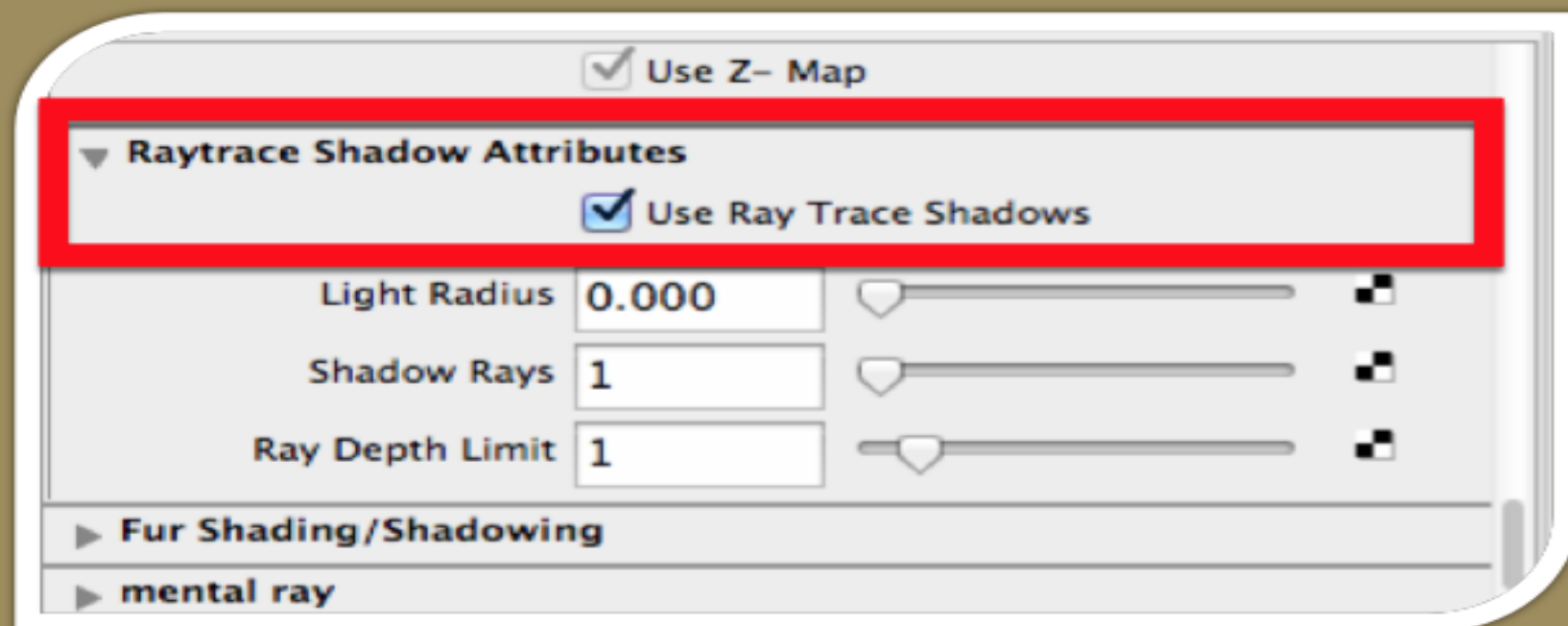


SHADOWS

TWO TYPES OF SHADOWS

- Depth Map
- **Raytrace**

- Under light shape attribute editor
- More accurate shadows
- Longer render time

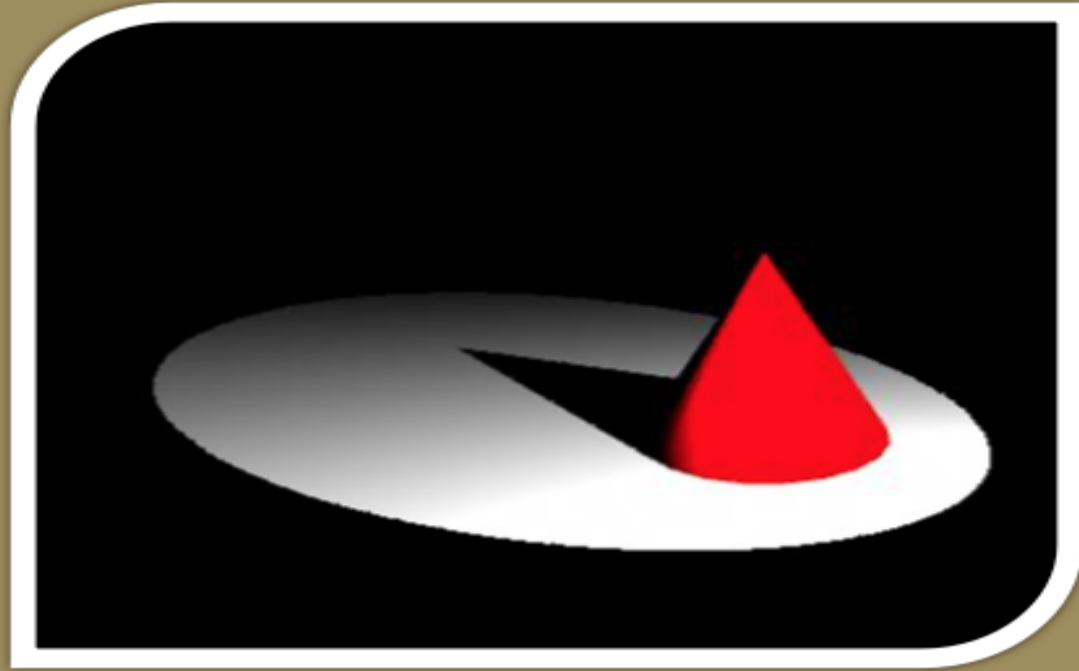


SHADOWS

TWO TYPES OF SHADOWS

- Depth Map
- Raytrace

- Slight difference from Depth Map shadows
- More accurate shadows
- Longer render time

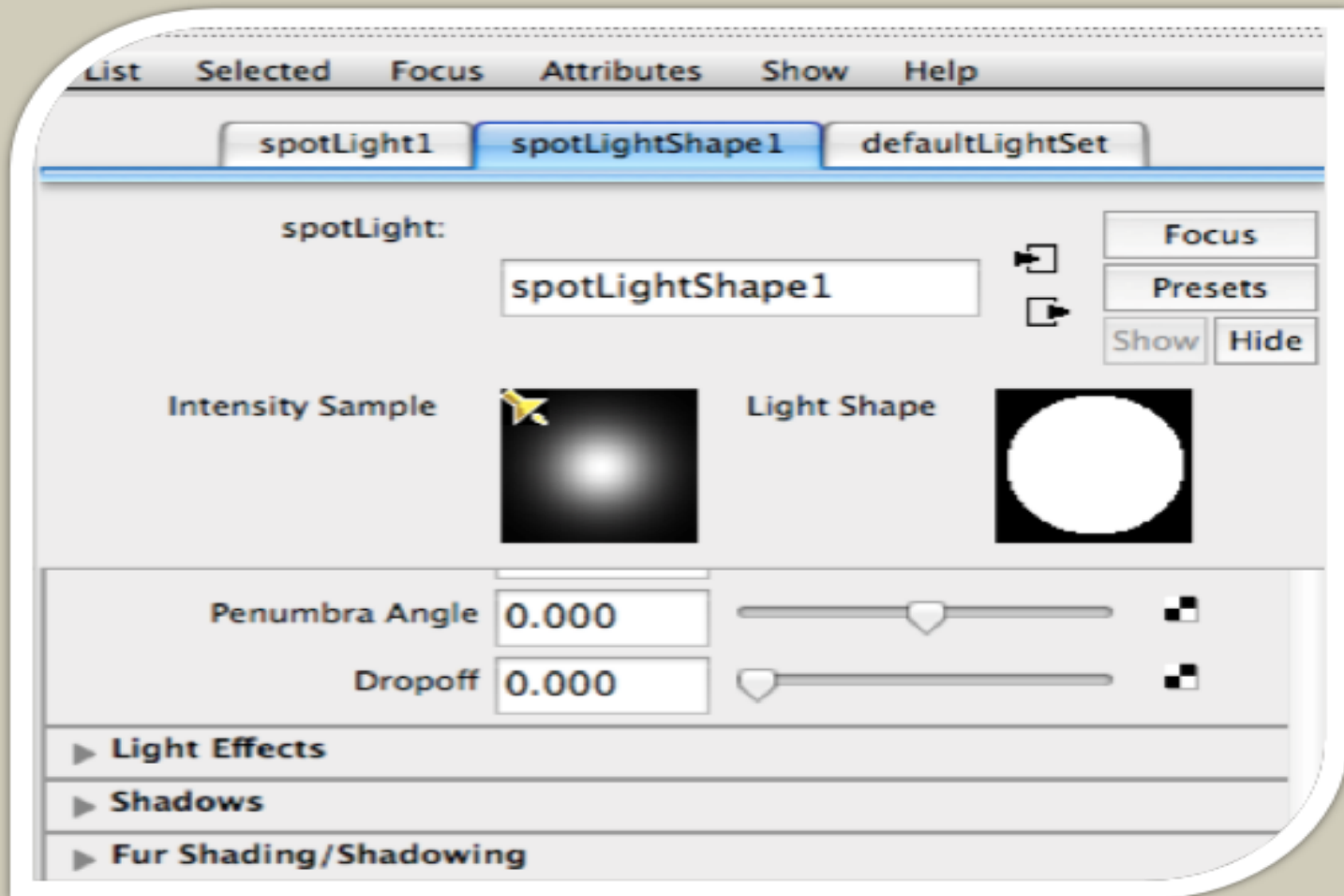


SHADOW EFFECTS

THREE TYPES OF SHADOW EFFECTS

- Hard Shadows
- Soft Shadows
- Fall-out

CHANGING LIGHT ATTRIBUTES

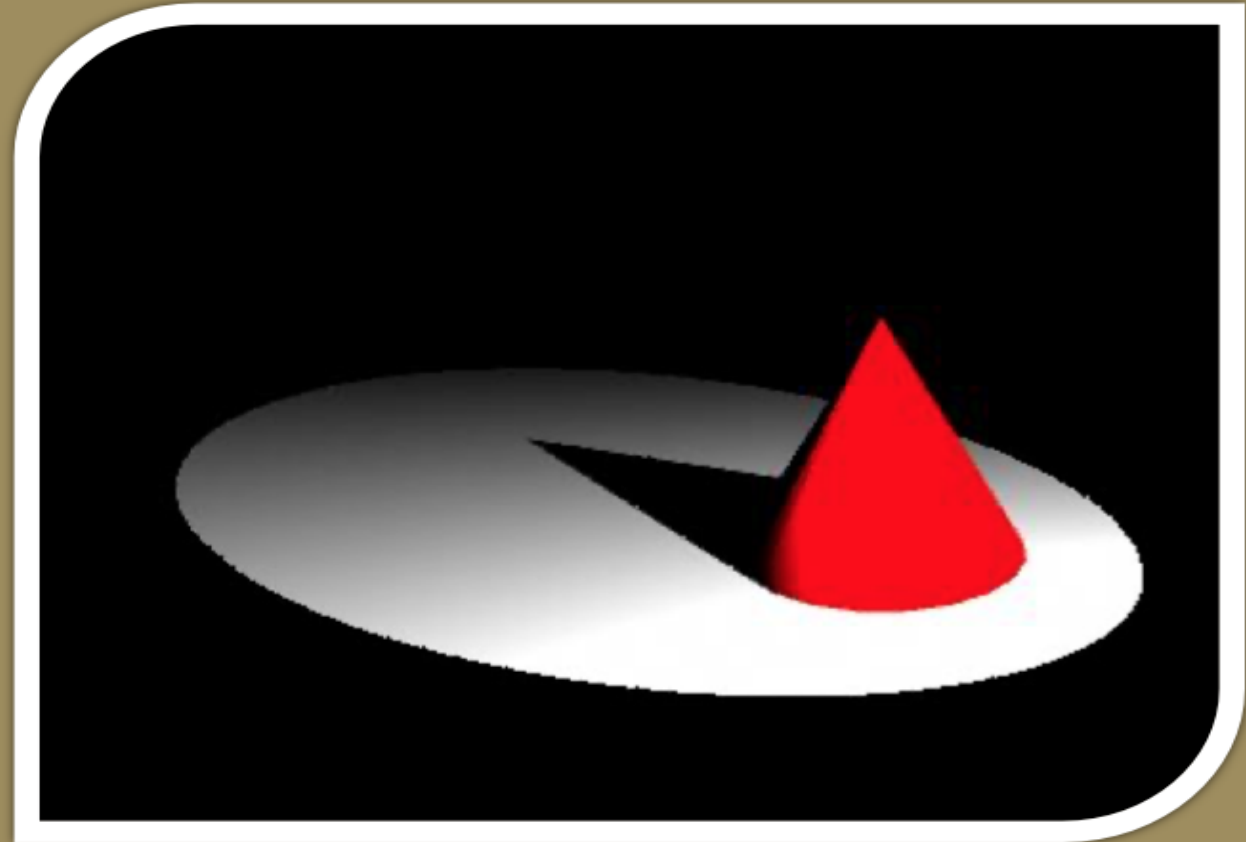


SHADOW EFFECTS

THREE TYPES OF SHADOW EFFECTS

- **Hard Shadows**
- Soft Shadows
- Fall-out

- Default shadow option
- Faster render time

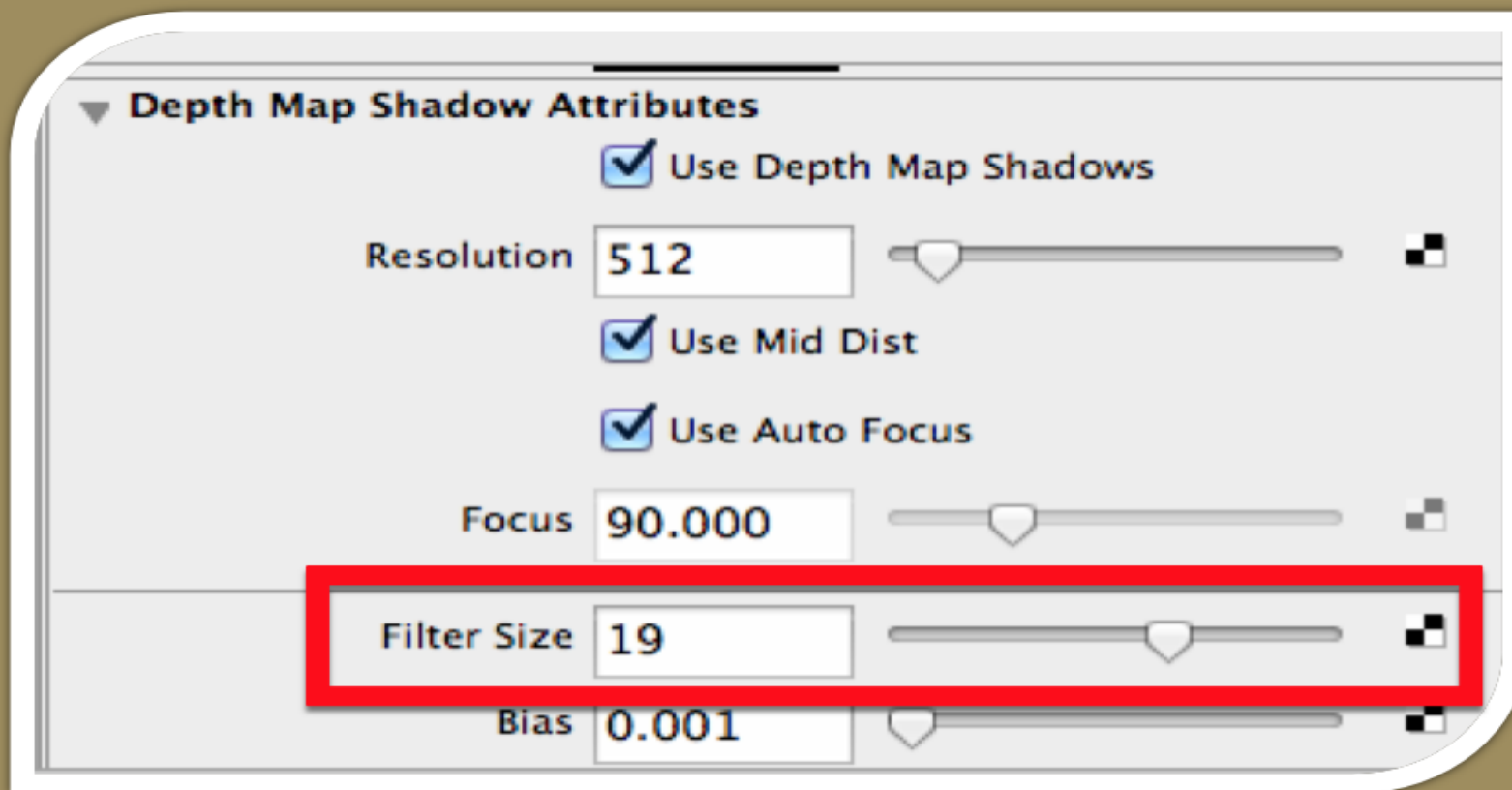


SHADOW EFFECTS

THREE TYPES OF SHADOW EFFECTS

- Hard Shadows
- **Soft Shadows**
- Fall-out

- Under *Depth Map Shadow Attributes*, increase *Filter Size*

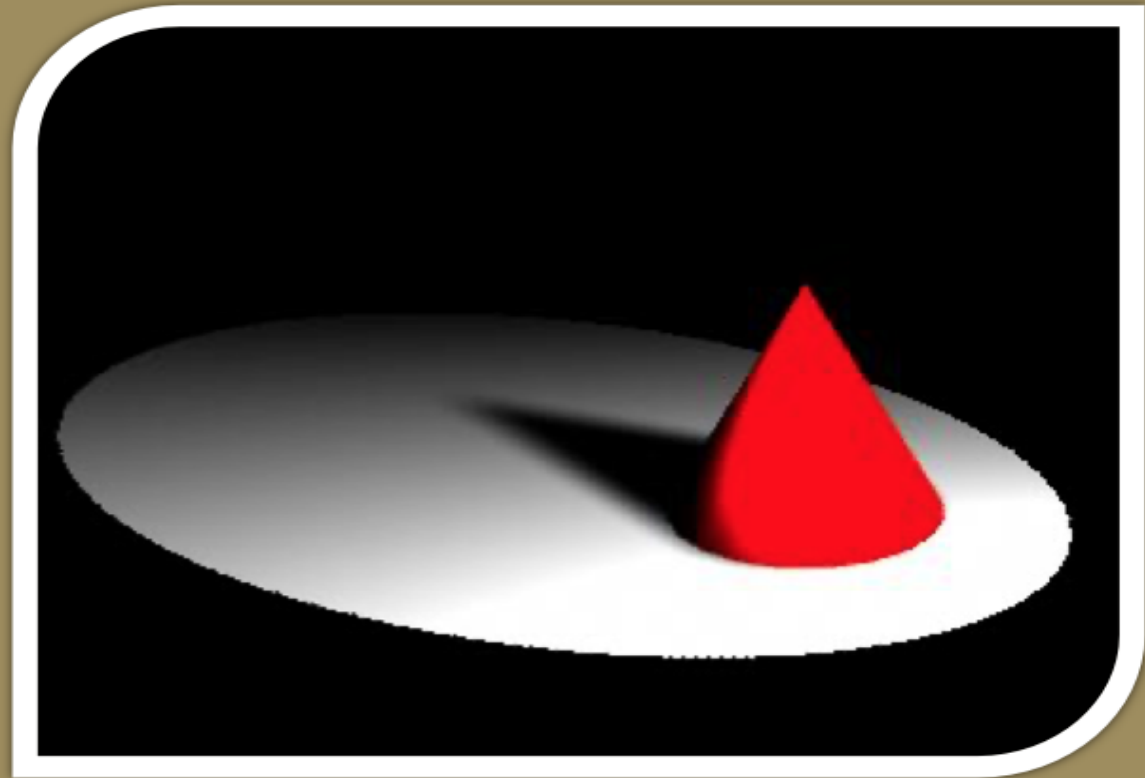


SHADOW EFFECTS

THREE TYPES OF SHADOW EFFECTS

- Hard Shadows
- **Soft Shadows**
- Fall-out

- Creates soft, more realistic faded edges around shadow
- Longer render time

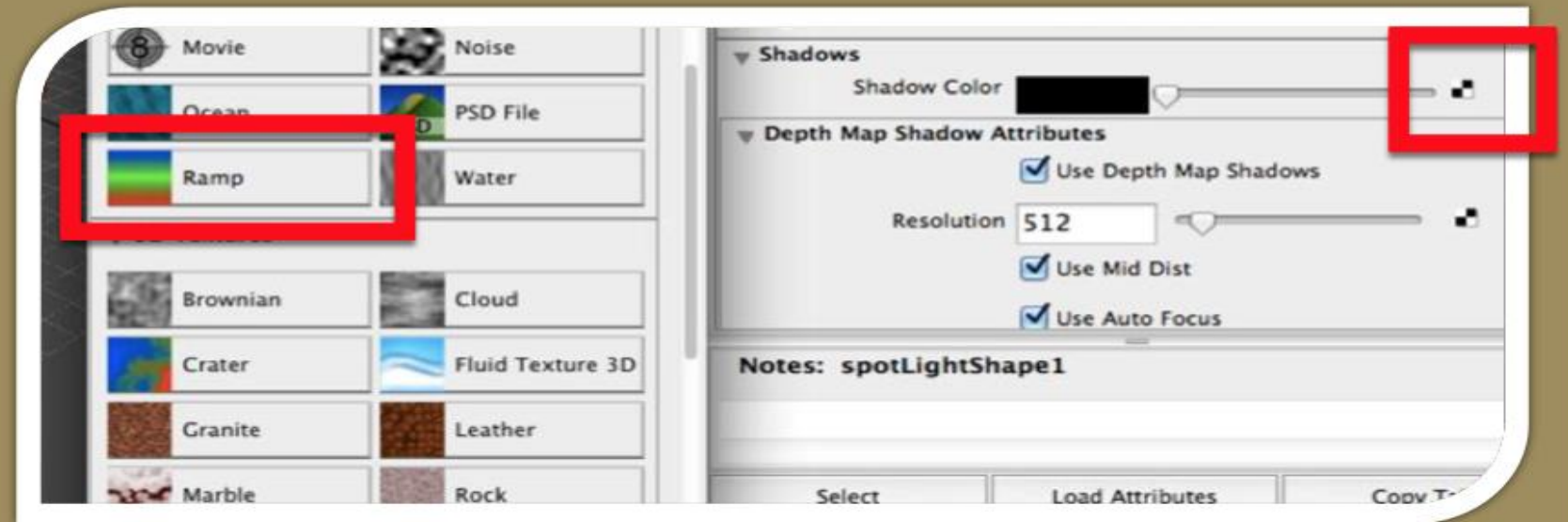


SHADOW EFFECTS

THREE TYPES OF SHADOW EFFECTS

- Hard Shadows
- Soft Shadows
- Fall-out

- More natural looking shadows
- Select checkered box by *Shadow Color*
- Select *Ramp*

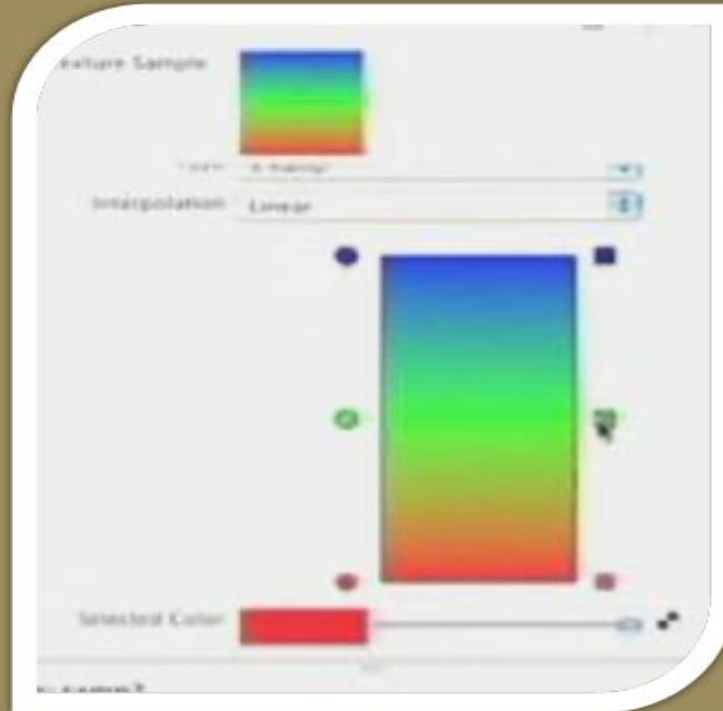


SHADOW EFFECTS

THREE TYPES OF SHADOW EFFECTS

- Hard Shadows
- Soft Shadows
- Fall-out

- Remove middle color (green) by selecting [X] on right
- Select top color to be white
- Select bottom color to be black



SHADOW EFFECTS

THREE TYPES OF SHADOW EFFECTS

- Hard Shadows
- Soft Shadows
- Fall-out

- Invert bottom and top colors by selecting colored dots on the left

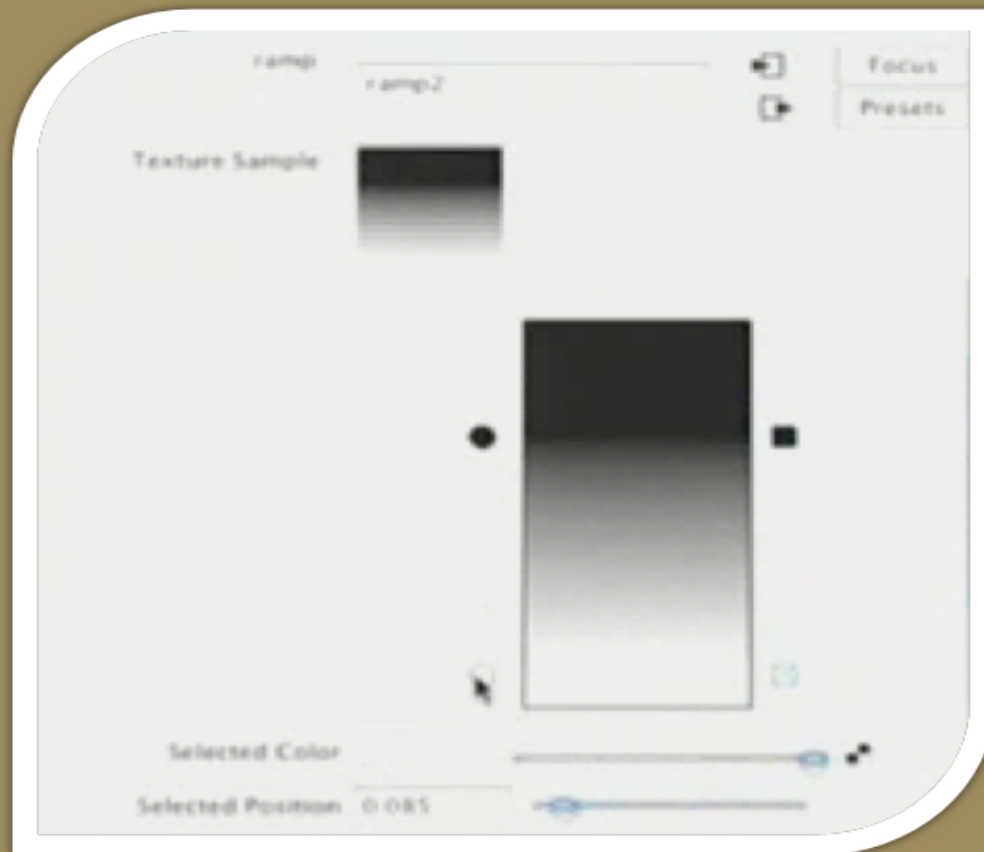


SHADOW EFFECTS

THREE TYPES OF SHADOW EFFECTS

- Hard Shadows
- Soft Shadows
- **Fall-out**

- Invert bottom and top colors by selecting colored dots on the left

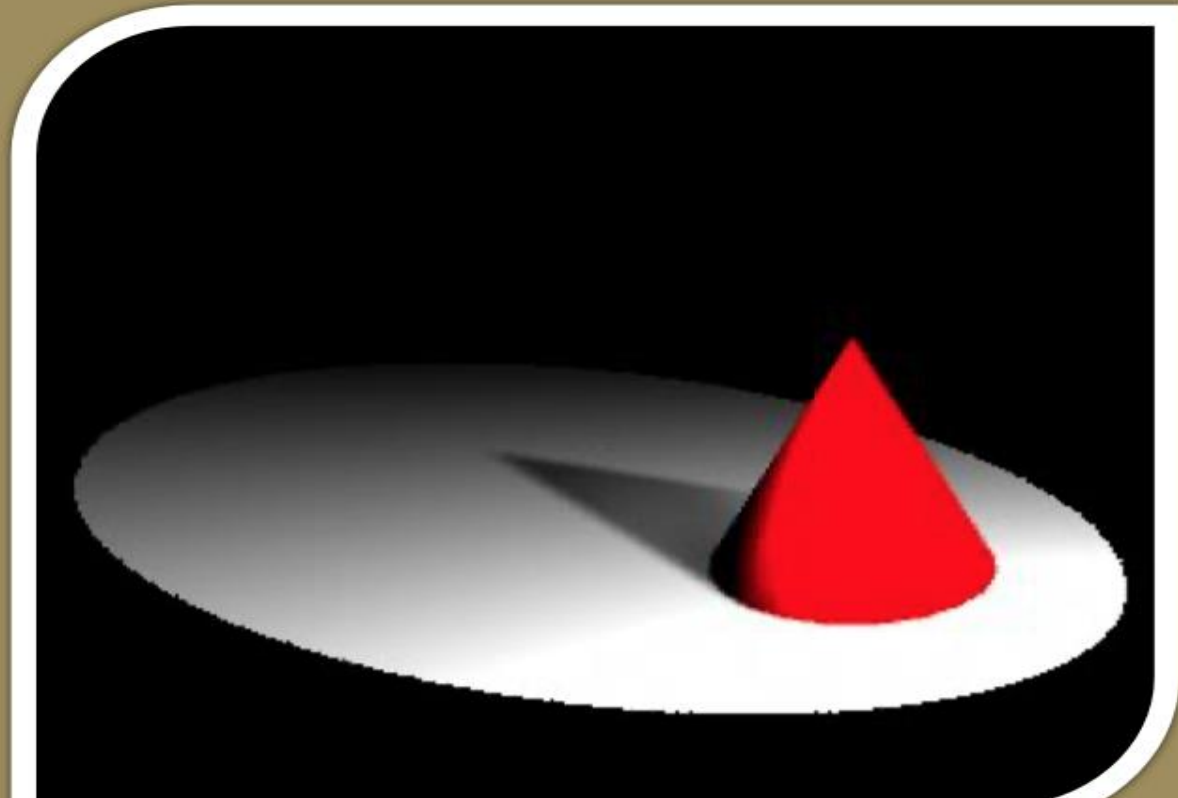


SHADOW EFFECTS

THREE TYPES OF SHADOW EFFECTS

- Hard Shadows
- Soft Shadows
- **Fall-out**

- Acts like a color gradient
- Shadow becomes lighter at top of shadow

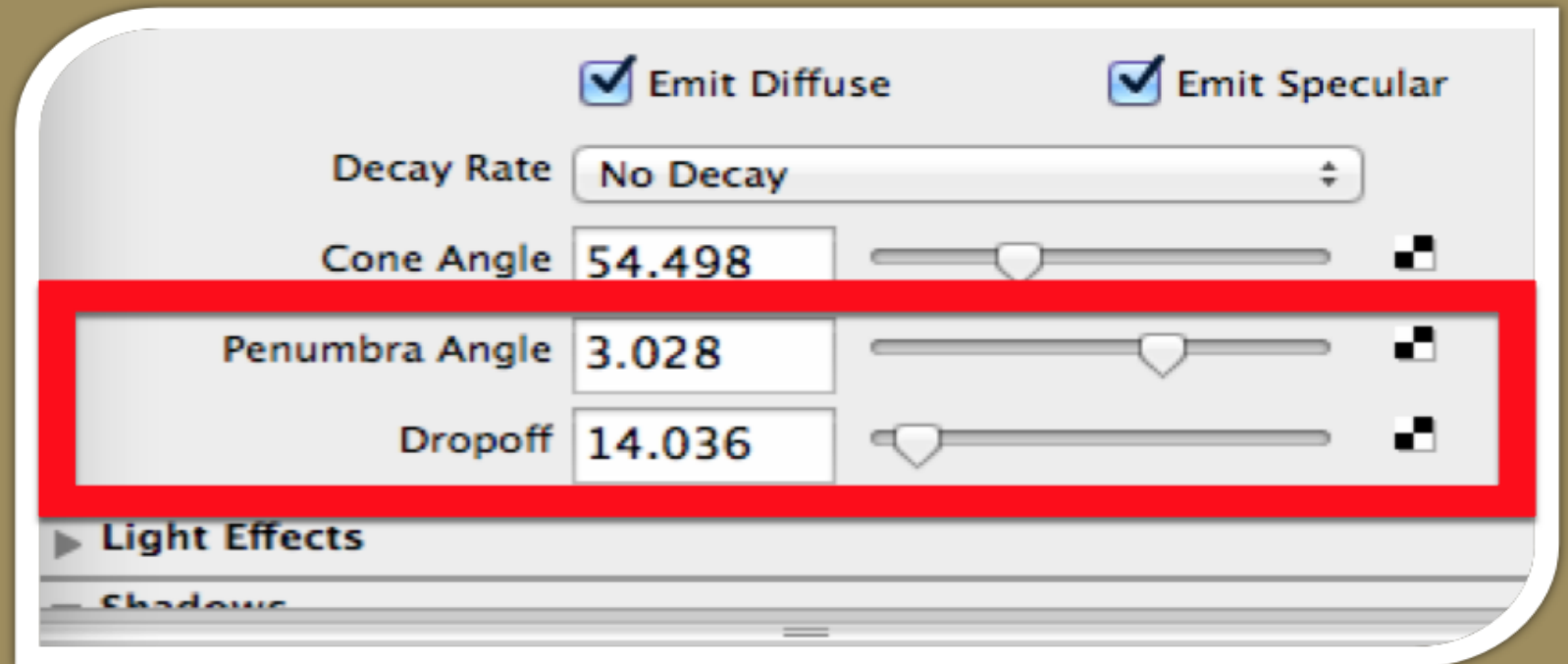


SHADOW EFFECTS

THREE TYPES OF SHADOW EFFECTS

- Hard Shadows
- Soft Shadows
- Fall-out

- Can also change softness of light from top attributes
 - Penumbra angle
 - Dropoff

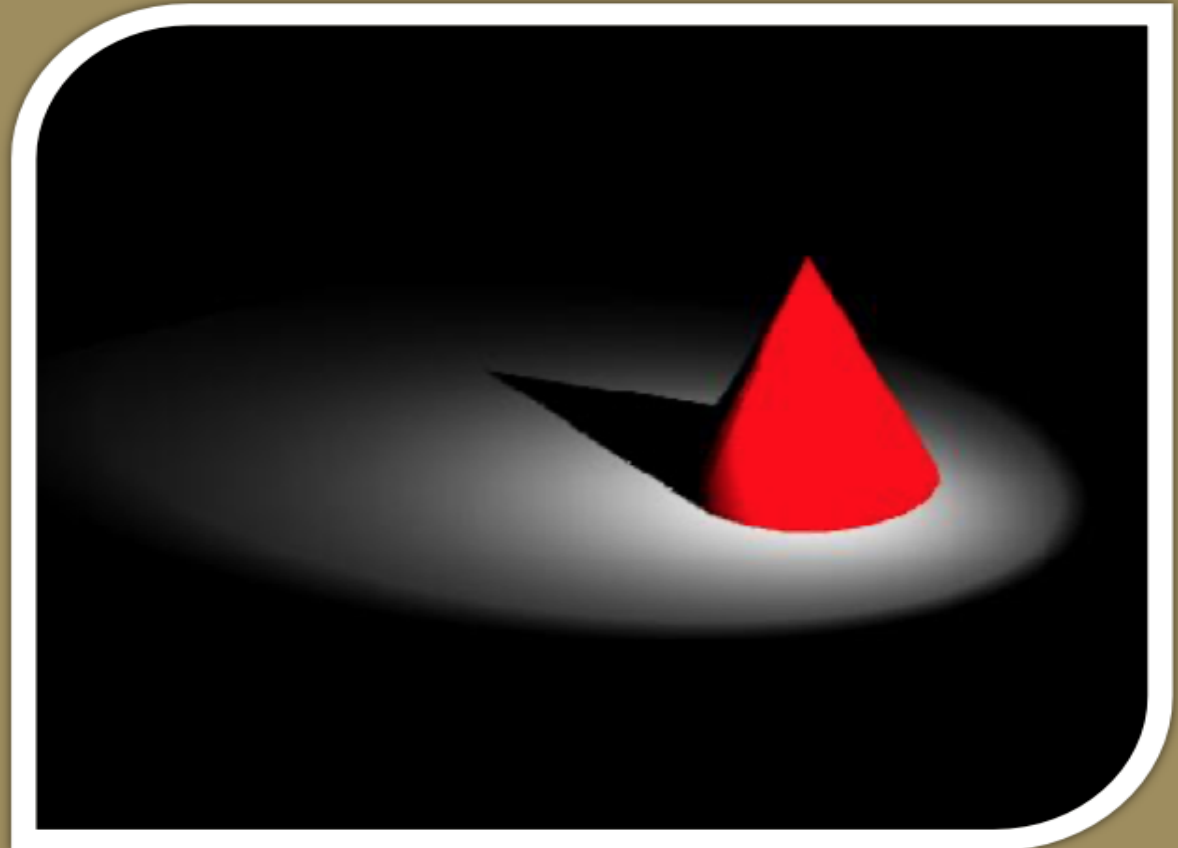


SHADOW EFFECTS

THREE TYPES OF SHADOW EFFECTS

- Hard Shadows
- Soft Shadows
- Fall-out

- Makes spotlight softer and more realistic



SHADING

Shading is a combination of the basic material of an object and any textures that are applied to it



In our presentation, we will discuss Materials. Textures will be covered by the Modeling group.

SHADING

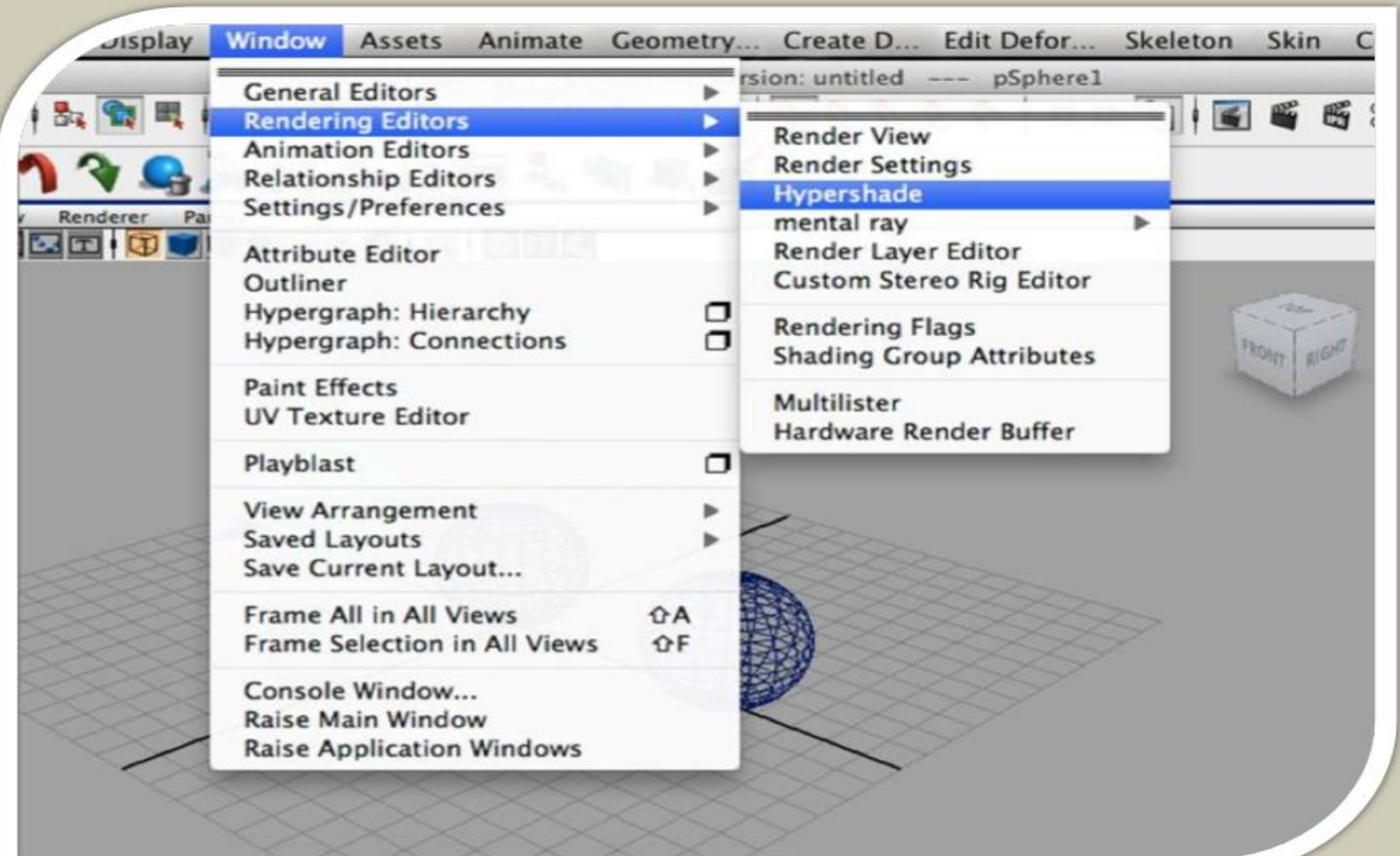
MANY TYPES OF MATERIALS

- Blinn
- Lambert
- Phong
- Etc.

Go to:

Windows->Rendering
Editors-
>Hypershade

USING HYPERSHADE

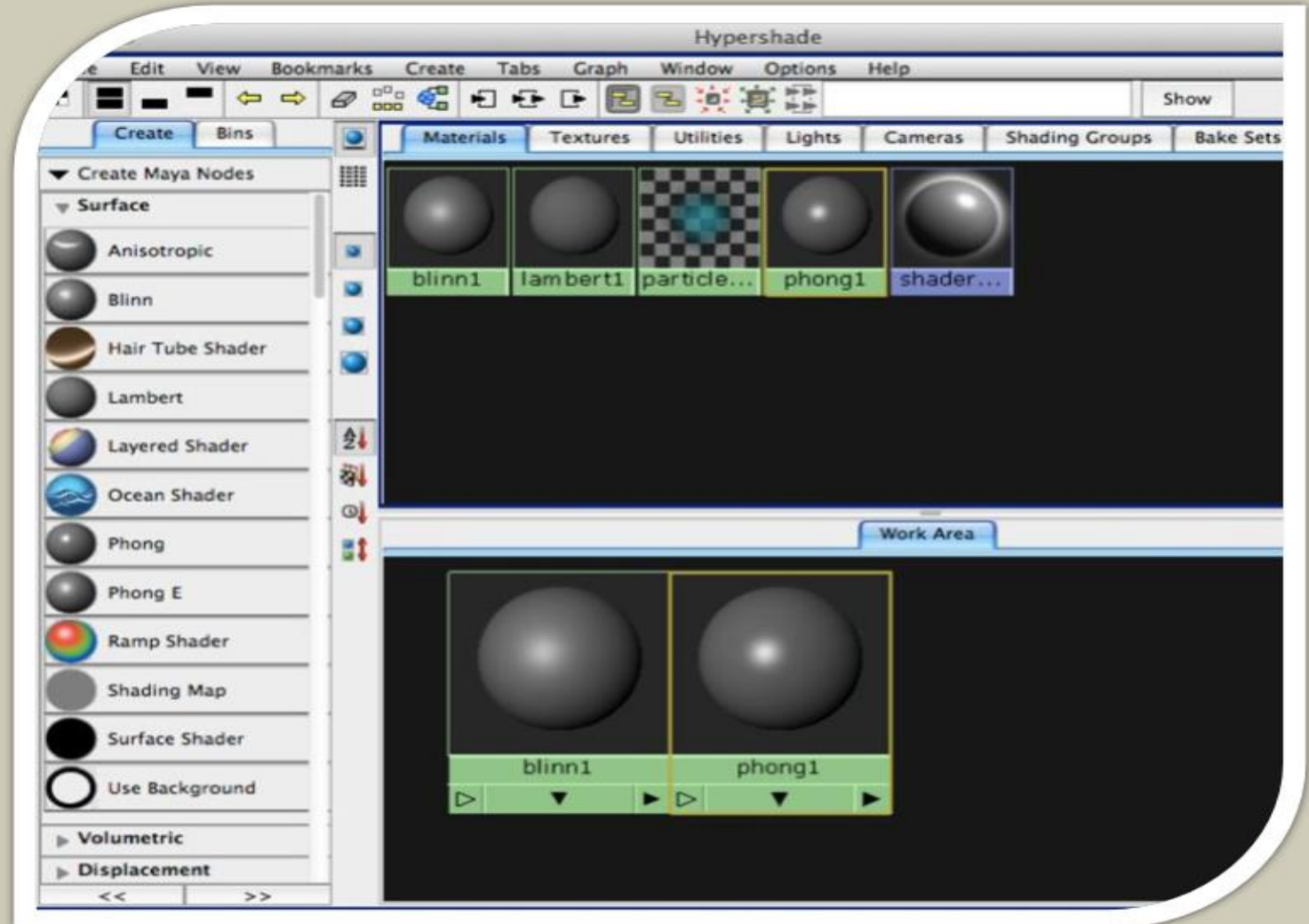


SHADING

USING HYPERSHADE

Select desired
Material type from
left-hand panel

or from the
Create -> Materials
menu



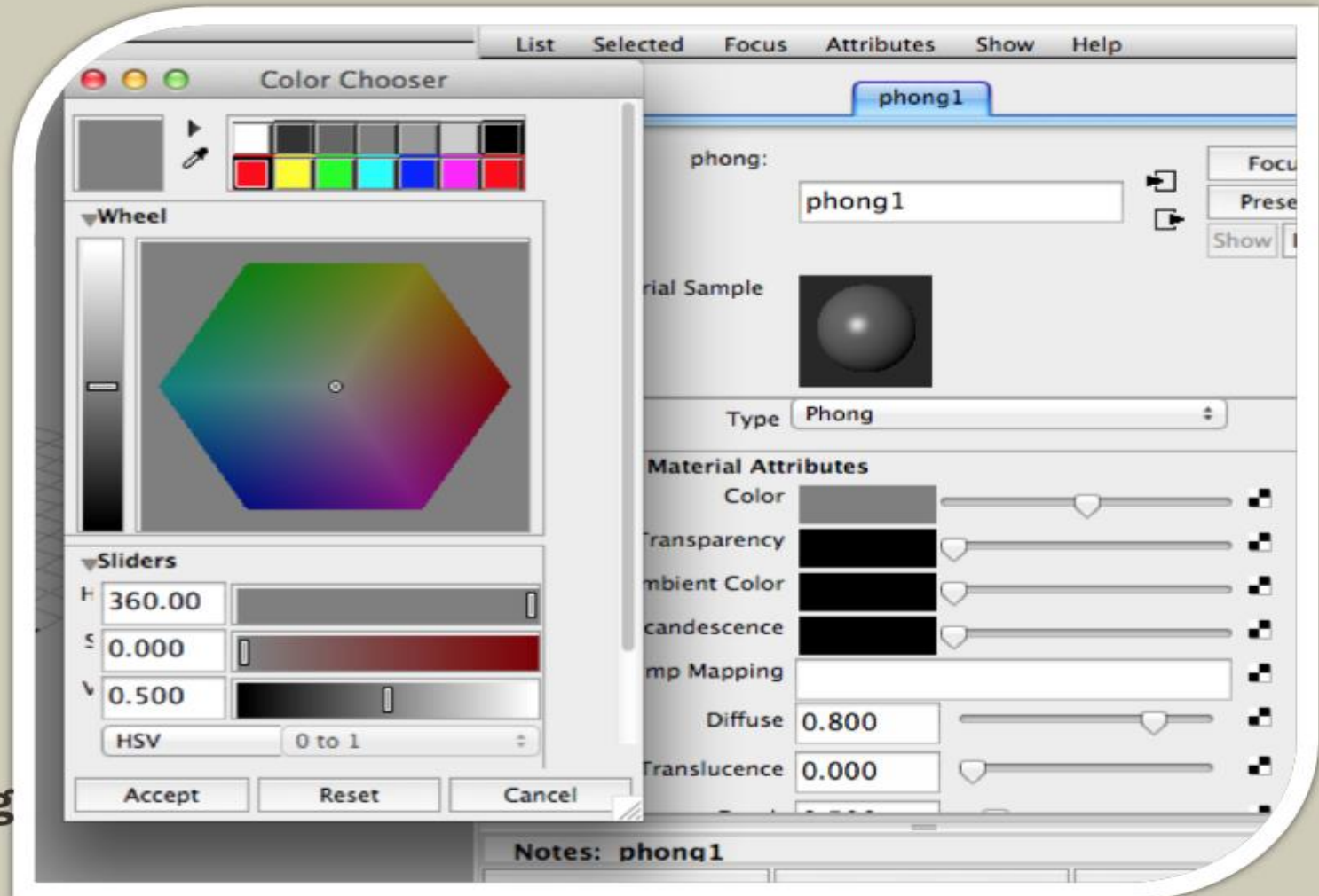
SHADING

Double click on the
Shader to open
Attribute Editor

Modify attributes such as
color, transparency,
shine, etc.

Factors beyond these
basic attributes that
determine the
appearance of an
object's surface are
defined by **textures**
(discussed in the Modeling
presentation)

ATTRIBUTE EDITOR



SHADING

MANY TYPES OF MATERIALS

- **Blinn**
- Lambert
- Phong
- Etc.

- Simulates diffuse reflection and soft specular highlights
- Takes into account viewing angle for specular highlight (Phong does not)
- Used for: metallic surfaces

