Before we Begin...

- This will be recorded
- Slideshow will be available
- KSP will be available
- Computer: 3 GHz 8 Core (16-thread)
  2013 Mac Pro, 16 Gb RAM
- If you have questions...
Material Graph Topics

- General Overview
- Anatomy of a Node
- Node Types
- Hands On:
  - Adjusting Logo Colors
  - Combining Bump Textures
  - Fading Roughness Textures
  - Layered Materials
  - Gradient between Materials
- Q & A
What is KeyShot’s Material Graph?
Material Graph:

- KeyShot Pro feature
- A node-based visual editor
- Allows advanced material creation
- Opens in a separate window

When it is used:
Anytime fine-tuned control is needed to build advanced materials
Examples of Advanced Materials
Access the Material Graph

To Open:
Click the Material Graph button, located in the Material Properties tab of the Project Panel.
Material Graph Workspace

Ribbon
A tool bar for Material Graph Items

Material Properties
Area to adjust node parameters

Node Library
A library of materials, procedural textures, utilities and animations that can be accessed from the work area

Work Area
The open gray area where materials are built
Anatomy of a Node
Anatomy of a Node

Nodes:
- Are building-blocks of materials
- Can be a material, texture, utility or animation
- Have input and output channels
- Output gets connected to another node’s input to combine them
- Input channels vary by node type

Node Name
Describes the node’s function

Output Channel
Nodes only have one output

Input Channel(s)
Display of node’s possible inputs

Thumbnail Preview
Approximation of node’s attributes

Camouflage
- Color 1
- Color 2
- Color 3
- Color 4
- +
Node Types
KeyShot’s Node Library

Material Nodes
- Offlight
- Plastic
- Glass
- Glass (Solid)
- Liquid
- Metal
- Paint
- Plastic
- Thin Film
- Translucent
- Advanced
- Anisotropic
- Oebra
- Crumps
- Measured
- Metallic Paint
- Plastic (Transparent)
- Translucent (Advanced)
- Velvet
- Area Light Diffuse
- Point Light Diffuse
- Point Light IES Profile
- Emissive
- Neon
- Wireframe
- Key

Texture Nodes
- Brushed
- Cloth Wave
- Fibre Wave
- Mesh (Circular)
- Mesh (Polygon)
- Texture Map
- Texture Map (Tiled)
- Brushed (Radial)
- Camouflage
- Cellular
- Color Gradient
- Counter
- Dielectric
- Geodesic
- Lather
- Marble
- Noise (Practical)
- Noise (Texture)
- Occlusion
- R Scratches
- R Spots
- R Vertex Color
- R Wood
- R Wood (Advanced)

Animation Nodes
- Color Fade

Utility Nodes
- Bump Add
- Color Adjust
- Color Composite
- Color Invert
- Color Key Mask
- Color To Number
- Curve To Number
- Mapping 2D
- Surface Backside Mask
Material Nodes
Layered Materials

To layer, add material nodes as labels to parent material.

Apply textures to a material’s opacity channel to control its visibility.
Opaque materials on Transparent materials

Transparent materials on opaque materials

Metal
  - Color
  - Bump
  - Opacity
  +

Glass (Solid) (*)
  - Bump
  - Opacity
  - Label 1
  +

Glass (Solid)
  - Bump
  - Opacity
  +

Metal (*)
  - Color
  - Bump
  - Opacity
  +
Emissive materials
Can be layered

Light materials
can NOT be layered

Emissive
- Color
- Bump
- Opacity

Metal (*)
- Color
- Bump
- Opacity
- Label 1

Area Light Diffuse

Metal (*)
- Color
- Bump
- Opacity
Texture Nodes

Image-based textures
• To add: Drag into Material Graph Work area from Texture Library

Procedural textures
• 2D Procedurals
• 3D Procedurals
• Add from Node Library or right-click in Material Graph Work Area
Utility Nodes

Standard Utility Nodes

- **Bump Add**
  - Bump 1
  - Bump 2
  - Ratio
  - +

- **Color Key Mask**
  - Source

- **Color Adjust**
  - Color
  - Colorize
  - Value
  - Contrast
  - +

- **Color To Number**
  - Input

- **Color Composite**
  - Source
  - Source Alpha
  - Background
  - Clipping Mask
  - +

- **Color Invert**
  - Source

Experimental Utility Nodes

- **Curve Color Randomize**
  - Map
  - +

- **Mapping 2D**

- **Surface Backside Mask**
Bump Add

- Combine two image-based textures or procedural textures
- Ex. Tile Normal + Scratches procedural

Properties
Ratio Slider: Controls how much each bump texture is represented

Weight 1 & 2: Strength of each individual texture
Color Adjust

- Modify existing color of a texture map or procedural texture
- Ex. Change color of a logo or graphic

Properties
Color: Change overall color of node’s output (could be a texture)

Colorize: Blends a secondary color to the overall color

Hue Slider: Controls ‘pure color’ of node’s output

Saturation Slider: Controls amount of pure color (vibrancy) in node’s output

Value Slider: Controls amount of white or black (brightness) is added to node output

Contrast Slider: Increase or decrease range of value, hue and saturation of node’s output
Color Composite

- Combine multiple textures with blend modes and Alpha
- Similar to Photoshop layers’ blending modes
- Ex. Combining and blending textures

Properties

Source: Think of as layer 1

Source Alpha: Opacity channel or layer mask for Source

Background: Think of as background layer

Background Alpha: Opacity channel or layer mask for Background

Blend Mode: Determines how Source and Background will interact with each other

Learn more about Blend Modes (Wikipedia)
Color Invert

- Multiply the color values by -1
- Ex. Turn black to white and vice versa

Properties

Source: Anything connected to the source input will be inverted
Color Key Mask

- Turn a specific color from a texture map into an opacity mask
- Ex. Make an opacity mask from a specific color

Properties

Connect texture to Source Input

Connect Color Key Mask output to Opacity of the material to be masked

Color Key: The color that will be turned into an opacity mask

Threshold: Specify minimal percentage of Color Key required before masked
Ex. 1 = exact match

Fuzziness: Controls blending of what is and isn’t included in the selection
**KeyShot Values**

Two kinds of value:

- **Grayscale:**
  (amount of white in a color)
  From 0% to 100%

- **Numerical:**
  Ex. 1, 2, 3 etc.

*Often, values can be defined by ‘color’, in which case, pure white = 1 and pure black = 0*
Color to Number

- Convert value ranges into numerical values
- Ex. Make fine-tuned adjustments to roughness maps

Properties

Input From: Minimum input value
- 0 = 100% black

Input To: Maximum input value
- 1 = 100% white

Output From: Minimum output value
- 0 = 100% black

Output To: Maximum output value
- 1 = 100% white

Smooth: Applies an S-curve to value range
**Color Fade**

- Transition from one color to another
- Ex. Show different color, finish or material option

**Properties**

Left Color: Beginning color

Right Color: Ending color

Time: Timestamp at which the selected color is fully realized

Click + icon to add new color, drag color drop to position
Color Fade Node
Number Fade

- Transition from one value to another
- Ex. Scale a texture or label

Properties

From: Beginning value

To: Ending value

Time Settings: Control duration of fade
Number Fade Node
Hands On