10.2.1.5.1 Render - Blender Render Engine - Materials - Material Nodes - Introduction

Material Nodes

- Introduction to Nodes
  - Accessing The Node Editor
  - Types of Material Nodes
- Node Types
  - Color Nodes
  - Convertor Nodes
  - Input Nodes
  - Output Node
  - Vector Nodes

Introduction to Nodes

In addition to creating materials as just described using all the settings on all the materials panels, Blender allows you to create a material by routing basic materials through a set of nodes. Each node performs some operation on the material, changing how it will appear when applied to the mesh, and passes it on to the next node. In this way, very complex material appearances can be achieved.

You should already be familiar with general material concepts and how to create materials/textures using the material menu. You should also have a general understanding of the texture coordinate systems available in Blender (e.g. Generated, UV, etc.). Also, many aspects of a node will be skipped here because in later sections you will see the function expanded upon. Each section builds off the previous.

To start, the node system does not make the material menu obsolete. Many features and material settings are still only accessible through the material panel (e.g. Ray Mirror). However with the advent of nodes, more complex and fantastic materials can be created since we now have greater control.

Just in case you’re not (yet) familiar with the concepts: when you create a system of nodes (otherwise known as a “noodle”), you’re describing a data-processing pipeline of sorts, where data “flows from” nodes which describe various *sources*, “flows through” nodes which represent various processing and filtering stages, and finally “flows into” nodes which represent outputs or destinations. You can connect the nodes to one another in many different ways, and you can adjust “knobs, ” or parameters, that control the behavior of each node. This gives you a tremendous amount of creative control. And, it will very quickly become intuitive.

Having said all that, let’s begin with a normal material.

Here we have the standard material we have added to a cube mesh. We could, as we have in the past, add color and other settings to this material and it would certainly look nice. But let’s say we are just not getting what we are looking for? What if we want to control the creation more tightly or add more complexity? Here is where nodes come in.

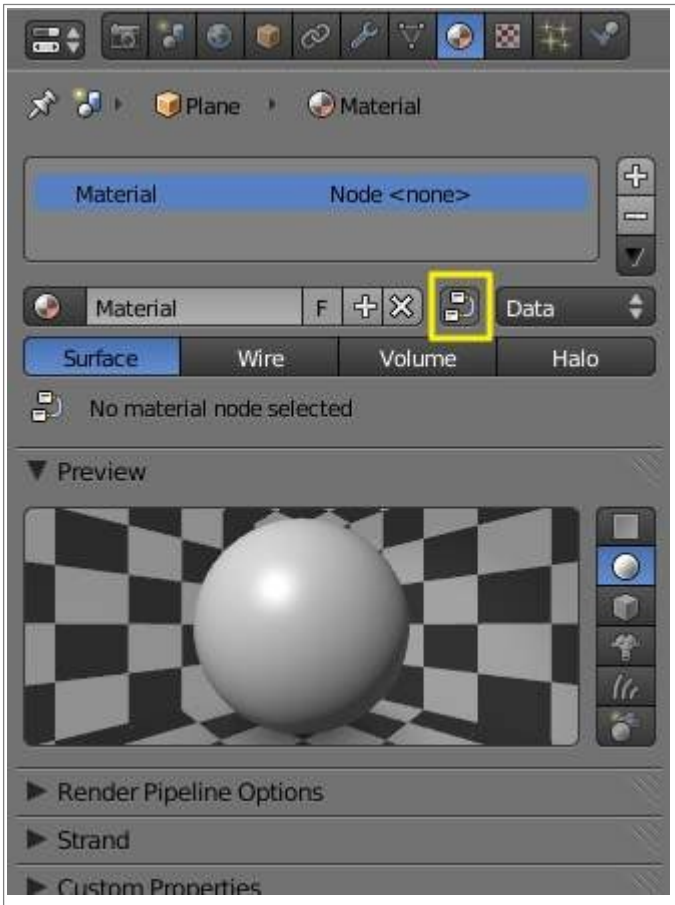
Making this node map is accomplished by working in a *Node Editor window*. This section covers:

- Enabling Material Nodes.
- The Node Editor window, its basic controls, and working with nodes.
- The specific types of nodes available for materials.

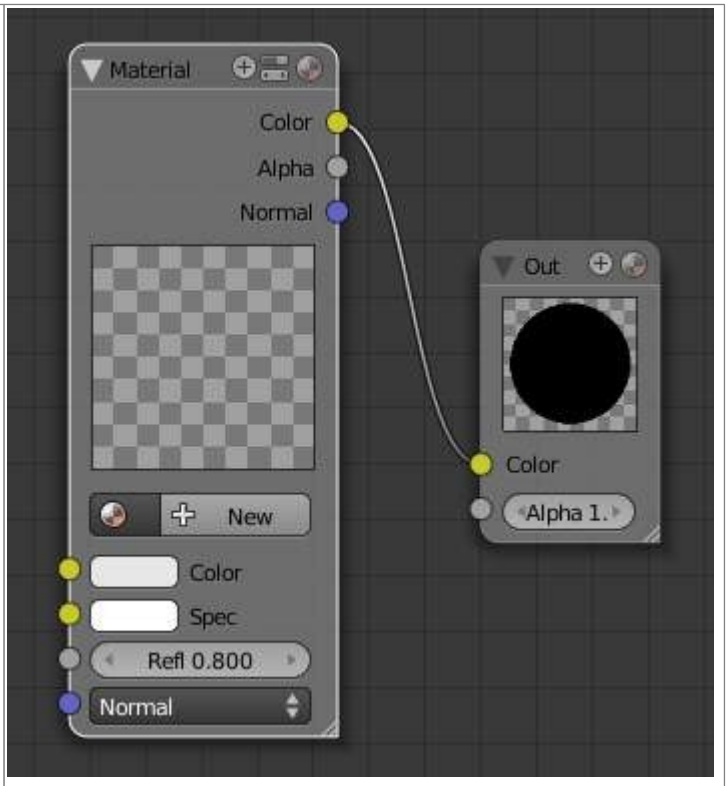
Accessing The Node Editor

First lets enter the *node editor* and make sure that the node editor has the material node button (the sphere icon) pressed, not the composite or texture node buttons.

Enabling Node Materials in the Material Buttons



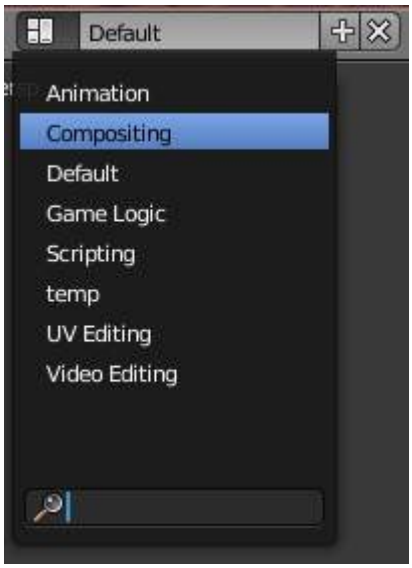
Material’s menu with Nodes enabled



Default nodes

Let’s take the base material and hit the Nodes button next to the material name in the material panel or the node editor. You will see a change in the material panel.

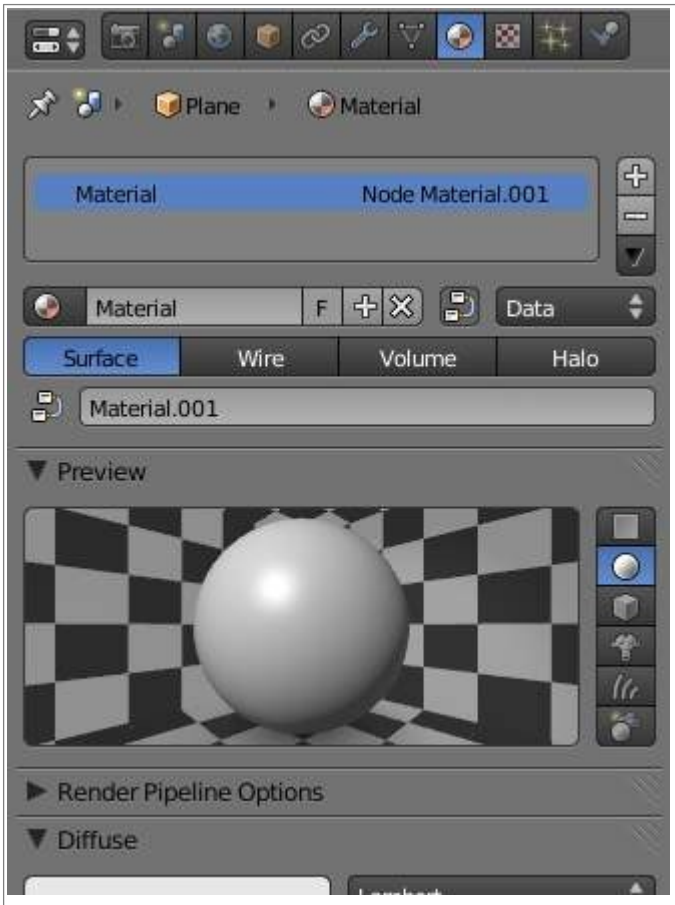
What you have just done is told Blender to make the material you were on to become the node tree. Most of the panels we normally find in the material menu are now gone.



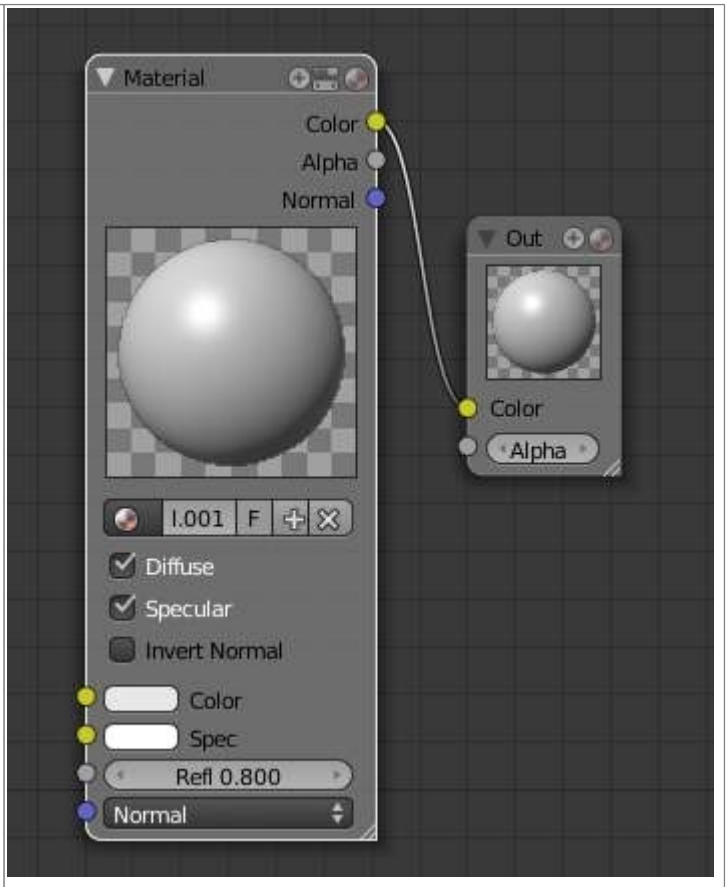
Accessing the Compositing screen

If you switch to the *Compositing* screen (`Ctrl-Left` if you are on the default screen) you'll find a *Node Editor* on the top half of the screen. When you enabled material nodes, a material node and an output node were automatically added to the node editor.

You can also split the 3D view in the default screen in two and change one into a *Node Editor.*



Material's menu with a first material added to the Node Editor



A first material added to the noodle

It is important to note that you can add a new material (which you can edit and change like any other material in the material panel), add an already created material or append a material from another blender file, and also use

the material that you used to create the node tree.

Here, we added a new material in the *Node editor* (*Material.001*), and as we did, we can access the properties of this material in the material's menu.

Types of Material Nodes

This section is organized by type of node, which are grouped based on similar functions:

Input
: Introduces a material or component to the node map.

Output
: Displays the result in progress as a small image.

Color
: Manipulates the colors of the material.

Vector
: Change the way light is reflected off the material.

Convertors
: Convert colors to other material colors.

Node Types

- Color Nodes
  - MixRGB
  - RGB Curves
  - Invert
  - Hue Saturation Value
- Convertor Nodes
  - ColorRamp Node
  - RGB to BW Node
  - Math Node
  - Vector Math Node
  - Squeeze Value Node
  - Separate RGB Node
  - Combine RGB Node
  - Separate HSV Node
  - Combine HSV Node
- Input Nodes
  - Material Node
  - Extended Material Node
  - Camera Data Node
  - Lamp Data Node
  - Value Node
  - RGB Node
  - Texture Node
  - Geometry Node
- Output Node

- Vector Nodes
  - Normal Node
  - Mapping Node
  - Vector Curves