# REU Modeling Course - Part 3

Blender

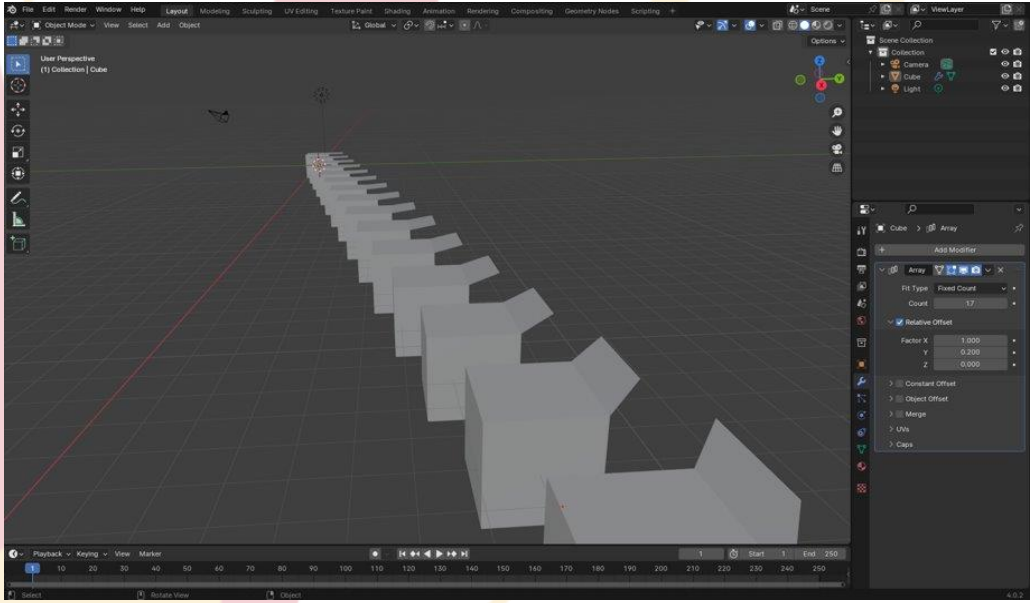
More Modeling

# Workshop Workflow

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

# Review

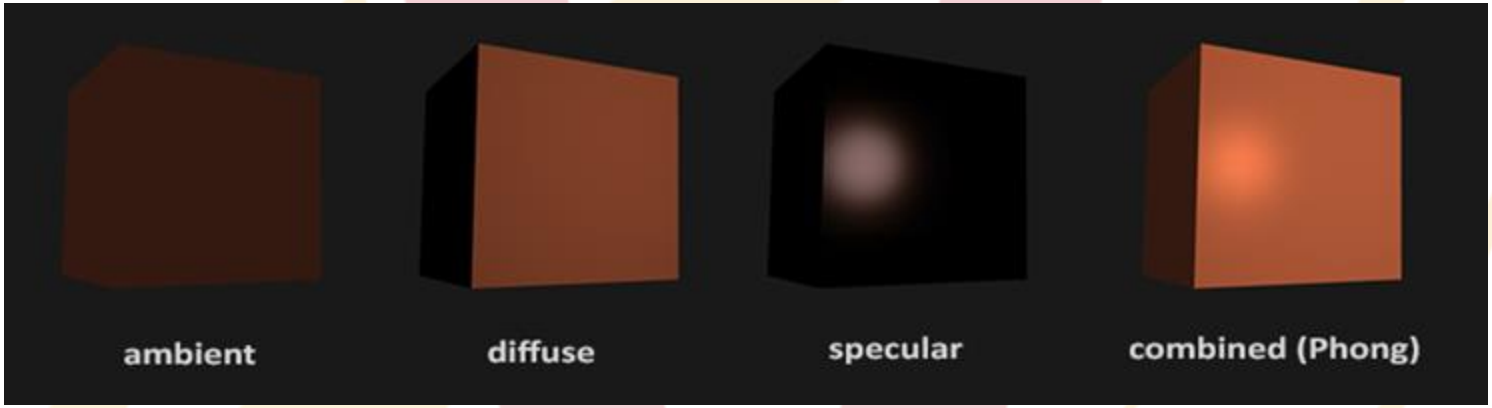
- What are modifiers?
- How do you add modifiers?



# Review

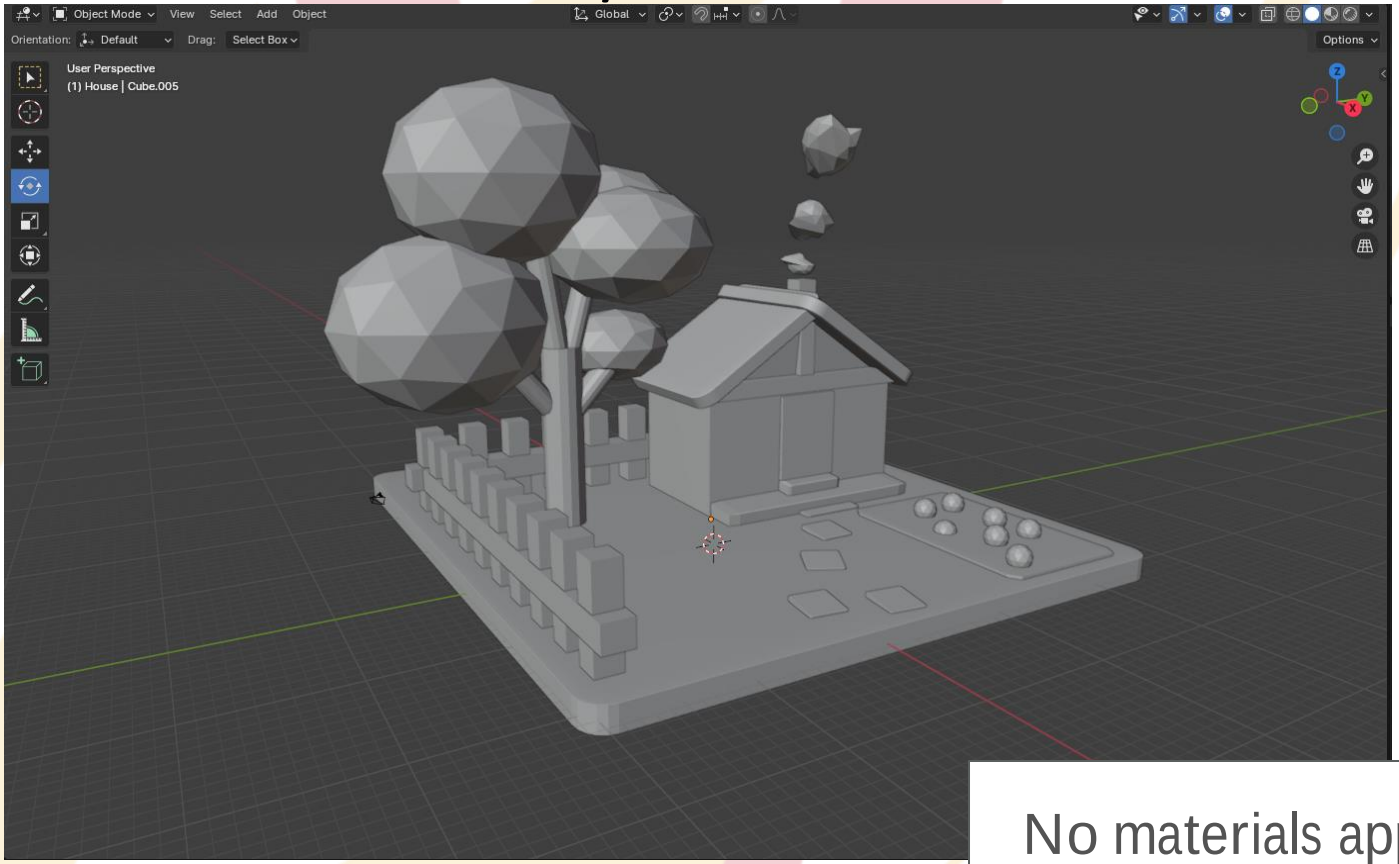
- How would you create this:

# Basic Lighting Types:



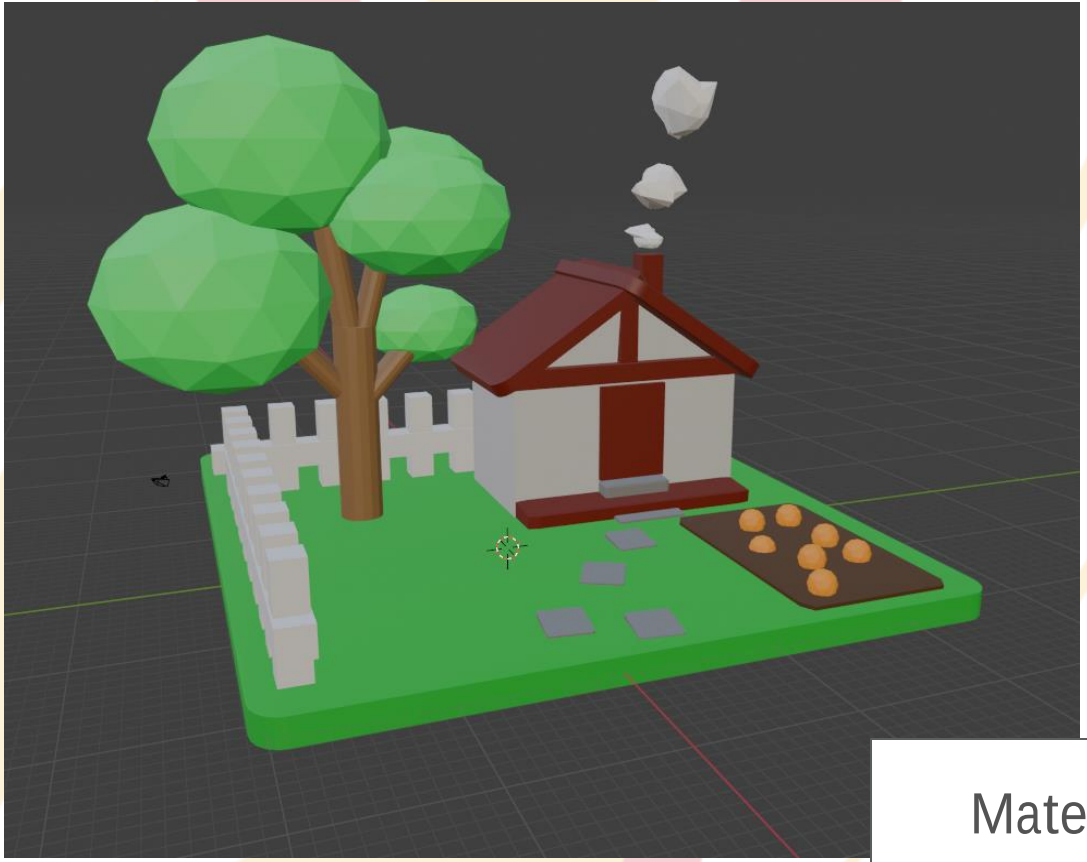

The light on objects in a scene is made up of a combination of these light types.

# Shaders/Materials




No materials applied

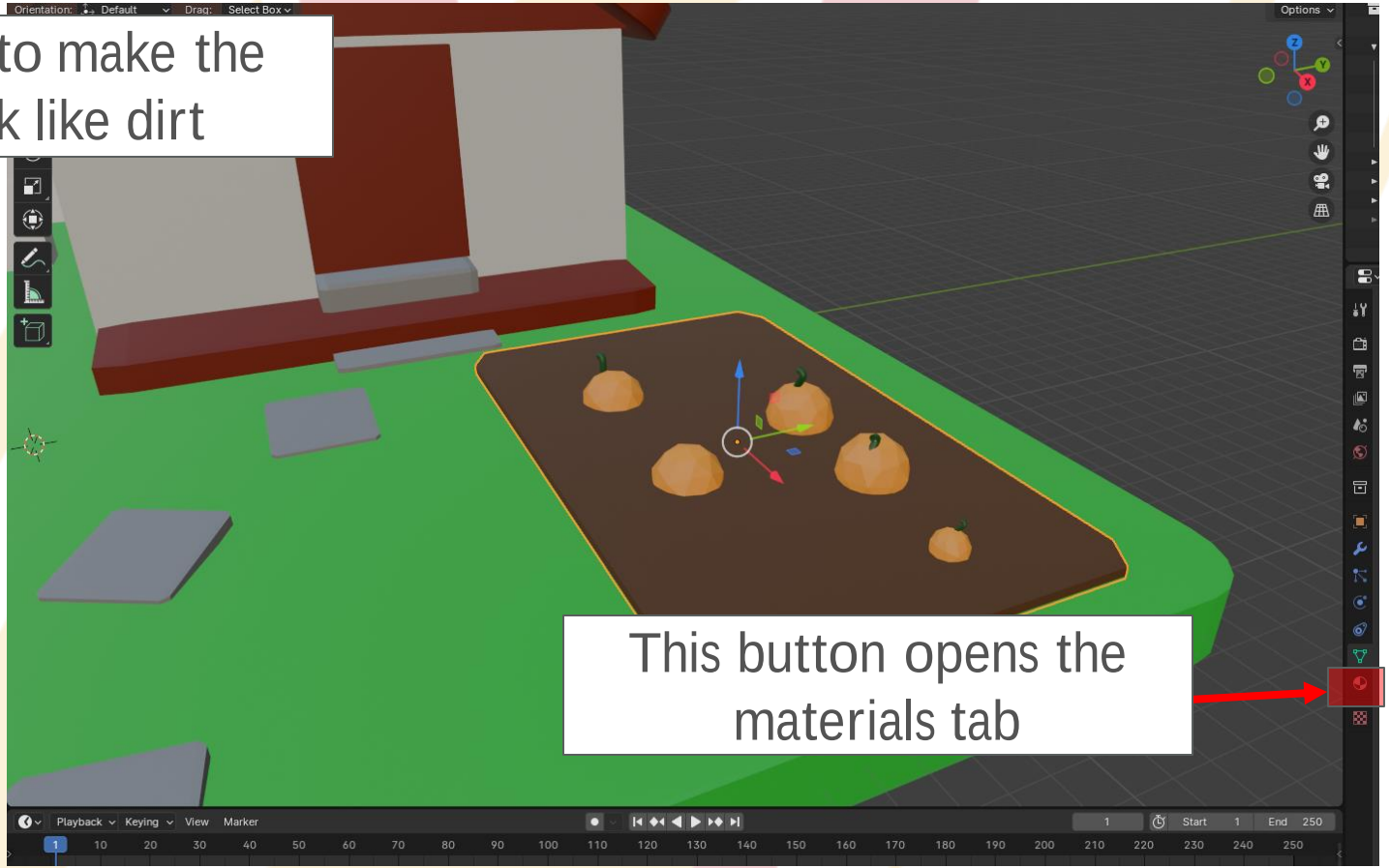
# Shaders/Materials



Materials applied

# Adding Basic Materials

We want to make the dirt look like dirt



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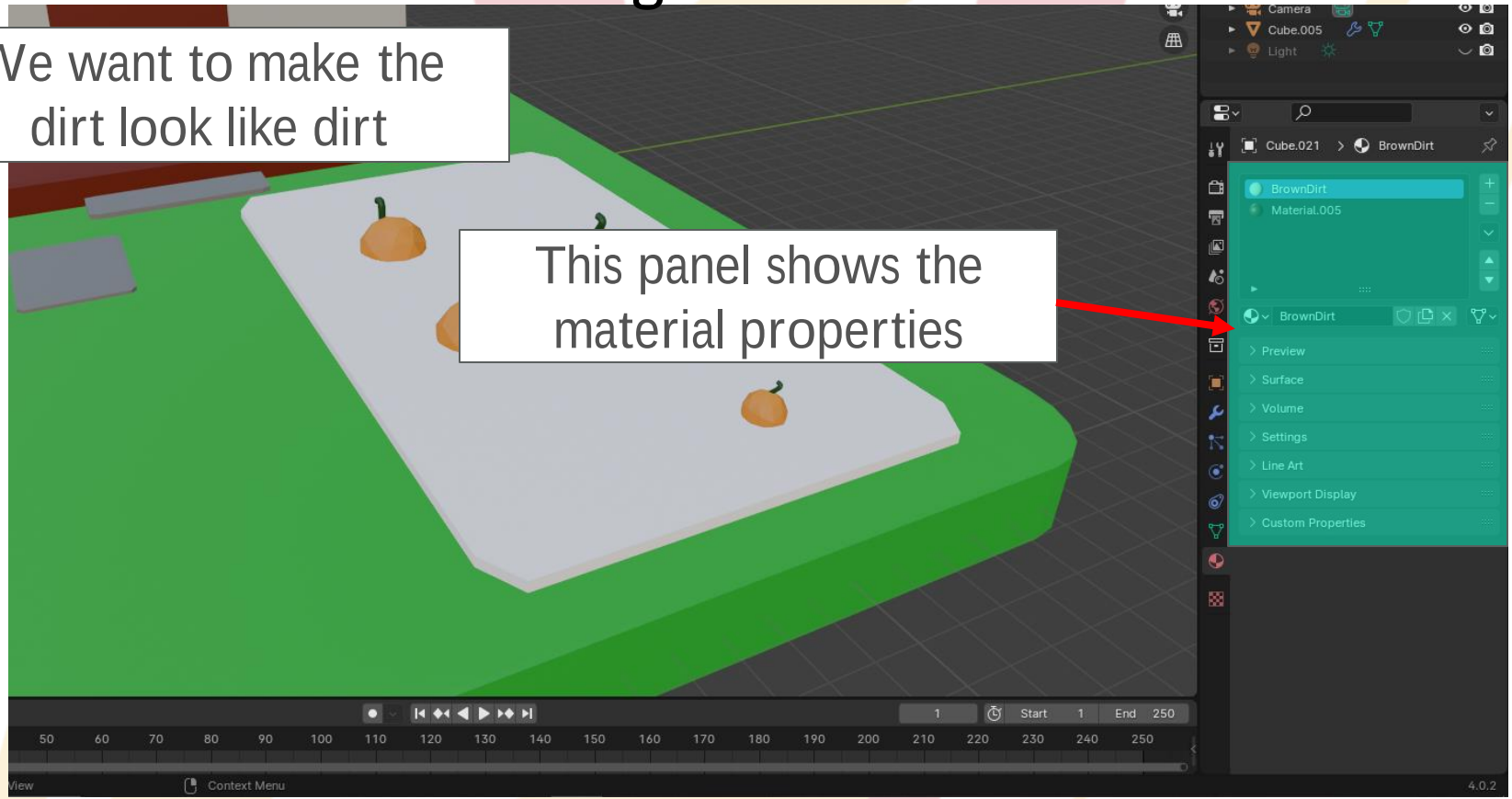

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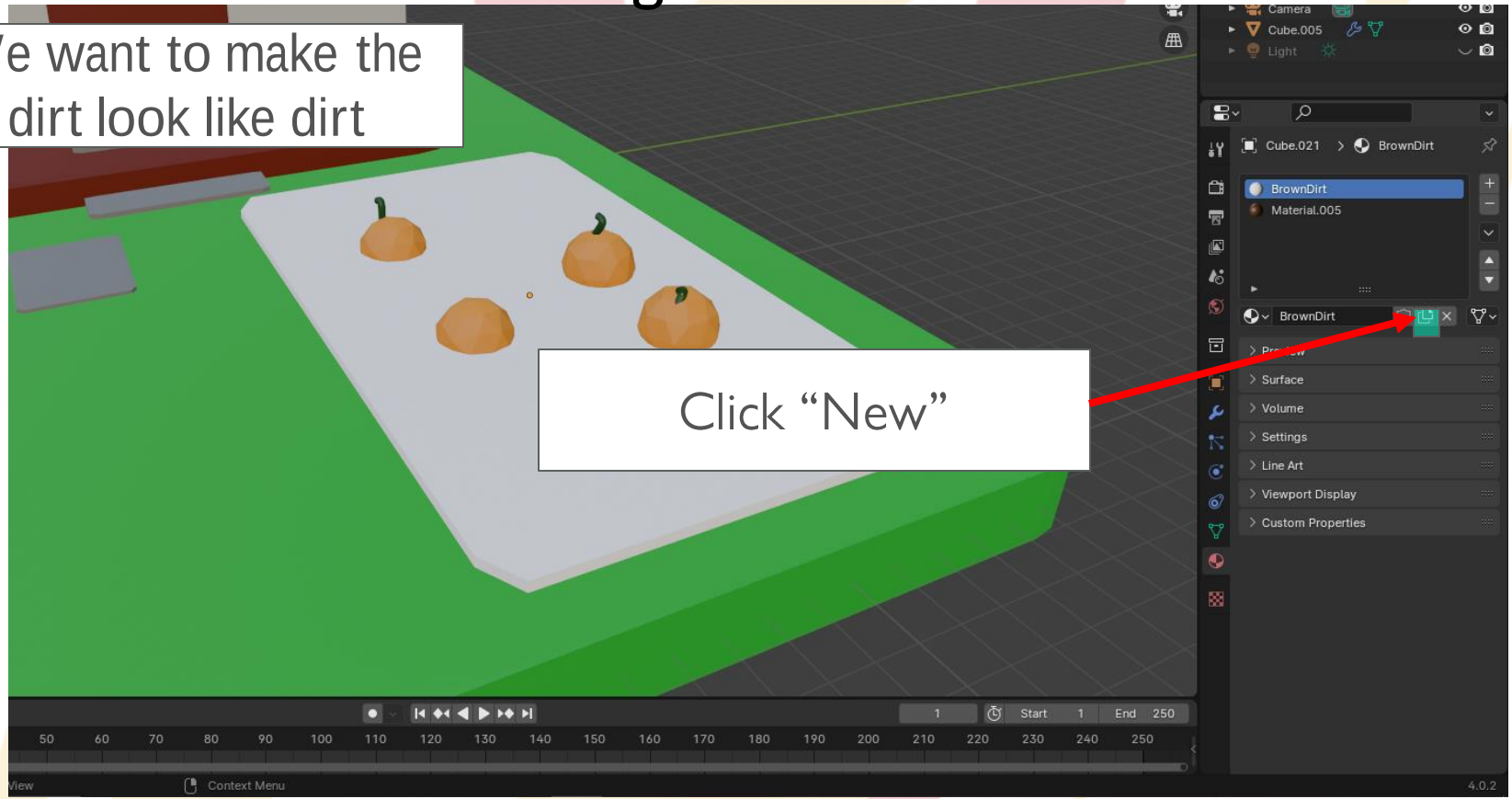

# Adding Basic Materials

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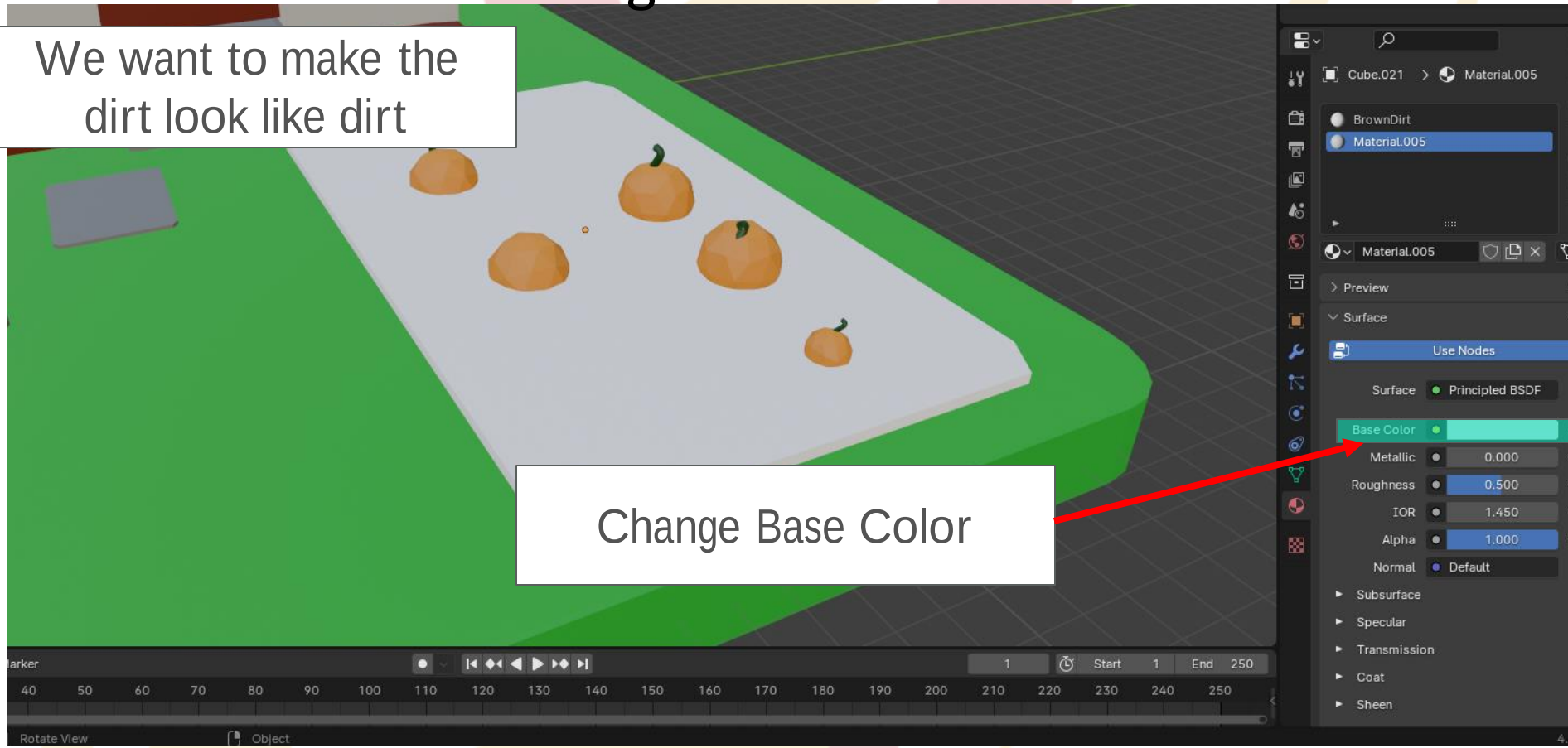
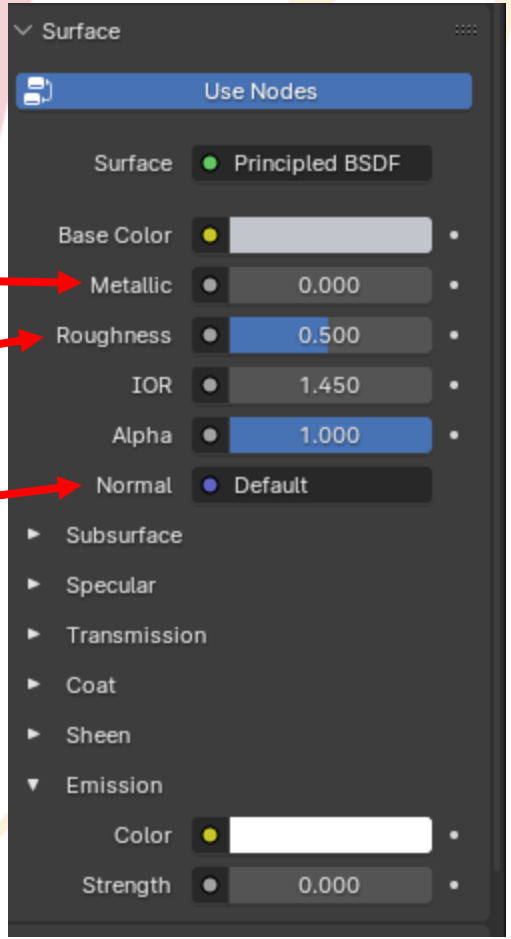


# Adding Basic Materials

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

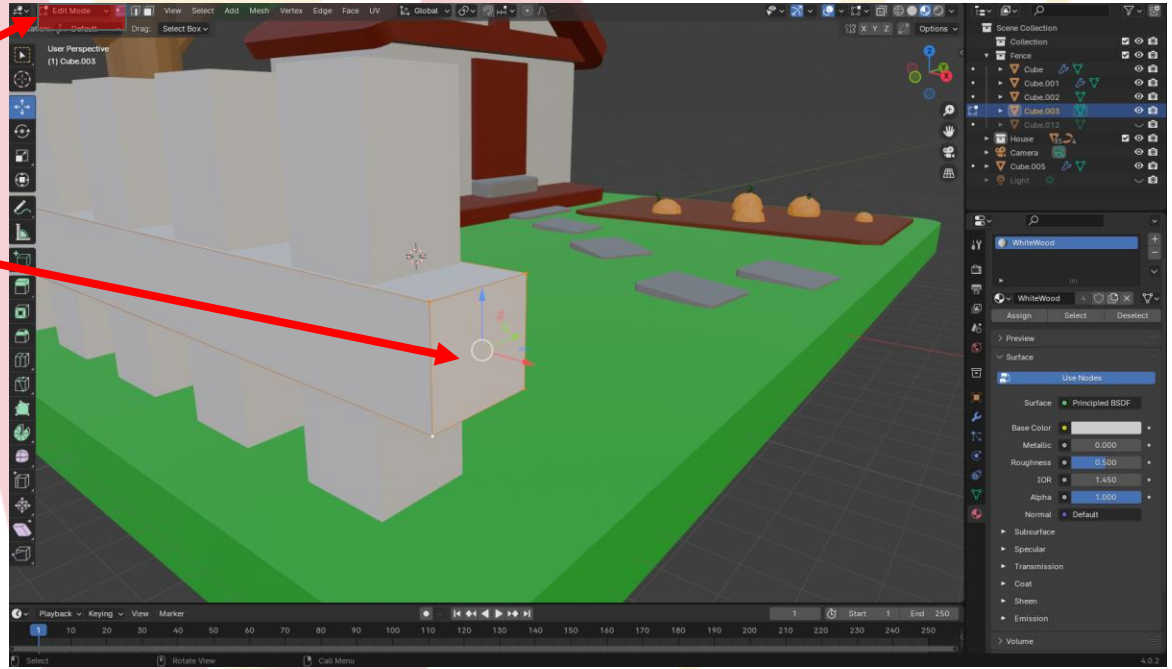


# Multiple Materials

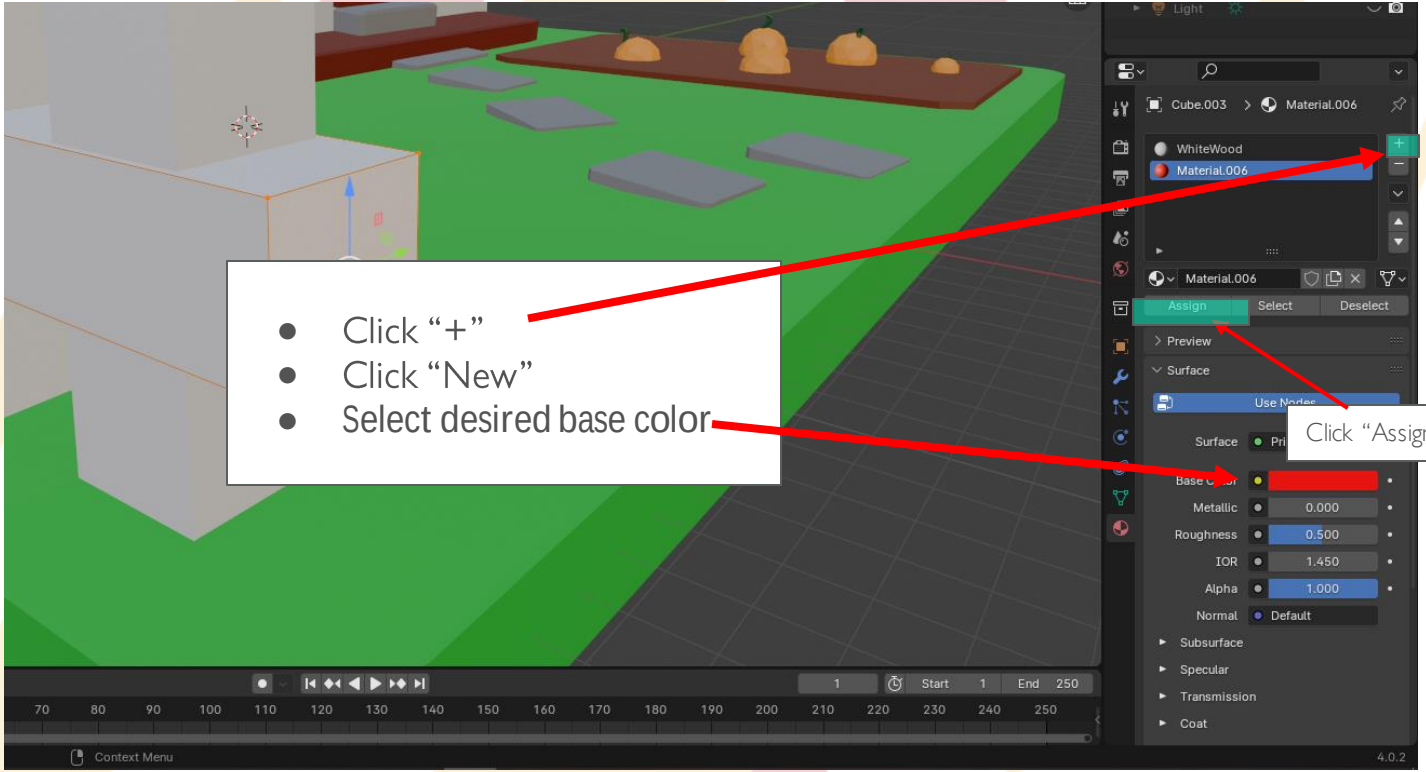
An object can have multiple materials

# Multiple Materials

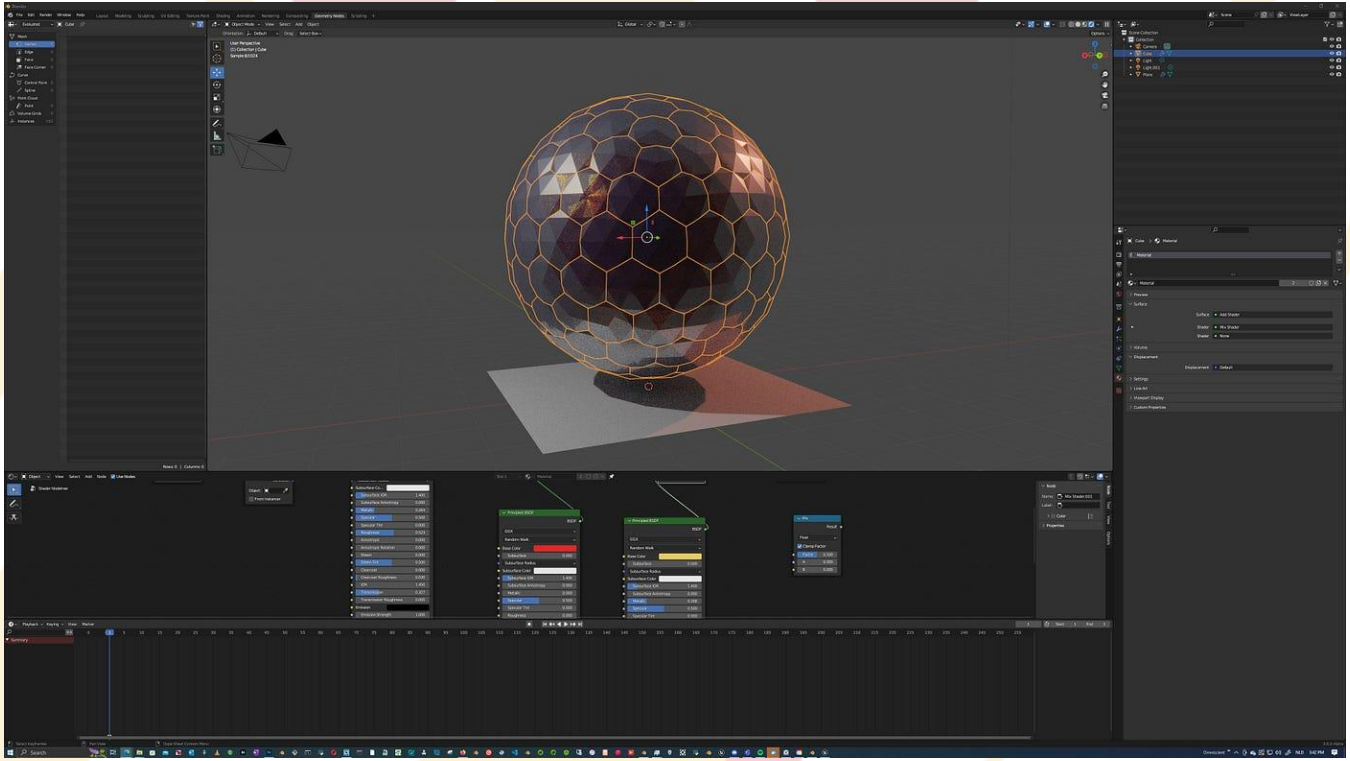
- Enter “Edit Mode” (Tab)
- Select vertices of desired face



# Multiple Materials



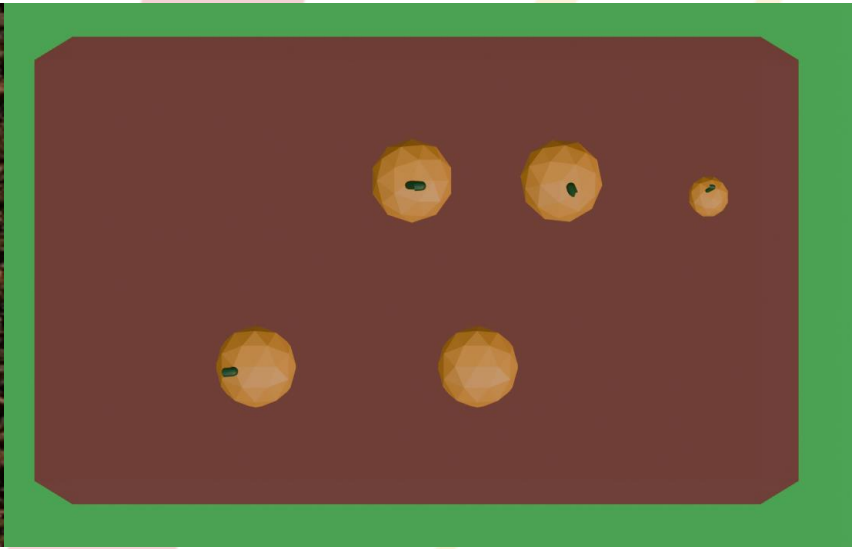
# Break Time!



# Shader Nodes

Real Dirt

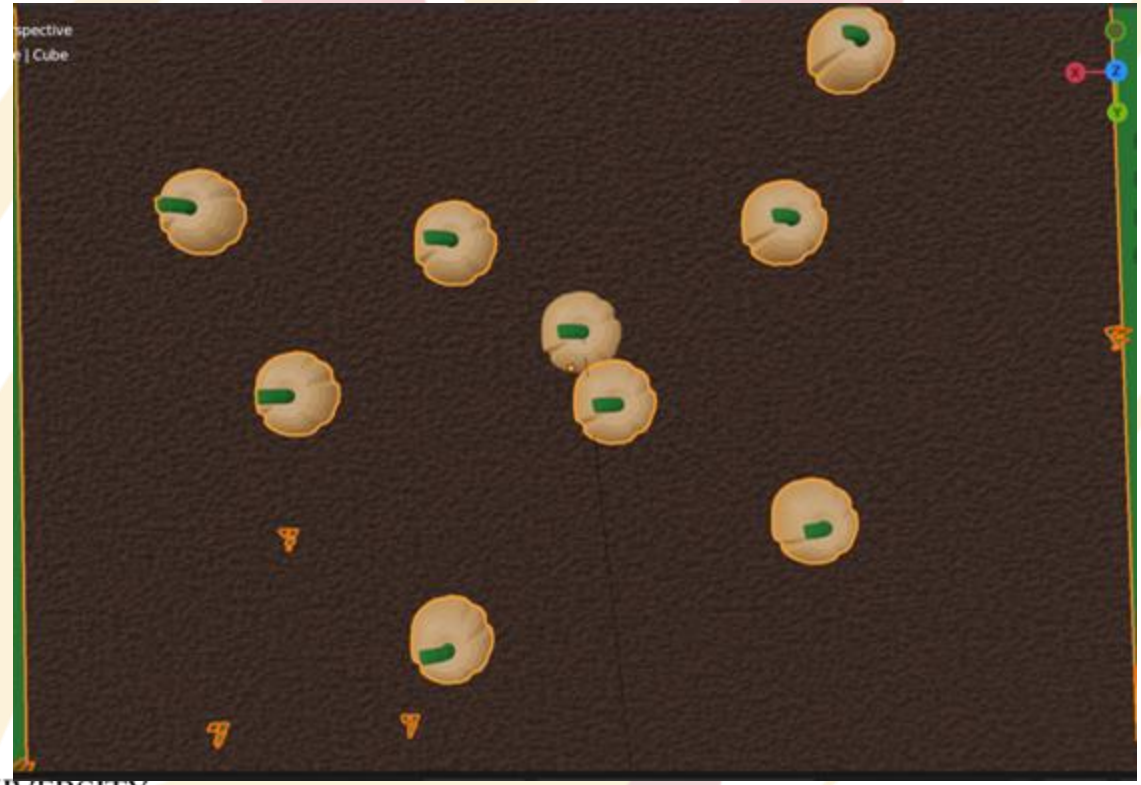
Our Dirt



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

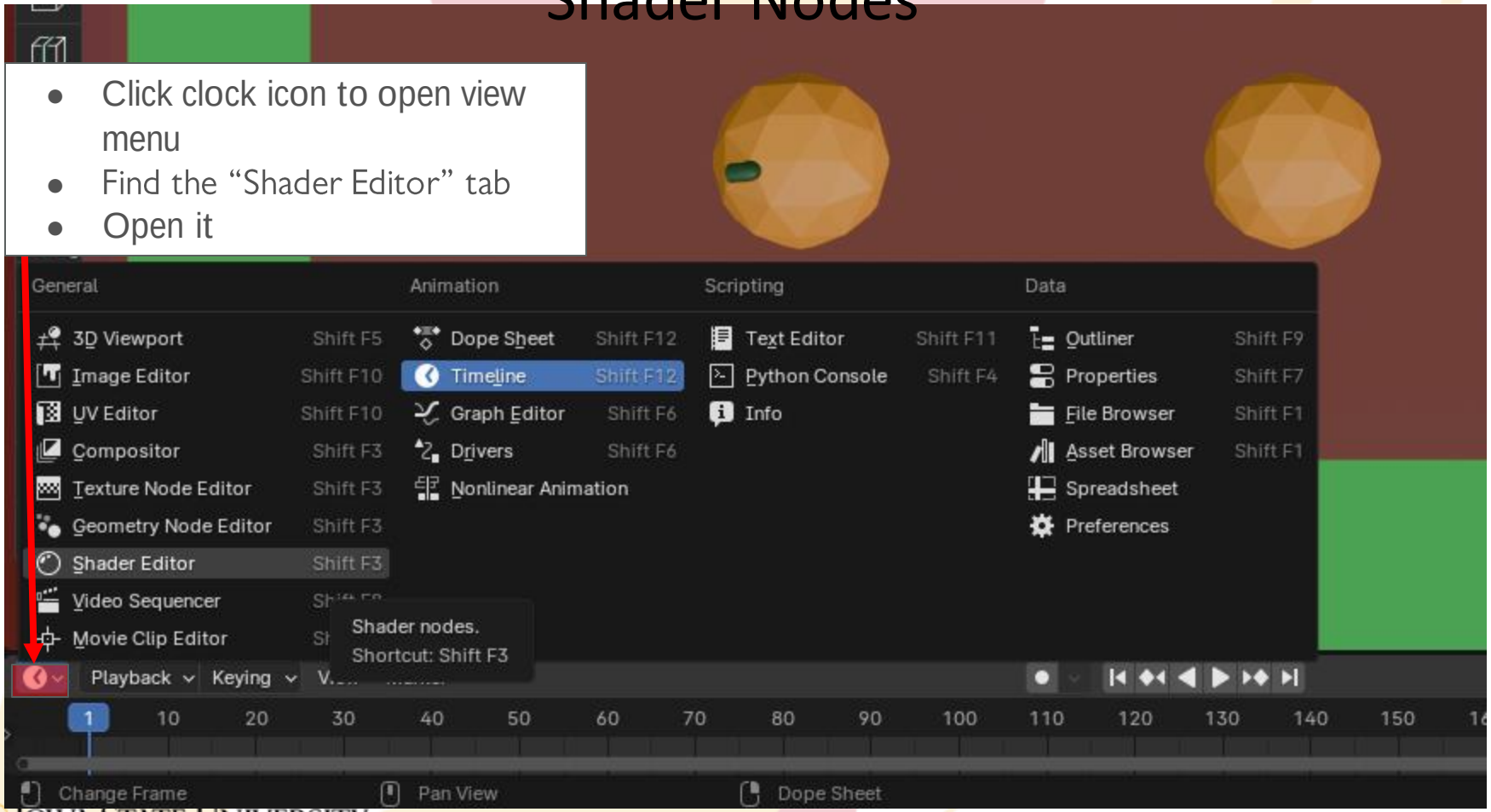
# Shader Nodes

With Shader Nodes we can make the dirt more realistic

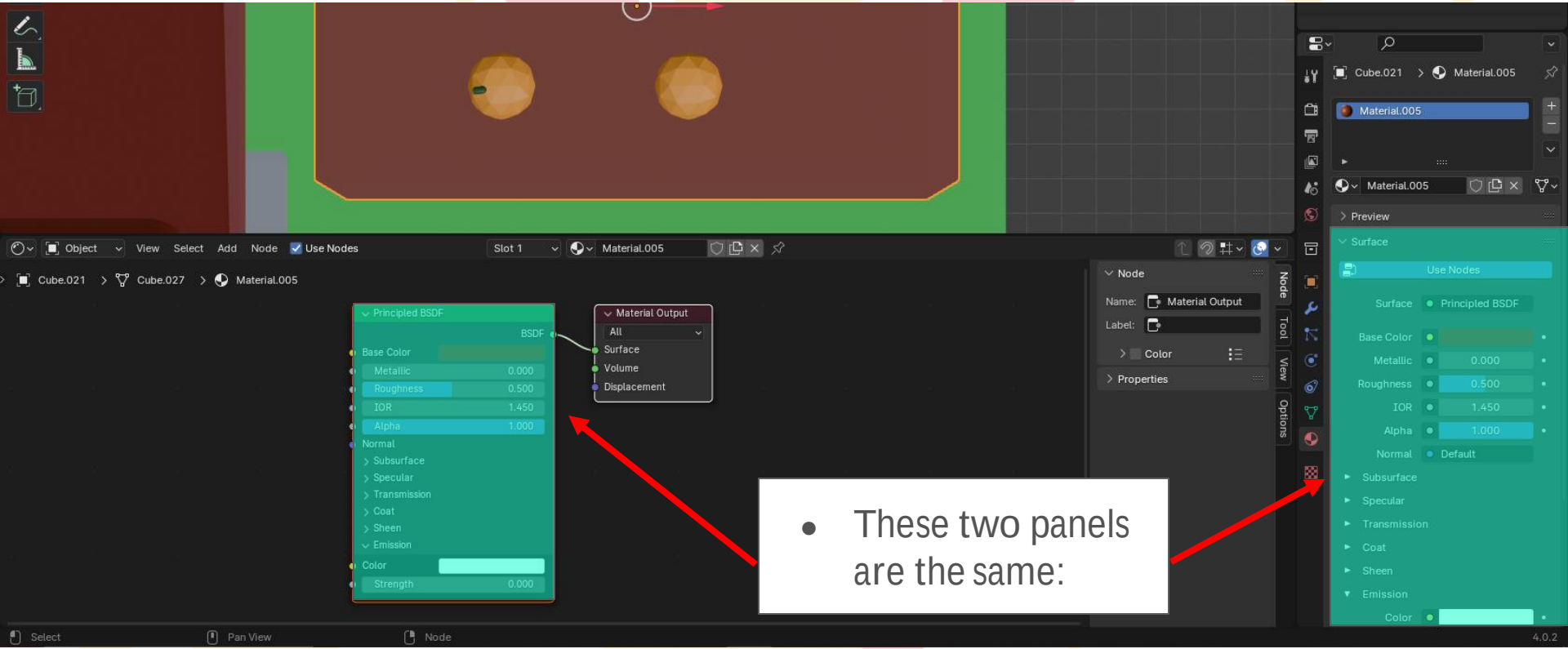


# Shader Nodes

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



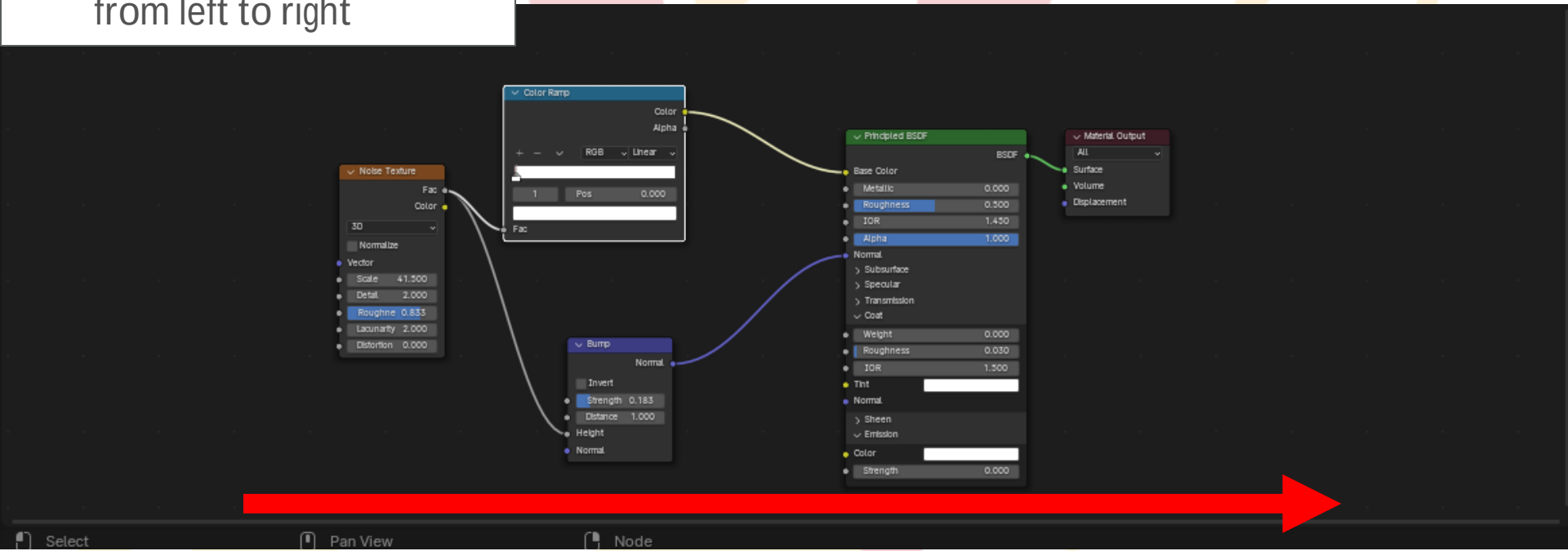
# Shader Nodes




- These two panels are the same:

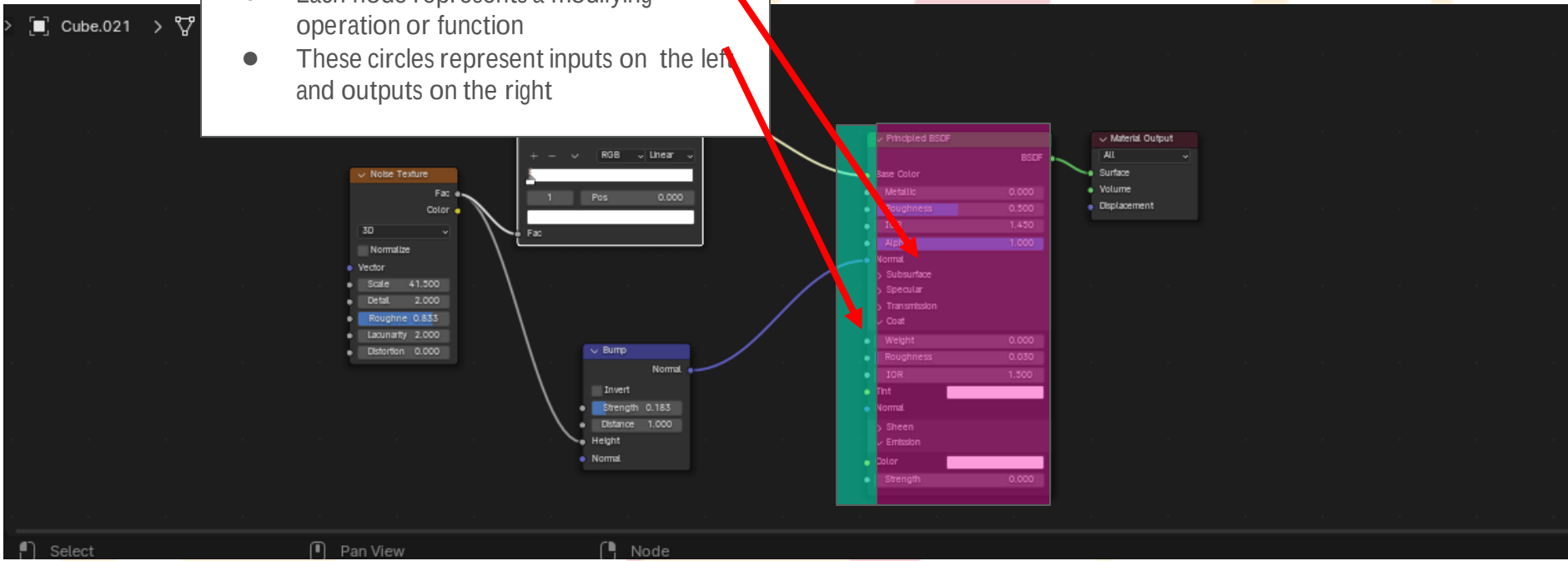
# How Do Nodes Work?

- The nodes are “read” from left to right



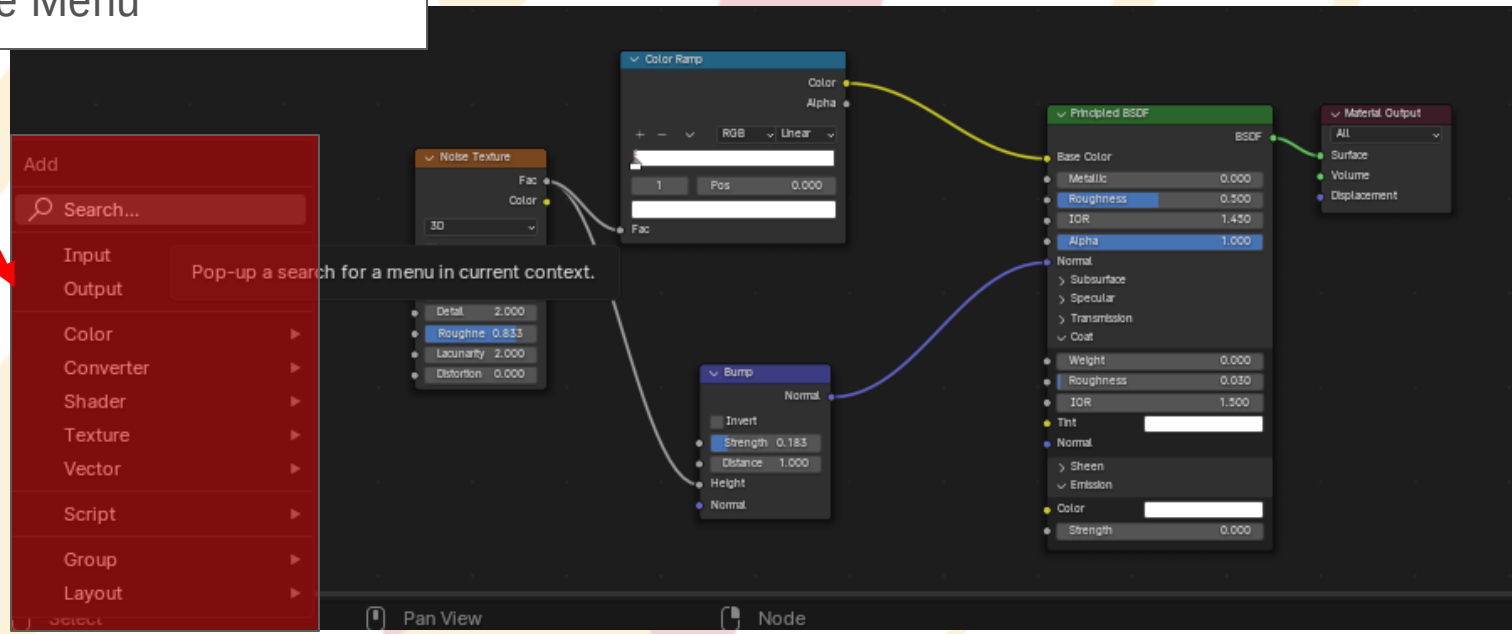
# How Do Nodes Work?

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



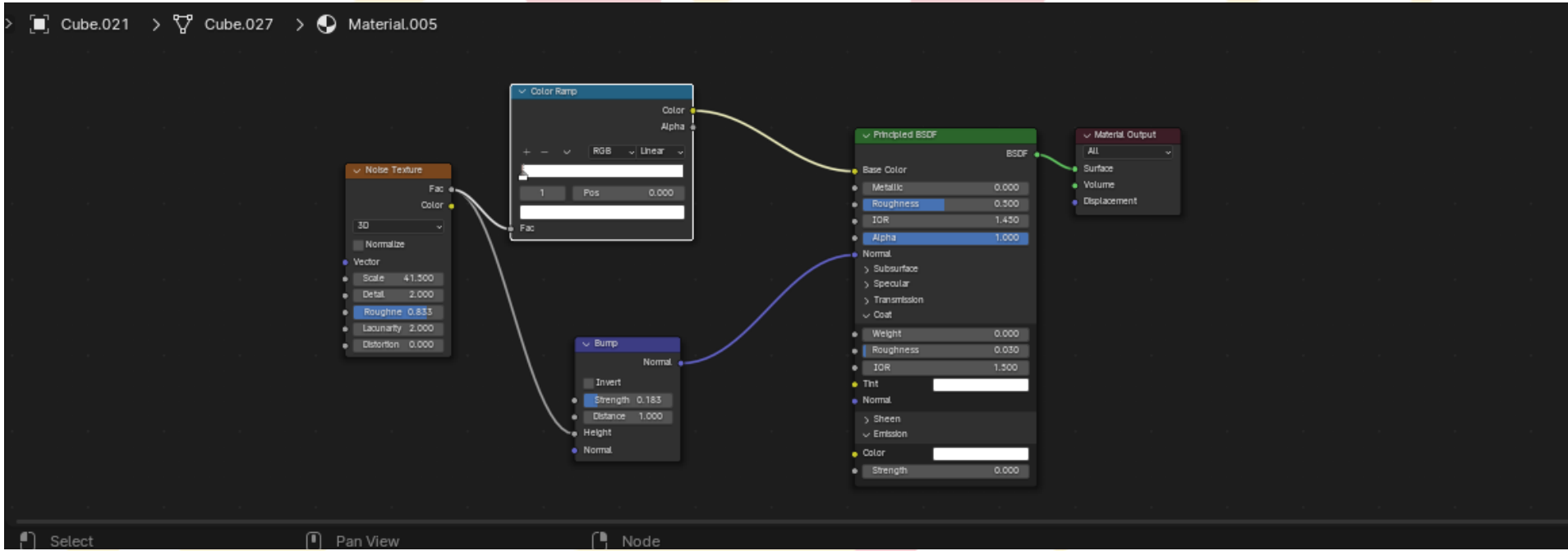
# Adding Nodes

- Shift + A to open Add Node Menu



# Practice:

Copy these nodes to make the dirt look more realistic



# Without Nodes

Textures by rawpixel, kues1 on Freepik

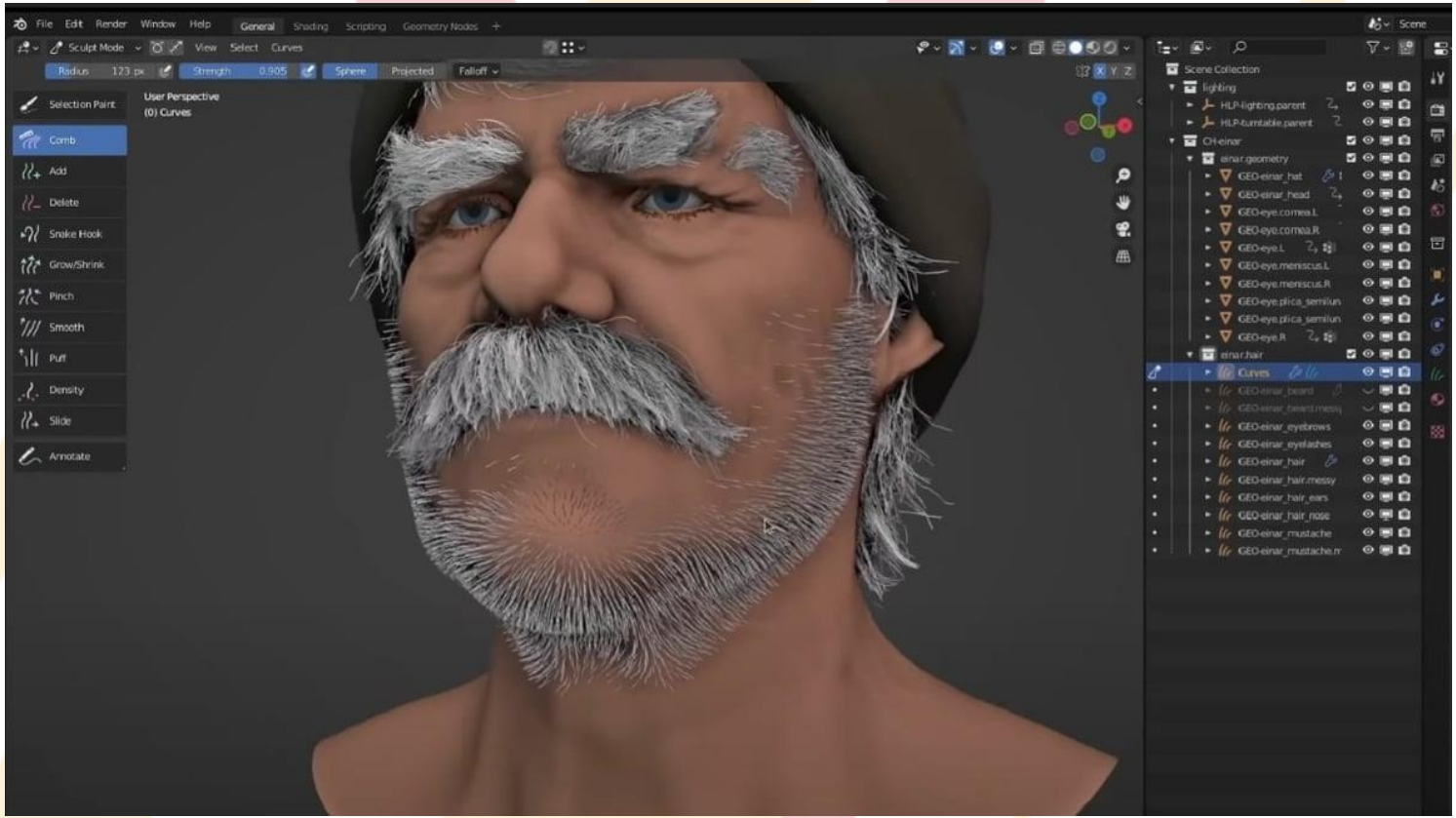
# With Nodes

# Mini Creation

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

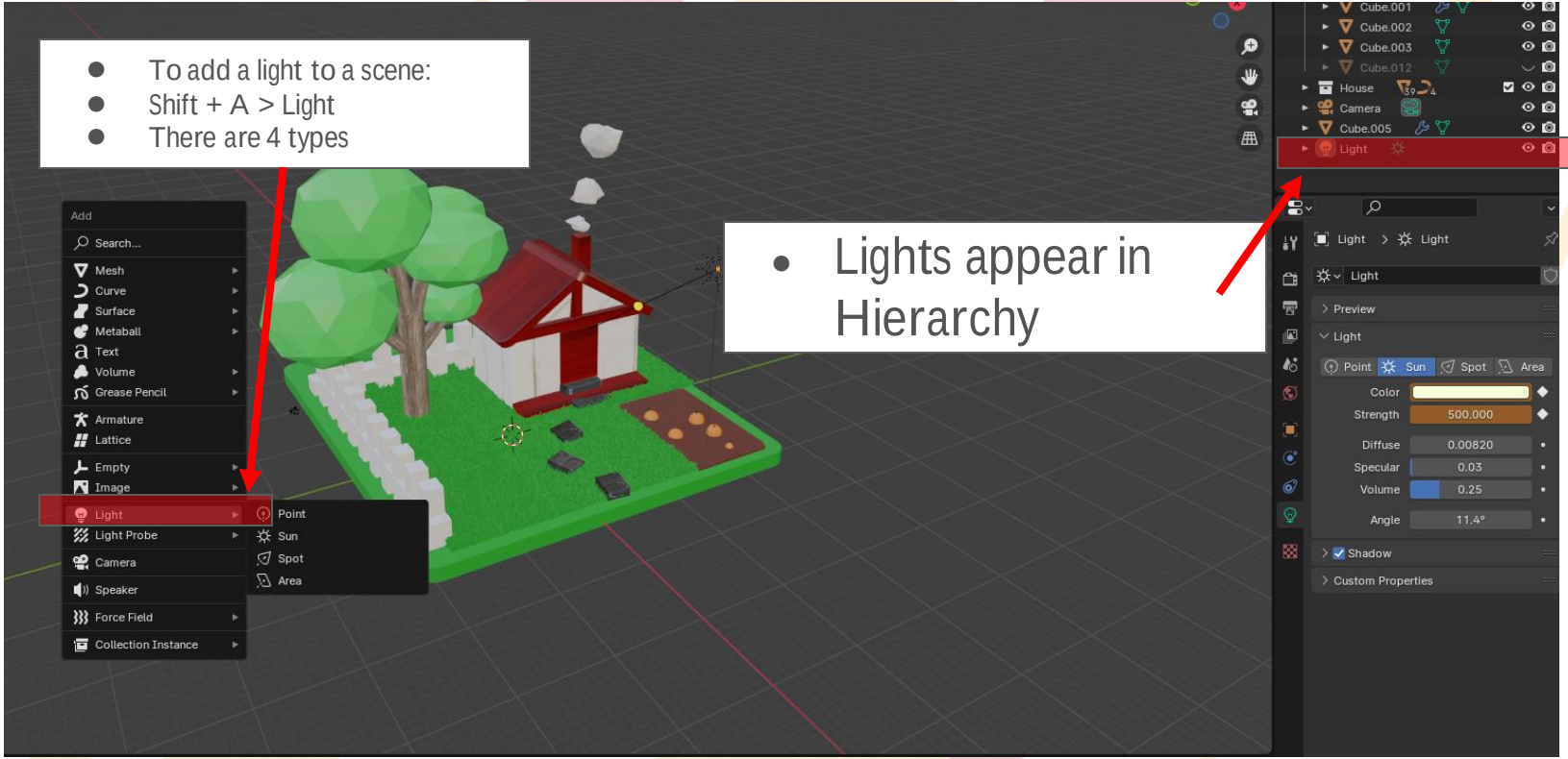
# Mini Creation

# Break Time


File Edit Render Window Help General Shading Scripting Geometry Nodes
Sculpt Mode View Select Curves
Radius 123 px Strength 0.905 Sphere Projected Falloff
Selection Paint
Comb
Add
Delete
Snake Hook
Grow/Shrink
Pinch
Smooth
Puff
Density
Slide
Annotate
User Perspective
(0) Curves
Scene
Scene Collection
lighting
HLP-lighting.parent
HLP-turntable.parent
CH-einar
einar.geometry
GEO-einar_hat
GEO-einar_head
GEO-eye.cornea.L
GEO-eye.cornea.R
GEO-eye.L
GEO-eye.meniscus.L
GEO-eye.meniscus.R
GEO-eye.plica_semilun
GEO-eye.plica_semilun
GEO-eye.R
einar.hair
Curves
GEO-einar_eyebrows
GEO-einar_eyelashes
GEO-einar_hair
GEO-einar_hair.messy
GEO-einar_hair_ears
GEO-einar_hair_nose
GEO-einar_mustache
GEO-einar_mustache.r

# Lights and Rendering

# Adding a Light



# Types of lights

## Point

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

## Sun

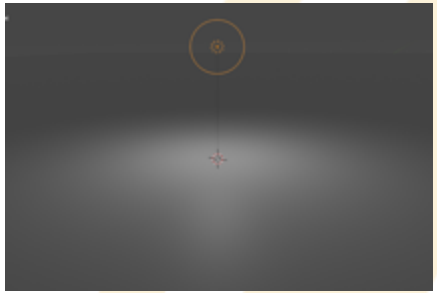
- Emits light with parallel rays, so position does not matter
- Used for outdoor/large spaces

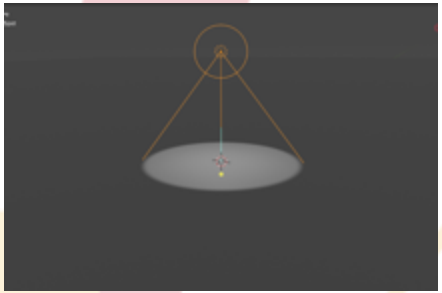
## Spot

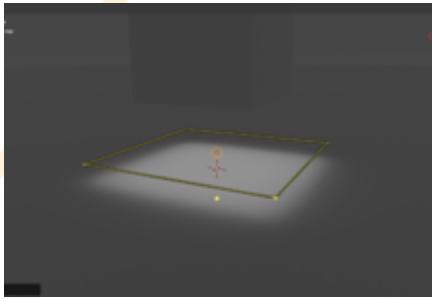
- Emits light in a cone shape
- Used for “moody” lighting

## Area

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

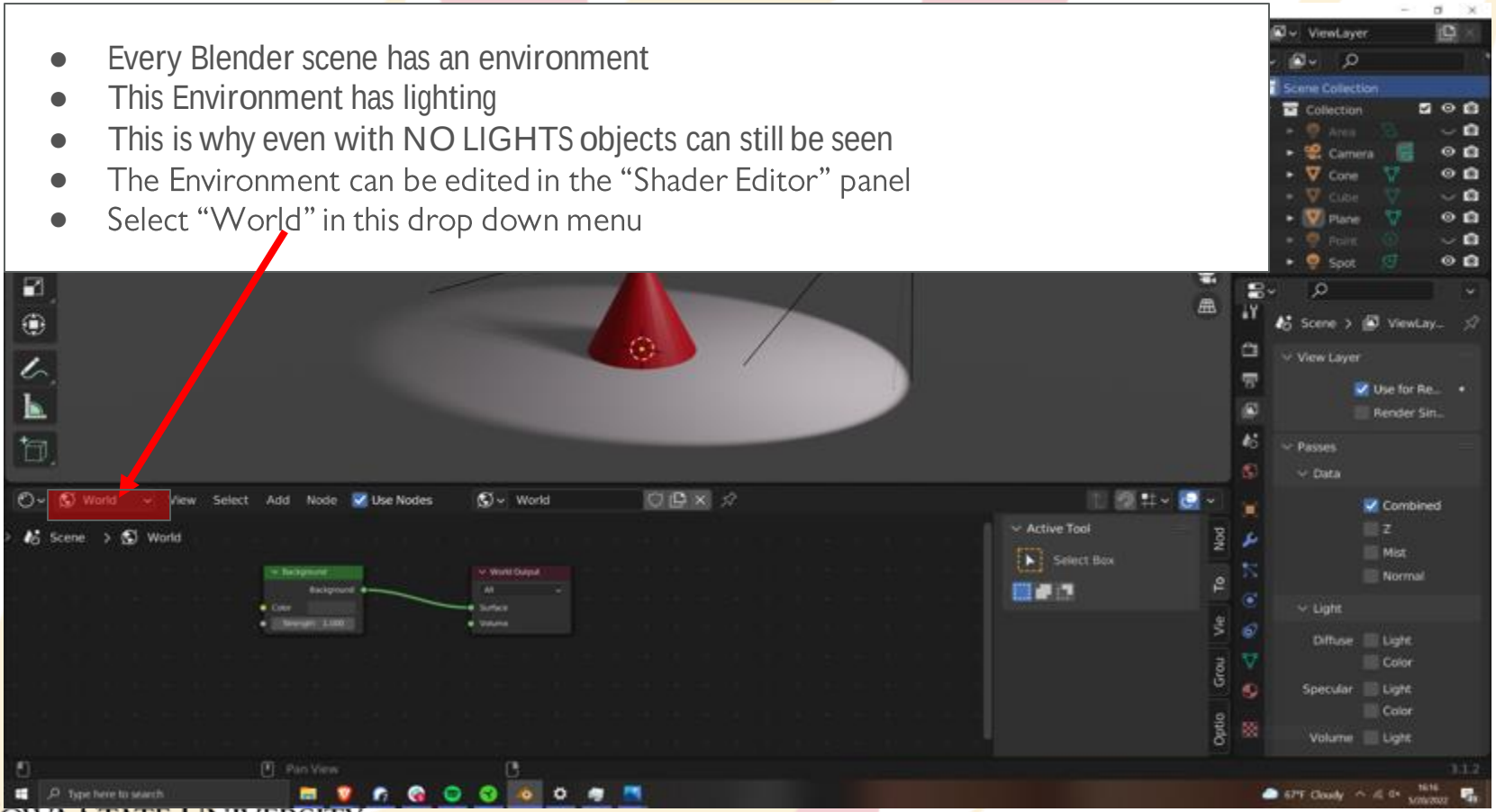




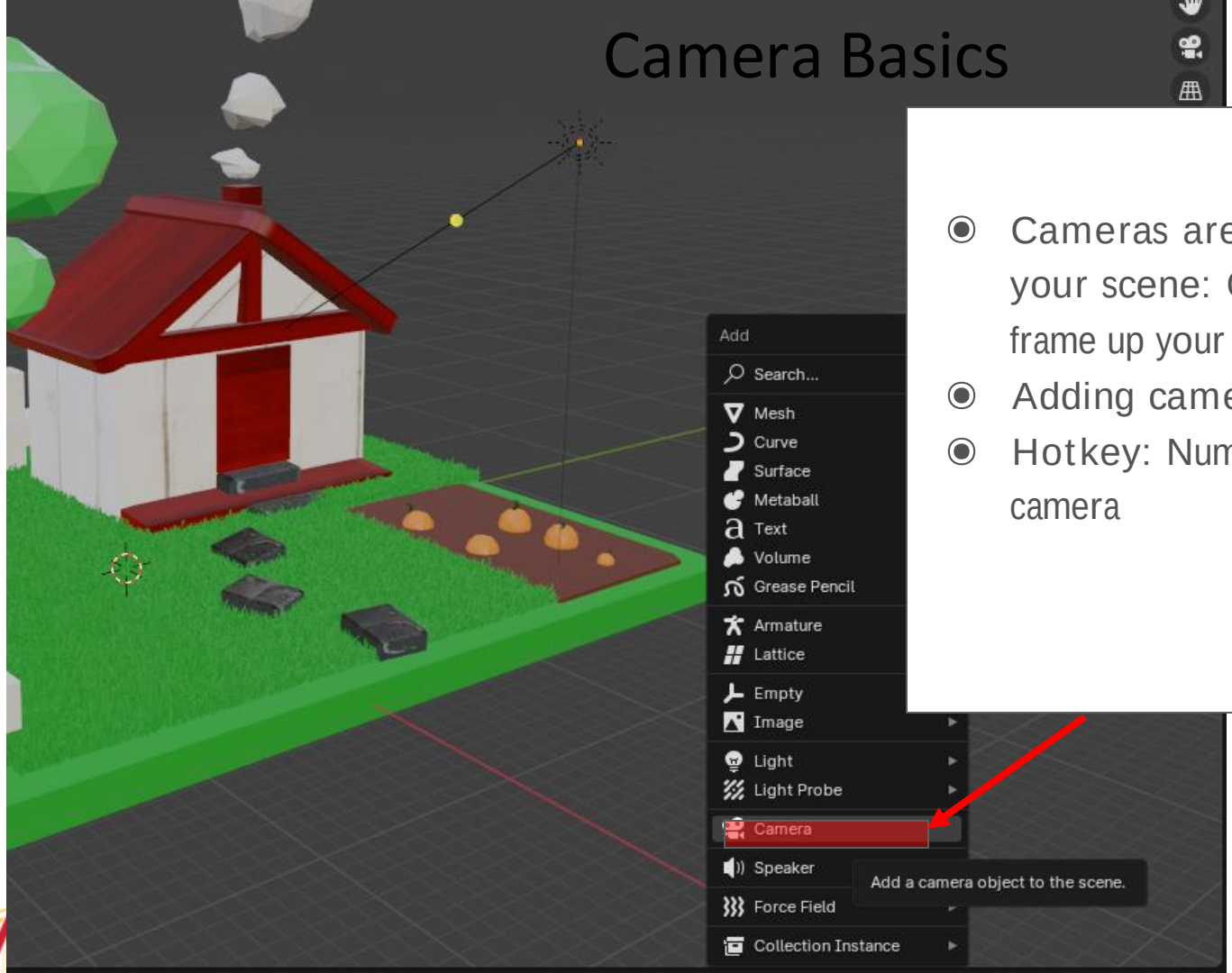


# Environment

- 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

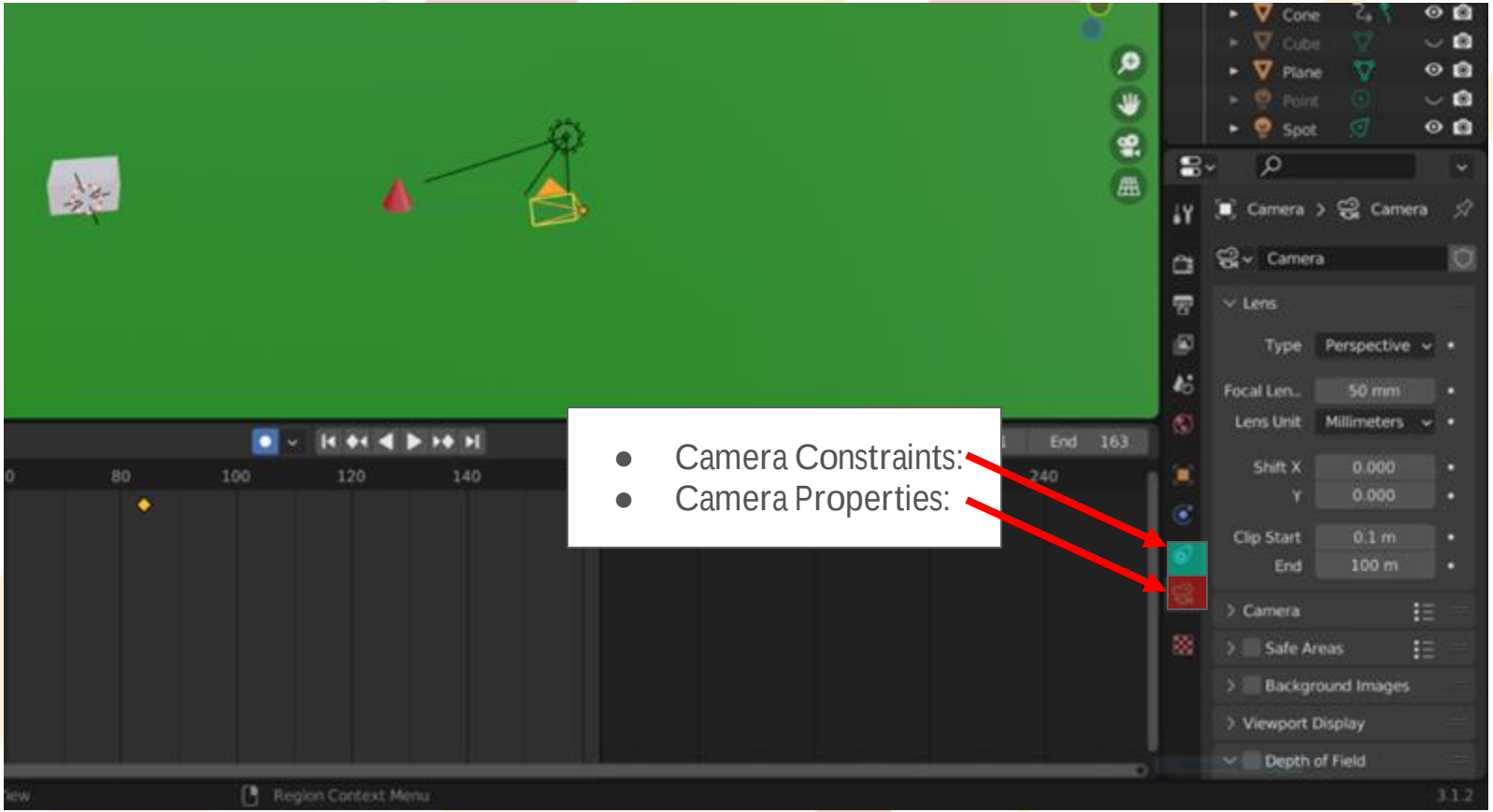


# Camera Basics




- 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

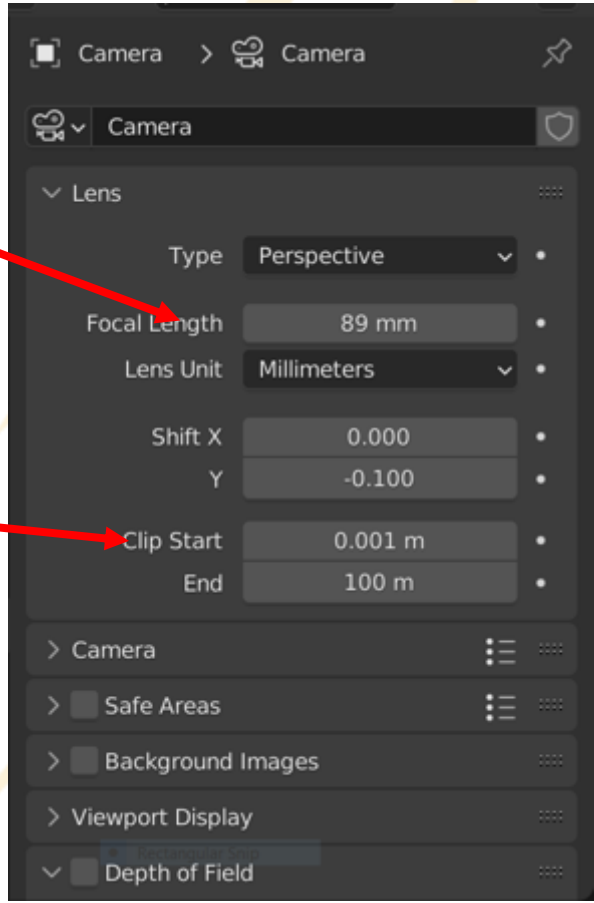
# Camera Properties



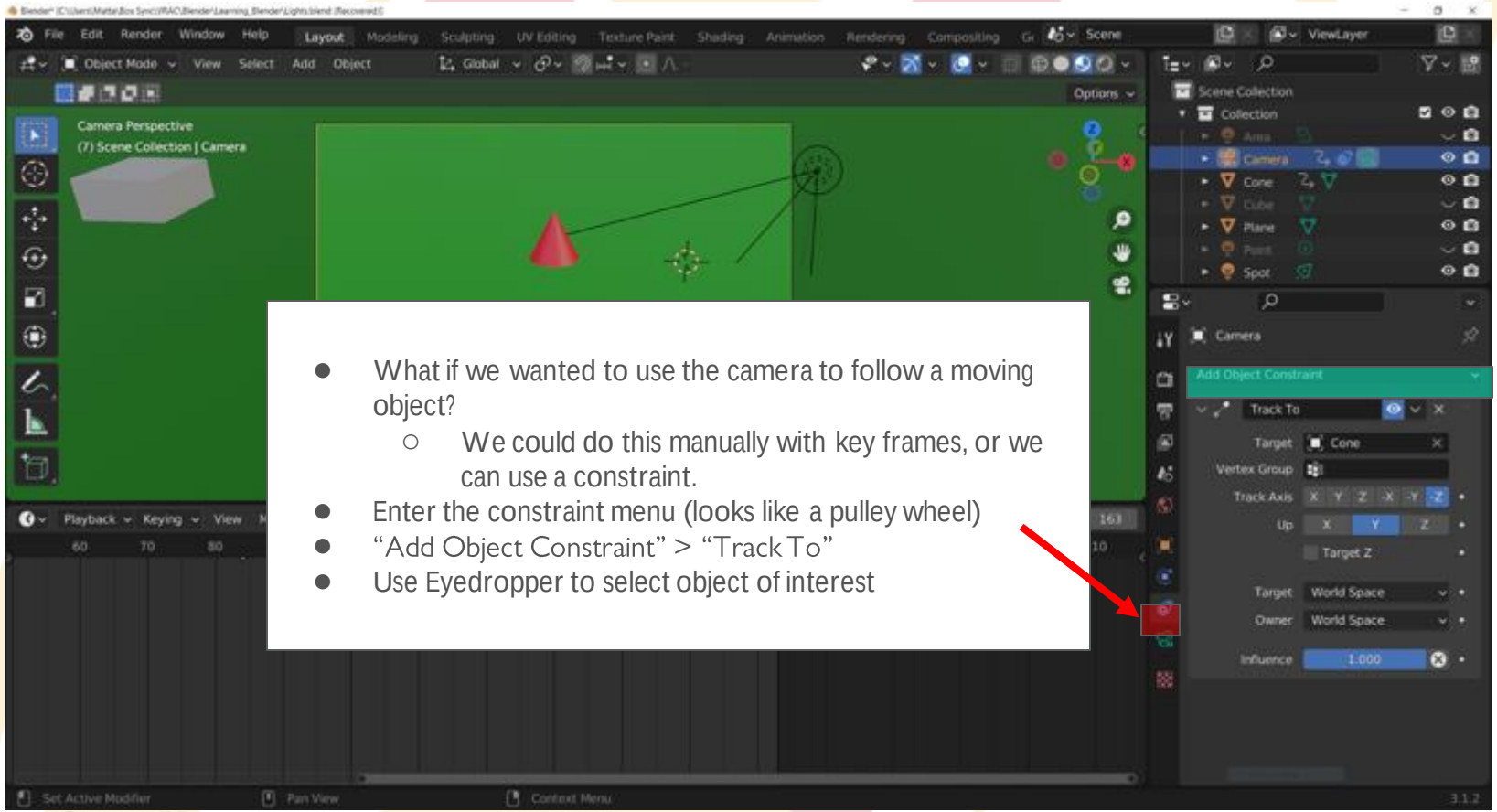

- Camera Constraints:
- Camera Properties:

# Camera 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



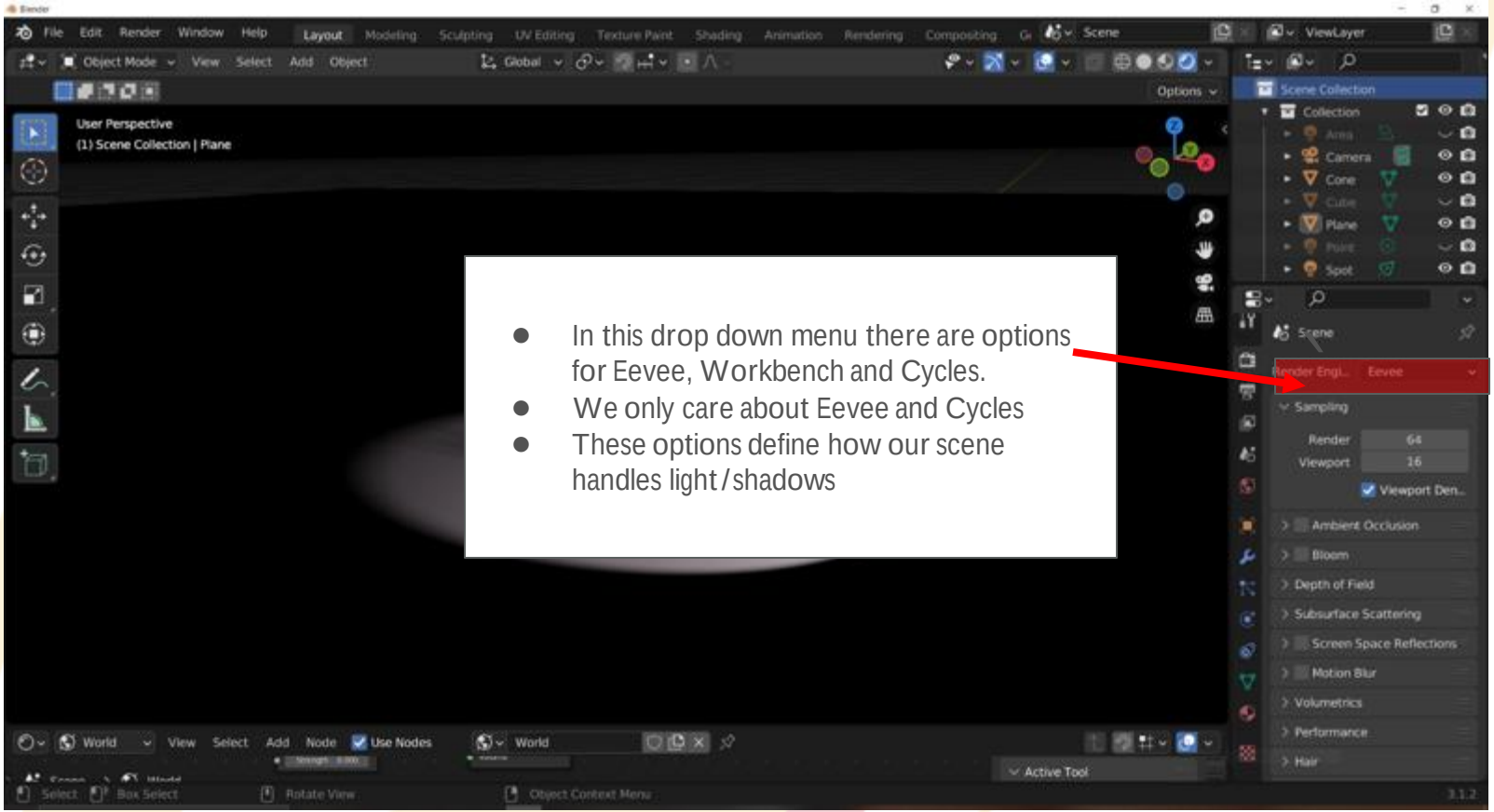
# Camera Tracking




- 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

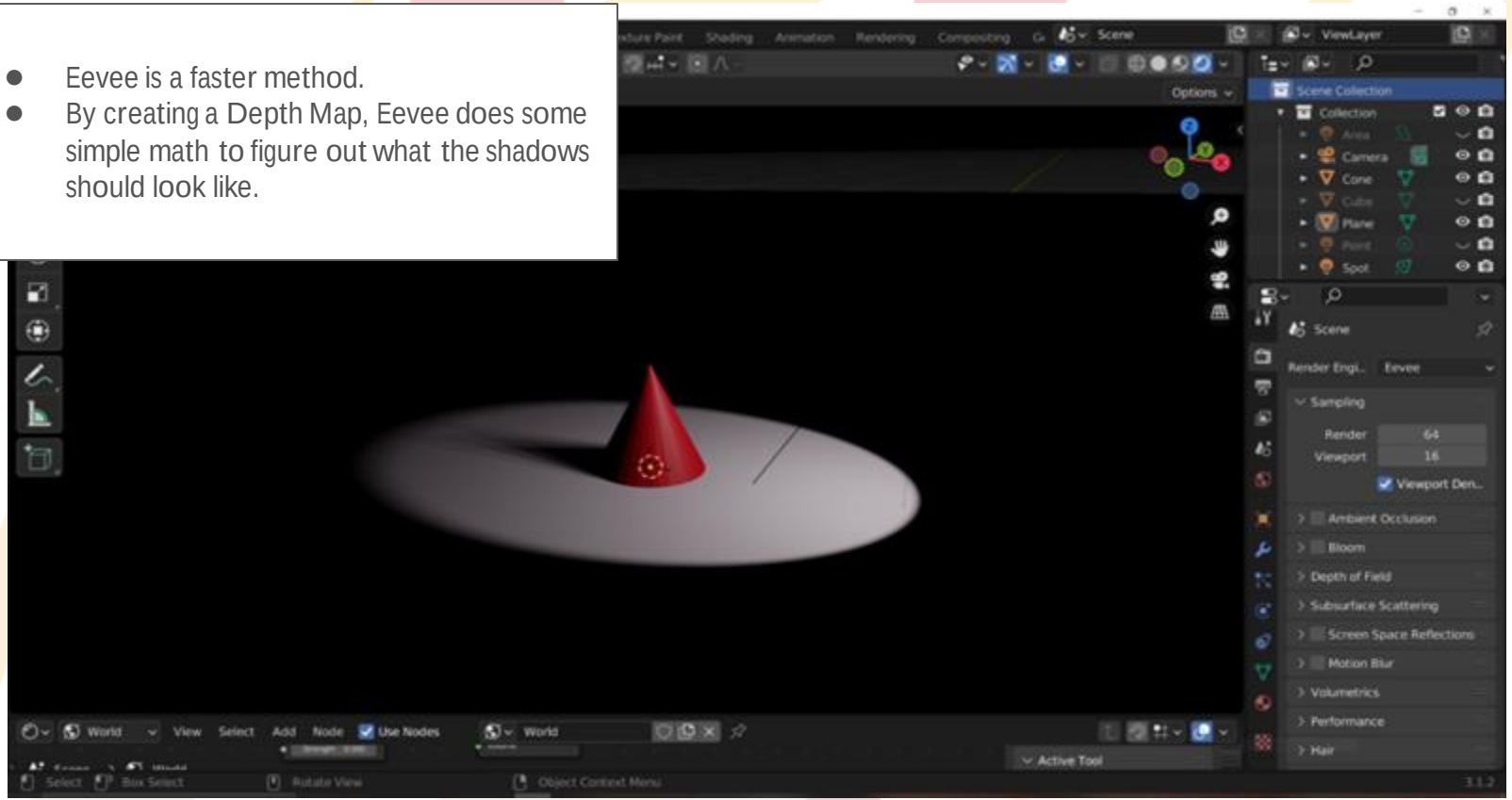
# Shadows




- In this drop down menu there are options for Eevee, Workbench and Cycles.
- We only care about Eevee and Cycles
- These options define how our scene handles light/shadows

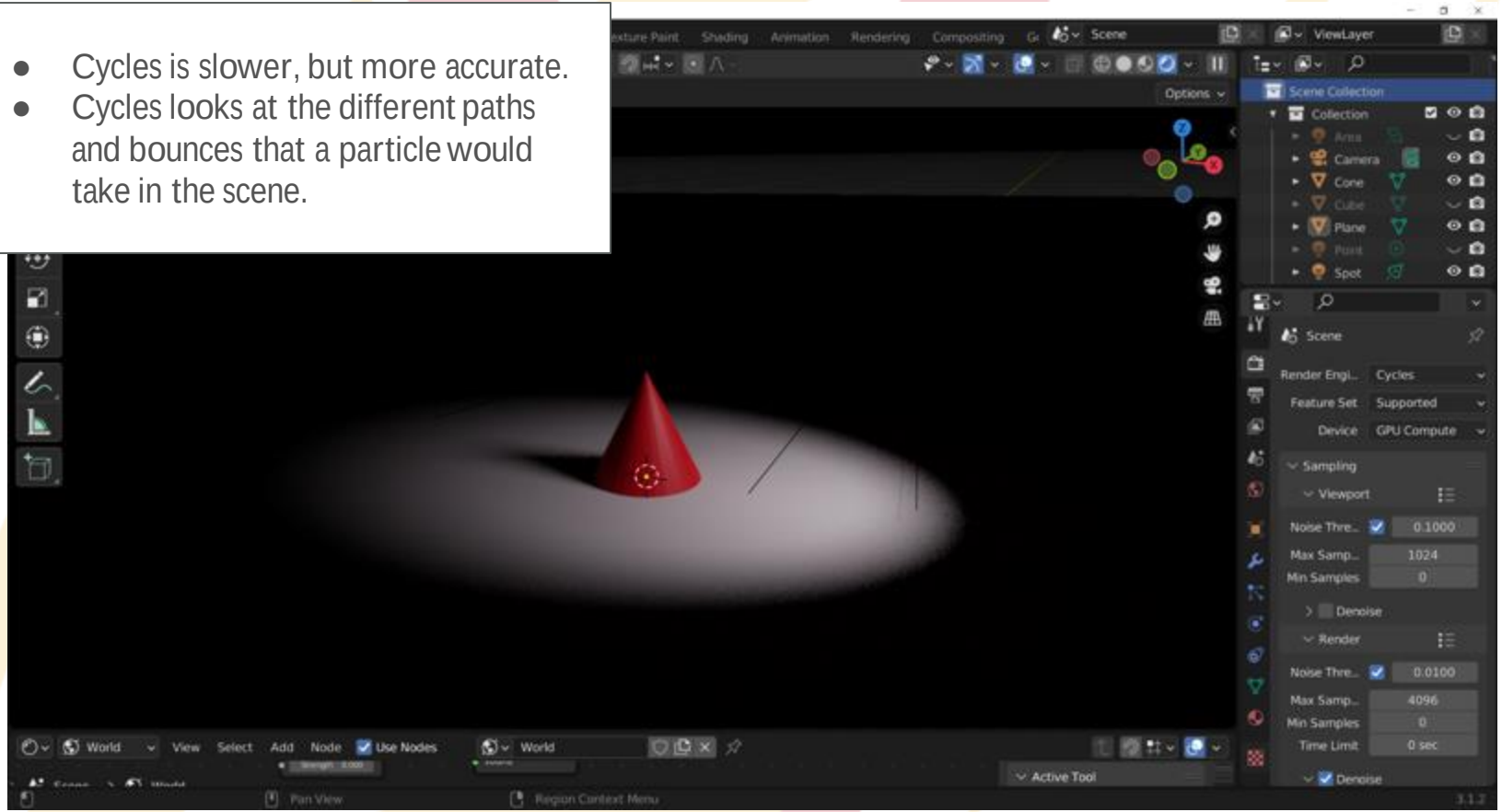
# Eevee: Depth Map

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

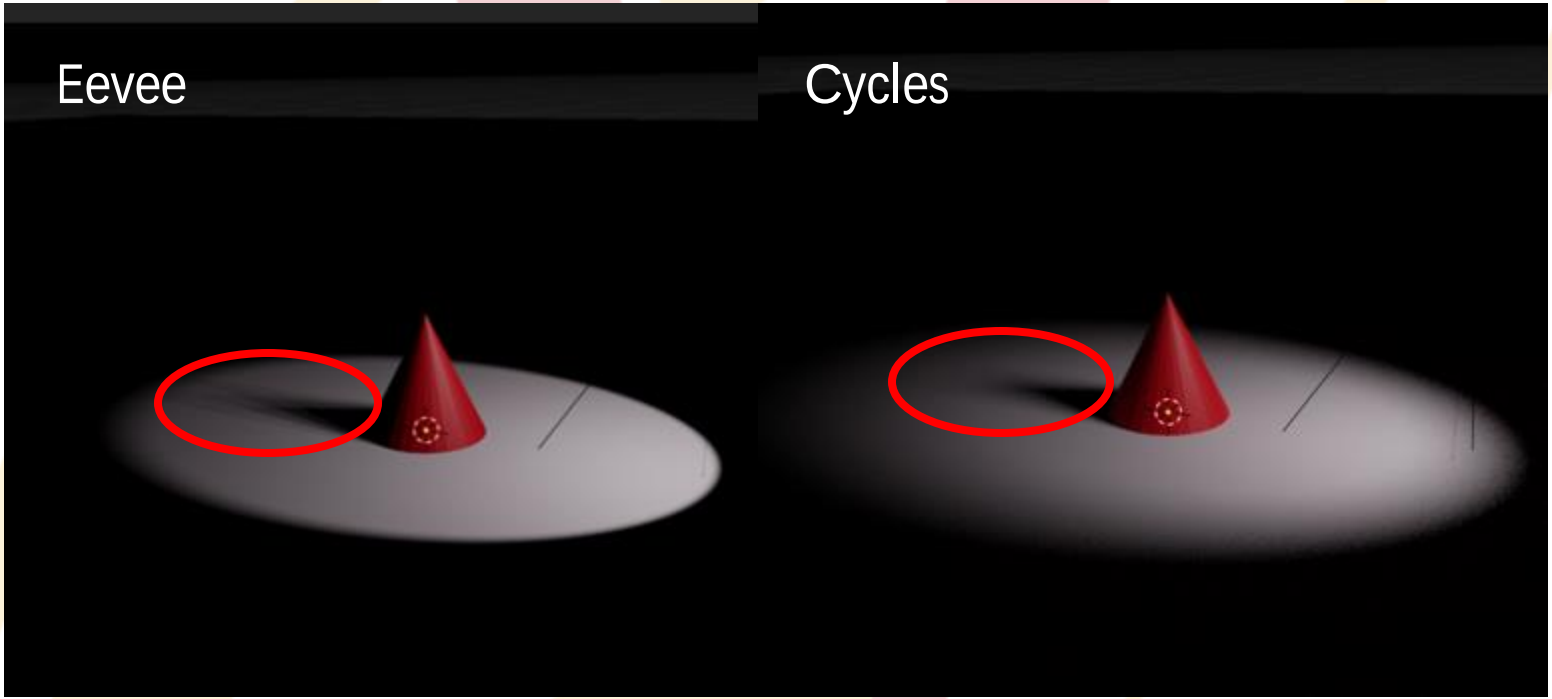


# Cycles: Ray Tracing

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

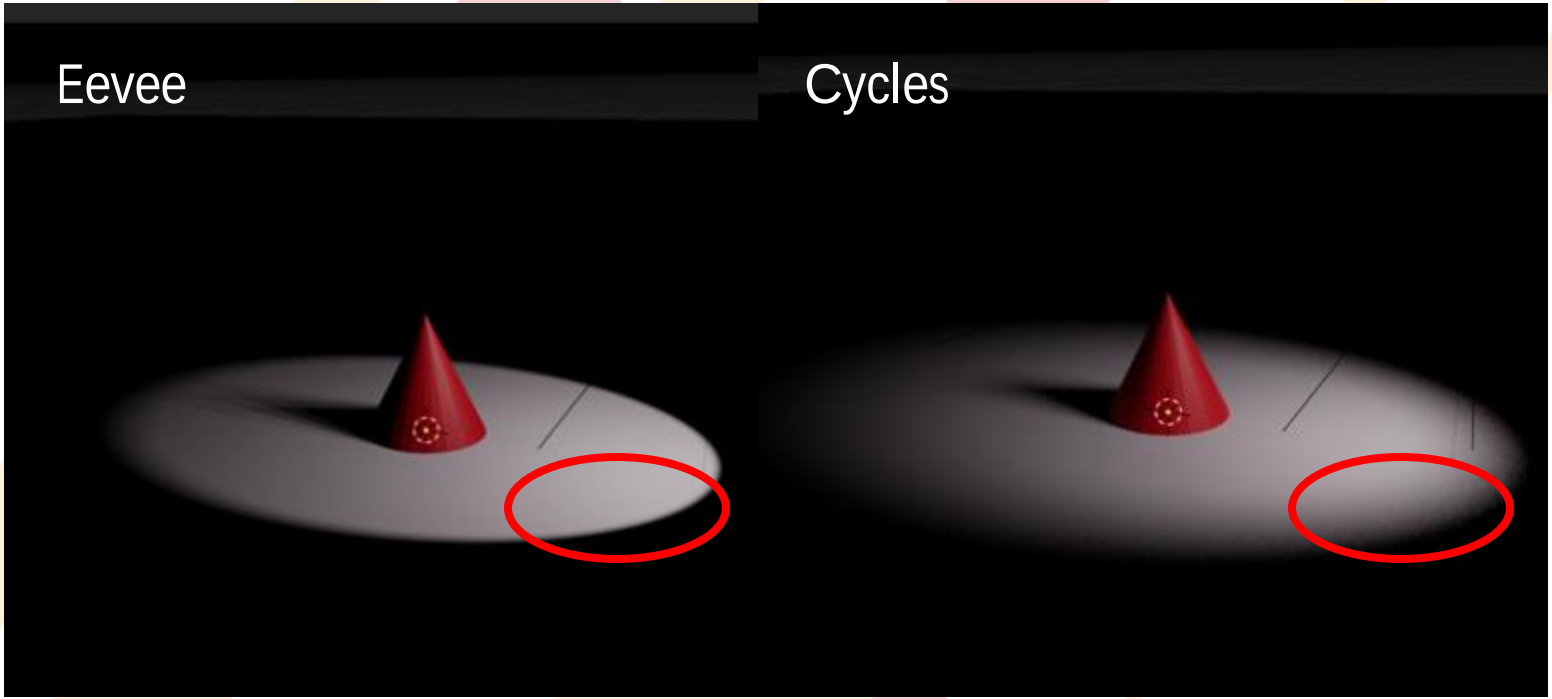


# Cycles: Ray Tracing




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