

# Shading e Texturing in Blender 3

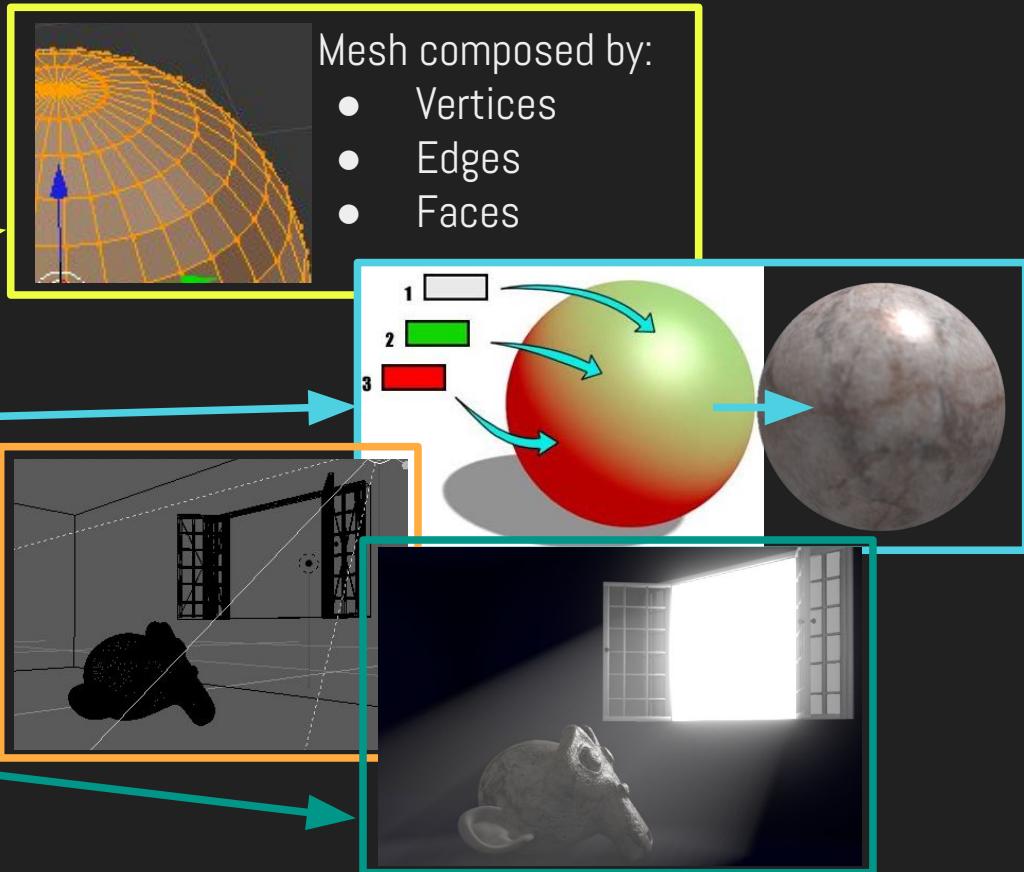
Daniele De Luca

# Scene

The scene includes points, lines and polygons that exist inside a three dimensions space defined by X, Y, Z axis.

In order to **compose a scene** is necessary:

- define 3D object geometry  
**OBJECT MODELING**
- define texture and material of all objects  
**SHADING AND TEXTURING**
- define scene light for realistic final render  
**LIGHTING**
- realize frame (**RENDERING**) or export created models in format file for real-time visualization



Blender

File Edit Render Window Help Layout Modeling Sculpting UV Editing Texture Paint Shading Animation Rendering Compositing Scripting +

Object Mode View Select Add Object Global

Front Perspective (1) Collection | Suzanne.001

Scene Collection Collection Camera Light Suzanne Suzanne.001

Suzanne.001 Scimmia\_2

Scimmia\_2 Preview Surface Use Nodes

Surface Principled BSDF GGX Christensen-Burley

Base Color Subsurface Radius Subsurface Color Metallic Specular Specular Tint Roughness Anisotropic Anisotropic Rotation Sheen Sheen Tint Clearcoat Clearcoat Roughness IOR Transmission Transmission Roughness Emission Alpha Normal Clearcoat Normal Tangent

Subsurface Radius: 1.000, 0.200, 0.100

Subsurface Color:

Metallic: 0.000

Specular: 0.500

Specular Tint: 0.000

Roughness: 0.500

Anisotropic: 0.000

Anisotropic Rotation: 0.000

Sheen: 0.000

Sheen Tint: 0.500

Clearcoat: 0.000

Clearcoat Roughness: 0.030

IOR: 1.450

Transmission: 0.000

Transmission Roughness: 0.000

Emission:

Alpha: 1.000

Normal

Clearcoat Normal

Tangent

Diffuse

Scimmia\_2

Select Box Select Rotate View Object Context Menu

# Materials

Blender

File Edit Render Window Help Layout Modeling Sculpting UV Editing Texture Paint Shading Animation Rendering Compositing Scripting +

Object Mode View Select Add Object Global

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Scene Collection Collection Camera Light Suzanne Suzanne.001

Suzanne.001 Scimmia\_2

Scimmia\_2 Preview Surface Use Nodes

Surface Principled BSDF GGX Christensen-Burley

Subsurface Radius 1.000 0.200 0.100

Subsurface Color

Metallic 0.000

Specular 0.500

Specular Tint 0.000

Roughness 0.500

Anisotropic Rotation 0.000

Sheen 0.000

Sheen Tint 0.500

Clearcoat 0.000

Clearcoat Roughness 0.030

IOR 1.450

Transmission 0.000

Transmission Roughness 0.000

Emission

Alpha 1.000

Normal

Clearcoat Normal

Tangent

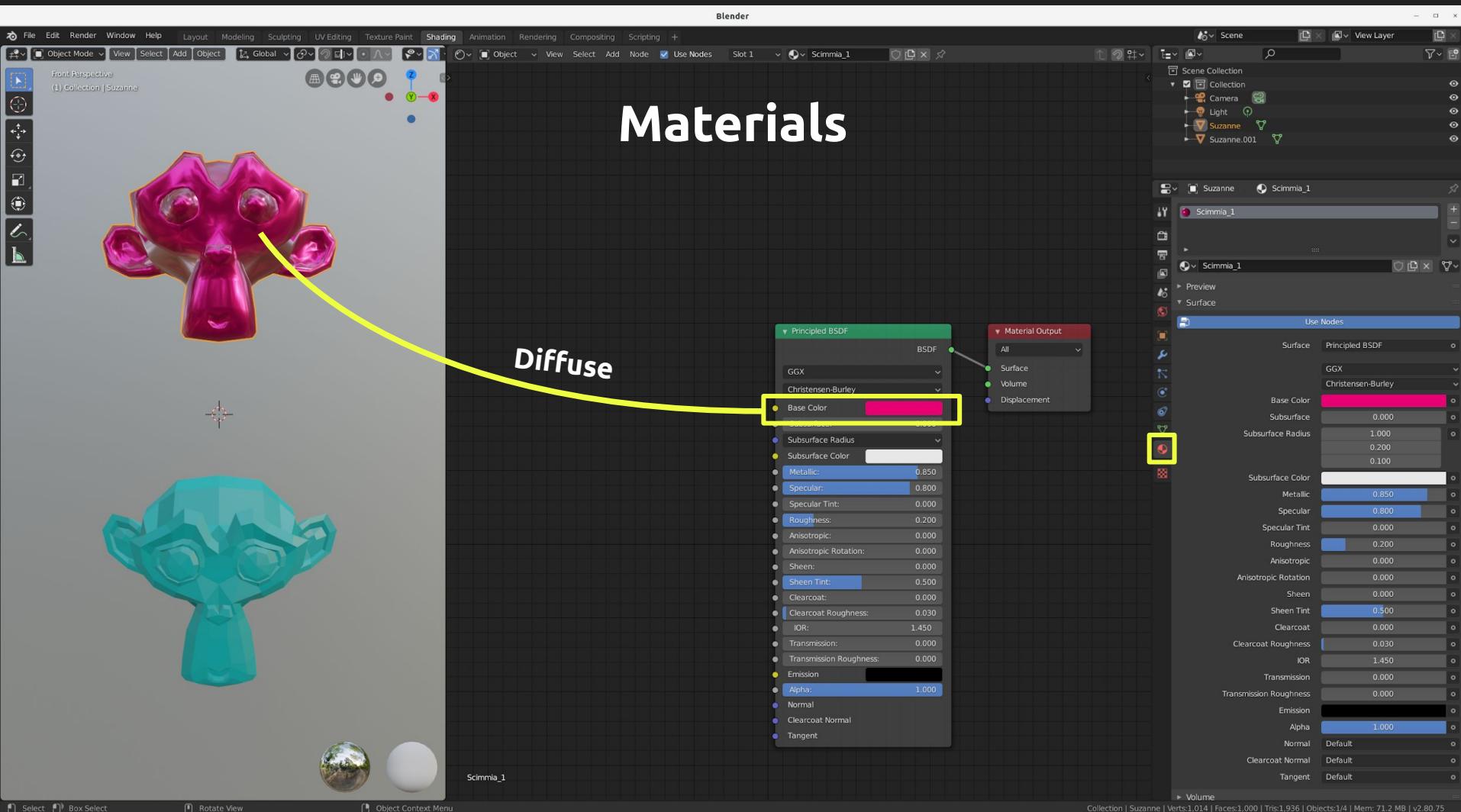
Volume

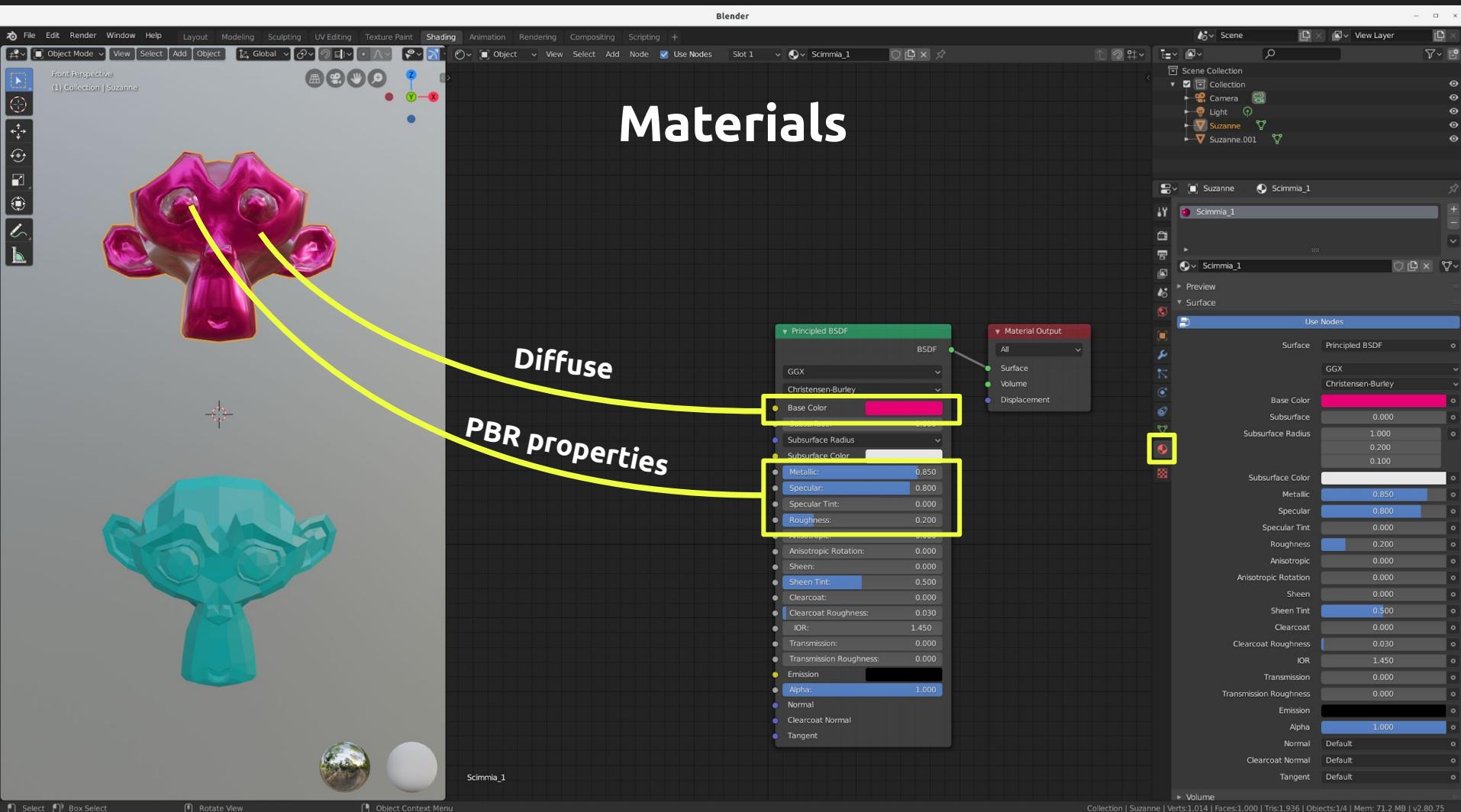
Collection | Suzanne.001 | Verts:1,014 | Faces:1,000 | Tris:1,936 | Objects:1/4 | Mem: 67.2 MB | v2.80.75

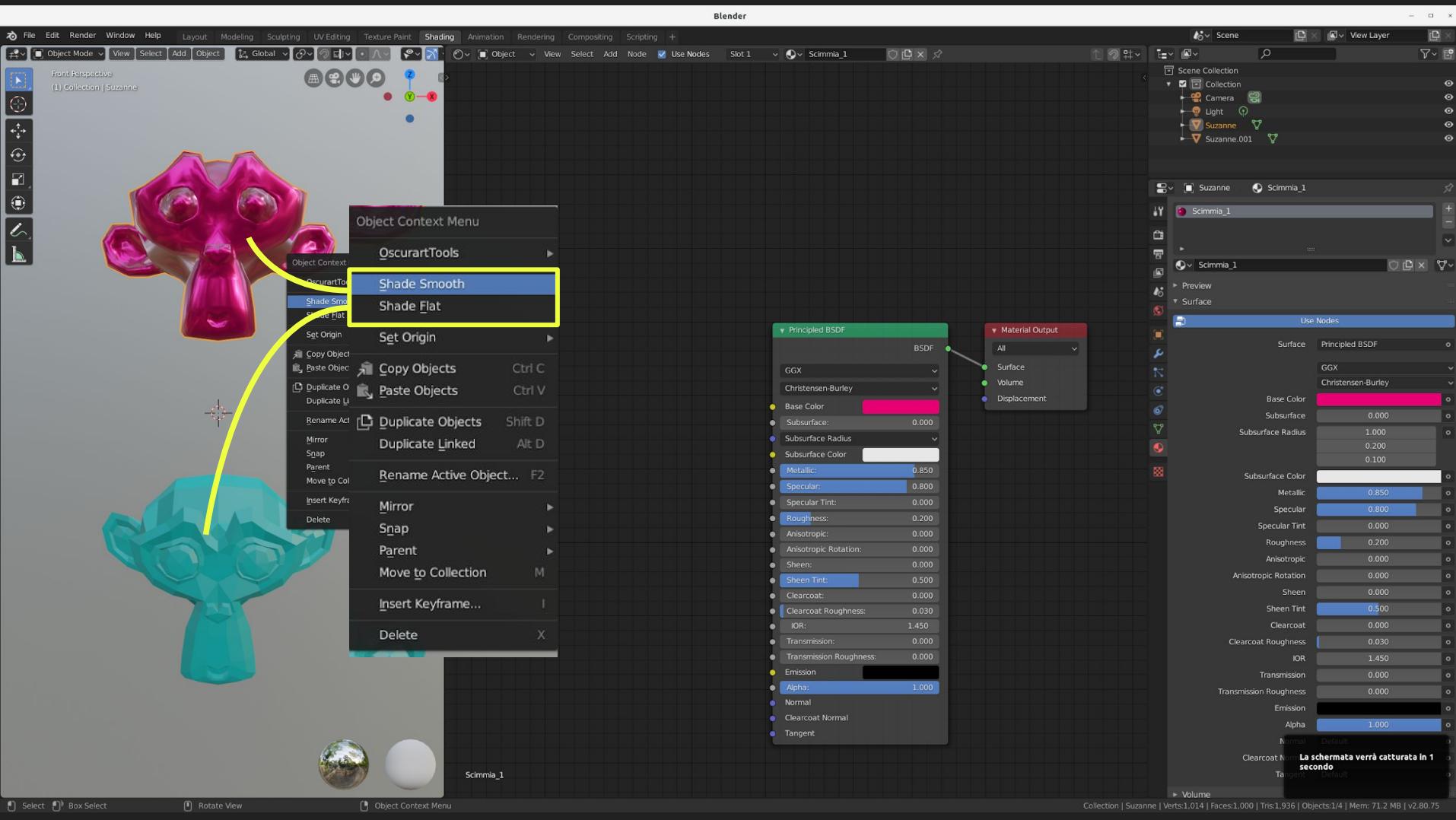
# Materials

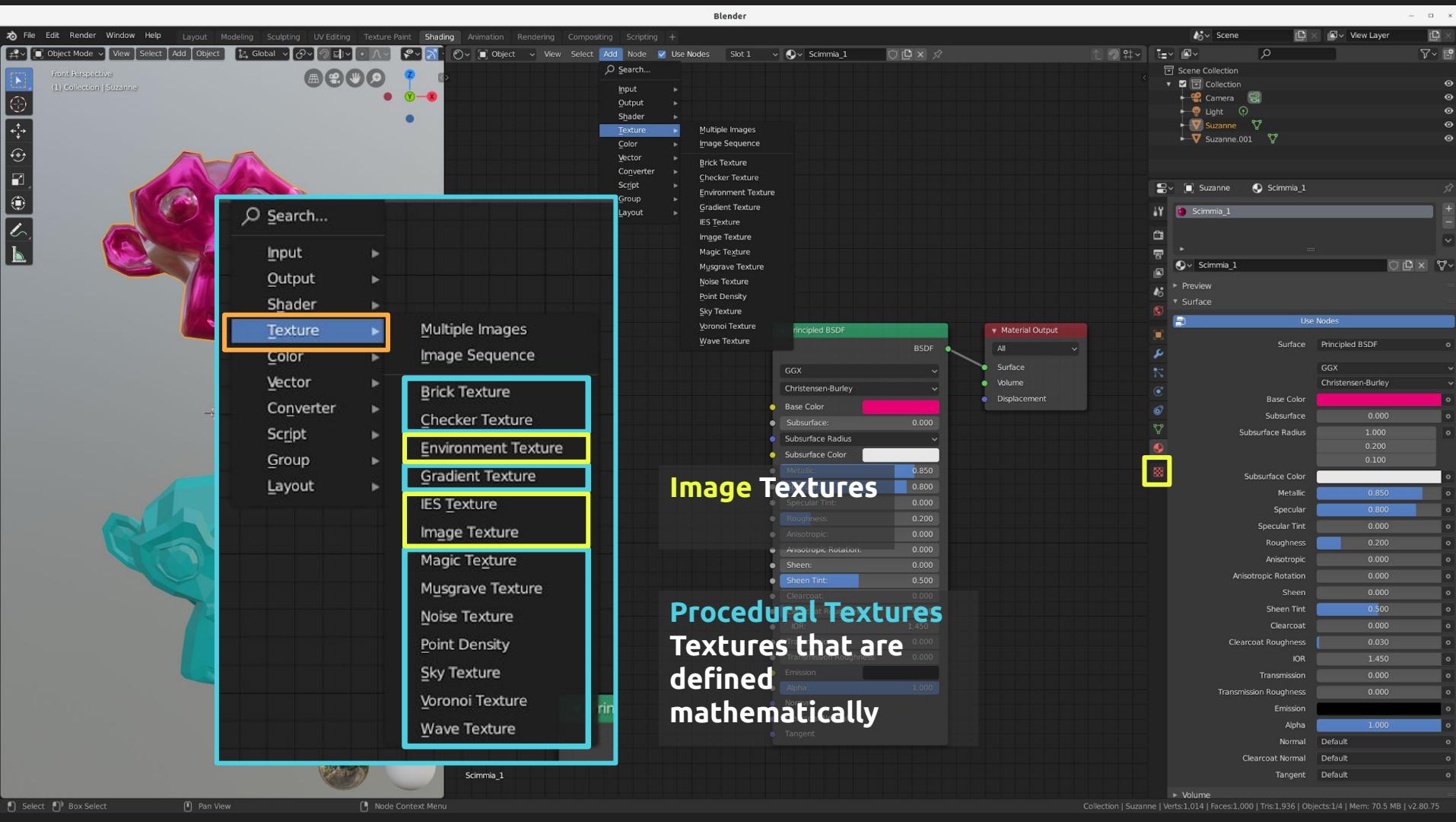
Diffuse PBR properties

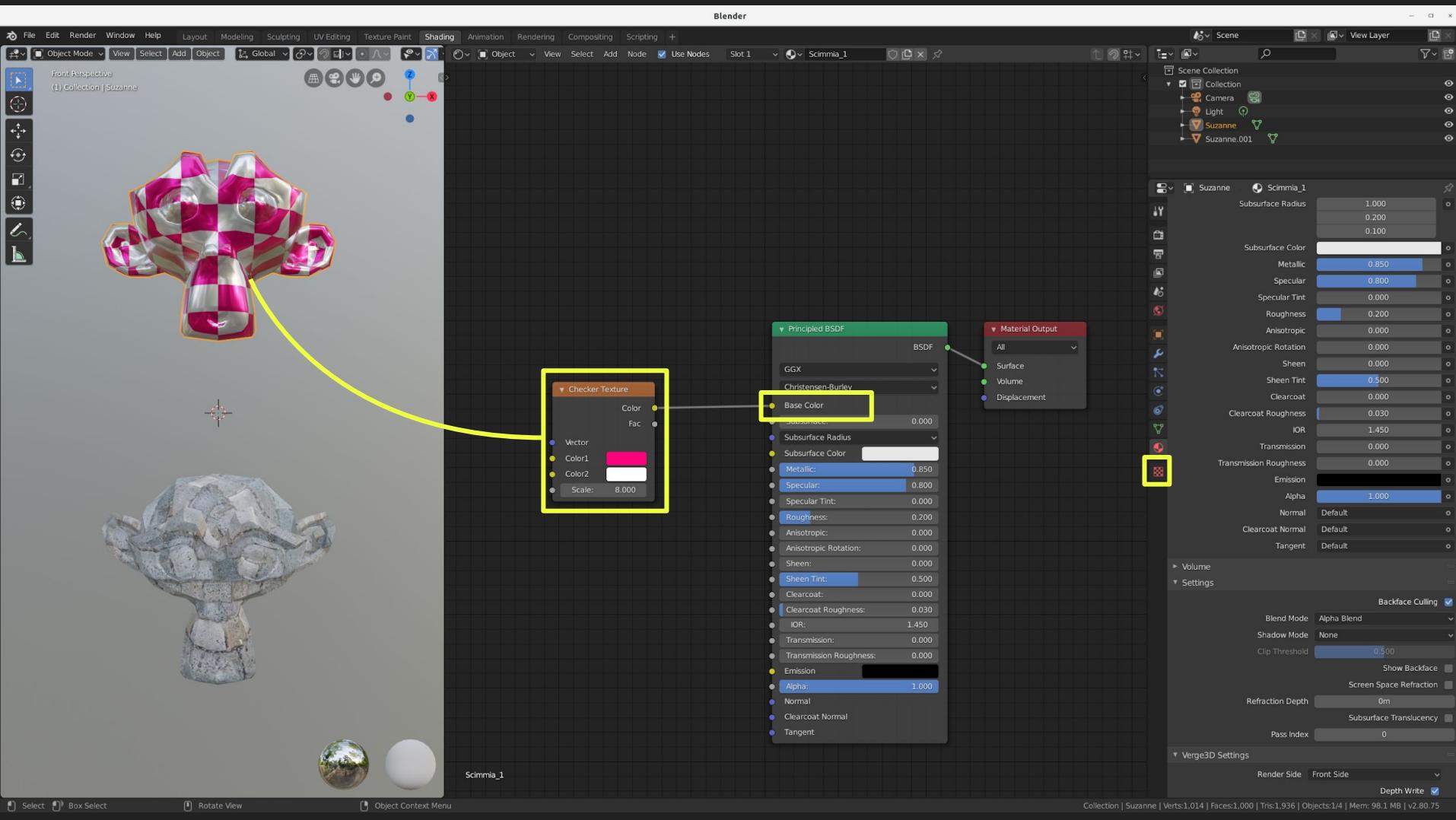
Select Box Select Rotate View Object Context Menu

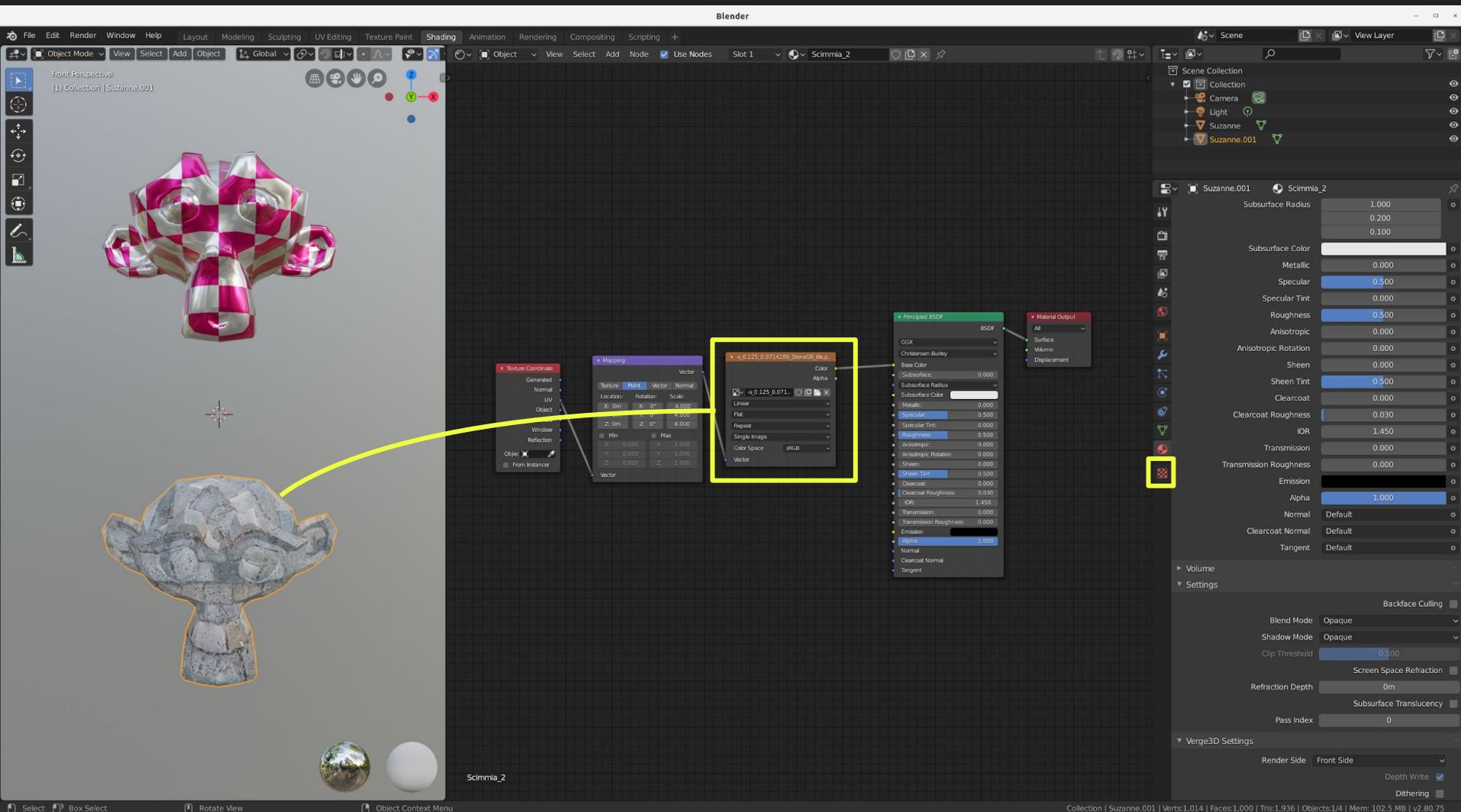












Blender

File Edit Render Window Help Layout Modeling Sculpting UV Editing Texture Paint Shading Animation Rendering Compositing Scripting +

Object Mode View Select Add Object Global

Front Perspective (1) Collection | Suzanne

Scene Collection Collection Camera Light Suzanne Suzanne.001

Subsurface Radius 1.000 0.200 0.100

Subsurface Color Metallic 0.850 Specular 0.800

Roughness CheckerTexture Anisotropic 0.000

Anisotropic Rotation 0.000 Sheen 0.000

Sheen Tint 0.500 Clearcoat 0.000

Clearcoat Roughness 0.030 IOR 1.450

Transmission 0.000 Transmission Roughness 0.000

Emission 0.000 Alpha 1.000

Normal Default Clearcoat Normal Default

Tangent Default

Backface Culling Alpha Blend

Shadow Mode None Clip Threshold 0.500 Show Backface

Refraction Depth 0m Screen Space Refraction

Subsurface Translucency Pass Index 0

Verge3D Settings

Render Side Front Side Depth Write

Collection | Suzanne | Verts:1,014 Faces:1,000 Tris:1,936 Objects:1/4 Mem: 103.3 MB v2.80.75

**Shiny**

**Opaque**

Principled BSDF BSDF

GGX Christensen-Burley

Color: Pink

Subsurface: 0.000

Subsurface Color: White

Metallic: 0.850

Specular: 0.800

Specular Tint: 0.000

Roughness: 0.000

Anisotropic: 0.000

Anisotropic Rotation: 0.000

Sheen: 0.000

Sheen Tint: 0.500

Clearcoat: 0.000

Clearcoat Roughness: 0.030

IOR: 1.450

Transmission: 0.000

Transmission Roughness: 0.000

Alpha: 1.000

Surface Volume Displacement

A texture affects the color of a material, they can also affect many of the other properties of a material.

Scrimia\_1

Select Box Select Rotate View Object Context Menu

Blender

File Edit Render Window Help Layout Modeling Sculpting UV Editing Texture Paint Shading Animation Rendering Compositing Scripting + Scene View Layer

Frame: 1 | Time: 00:00:00.000 | Slot 1 | Composite | Quick D-NOISE

Render Result

181.53M

Render / Output

Render Audio...  
View Render F11  
View Animation Ctrl F11  
Display Mode  
Lock Interface

Scene Collection  
Collection  
Camera  
Light  
Suzanne

Scene  
Dimensions  
Resolution X 1920 px  
Y 1080 px  
% 100%  
Aspect X 1.000  
Y 1.000  
Render Region  
Crop to Render Region  
Frame Start 1  
End 250  
Step 1  
Frame Rate 24 fps  
Time Remapping  
Stereoscopy  
Output  
/tmp/  
Overwrite  Placeholders   
File Extensions  Cache Result   
File Format PNG  
Color BW RGB RGBA  
Color Depth 8 16  
Compression 15%  
Metadata  
Post Processing

Change Frame Pan View Sample Color

Collection | Camera | Verts: 1,014 | Faces: 1,936 | Tris: 1,936 | Objects: 1/4 | Mem: 189.4 MB | v2.80.75

Blender

File Edit Render Window Help Layout Modeling Sculpting UV Editing Texture Paint Shading Animation Rendering Compositing Scripting + Scene View Layer

Frame: 1 | Time: 00:00:00.000 | Dimensions: 1920x1080 | Resolution: 100% | Aspect: 1.000x1.000 | Render Region: Enabled | Crop to Render Region: Enabled | Frame Start: 1 | End: 250 | Step: 1 | Frame Rate: 24 fps | Time Remapping: Off | Stereoscopy: Off | Output: /tmp/ | Overwrite: On | Placeholders: Off | File Extensions: On | Cache Result: Off | File Format: PNG | Color: BW | RGB | RGBA | Color Depth: 8 bits | Compression: 15% | Metadata: Off | Post Processing: Off

81.53M

Render buttons

Render / Output

Collection Camera Light Suzanne

Change Frame Pan View Sample Color

Collection | Camera | Verts: 1,014 | Faces: 1,936 | Tris: 1,936 | Objects: 1/4 | Mem: 189.4 MB | v2.80.75

Blender

File Edit Render Window Help Layout Modeling Sculpting UV Editing Texture Paint Shading Animation Rendering Compositing Scripting + Scene View Layer

Frame:1 | Time: 81.53M

Render Result Slot 1 Composite Quick D-NOISE

Render buttons

81.53M

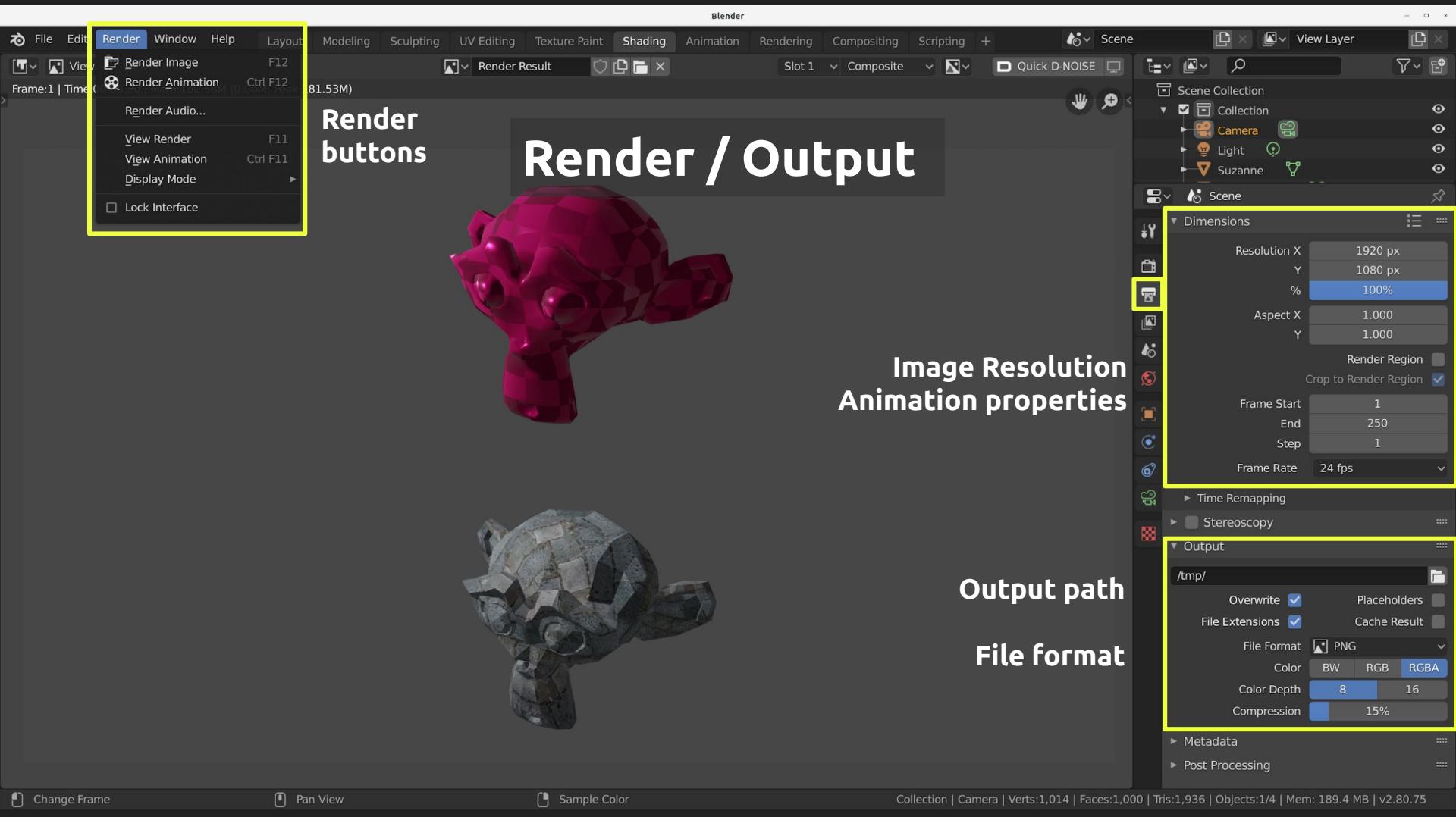
Render / Output

Scene Collection  
Collection  
Camera  
Light  
Suzanne

Dimensions  
Resolution X: 1920 px  
Y: 1080 px  
%: 100%  
Aspect X: 1.000  
Y: 1.000  
Render Region  
Crop to Render Region: checked  
Frame Start: 1  
End: 250  
Step: 1  
Frame Rate: 24 fps  
Time Remapping  
Stereoscopy  
Output  
/tmp/  
Overwrite: checked  
File Extensions: checked  
File Format: PNG  
Color: BW, RGB, RGBA  
Color Depth: 8  
Compression: 15%  
Metadata  
Post Processing

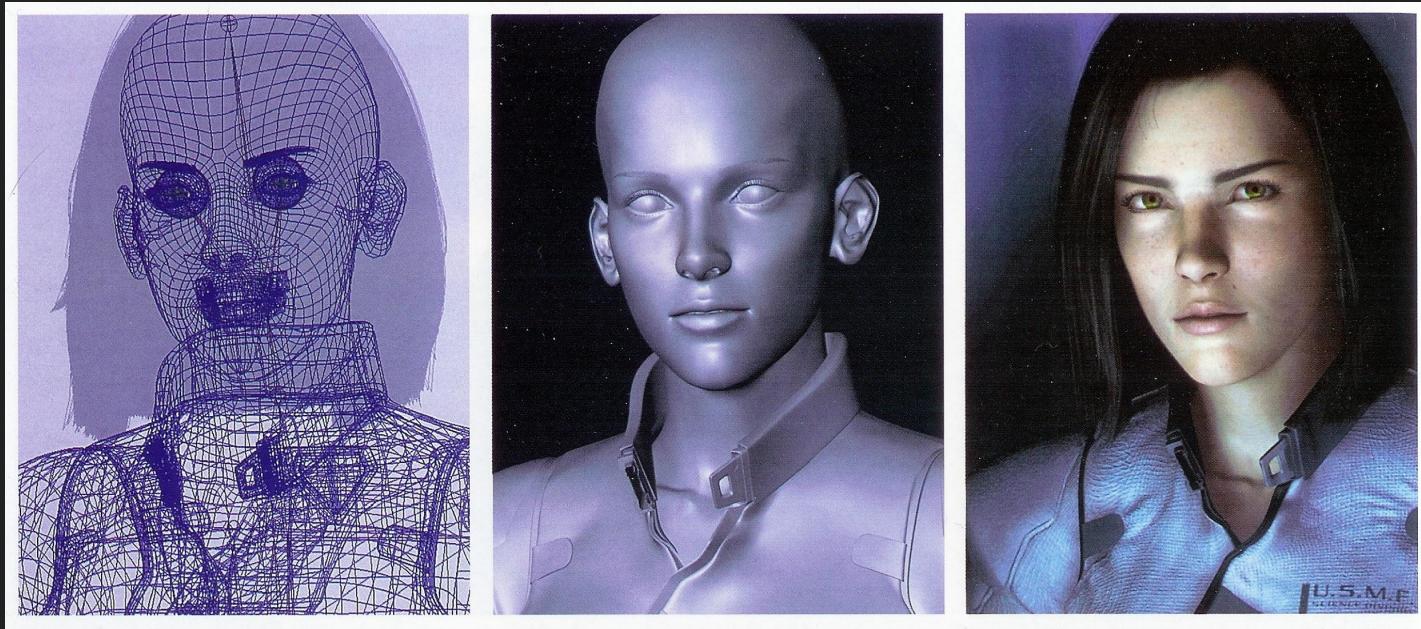
Change Frame Pan View Sample Color

Collection | Camera | Verts:1,014 | Faces:1,936 | Tris:1,936 | Objects:1/4 | Mem: 189.4 MB | v2.80.75



# Materiali

I materiali permettono agli oggetti di avere colore e di reagire alla luce, sono contenitori di proprietà



Final Fantasy by Hironobu Sakaguchi, 2001

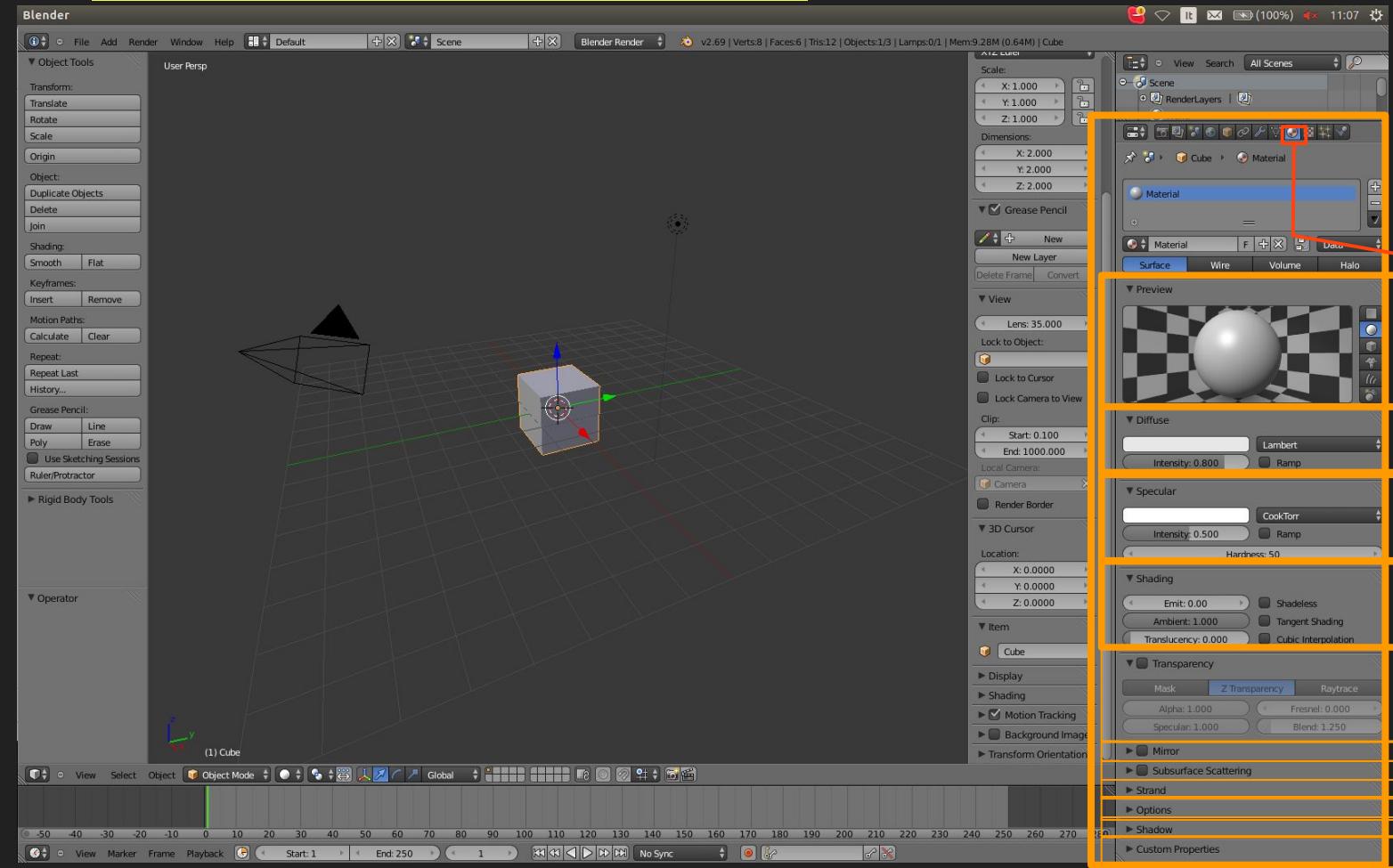
# Materiali

Gli shader e le texture collaborano insieme nei materiali per dare vita agli oggetti:

- gli **shader** sono proprietà fisiche che ci mostrano **la materia o “pasta”** di cui ogni oggetto è composto
- le **texture** sono un ausilio agli shader e definiscono **colori** o aiutano nella composizione di materiali più complessi



# Materiali in Blender Internal

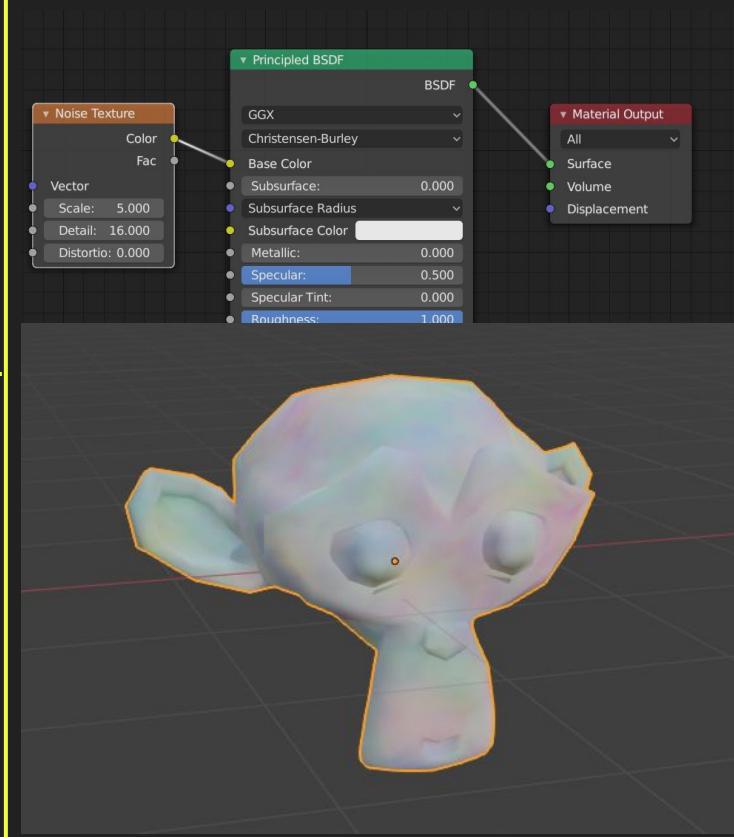
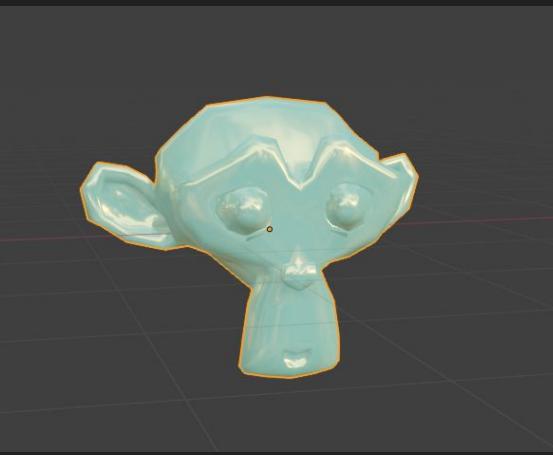
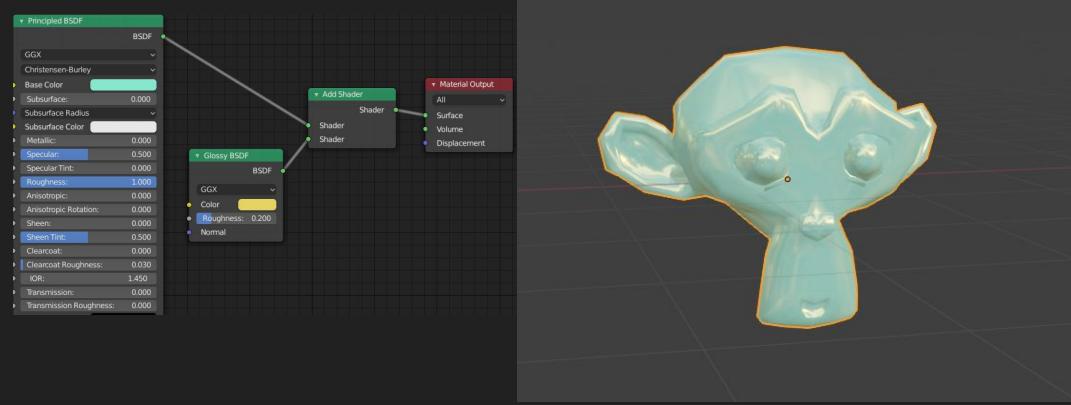
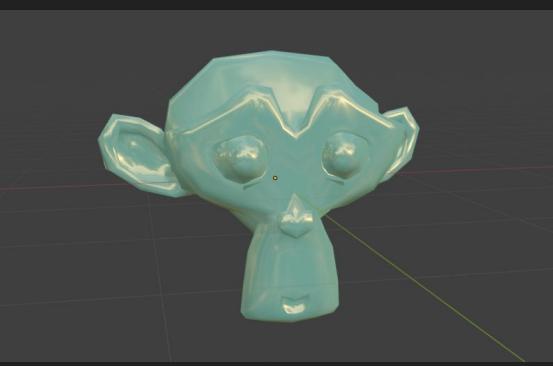
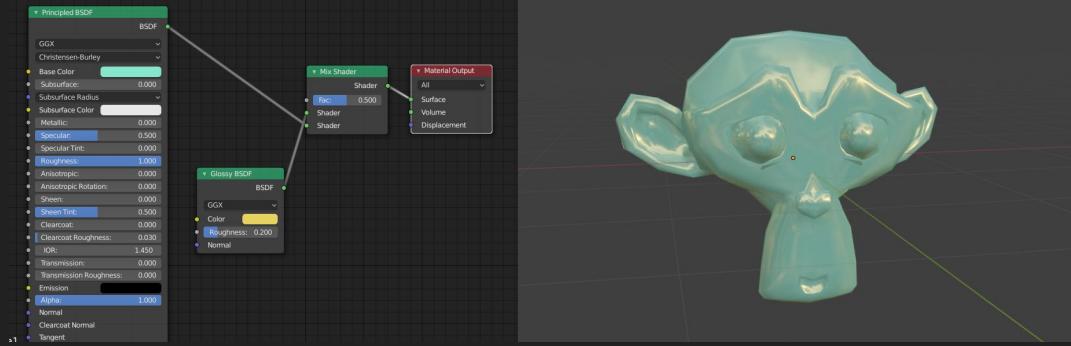


Pannello  
Material

1. Preview
2. Diffuse
3. Specular
4. Shading
5. Transparency
6. Mirror
7. Subsurface
8. Strand
9. Options
10. Shadow
11. Custom

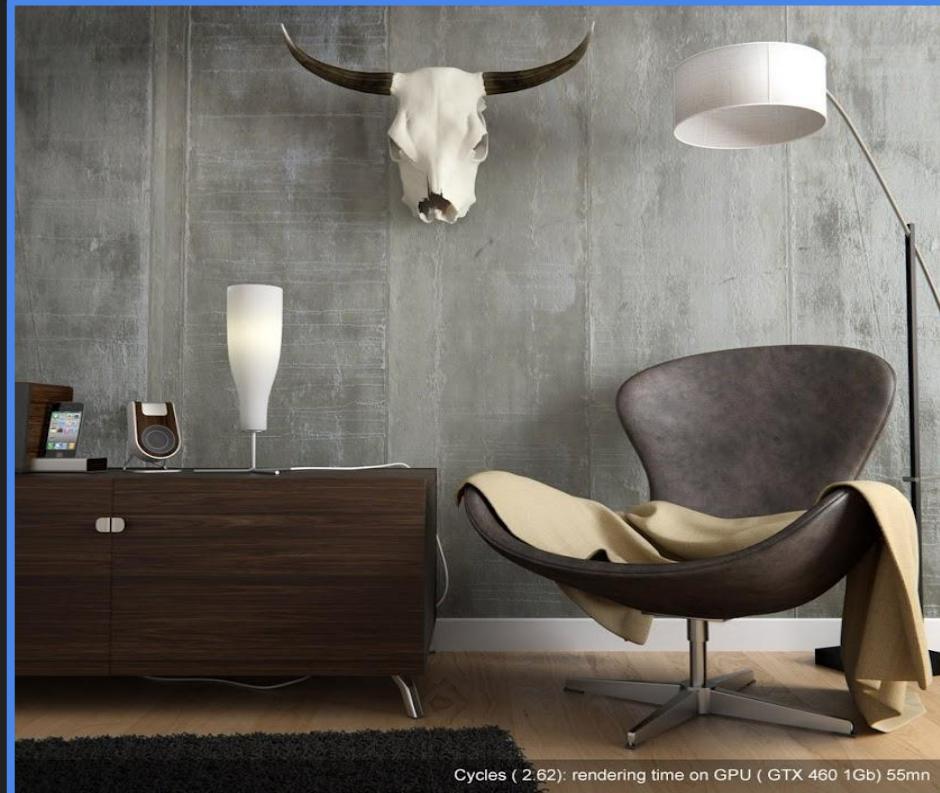
# Materiali e texturing in Blender 2.8+

# Materiali in Cycles



# Materiali e texturing in Blender 2.8+

## Blender Internal vs Cycles



# Materiali e texturing in Blender 2.8+

Cycles Eevee

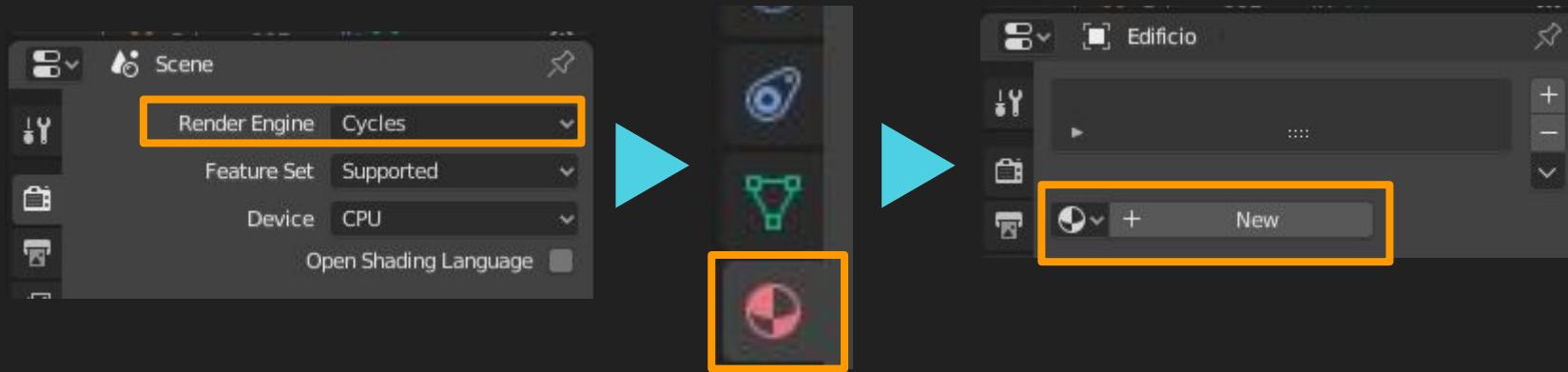




# Esercizio

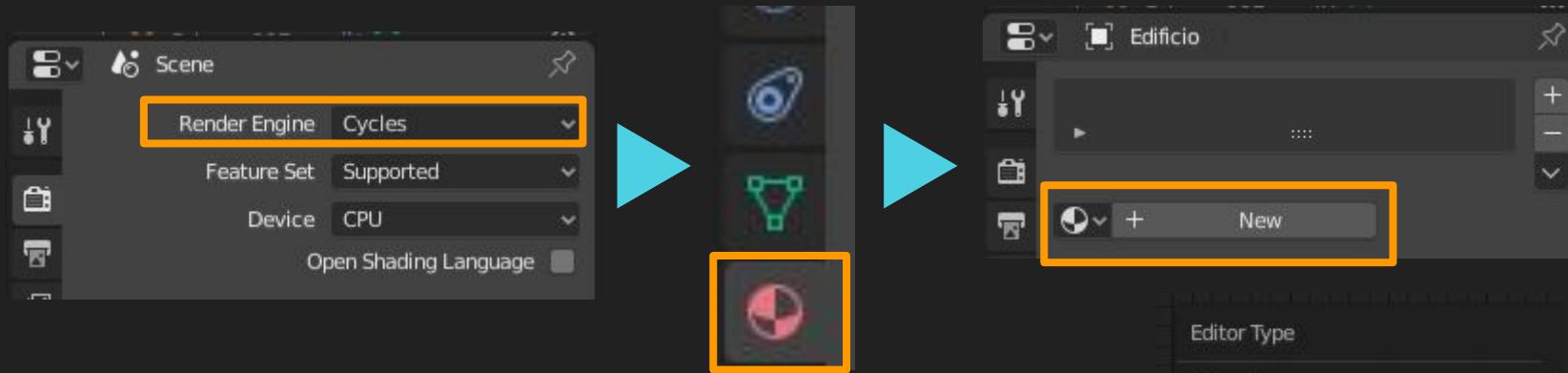
## Shader e Texturing

Abilito **Cycles render** e vado nel pannello **Materials**  
con l'edificio selezionato aggiungo un materiale mediante il pulsante **New**



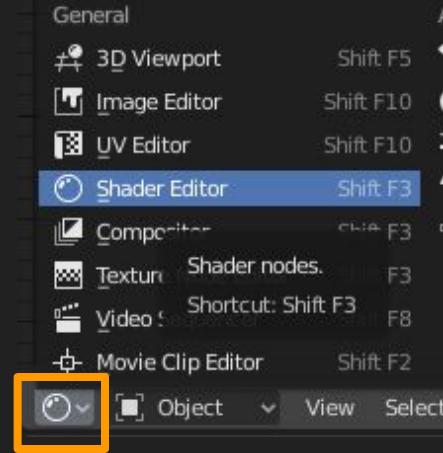
Il materiale sarà **l'intonaco** base del nostro edificio,  
quindi nominiamo il materiale “**intonaco**”

Abilito **Cycles render** e vado nel pannello **Materials**  
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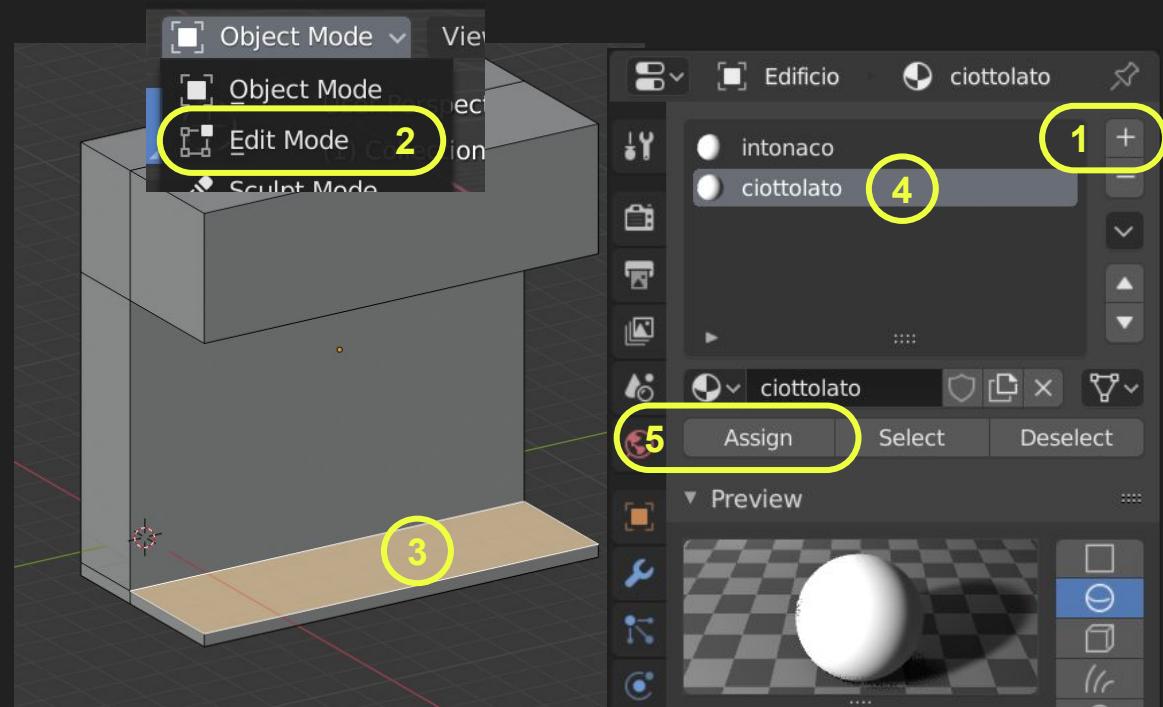
Per gestire le proprietà del materiale appena creato  
apriamo un pannello **shader editor** al posto della  
timeline



Assegno **materiali diversi** alla geometria facce, sempre curandomi di dare nomi significativi.

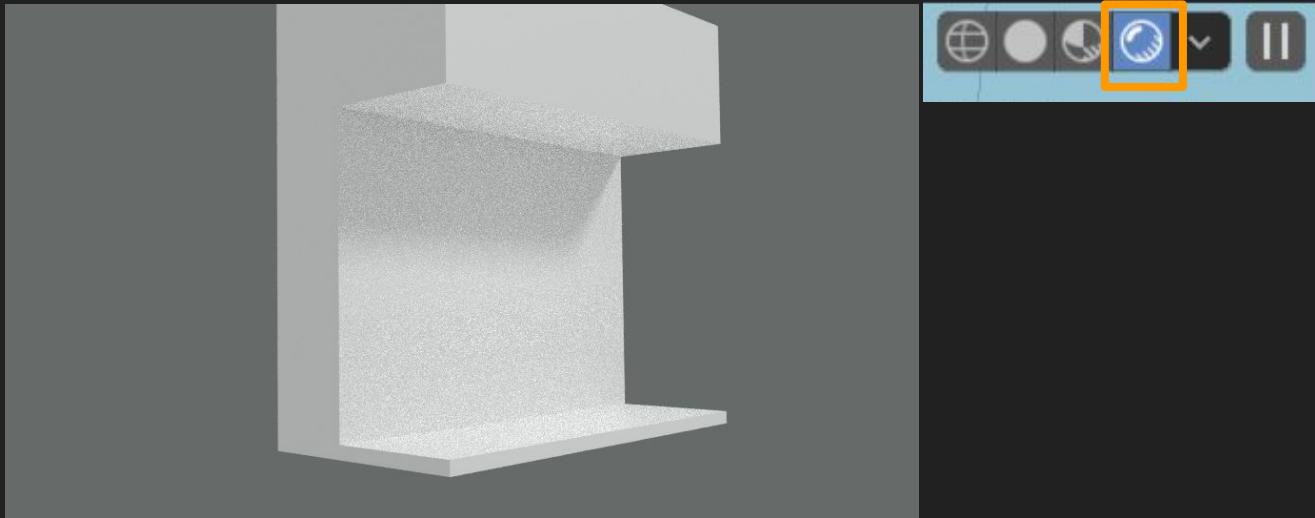
Per assegnare materiali diversi alle facce della mesh:

1. Creo un secondo materiale ( + )
2. Vado in **Edit Mode**
3. **Selezione** le facce
4. **Selezione** il **materiale** da applicare
5. Premere il bottone "**Assign**" sotto la lista dei materiali



Per avere feedback visivo sui materiali di scena anche senza renderizzare posso modificare il **Viewport color** così da visualizzare ogni materiale con un colore diverso

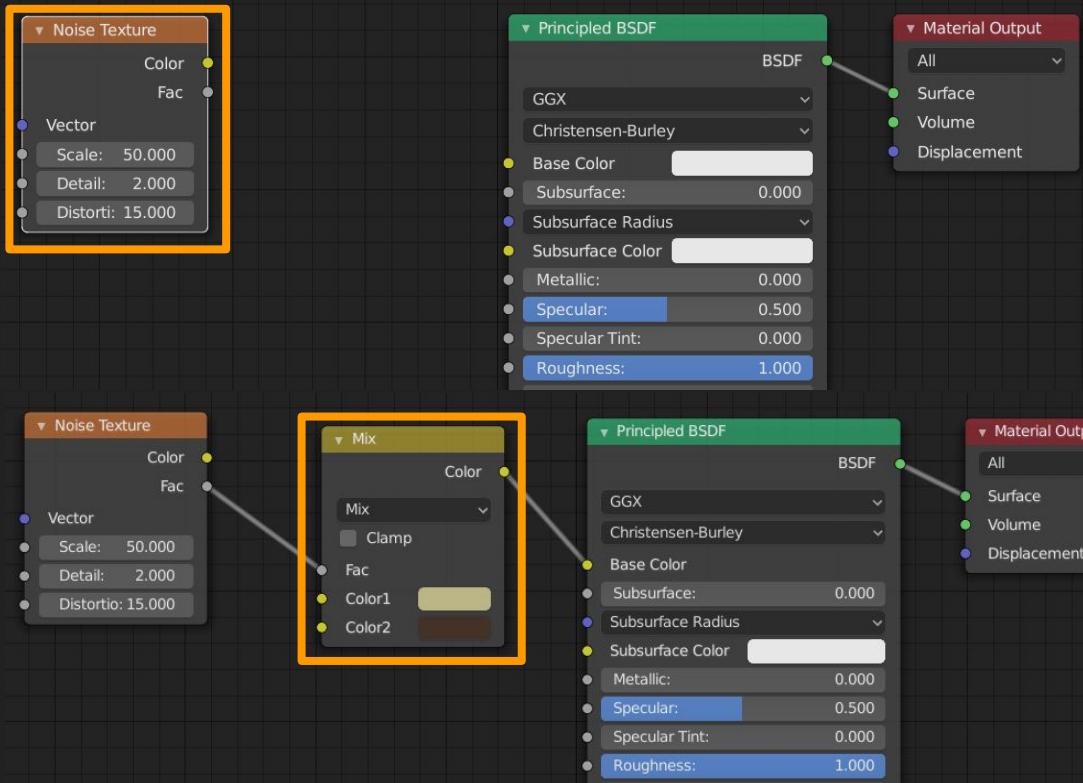
Per visualizzare i materiali, Cycles ci permette di vedere direttamente nella 3D view il **modello renderizzato** abilitando la visualizzazione Rendered



La luce e la camera sono già presenti ed impostate nella Collection “luci\_cam”  
per visualizzarle occorre abilitarle dall’outliner

Assegnati i materiali è possibile iniziare a definire le tipologie di **shader** per ciascun materiale

La **creazione di un materiale** in cycles con i nodi procede **da sinistra verso destra**

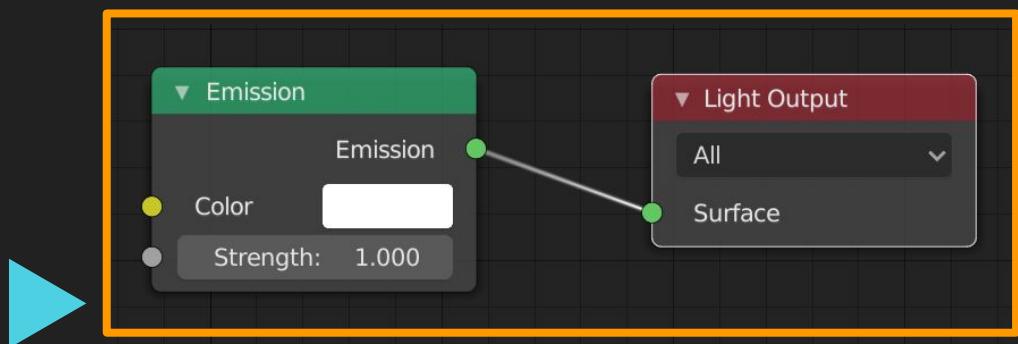
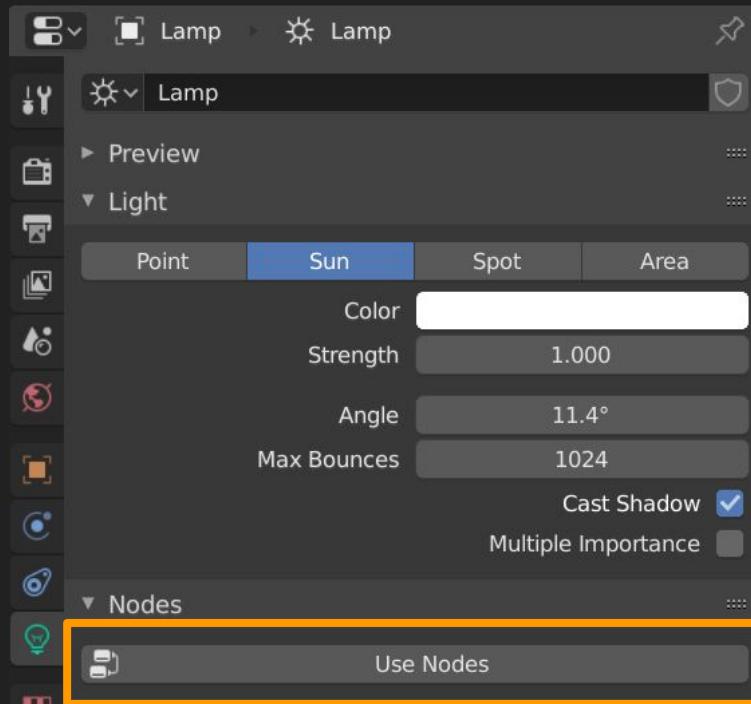


iniziamo con l'intonaco usando una **texture noise** (rumore) che definirà le **variazioni di colore**

Per **collegare** i nodi occorre **cliccare e trascinare** i pallini colorati

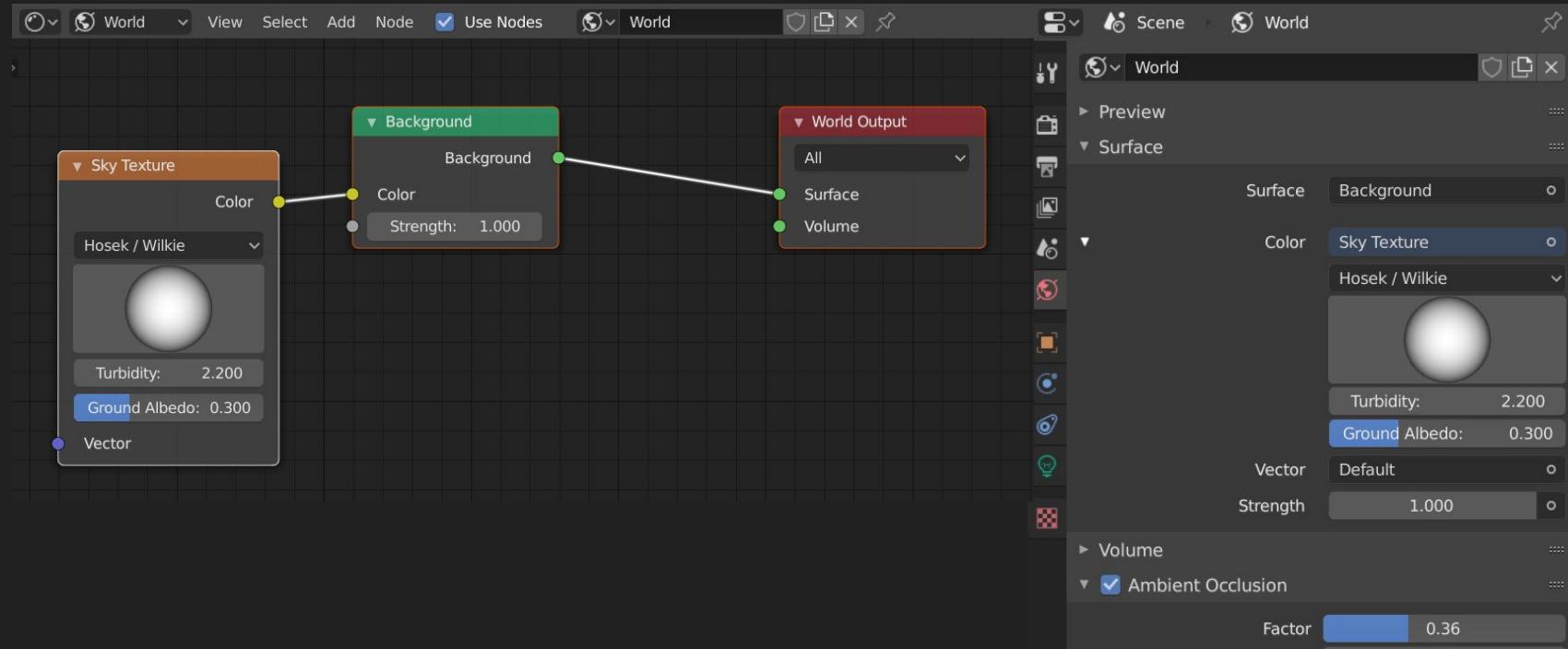
per rimuovere una connessione premere **CTRL** e tracciare una **linea** per tagliare una connessione

Anche le **luci** di scena ed il **mondo** che circonda la scena seguono lo stesso paradigma dei nodi



# Materiali e texturing in Blender 2.8

Anche le **luci** di scena ed il **mondo** che circonda la scena seguono lo stesso paradigma dei nodi



# UV Mapping

Per definire il materiale del **pavimento** utilizzeremo l'UV Mapping

La **Mappatura UV** (UV Mapping) è il processo di modellazione 3D che permette di creare la **rappresentazione 2D di un'immagine 3D**.[\[wiki\]](#)

# UV Mapping

Per definire il materiale del **pavimento** utilizza-

La **Mappatura UV** (UV Ma-  
un'immagine 3D.[wiki]

Nothing better than christmas chocolates to  
explain **#UVmapping** to your kids **#CGI #3D**  
**#material #texture**

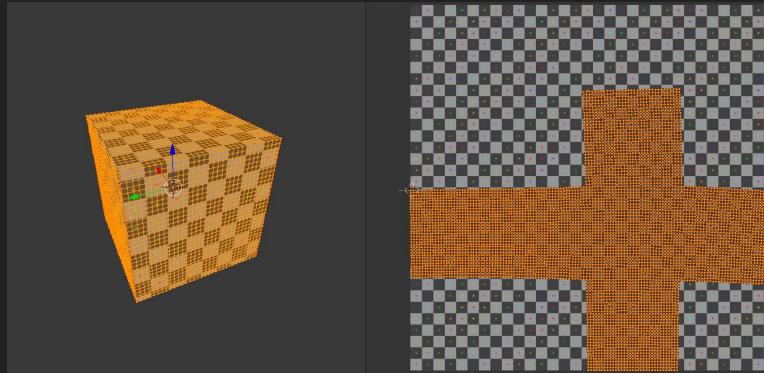
are la **rappresentazione 2D** di



# UV Mapping

Per definire il materiale del **pavimento** utilizzeremo l'UV Mapping

La **Mappatura UV** (UV Mapping) è il processo di modellazione 3D che permette di creare la **rappresentazione 2D di un'immagine 3D**.[\[wiki\]](#)



La **mesh 3d (XYZ)** viene quindi rappresentata da **coordinate bidimensionali dette uv**.

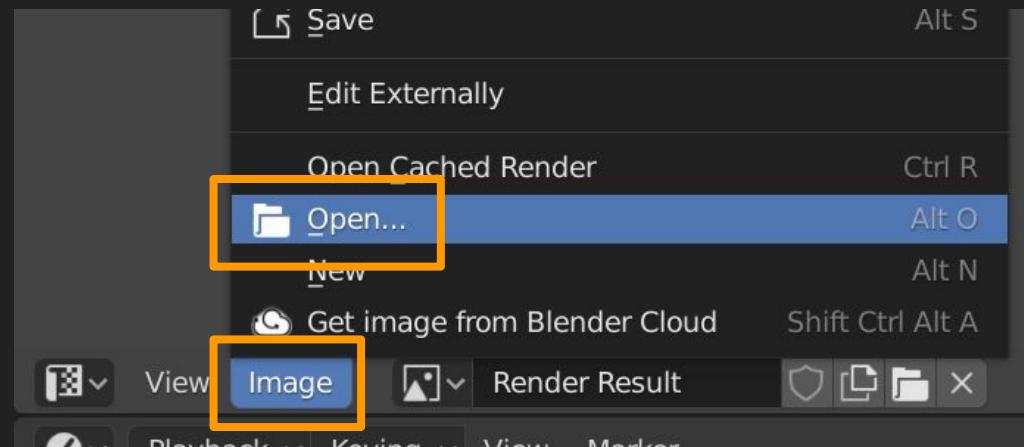
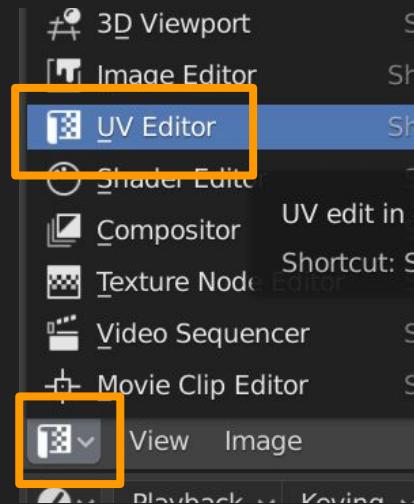
Per effettuare questa mappatura esistono degli strumenti chiamati **unwrap** ossia spacchettamento

In pratica le facce di una geometria vengono aperte ed appoggiate sulla superficie dell'immagine

# UV Mapping

Per UnWrappare la mesh vado in Edit Mode

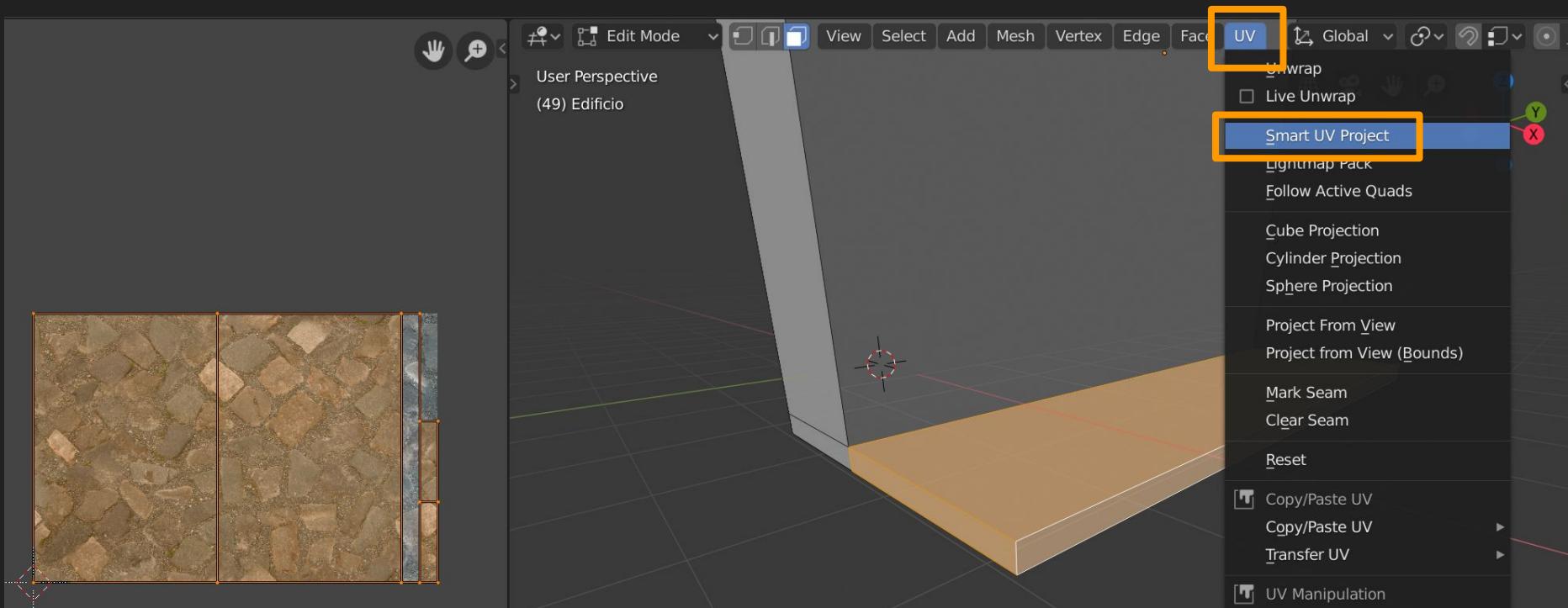
ed abilito l'**UV editor**



Nel pannello, vado in **Image** → **Open image** ed apro la texture "BrickFloor.jpg"

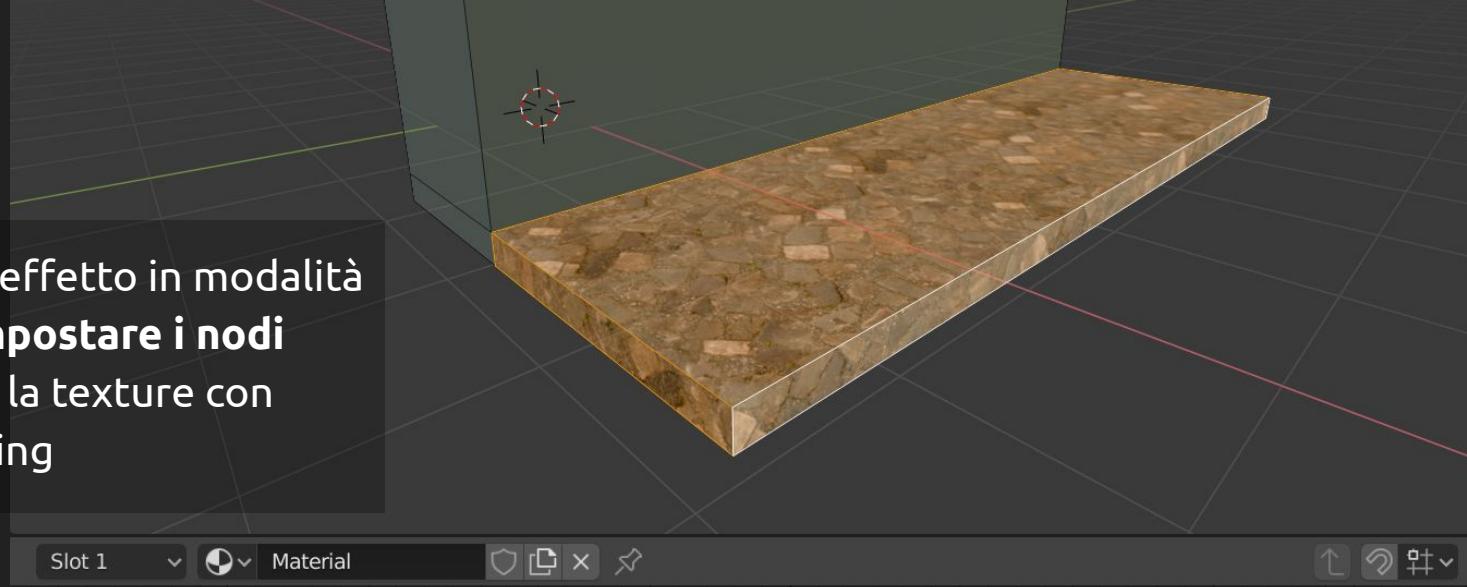
# UV Mapping

UV eseguo l'Unwrap di tipo Smart UV Project



# UV Mapping

Per visualizzare l'effetto in modalità Rendered devo impostare i nodi affinchè utilizzino la texture con modalità UvMapping



The image shows the Blender Node Editor interface. At the top, there is a Material panel with tabs for Slot 1, a Material preview, and various icons. Below it is the main node editor area.

**UV Map Node:** A node labeled "UV Map" is selected. It has two outputs: "UV" (which is connected to the "Vector" input of a "BrickFloor.jpg" texture node) and "Alpha" (which is connected to the "Alpha" input of the "BrickFloor.jpg" texture node).

**Texture Node:** A texture node labeled "BrickFloor.jpg" is connected to the "Color" input of the "Principled BSDF" node. The texture node has settings for "Linear", "Flat", "Repeat", "Single Image", "Color Space sRGB", and "Vector".

**Principled BSDF Node:** This is the primary shader node. Its properties panel is open, showing the following settings:

- GGX
- Christensen-Burley
- Base Color (yellow dot)
- Subsurface: 0.000
- Subsurface Radius
- Subsurface Color (white box)
- Metallic: 0.000
- Specular: 0.500
- Specular Tint: 0.000
- Roughness: 1.000
- Anisotropic: 0.000
- Anisotropic Rotation: 0.000

**Material Output Node:** A "Material Output" node is connected to the "BSDF" output of the Principled BSDF node. Its properties panel shows "All" selected under "Surface".

# Completare



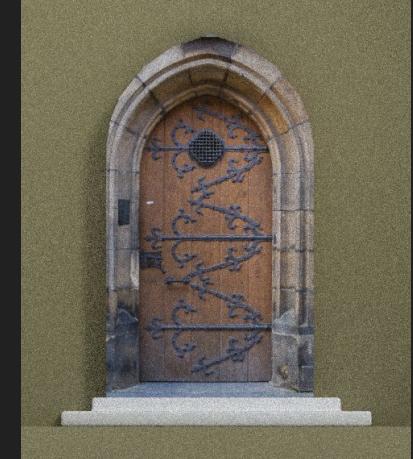
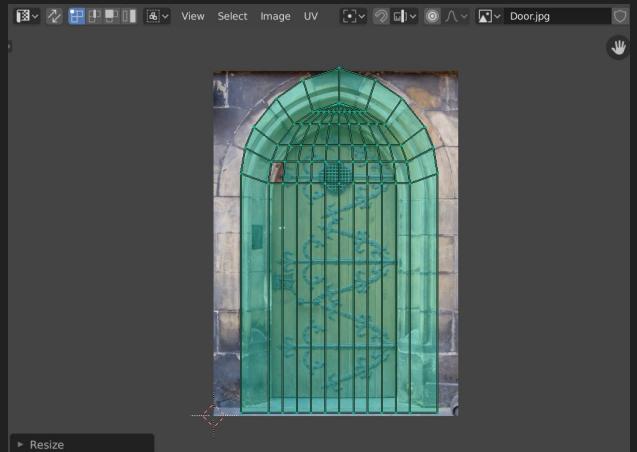
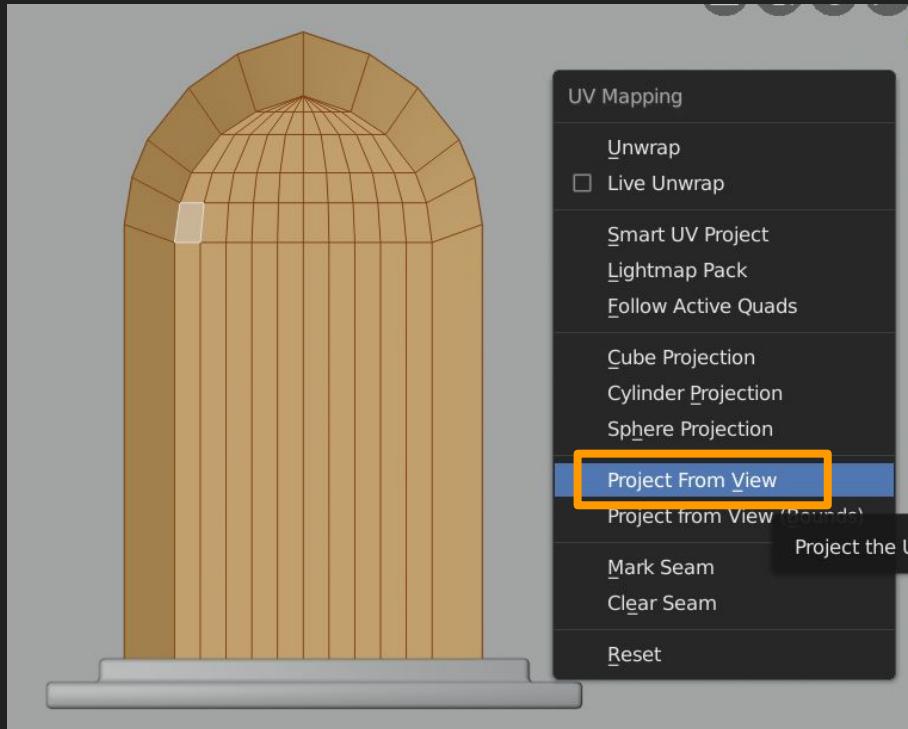
Utilizzando le medesime tecniche texturizzo gli oggetti presenti nella **collection 2**

Se la texture appare troppo grande o posizionata male la posso **scalare e ruotare** nell'**UV Editor**

Per comodità posso utilizzare la tecnica del **Follow Active Quad** per texturizzare superfici con quad continui come le colonne

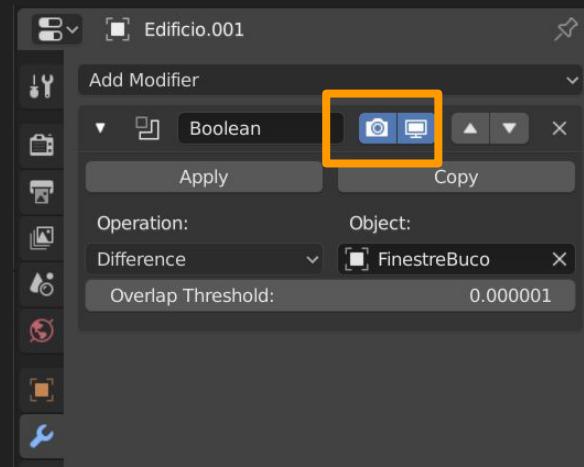
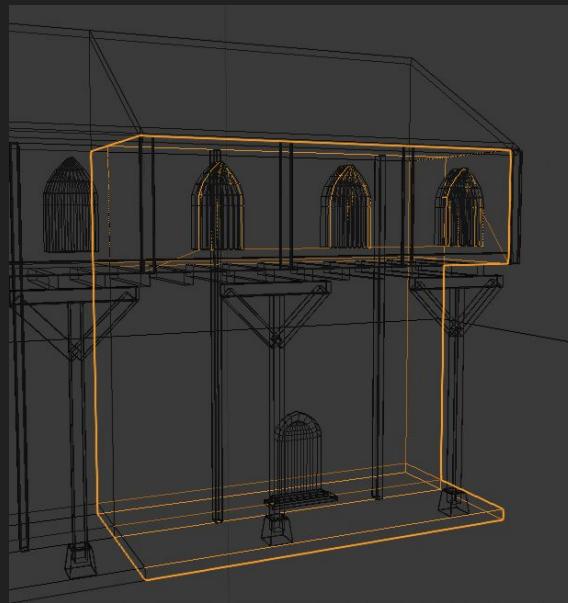
**NB:** tutte gli **oggetti instanziati**, cioè che posseggono la stessa mesh, erediteranno gli stessi materiali e lo stesso unwrap

Per texturizzare la porta mi posiziono in **vista frontale ortogonale** ed utilizzo L'Unwrap di tipo **project from view**

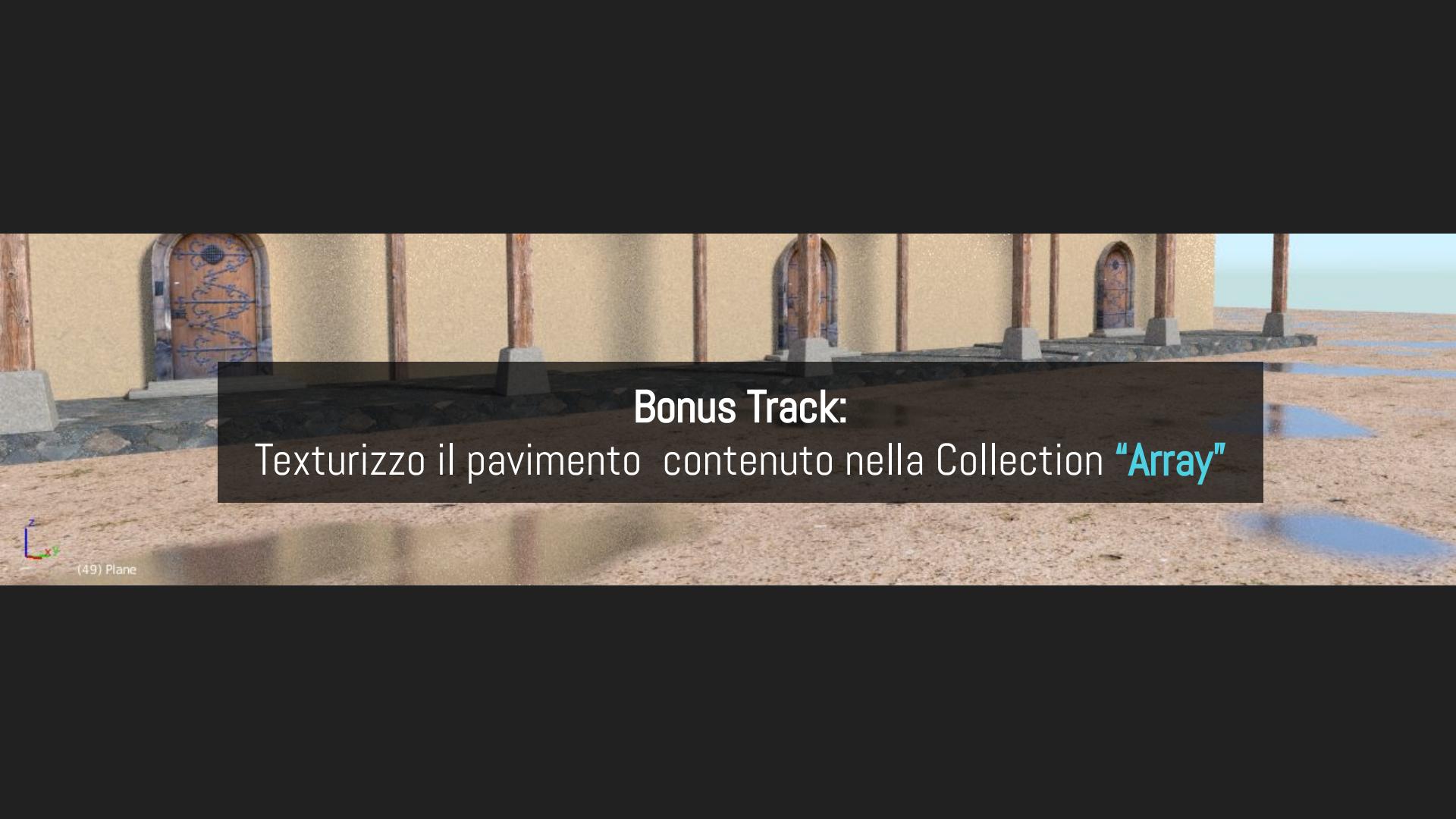


Questo unwrap proietta i vertici sulla **texture** dalla vista in cui mi trovo

Utilizzando le medesime tecniche texturizzo gli oggetti presenti nelle **Collection "edificio\_elementi"** e **"dettagli"**  
Per mostrare i buchi per le finestre **seleziono l'edificio** ed abilito il **modificatore Boolean** preimpostato

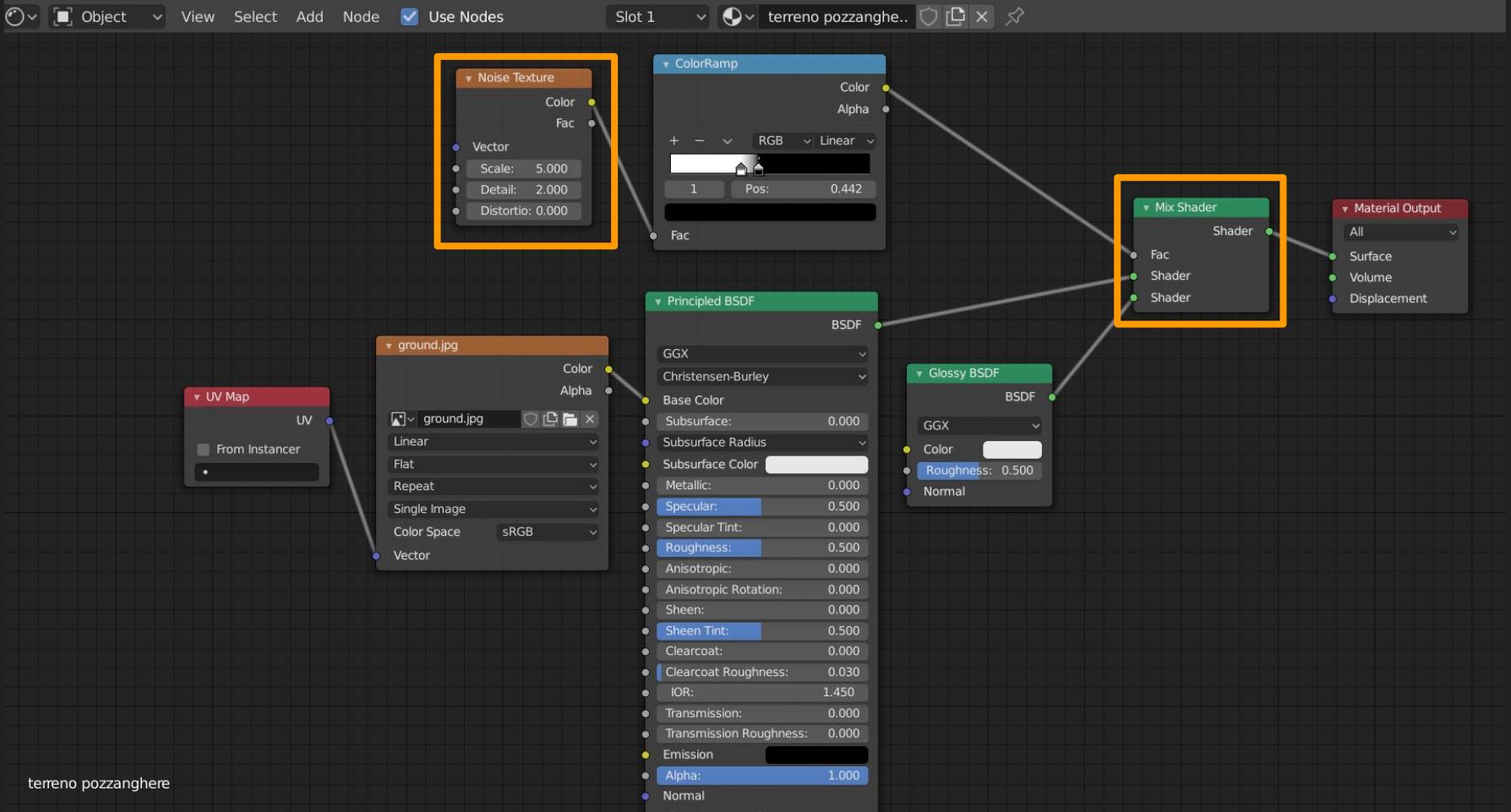


Per migliorare la resa visiva **aumento la luminosità** della lampada in scena e della sky texture



**Bonus Track:**  
Texturizzo il pavimento contenuto nella Collection "**Array**"

  
(49) Plane



temeno pozzanghere

Mediante una texture **noise** effettuo un **mix tra opaco e lucido** per creare delle **pozzanghere**



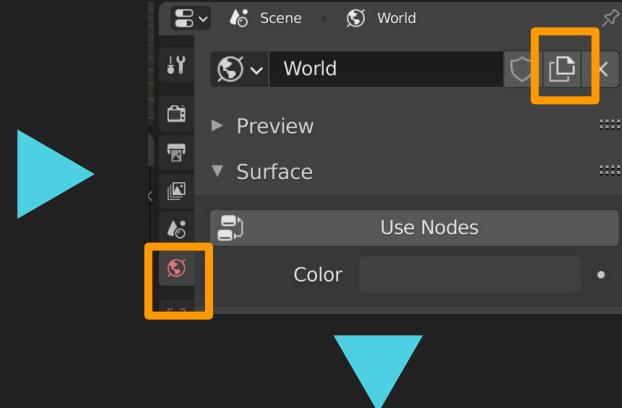
Bonus Track #2:  
Inserisco una texture **environment** per illuminare il world

## Recupero una texture di tipo 360 equirettangolare

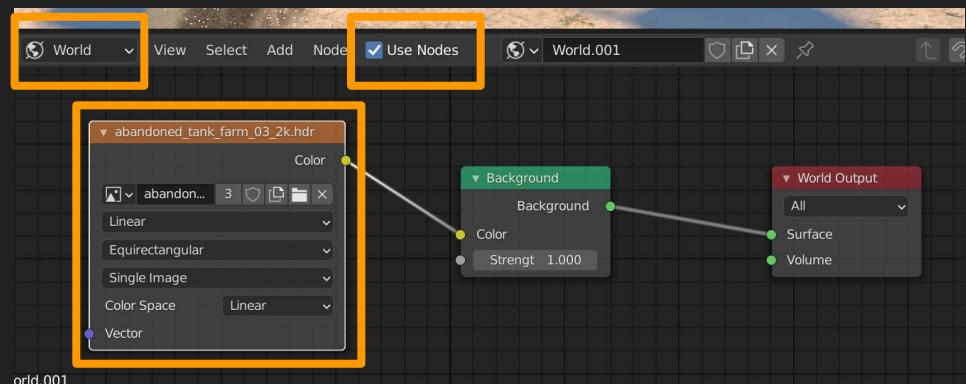


[https://hdrihaven.com/hdri/?h=wide\\_street\\_01](https://hdrihaven.com/hdri/?h=wide_street_01)

## Creo un nuovo world



Nello shading del world abilito i nodi



e collego il file .hdr scaricato mediante una **Environment texture**



Grazie per la  
vostra attenzione

Domande?



VISIT LAB  
VISUAL INFORMATION  
TECHNOLOGY LAB  
CINECA

Domande?

NO ?!11?

# Desiderata

- Eevee e Real Time rendering
- Geometry nodes
- Rigging ed animazione
- Fisica e Quick effects
- Sculpt e texture painting
- Import / Export
- Stampa 3D
- Grease Pencil
- Links utili
- ...

Grazie per la  
vostra attenzione

bis