

REU Modeling Course - Part 3

Blender

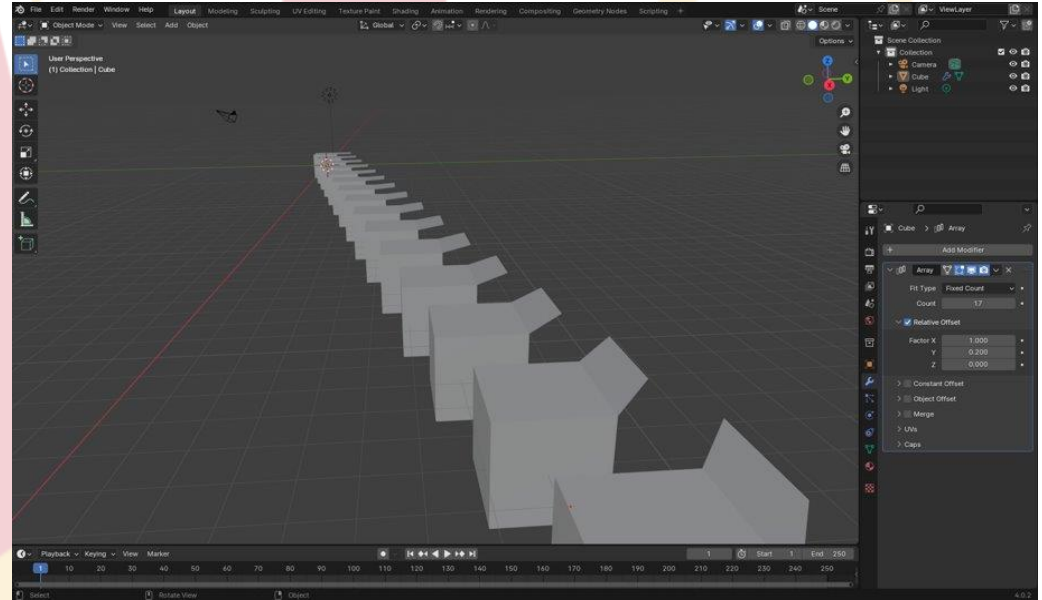
More Modeling

Workshop Workflow

- Review
- Creating & Applying Materials
- Rendering
- Mini Creation

Review

- What are modifiers?
- How do you add modifiers?

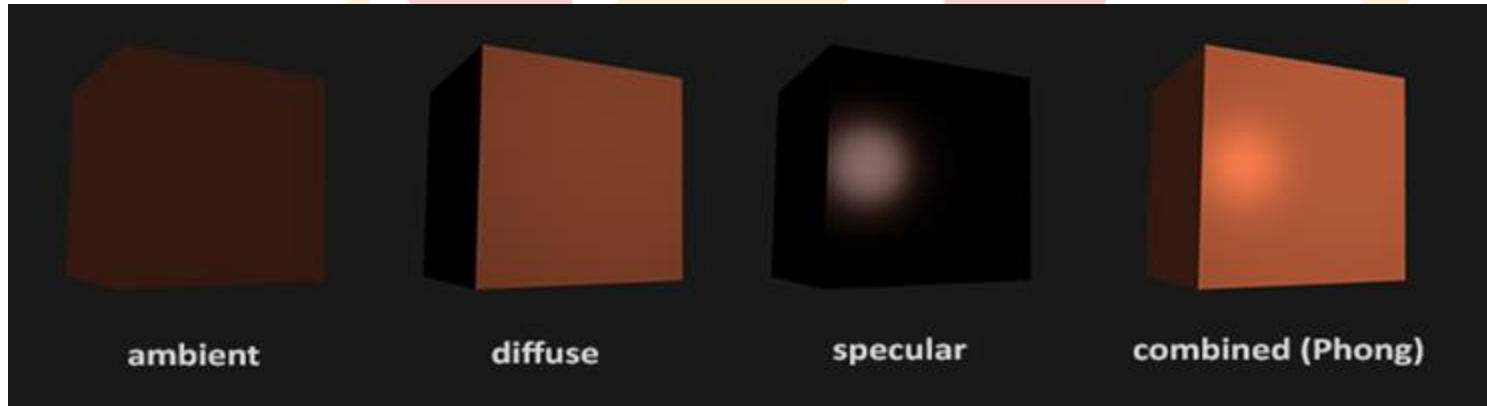


Review

- How would you create this:



Basic Lighting Types:



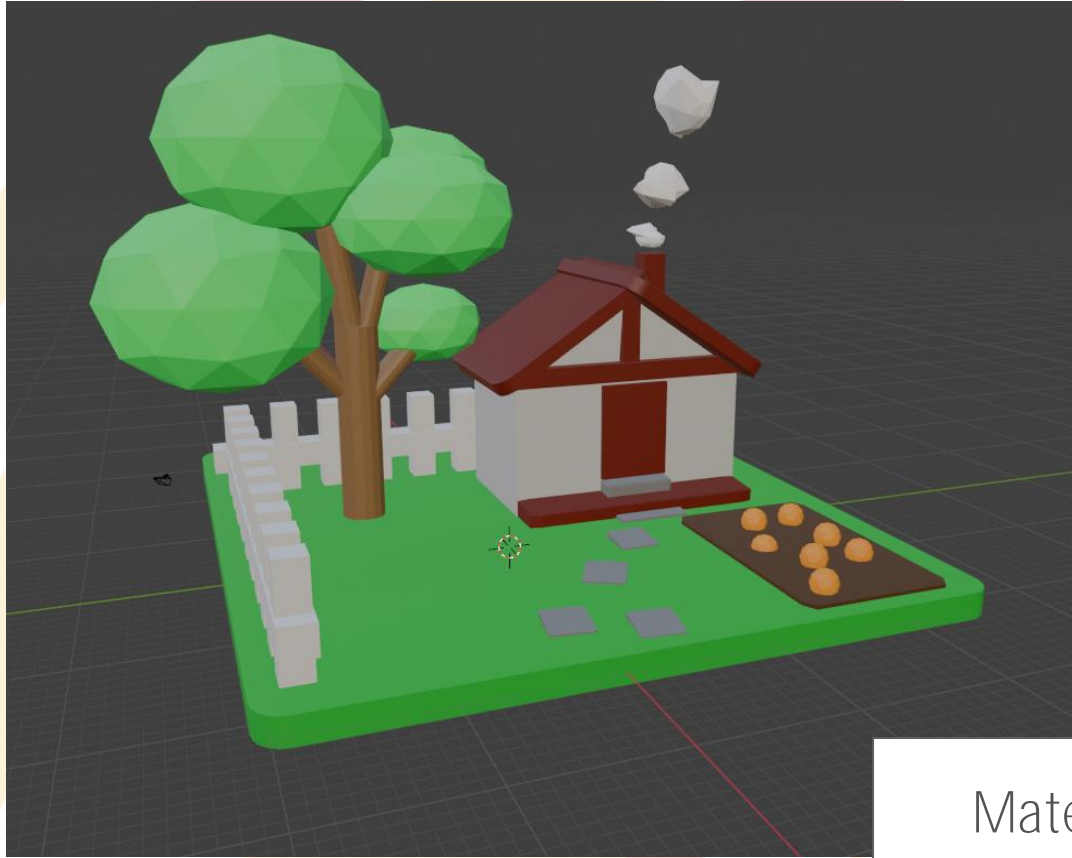
The light on objects in a scene is made up of a combination of these light types.

Shaders/Materials



No materials applied

Shaders/Materials



Materials applied

Adding Basic Materials

We want to make the dirt look like dirt

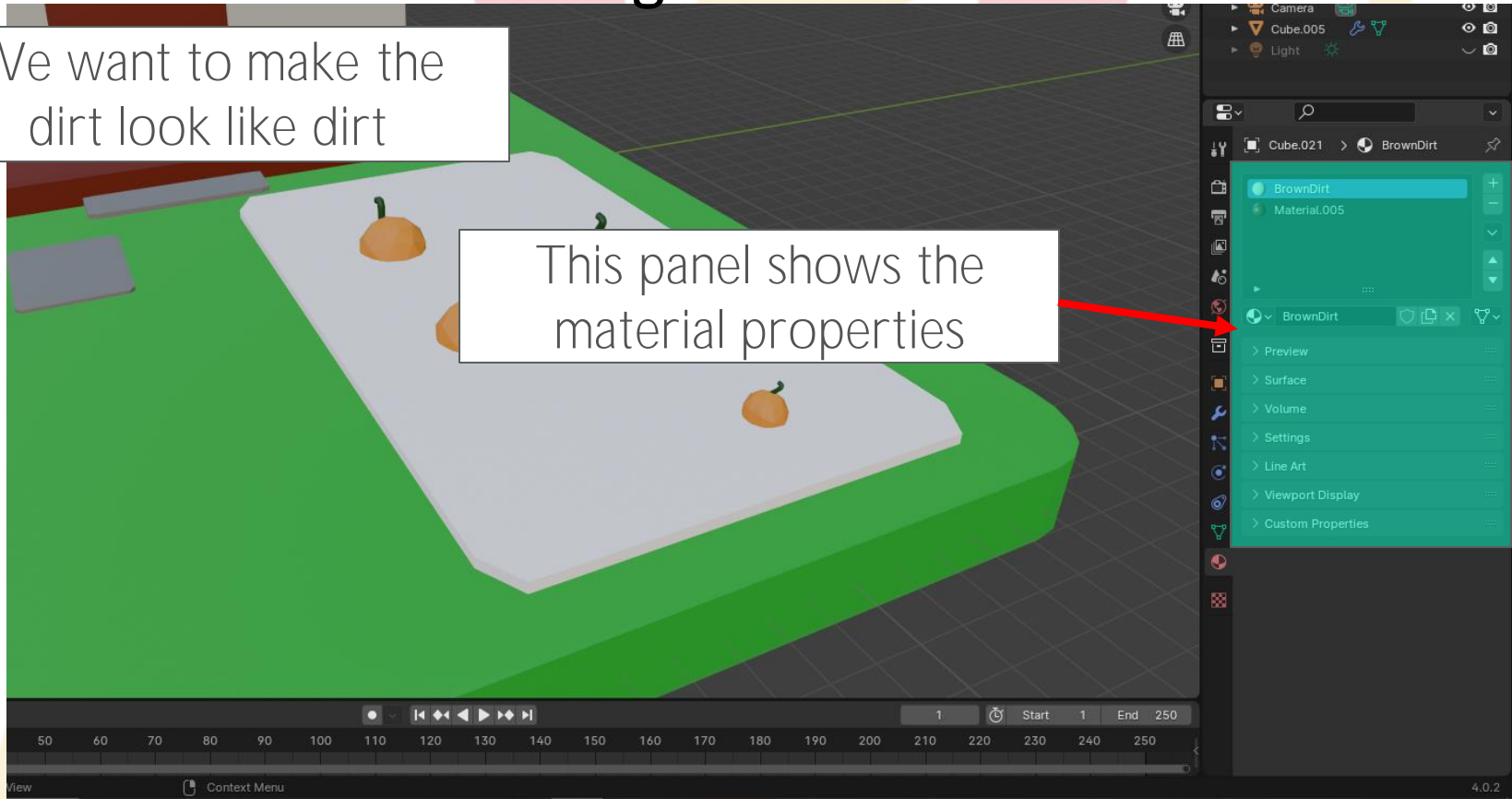


This button opens the materials tab

Adding Basic Materials

We want to make the dirt look like dirt

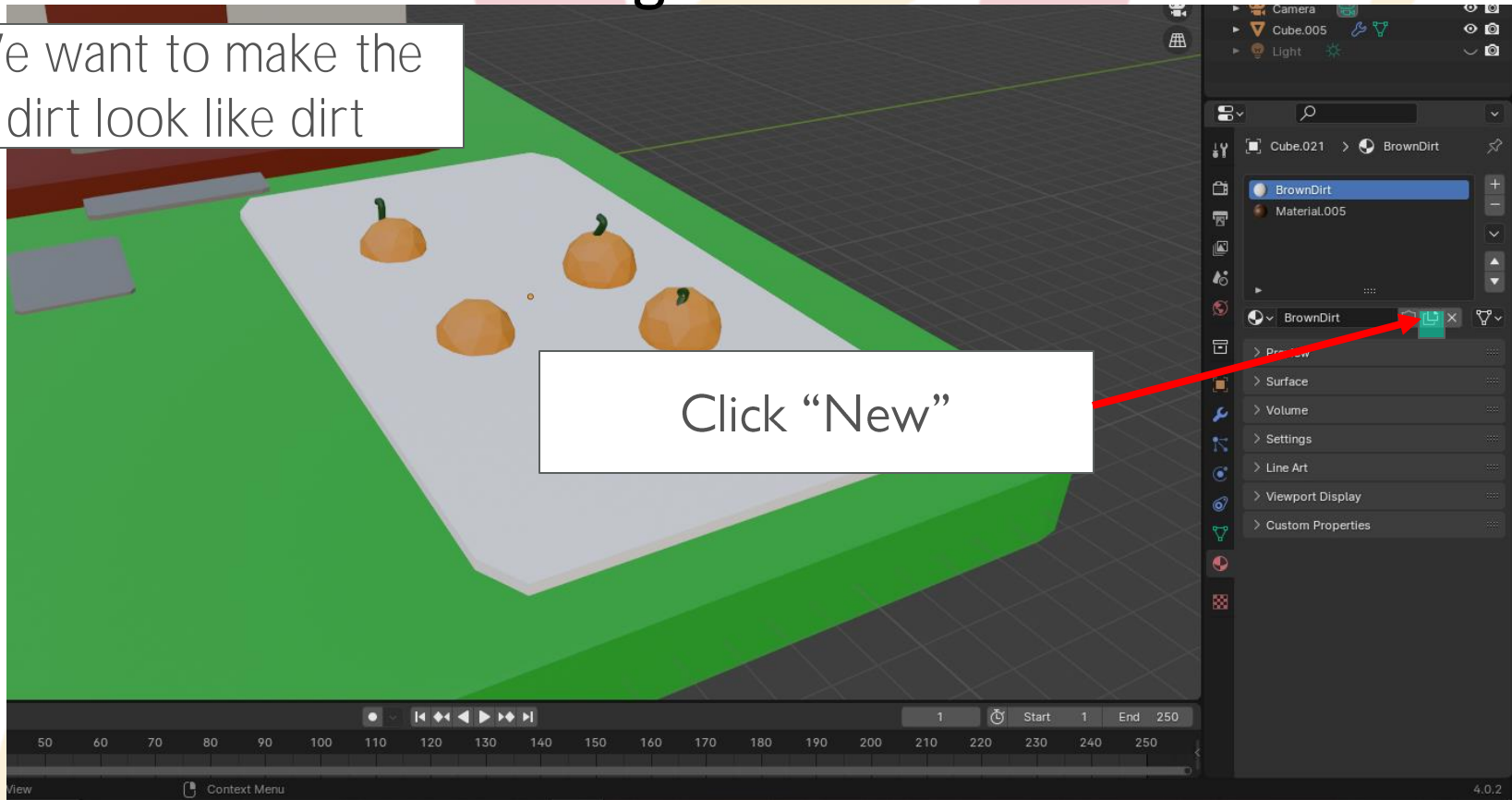
This panel shows the material properties



Adding Basic Materials

We want to make the dirt look like dirt

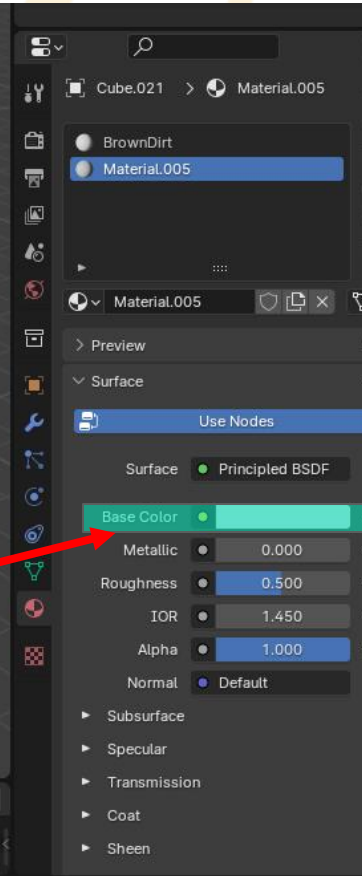
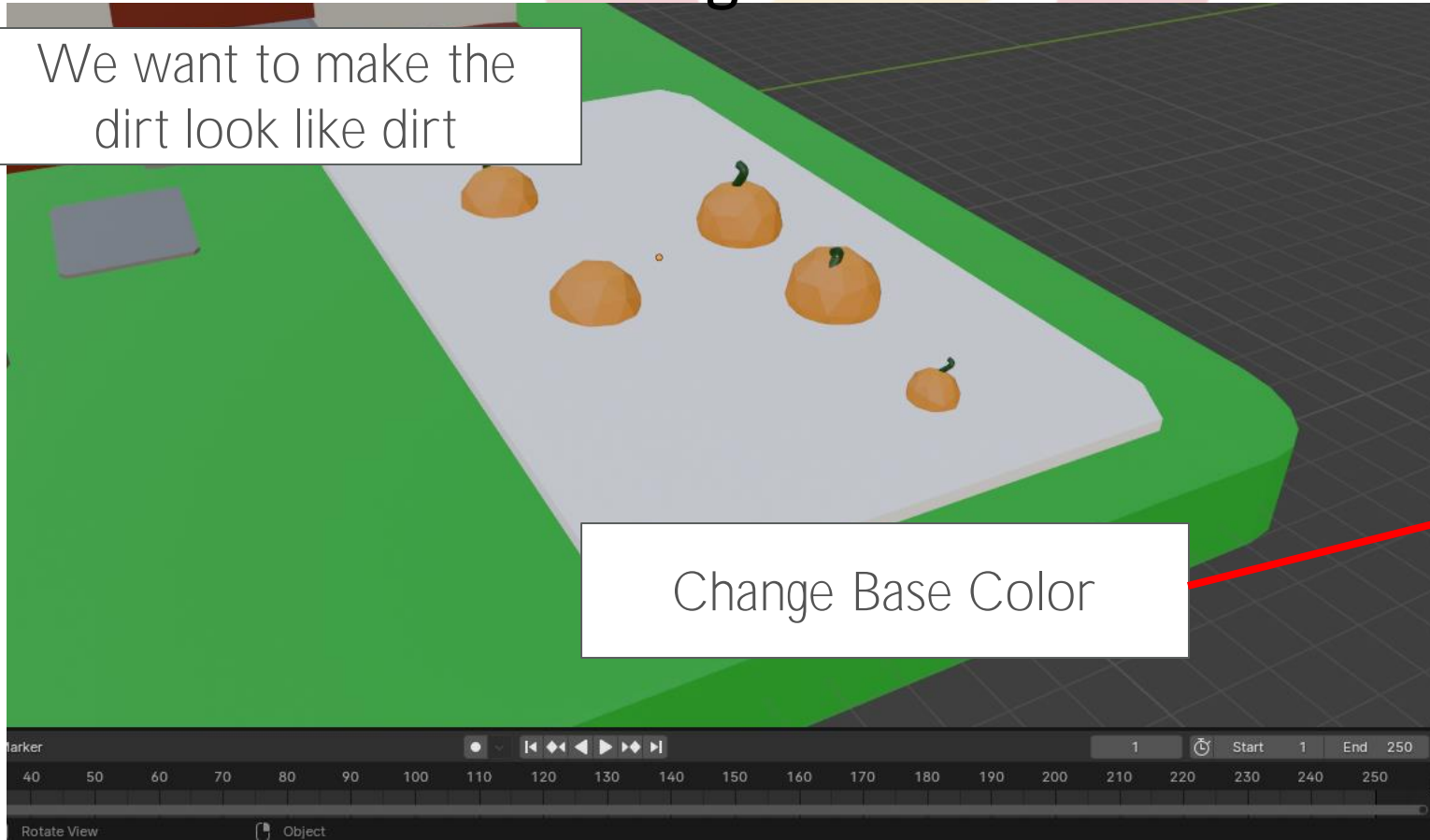
Click "New"



Adding Basic Materials

We want to make the dirt look like dirt

Change Base Color



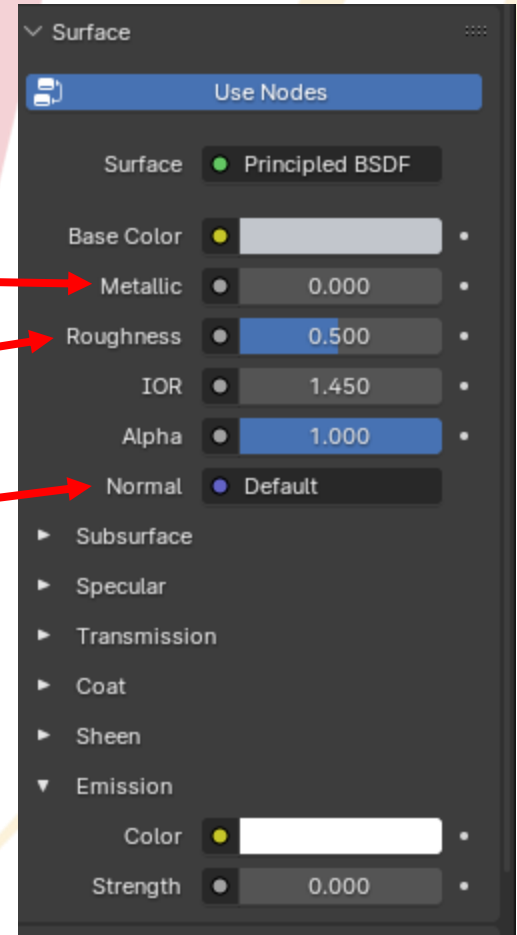
Adding Basic Materials

This is a good start!



More Material Properties

- Metallic:
 - As the name implies, makes objects look like metal
- Roughness:
 - Less rough = glassy looking
 - More rough = matte
- **Normal:**
 - (More on this later)
- Emission:
 - High value = glowing



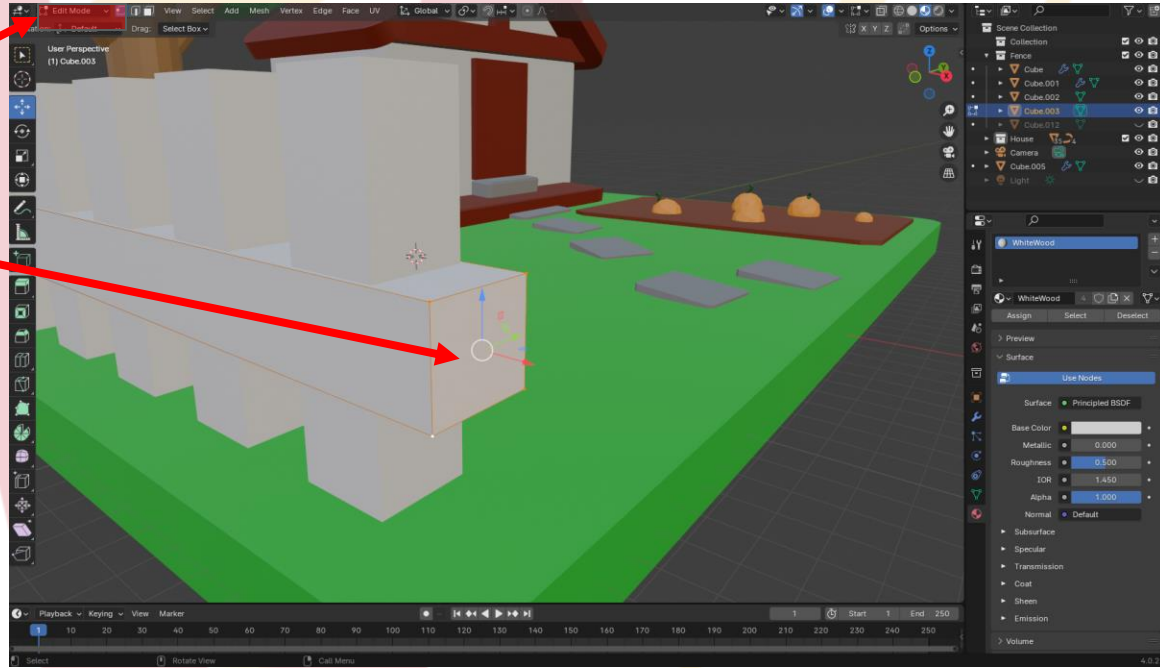
Multiple Materials

An object can have multiple materials



Multiple Materials

- Enter “Edit Mode” (Tab)
- Select vertices of desired face



Multiple Materials

● Click “+”

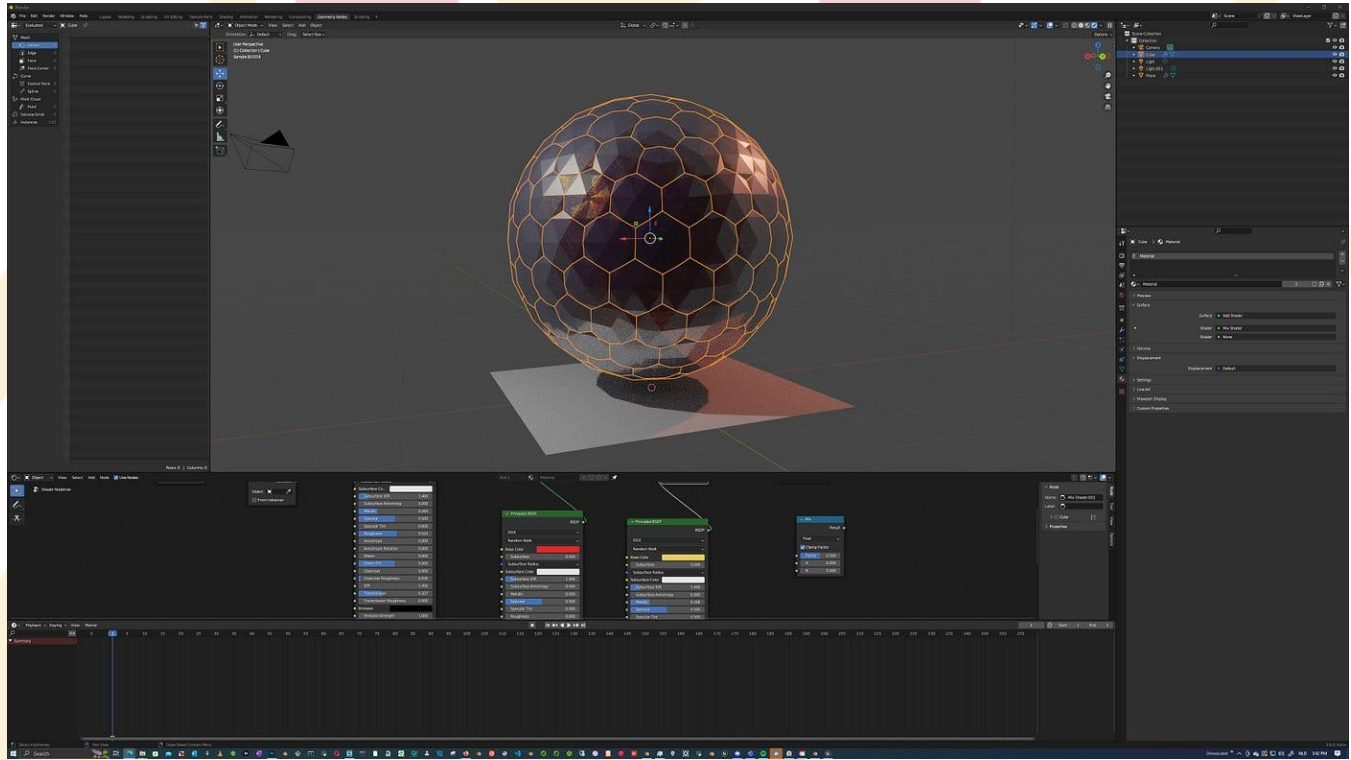
● Click “+”

● Select desired base color

Click “Assign”

4.0.2

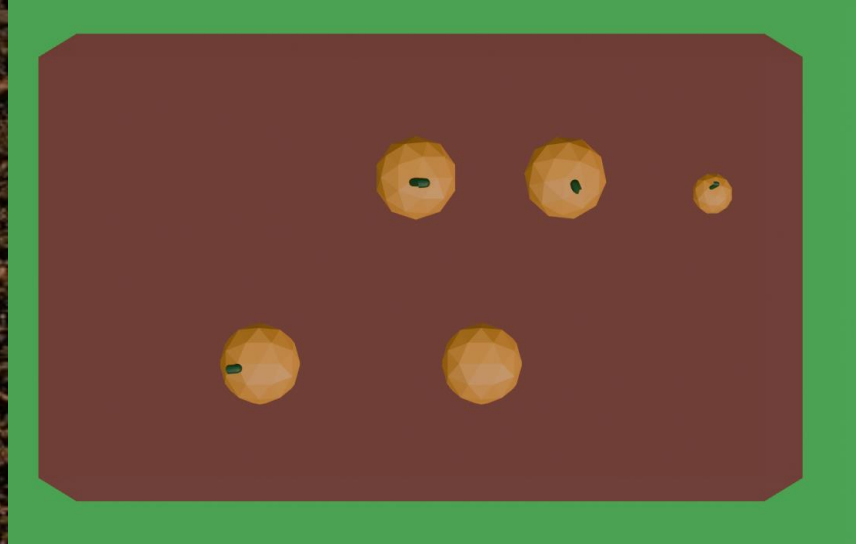
Break Time!



Shader Nodes

Real Dirt

Our Dirt



What if we wanted to make our dirt look more realistic?

Shader Nodes

With Shader Nodes we can make the dirt more realistic



Shader Nodes

- Click clock icon to open view menu
- Find the “Shader Editor” tab
- Open it

The screenshot shows the Blender 2.80 interface with the Viewport menu open. The menu is divided into four columns: General, Animation, Scripting, and Data. The Shader Editor tab is highlighted in the General column. A red arrow points to the clock icon in the bottom-left corner of the interface, which is used to open the Viewport menu. A tooltip for the Shader Editor tab is visible, showing the text "Shader nodes. Shortcut: Shift F3".

General	Animation	Scripting	Data
3D Viewport (Shift F5)	Dope Sheet (Shift F12)	Text Editor (Shift F11)	Outliner (Shift F9)
Image Editor (Shift F10)	Timeline (Shift F12)	Python Console (Shift F4)	Properties (Shift F7)
UV Editor (Shift F10)	Graph Editor (Shift F6)	Info	File Browser (Shift F1)
Compositor (Shift F3)	Drivers (Shift F6)		Asset Browser (Shift F1)
Texture Node Editor (Shift F3)	Nonlinear Animation		Spreadsheet
Geometry Node Editor (Shift F3)			Preferences
Shader Editor (Shift F3)			
Video Sequencer (Shift F9)			
Movie Clip Editor (Shift F8)			

Shader Nodes

Principled BSDF

Base Color	
Metallic	0.000
Roughness	0.500
IOR	1.450
Alpha	1.000
Normal	
Subsurface	
Specular	
Transmission	
Coat	
Sheen	
Emission	
Color	
Strength	0.000

Material Output

- All
- Surface
- Volume
- Displacement

Material Output

Color

Properties

Surface

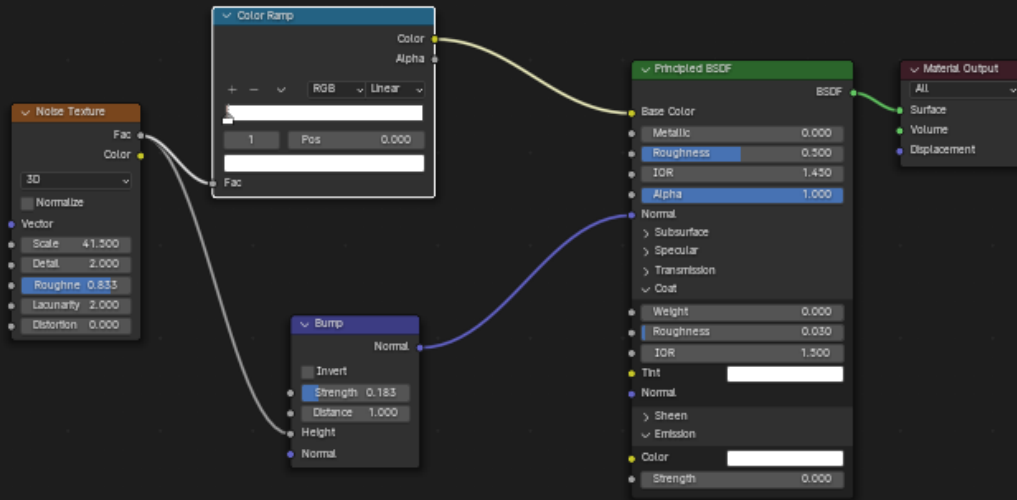
Use Nodes

- Surface Principled BSDF
- Base Color
- Metallic 0.000
- Roughness 0.500
- IOR 1.450
- Alpha 1.000
- Normal Default
- Subsurface
- Specular
- Transmission
- Coat
- Sheen
- Emission
- Color

These two panels are the same:

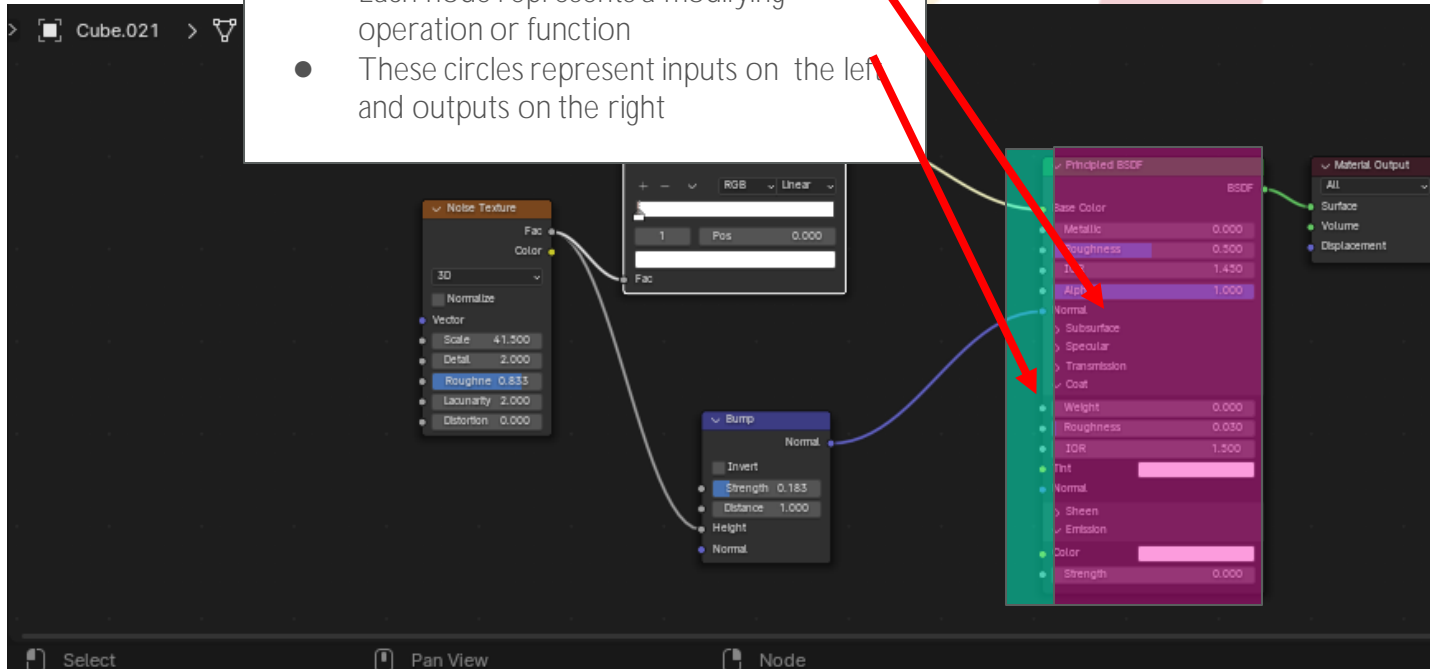
How Do Nodes Work?

- The nodes are “read” from left to right



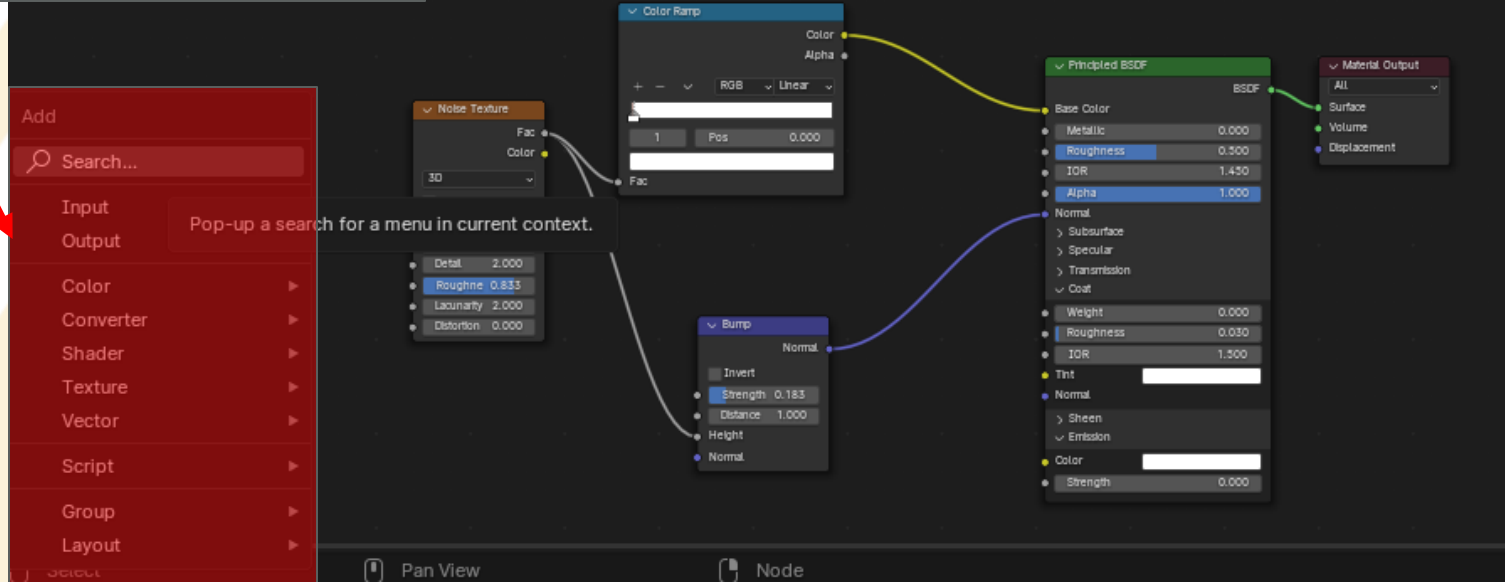
How Do Nodes Work?

- Each node represents a modifying operation or function
- These circles represent inputs on the left and outputs on the right



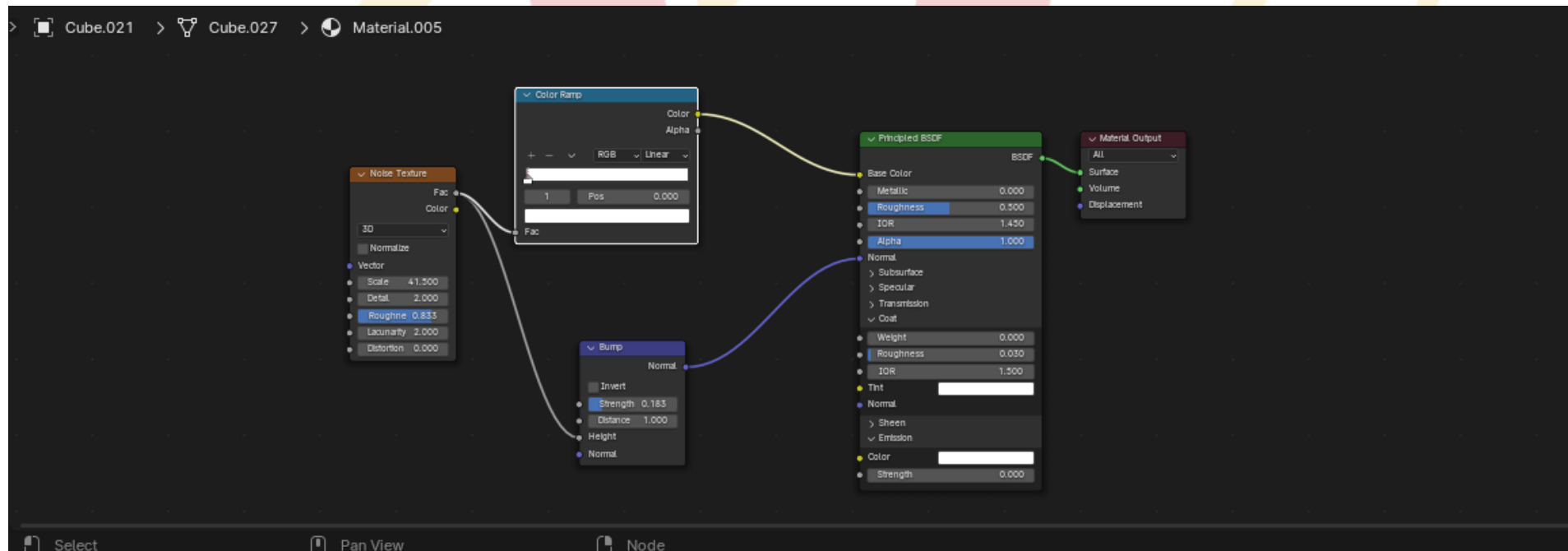
Adding Nodes

- Shift + A to open Add Node Menu

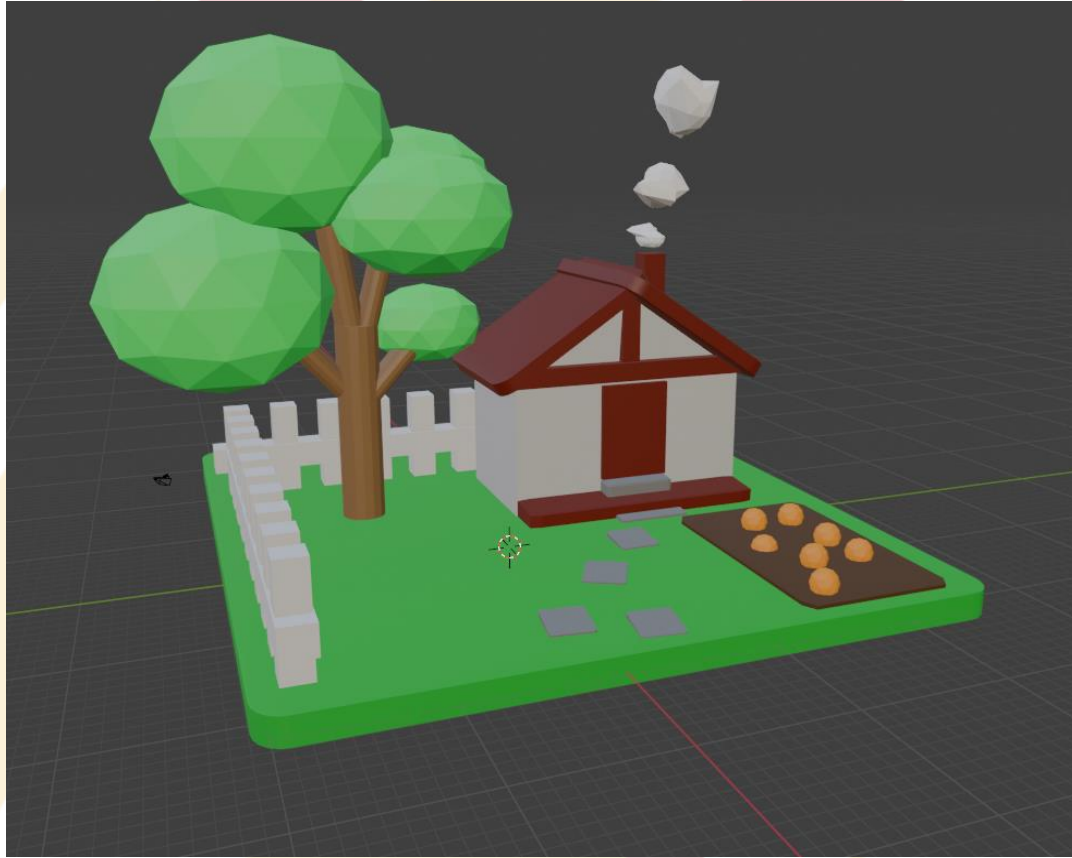


Practice:

Copy these nodes to make the dirt look more realistic



Without Nodes



With Nodes



Mini Creation

- Add materials to all of the objects from session 2
 - Start with simple materials (colors)
 - Then try one with the Node Editor



Mini Creation



Break Time



Lights and Rendering



Adding a Light

- To add a light to a scene:
- Shift + A > Light
- There are 4 types

- Lights appear in Hierarchy



Types of lights

Point

- Emits light from all directions
- Used for lamps or items that light up

Sun

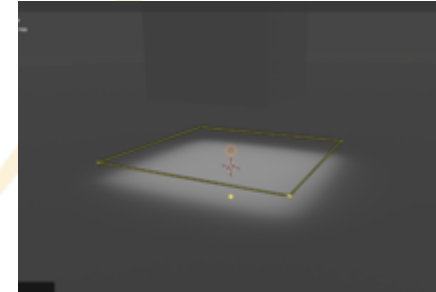
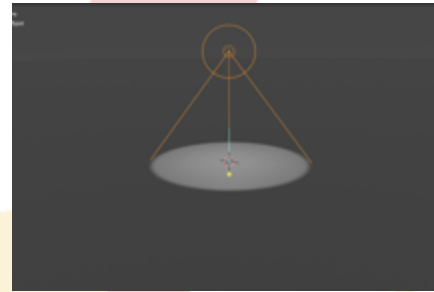
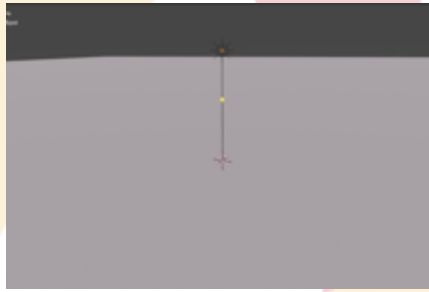
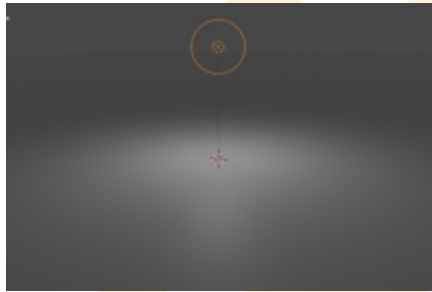
- Emits light with parallel rays, so position does not matter
- Used for outdoor/large spaces

Spot

- Emits light in a cone shape
- Used for “moody” lighting

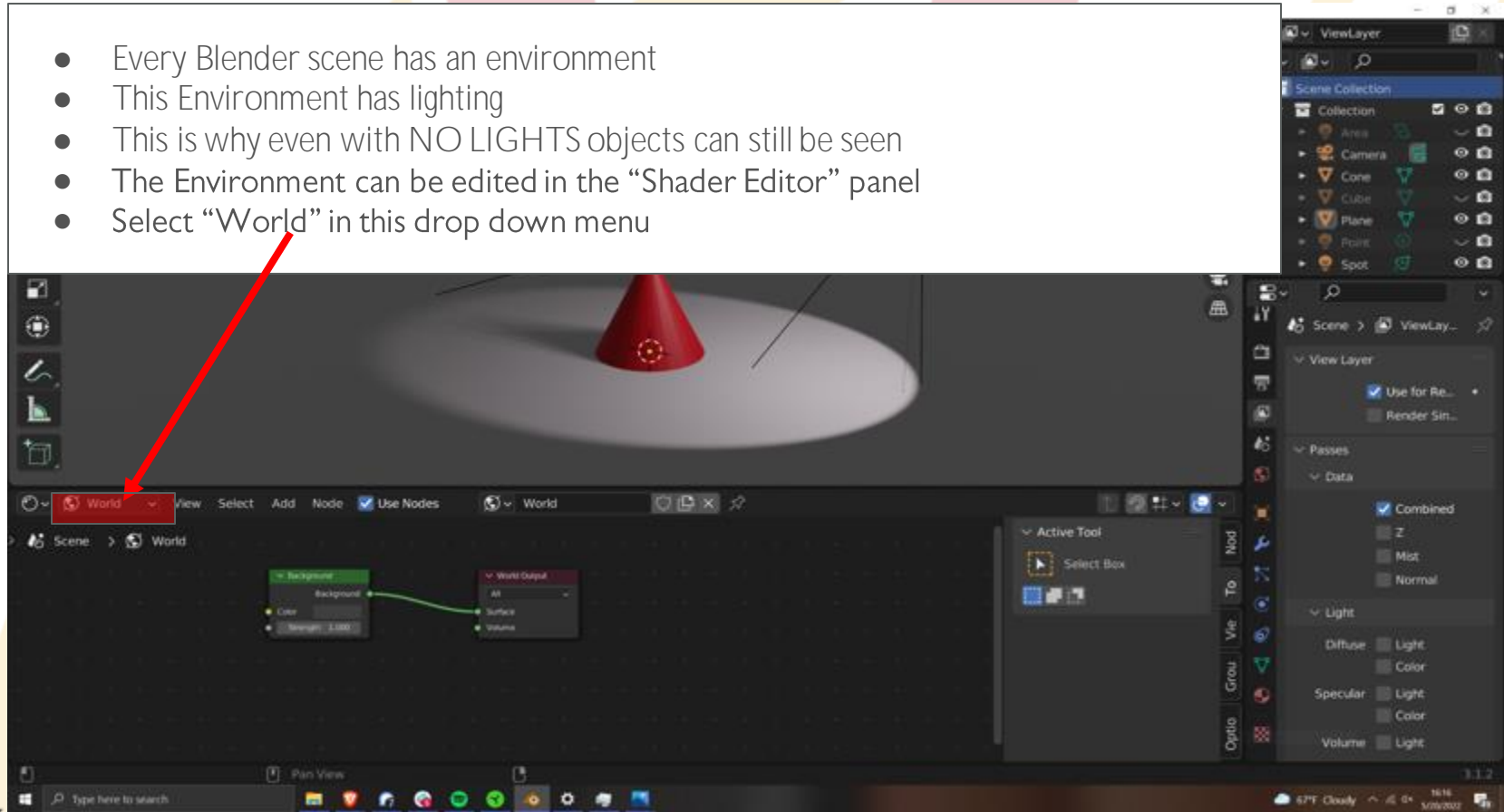
Area

- Emits light in one direction from a square
- Used for indoor spaces

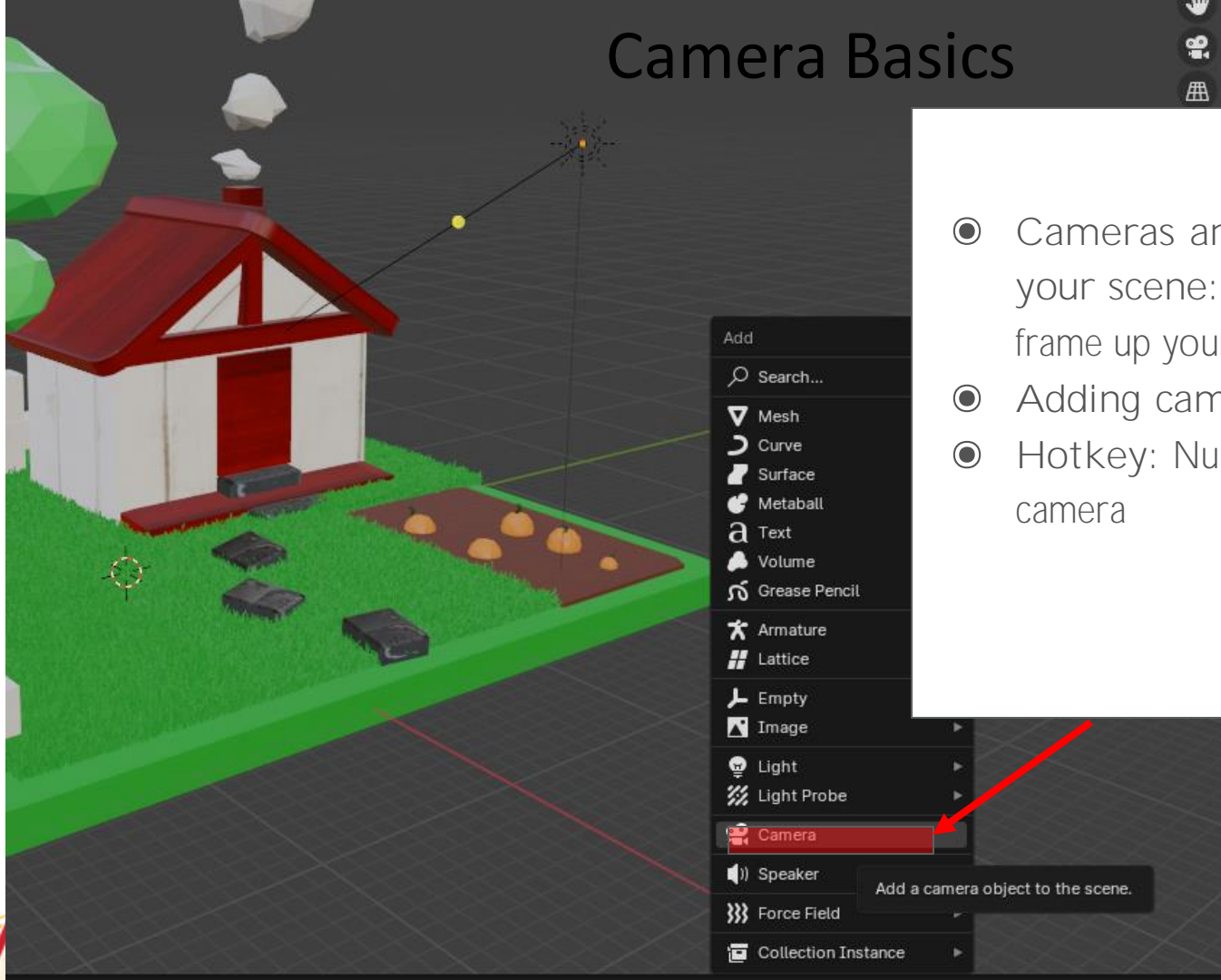


Environment

- Every Blender scene has an environment
- This Environment has lighting
- This is why even with NO LIGHTS objects can still be seen
- The Environment can be edited in the “Shader Editor” panel
- Select “World” in this drop down menu



Camera Basics



- Cameras are where/what you view your scene: Cameras allow you to frame up your objects
- Adding cameras: Shift + A > Camera
- Hotkey: Numpad 0 = set view to active camera

Camera Properties

● Camera Constraints:

● Camera Properties:

Camera > Camera

Camera

Lens

Type Perspective

Focal Len... 50 mm

Lens Unit Millimeters

Shift X 0.000

Y 0.000

Clip Start 0.1 m

End 100 m

Camera

Safe Areas

Background Images

Viewport Display

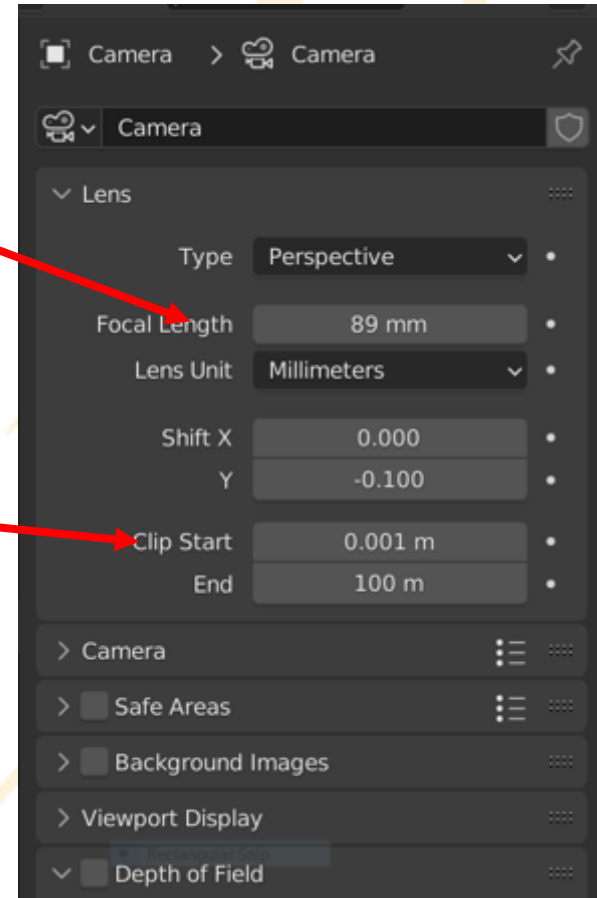
Depth of Field

Region Context Menu

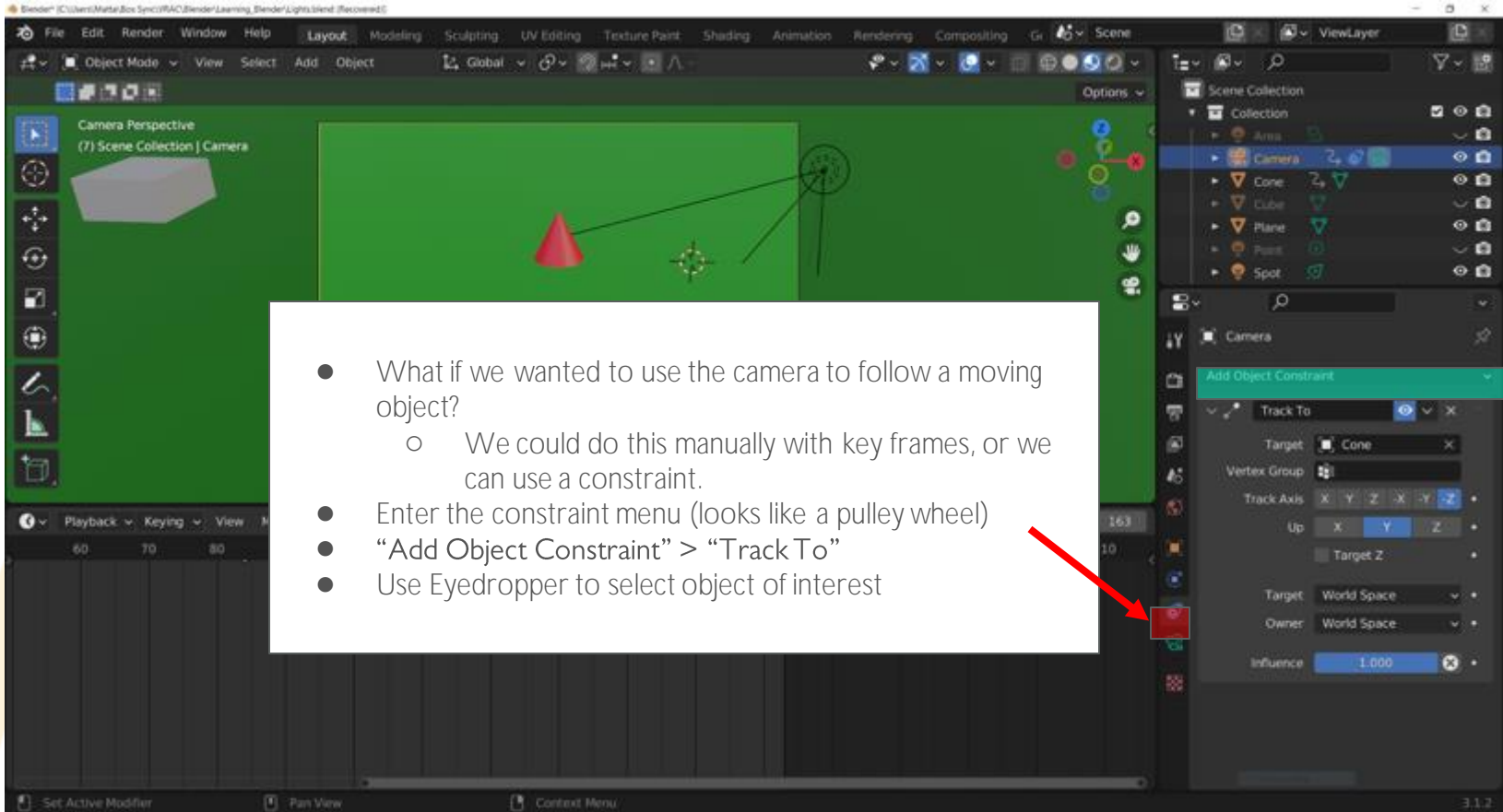
3.1.2

Camera properties

- Focal Length
 - Corresponds to the “Zoom” of the camera
 - Bigger numbers = tighter shot
 - Smaller number = wider shot
- Clip Start/End
 - How far can the camera see



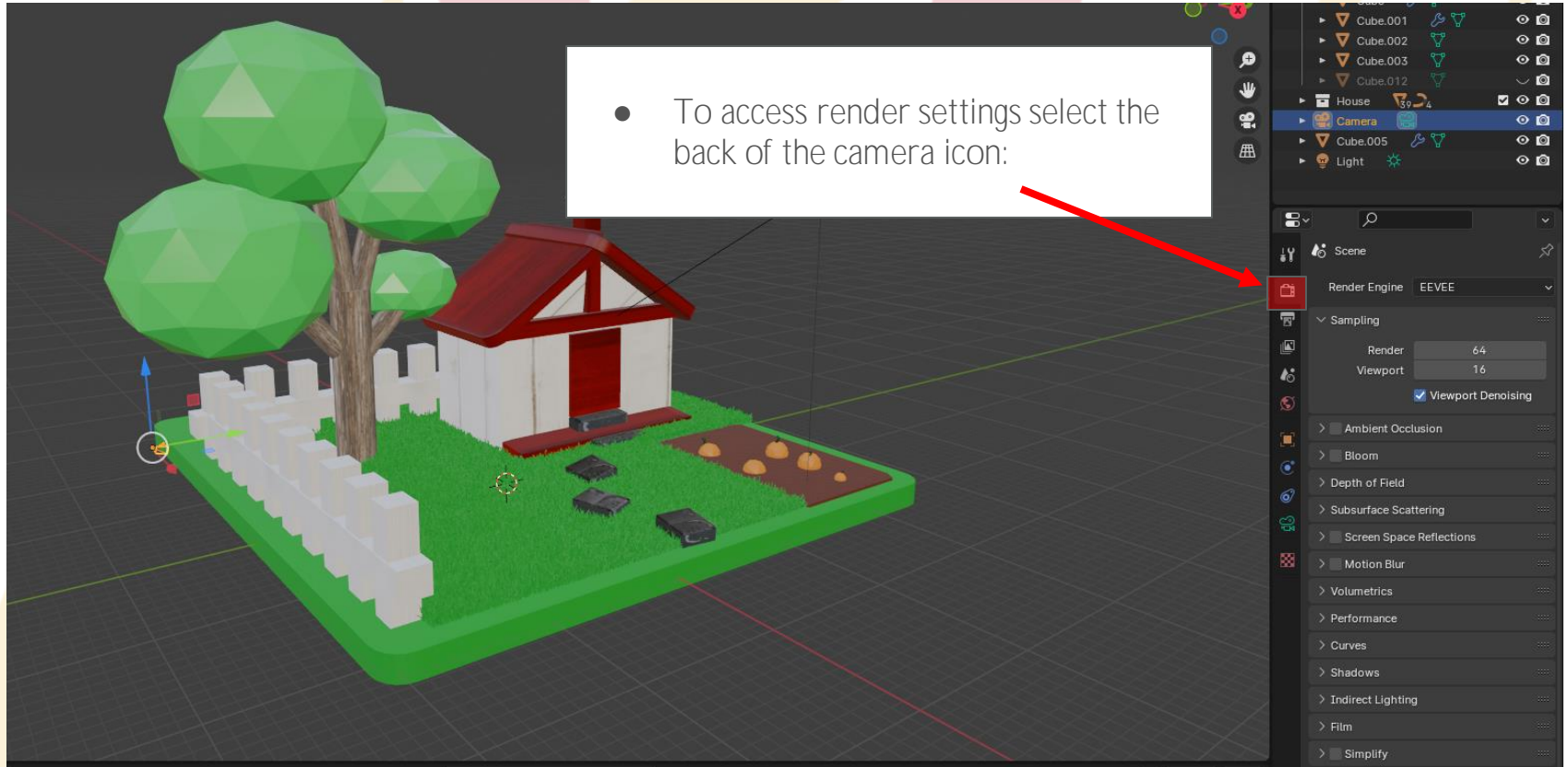
Camera Tracking



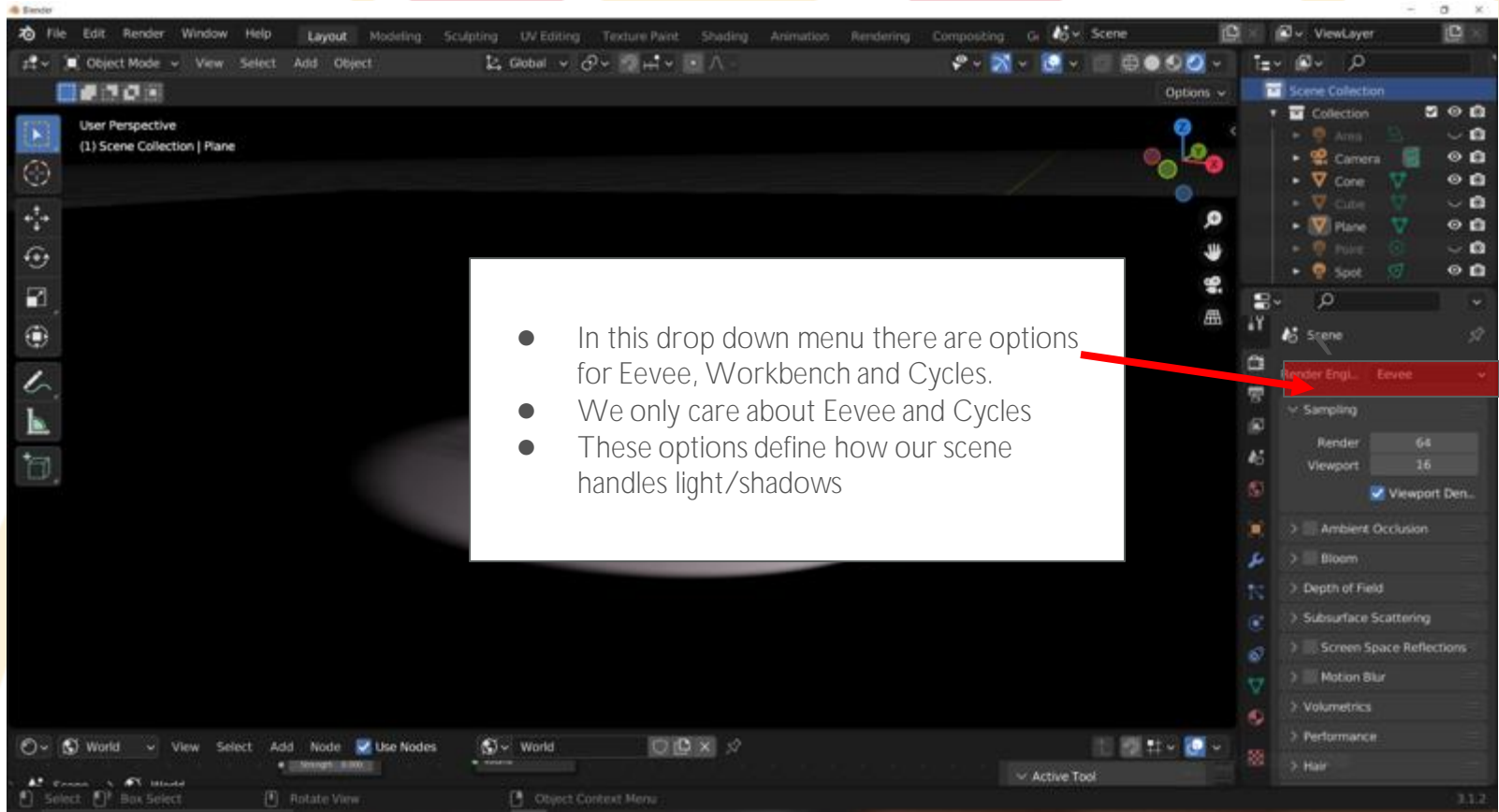
The screenshot shows the Blender 3.1.2 interface in Object Mode. The main 3D viewport displays a red cone object on a green plane. A camera is positioned to track the cone. The right-hand side of the interface shows the Outliner and Properties panels. The Properties panel is set to 'Track To' and shows the 'Cone' as the target. The 'Track Axis' is set to 'Y'. A red arrow points from the text 'Use Eyedropper to select object of interest' to the red eyedropper icon in the Properties panel.

- What if we wanted to use the camera to follow a moving object?
 - We could do this manually with key frames, or we can use a constraint.
- Enter the constraint menu (looks like a pulley wheel)
- “Add Object Constraint” > “Track To”
- Use Eyedropper to select object of interest

Render Settings

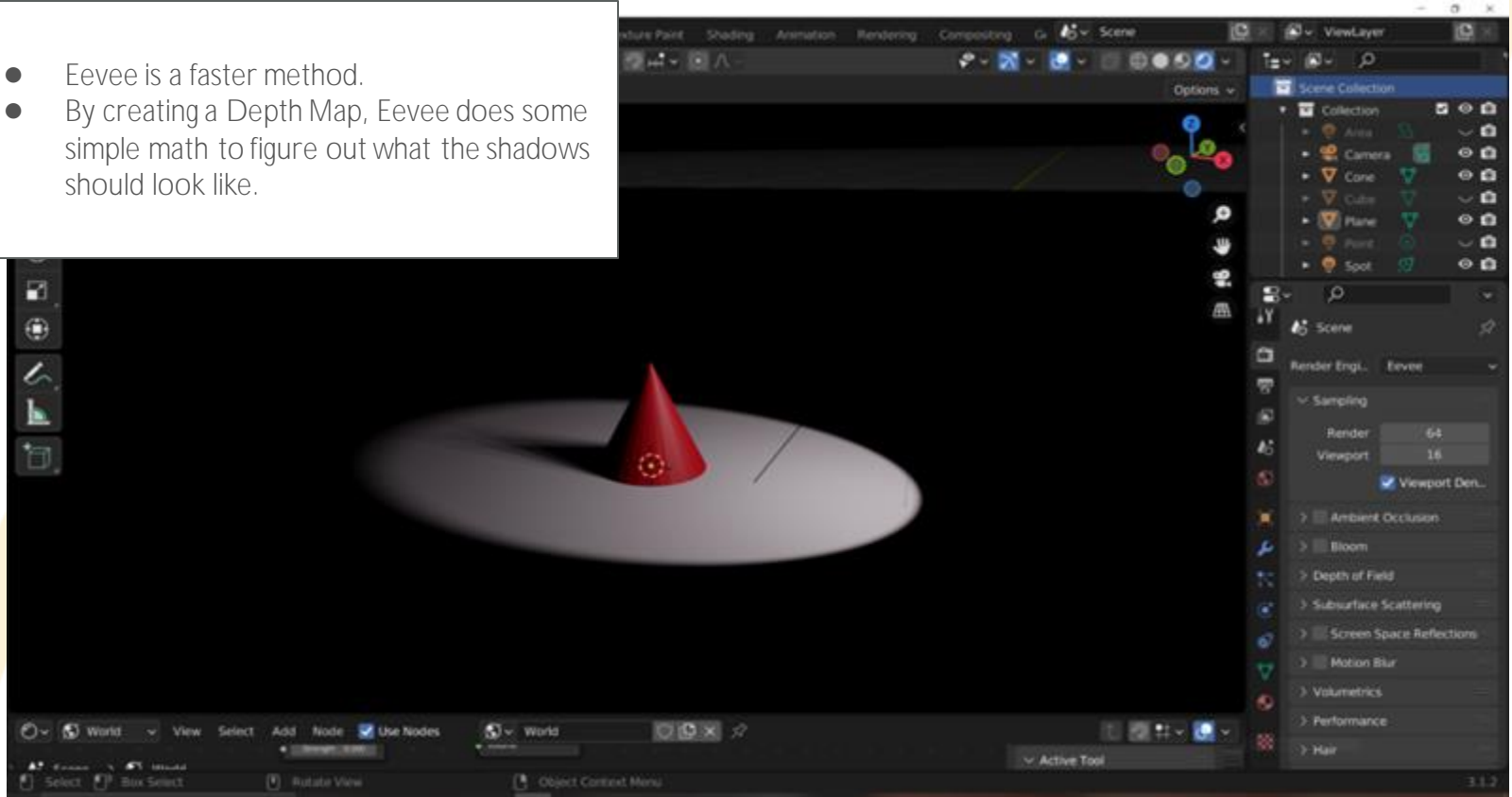


Shadows



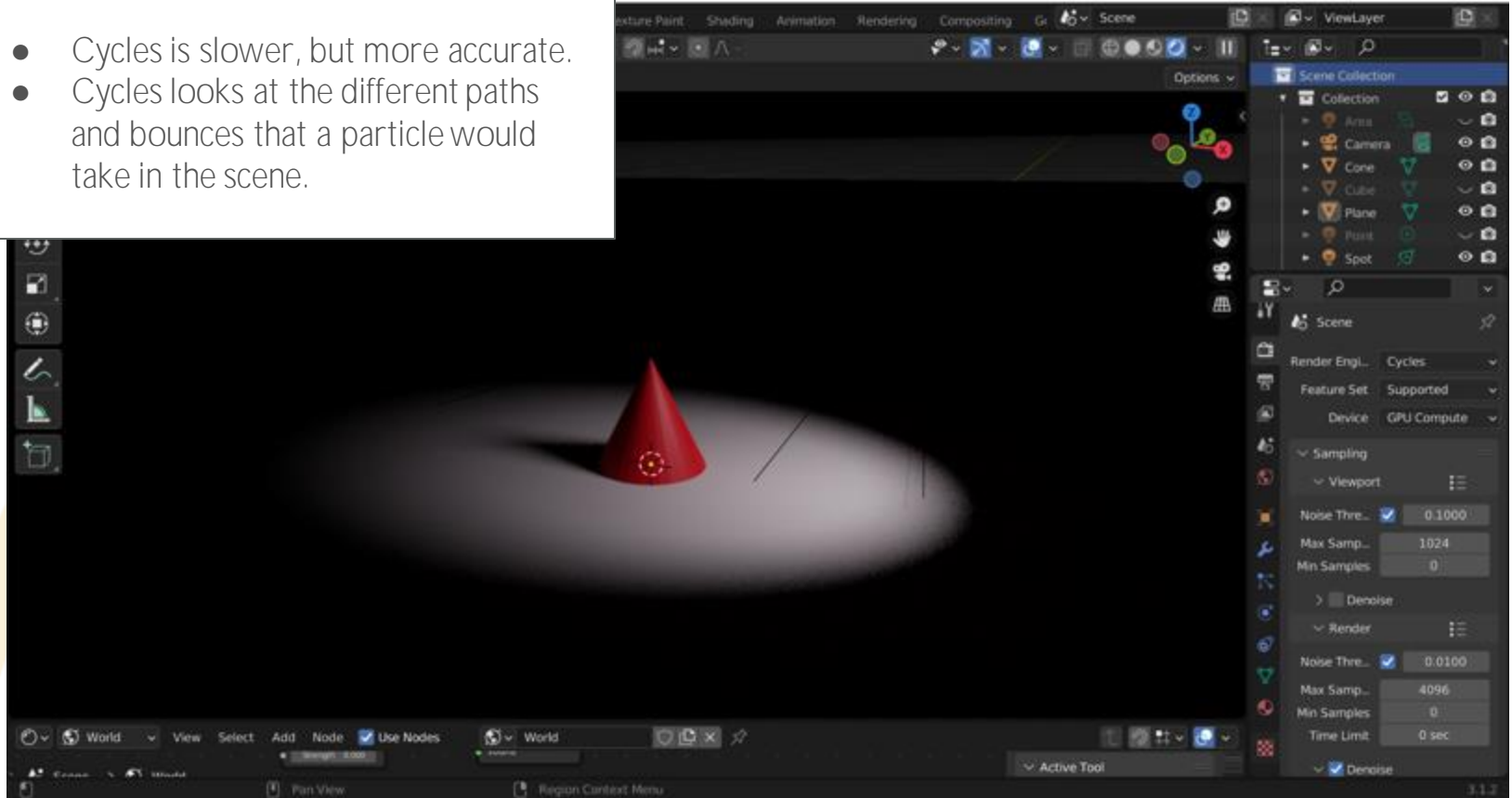
Eevee: Depth Map

- Eevee is a faster method.
- By creating a Depth Map, Eevee does some simple math to figure out what the shadows should look like.

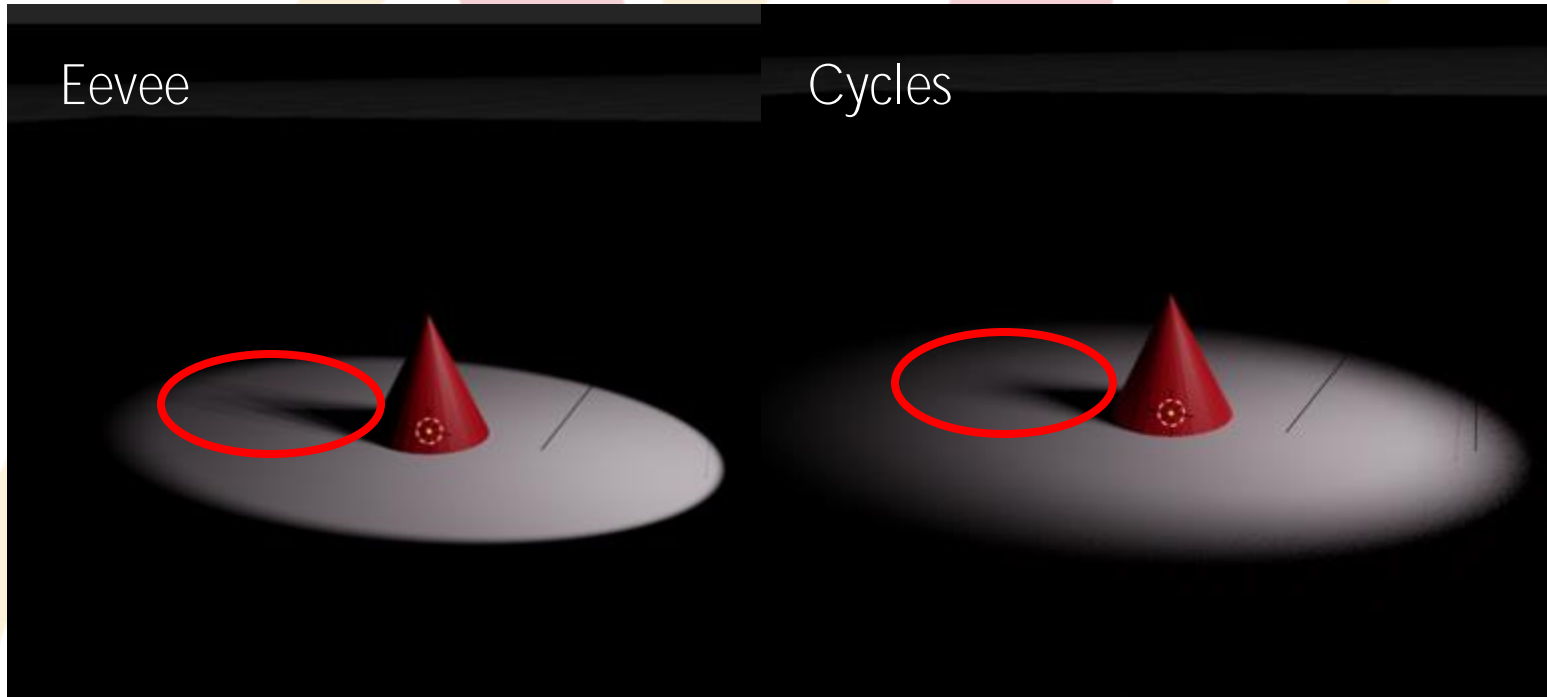


Cycles: Ray Tracing

- Cycles is slower, but more accurate.
- Cycles looks at the different paths and bounces that a particle would take in the scene.

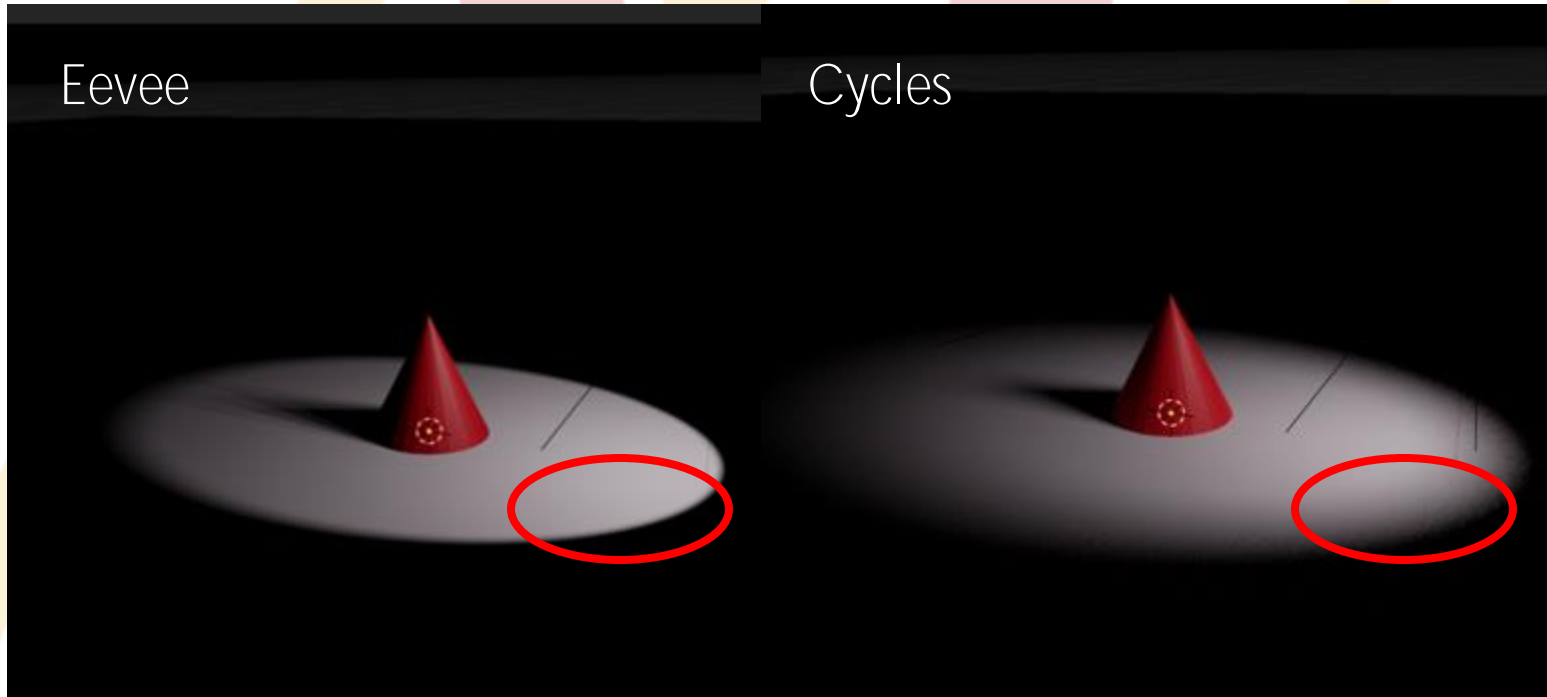


Cycles: Ray Tracing



Cycles has less aliasing at the top of the cone

Cycles: Ray Tracing



The shadow drop off is more accurate

Today's Mini Creation

Apply 1 or more lights in your scene from
Mini Creation 2 and render

Render



Final Blender Task: Export for Unity

