



UNIVERSITY OF MALTA
Institute of Digital Games

Creating Virtual Worlds

Lecture **1**

Getting Started

Our topics today ...

▶ **Introductions**
Who are we, and who are you?

▶ **Virtual Worlds**
What they are and where to find them

▶ **Class Structure**
What we'll do in this course

▶ **Unity3D**
Introduction to the software



Marcello Gómez Maureira

BSc. in Game Architecture and Design

MSc. in Media Technology

Current: PhD on Curiosity through Games



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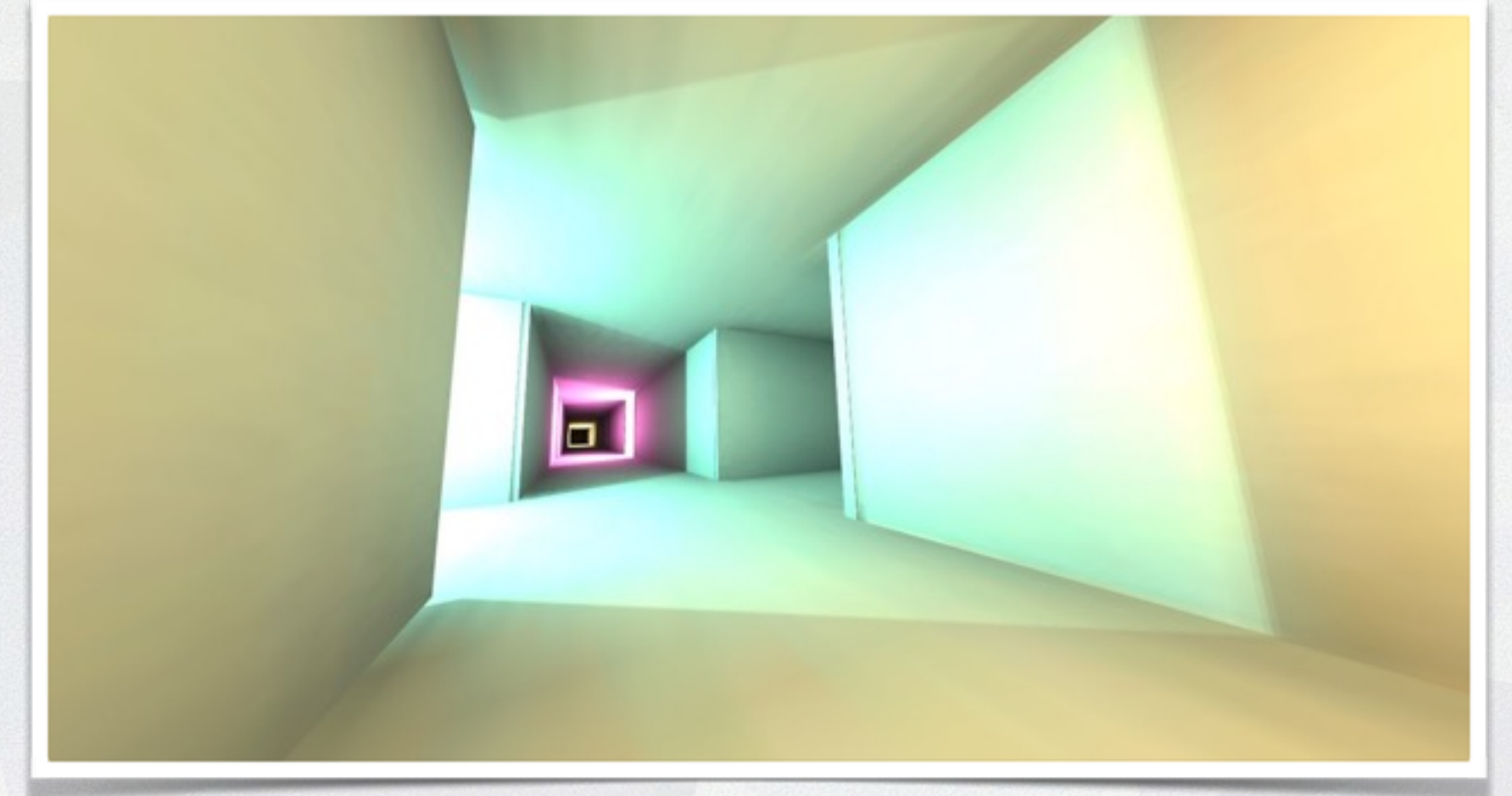
BSc. in Game Architecture and Design

MDes. in Animation

Current: MSc. in Game Design and Analysis

What We'll Be Doing

Creating **virtual environments** to explore through PC controls and Head Mounted Displays (HMDs)



Conveying a narrative or atmosphere using **basic geometry, colour, lights, and composition**

Give you the basic tools you need to express yourself in this digital medium

Why?

... To **express yourself artistically** in a new and exciting way

... To **learn new skills** which are becoming increasingly more important

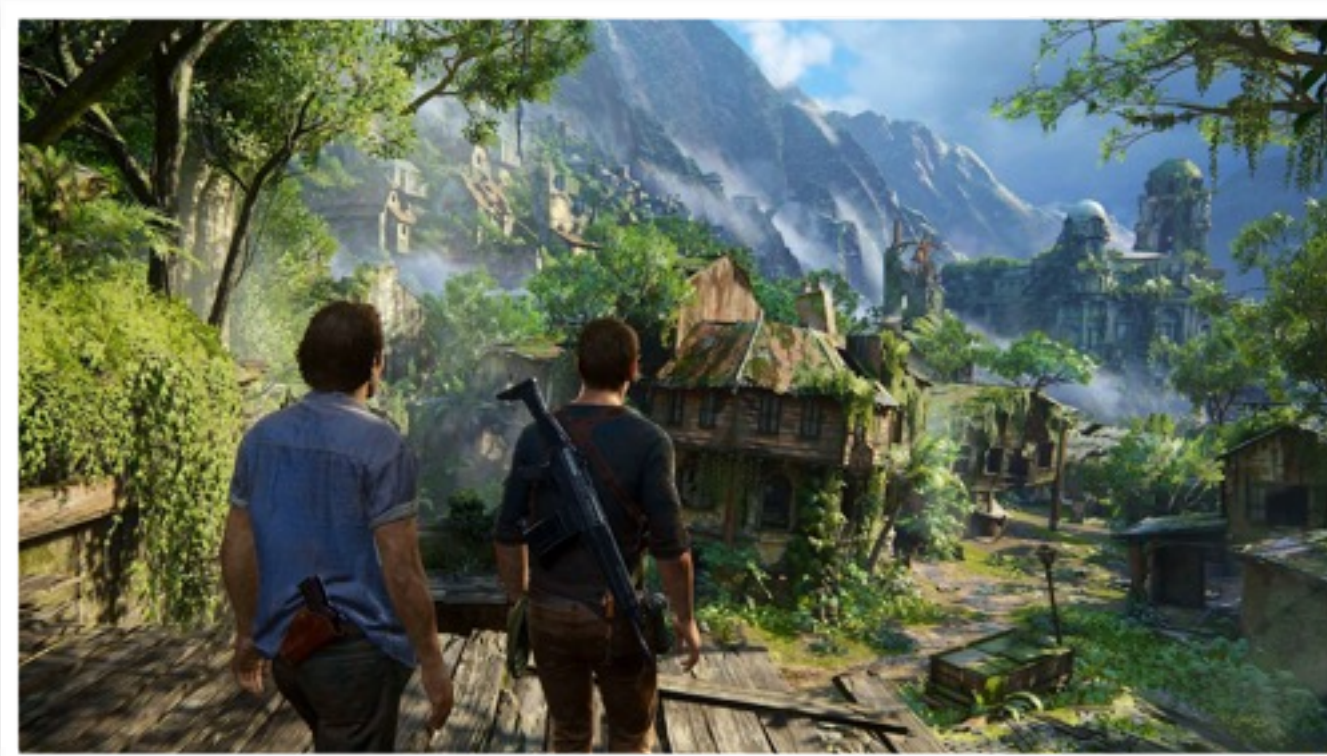
... To **understand technical considerations, support project development in a team, and communicate more efficiently** with others



Who are you

... and what brings you here?

Virtual Environments



The most common use of virtual environments (CG) are the **movie, television,** and **video game** industries

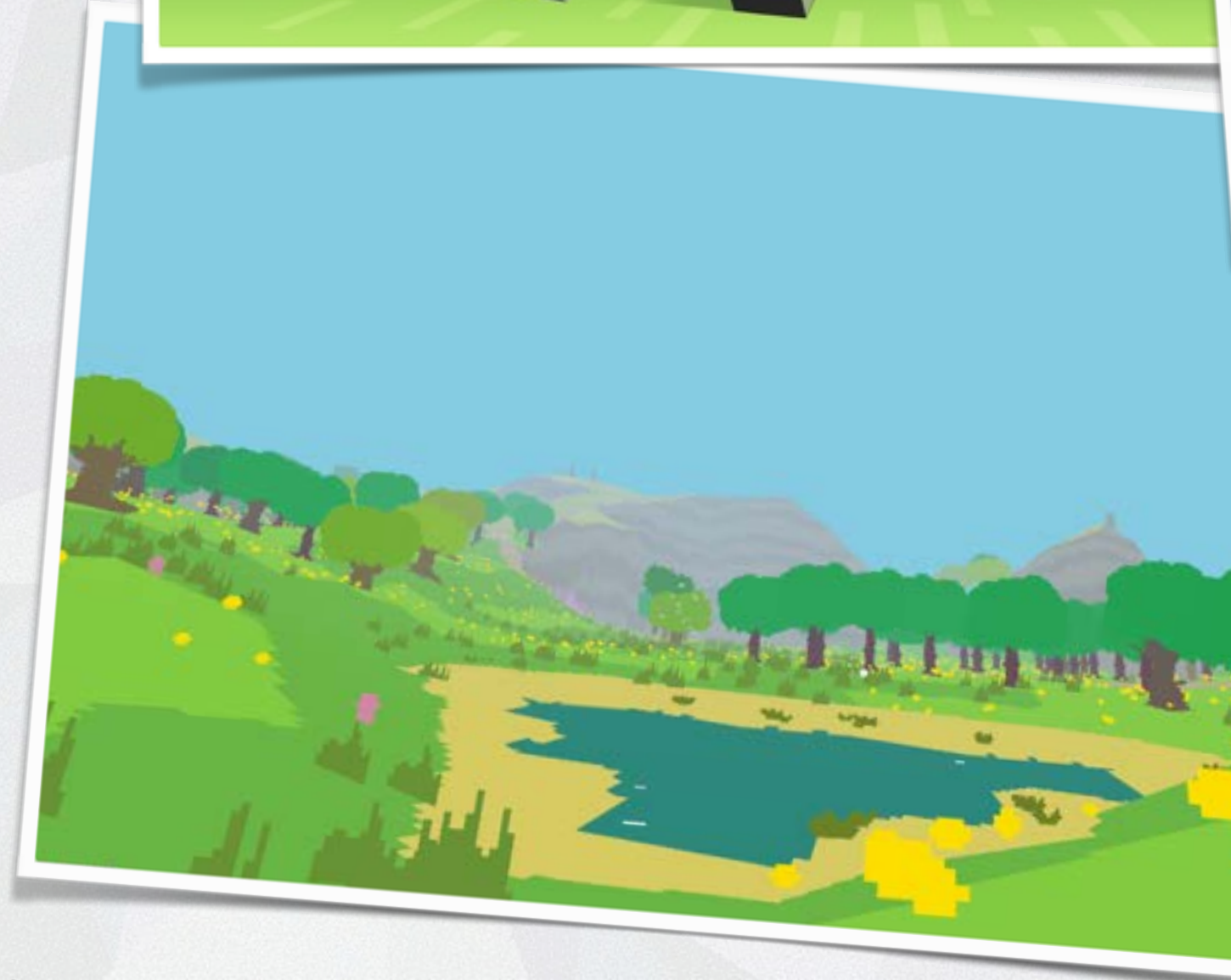
Often the goal is **(stylized) photo realism**

Nothing you see is real!

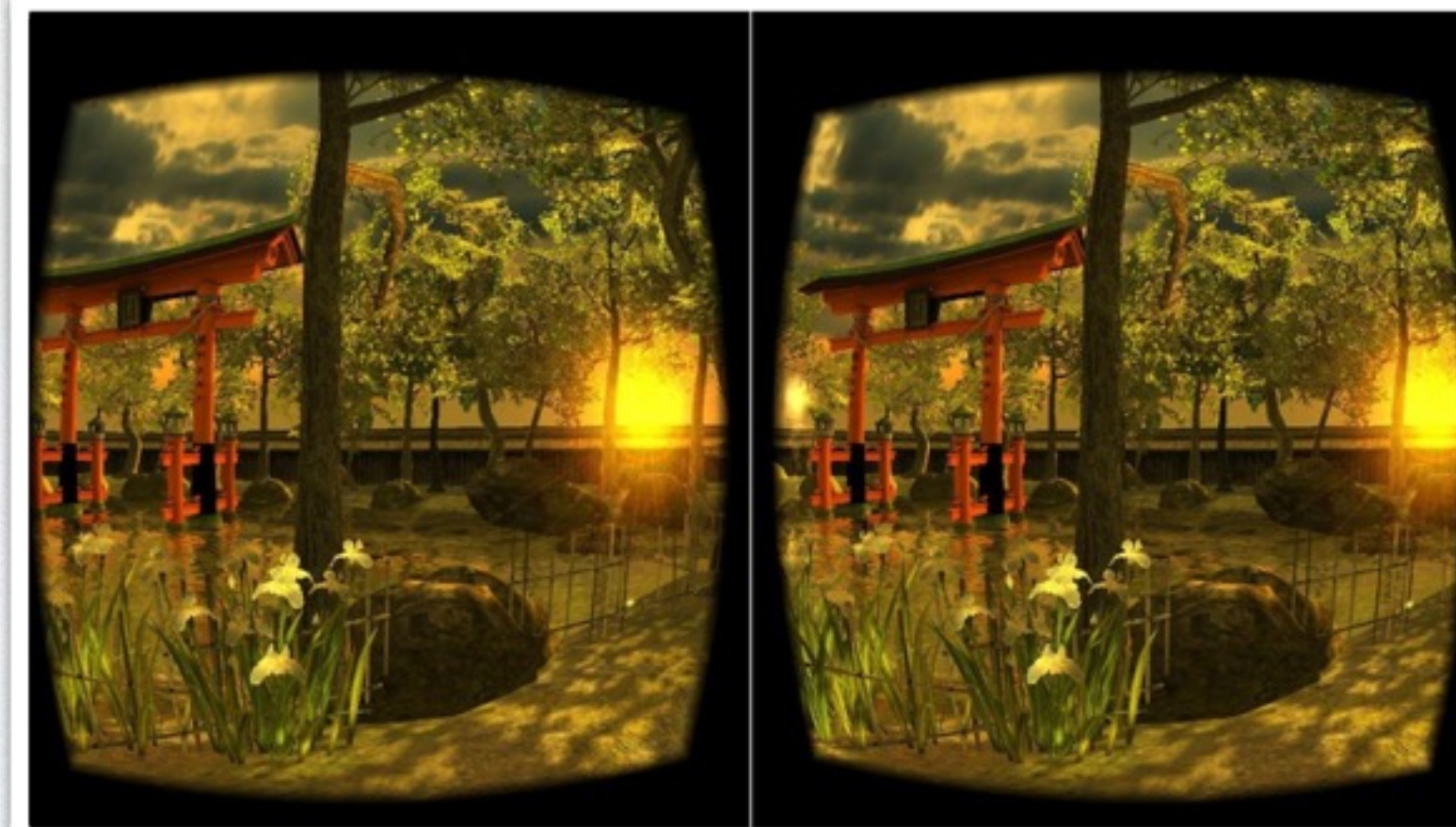
But environments do not need to be realistic to be interesting (quite the opposite)

Entire worlds can be made from **simple geometric shapes**

This is more common in the video game industry



Environments created for **virtual reality** also show more variety



We are not limited to computer generated objects; **video material** can be used to make interesting spaces too



In this course we will see how to make **interesting, explorable** environments

We'll only use **basic tools** and **free materials**

No previous experience needed!



Course Structure

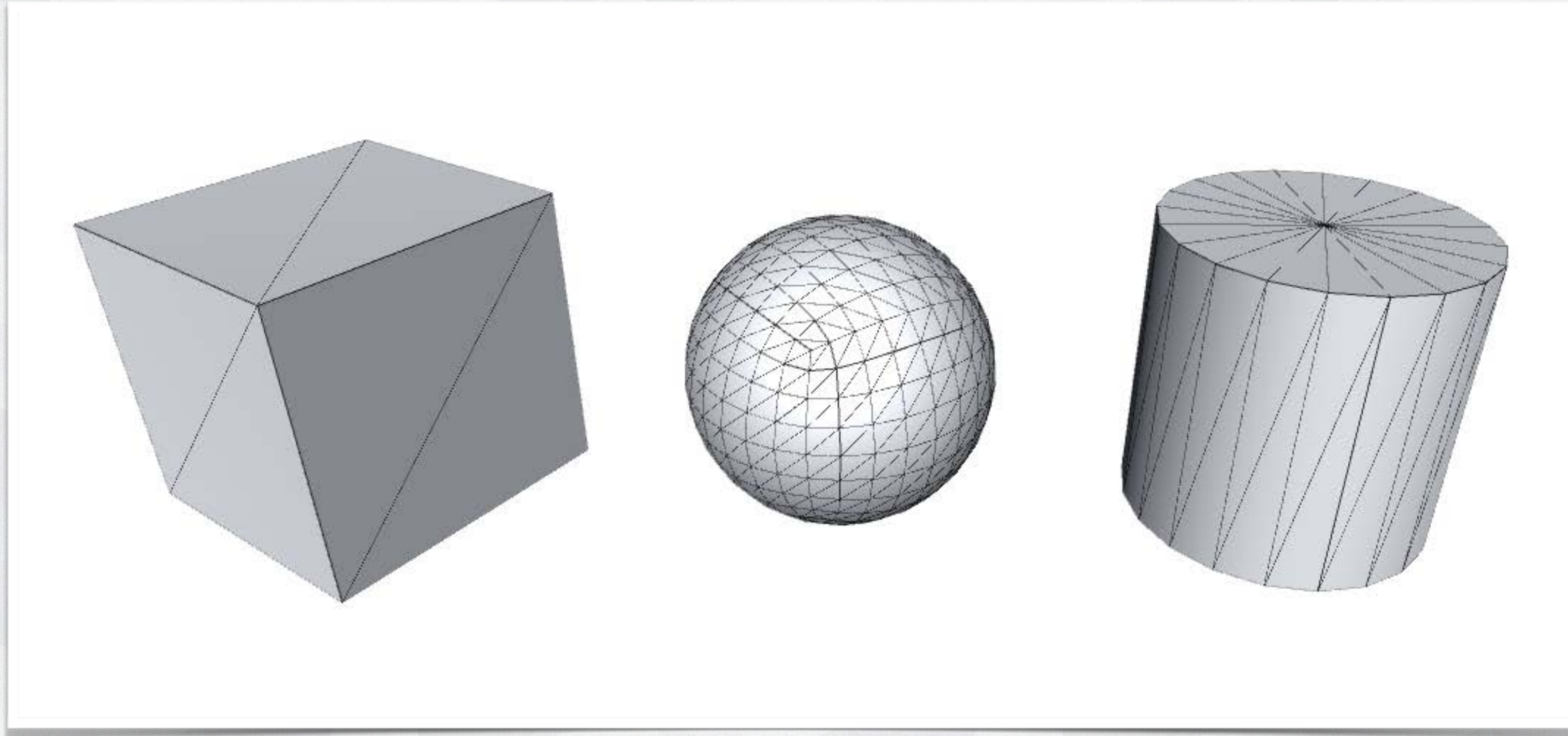
- ▶ **8 classes in total**
From today until 9th of December
- ▶ **Sessions are 2 hours long**
Fridays from 12:00 - 14:00
- ▶ **20 Min. review of previous week**
By you!
- ▶ **30 Min. theory — break — 1 hour practice**
Today is an exception



Course Assignment

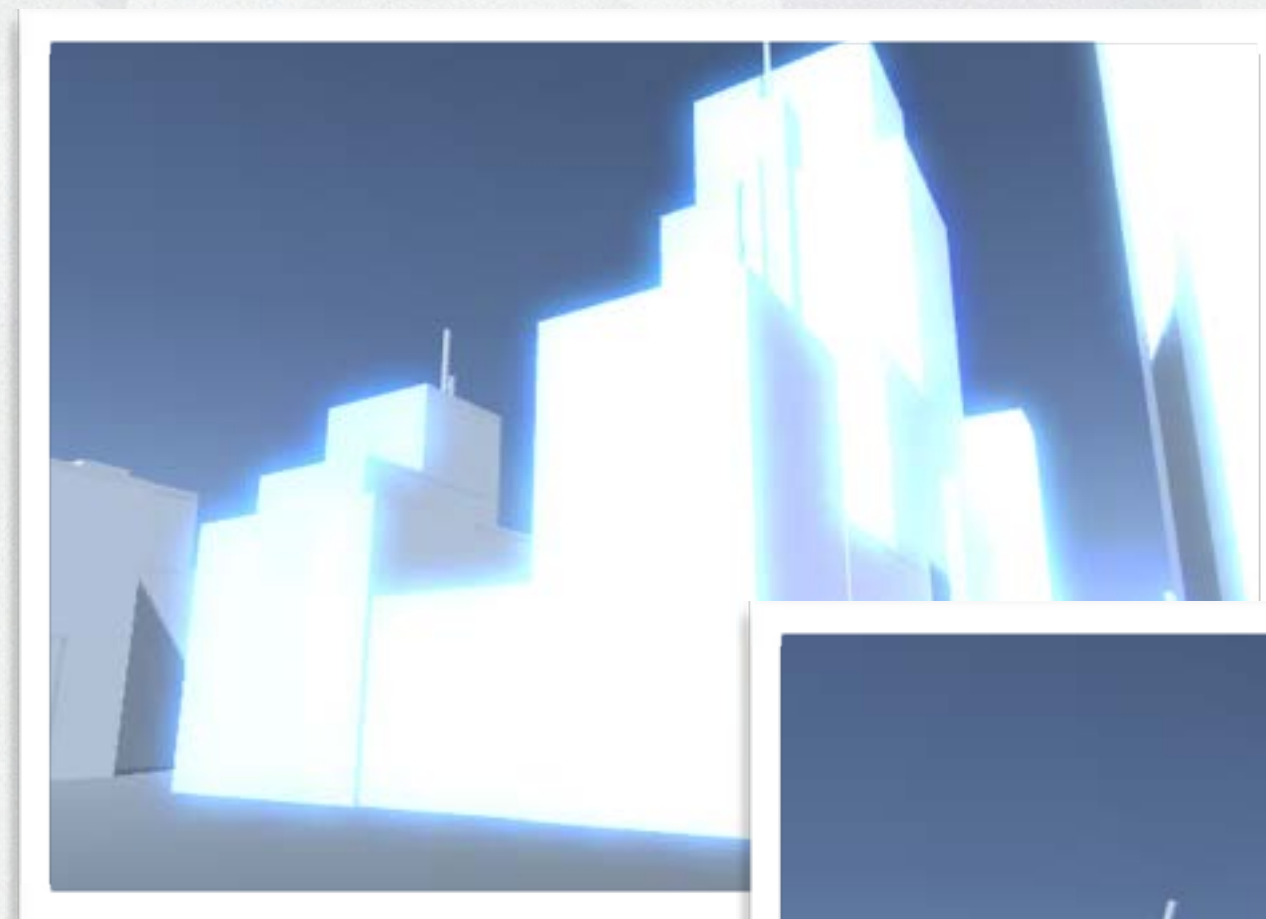
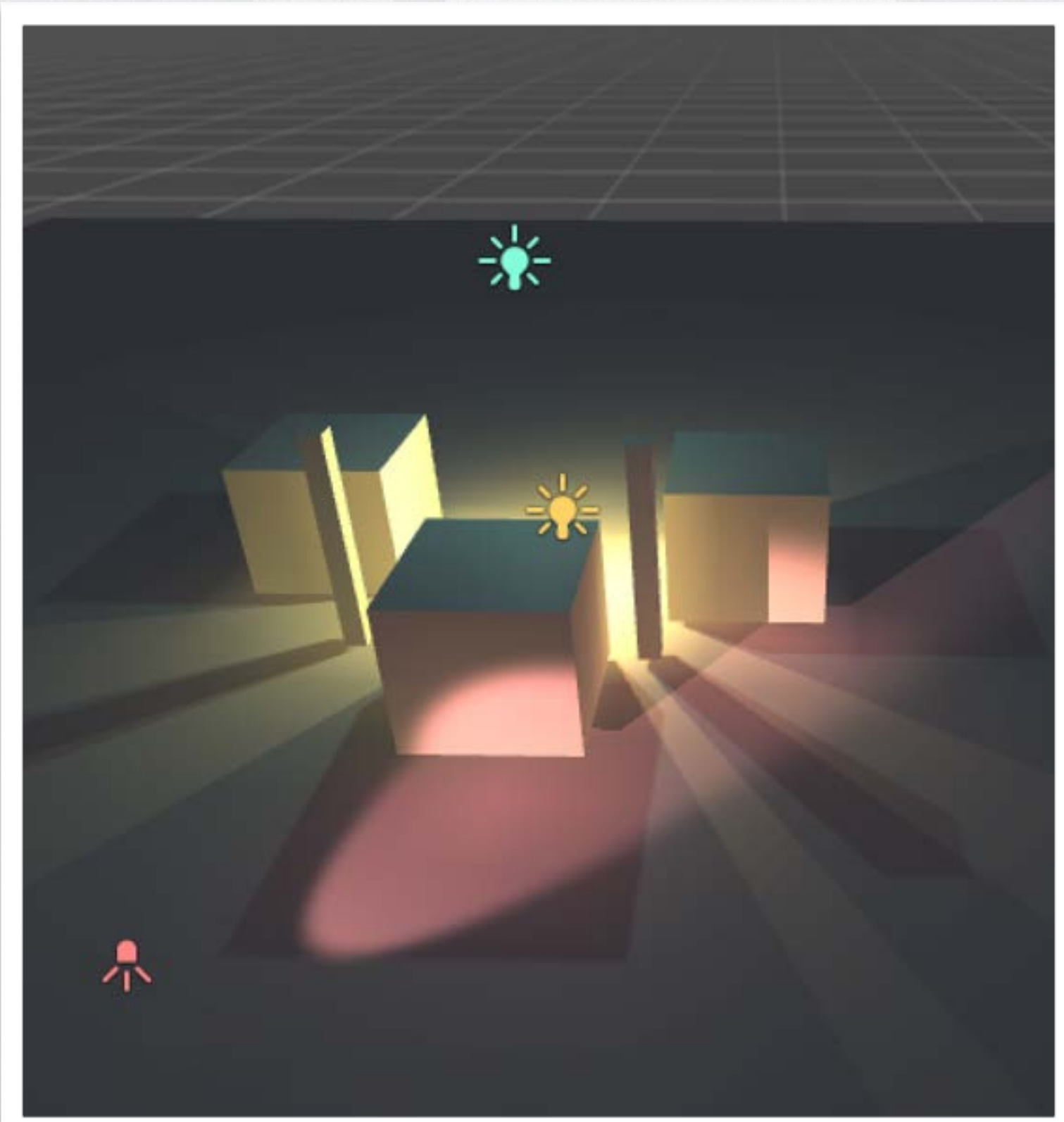
Create a **surreal city** environment in teams of two

We will start with **basic shapes**, add some **lights** and **texture**, as well as **moving elements** and **interactivity** throughout the course



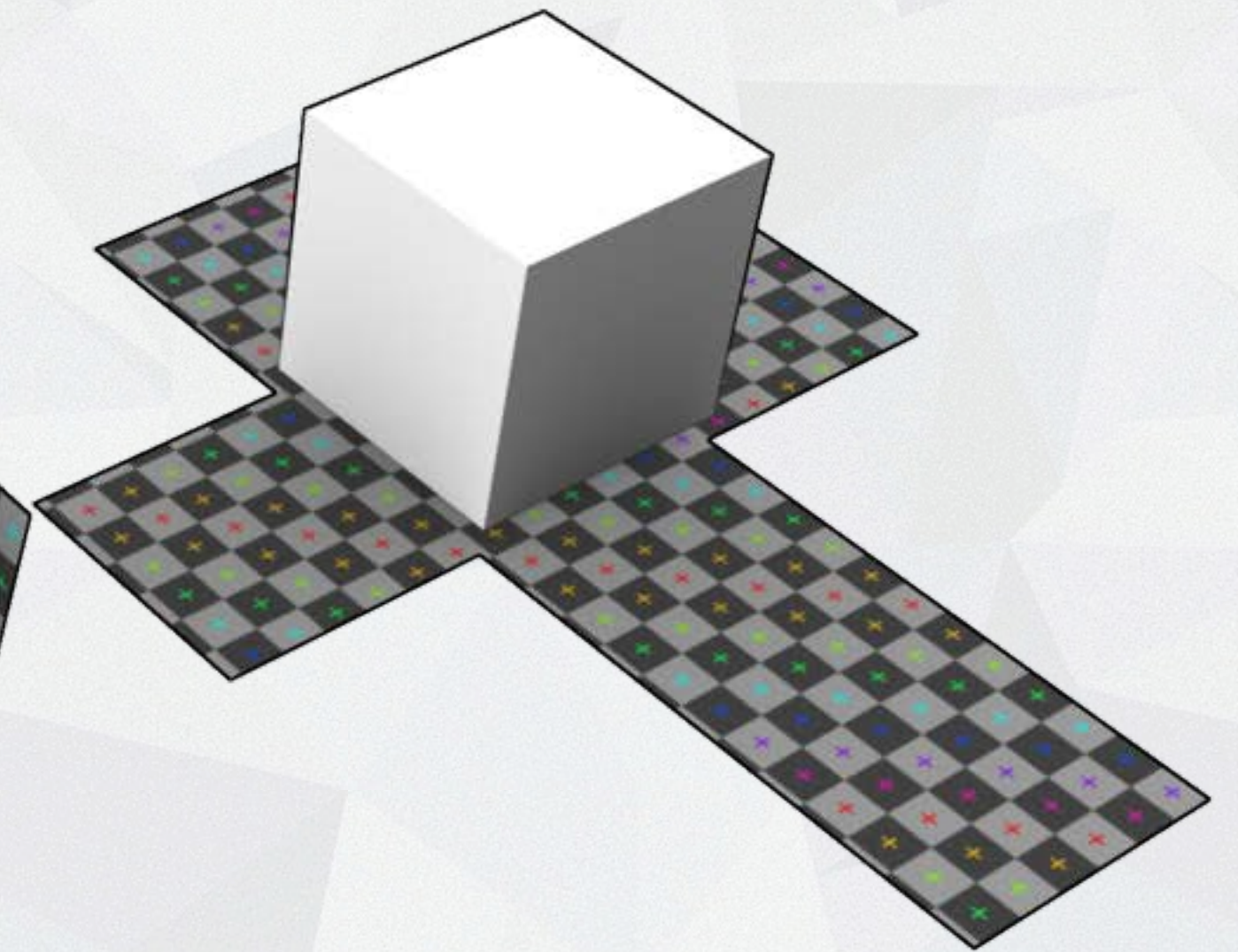
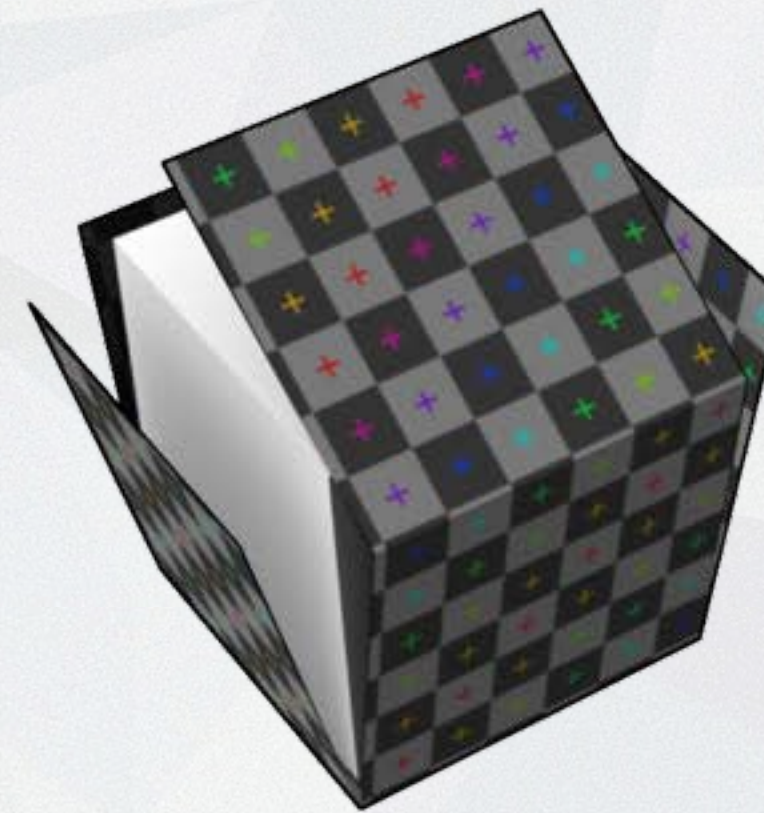
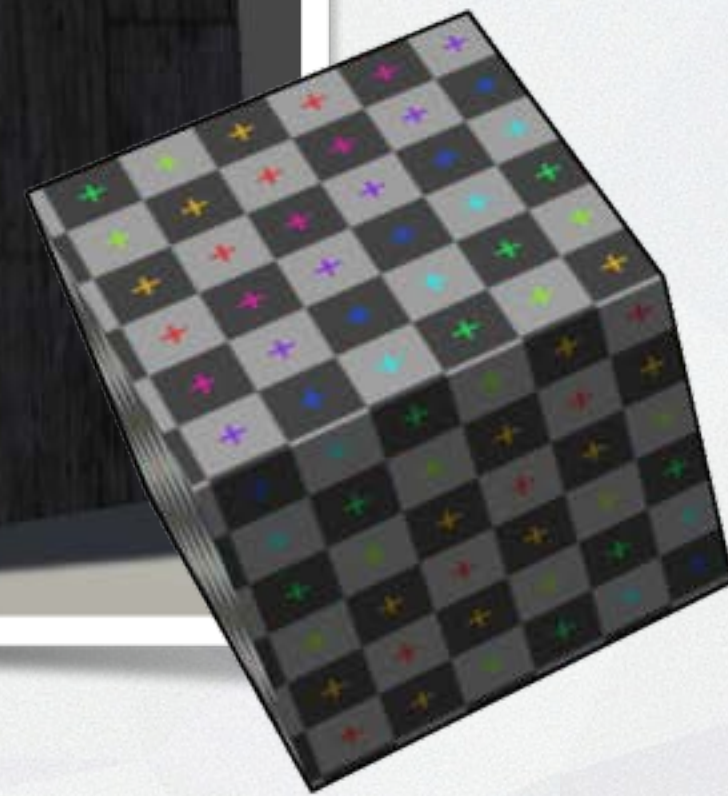
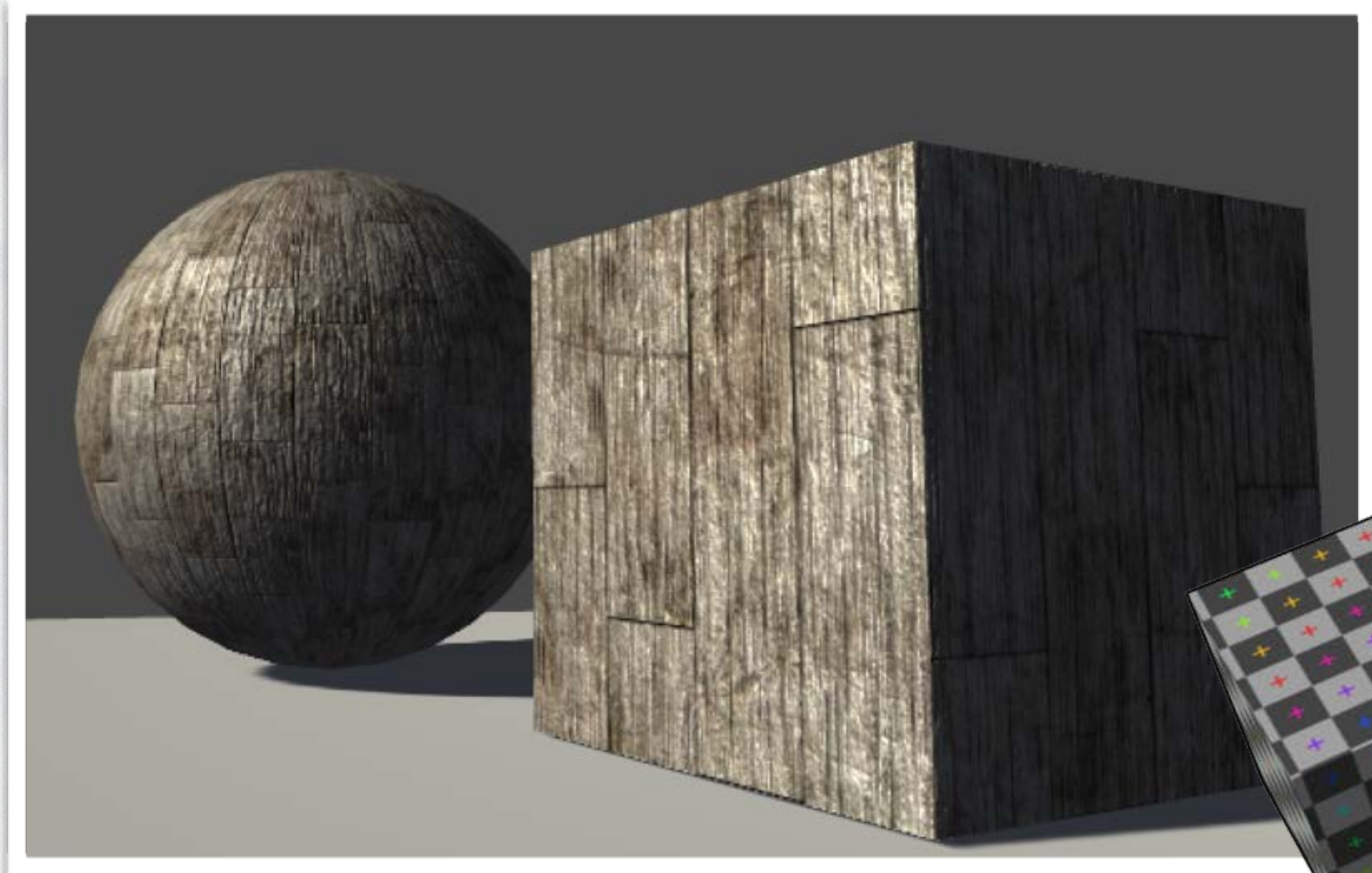
2: Primitives and Polygons

Polygons 101 – Creating and transforming geometry in Unity – Building a city with basic shapes



3: Imports, Cameras, and Lights

More complex models – Setting up lights – Basic camera settings – Adding a mood to your city



4: Materials and Textures

*Surface properties – Creating and adding materials –
Texture maps – UV Maps*

5 & 6: Unity Scripts and Components I & II

*A closer look at components – Programming 101 –
Implementing scripts into your scene – Unity Functions –
Using the Unity documentation*

```
1 using UnityEngine;
2 using System.Collections;
```

```
3
4 /*
5 This script is used to make move an object in a hover-like
6 motion - or to be more precise, in a sinus pattern.
7
```

```
8 The public parameters are:
9 Frequency -- sets the speed of the motion
10 Amplitude -- sets the distance travelled by the movie
11 Time Offset -- shifts the movement in time
12 (useful when using the script on multiple objects)
13 Move X,Y,Z -- set the direction in which the object moves
```

```
14 */
15
```

```
16 public class Hover : MonoBehaviour {
```

```
17 // Setting default script parameters
18 public float frequency = 1.0f;
19 public float amplitude = 1.0f;
20 public float timeOffset = 0.0f;
```

```
21 // Use a range slider on the next variables
22 // Allow setting of -1, 0, 1 to indicate which directions are affected
23 [Range(-1, 1)]
24 public int rotateX, rotateY, rotateZ;
```

```
13 public class Rotate : MonoBehaviour {
```

```
14 // Setting default script parameters
15 public float speed = 10.0f;
```

```
16 // Use a range slider on the next variables
17 // Allow setting of -1, 0, 1 to indicate which directions are affected
18 [Range(-1, 1)]
19 public int rotateX, rotateY, rotateZ;
```

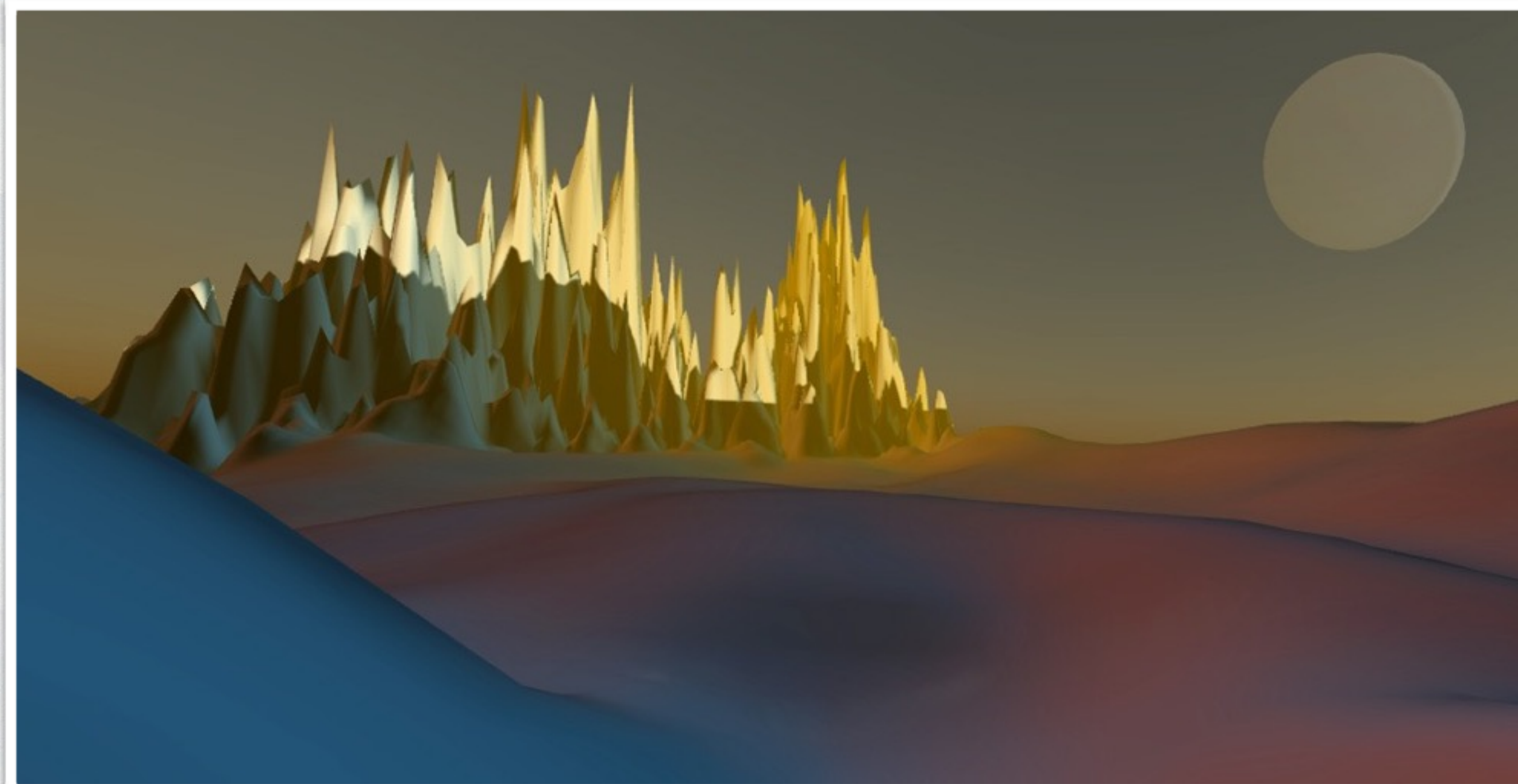
```
20 // Private variables for internal script parameters
```

```
13 public class PlayMovie : MonoBehaviour {
14 // Setting default script parameters
15 public bool playAudio = true;
16 public bool loopMovie = true;
```

```
17 // Private variables for internal script parameters
18 private MovieTexture movie;
19 private AudioSource audio;
```

```
20 void Start () {
21 // Creating a reference to the movie texture
22 movie = (MovieTexture) FindObjectOfType<MovieTexture>();
23 if (playAudio)
24 audio = (AudioSource) FindObjectOfType<AudioSource>();
25 }
```

```
26 void Update () {
27 // Moving the object in a sinus pattern
28 Vector3 position = transform.position;
29 position.y = Mathf.Sin(Time.time * frequency) * amplitude;
30 transform.position = position;
31 if (playAudio)
32 audio.Play();
33 }
```



7: Terrain, Grass, and Particles

Additional tools – Make your scene even more unique

8: Showcase

Where to go from here – Trying out your scenes

Assessment

- ▶ **Degree Plus = No grades**
Course is listed on your transcript when you graduate
- ▶ **Attendance is mandatory to pass**
If you can't attend, mail us before class starts with the reason
- ▶ **Try to find some time to practice**
This will help you in making the most out of this course



Break Time!
Any questions?

After the break:

***Unity 101 and opening the program for the
first time***

Why Unity3D?

- ▶ **Widely used game engine**
Especially by small development teams
- ▶ **Good support and documentation**
Easy to find solutions to issues or how to do something
- ▶ **Asset Store & Plugins**
Many free tools and asset packs, integration of VR
- ▶ **Free for non-commercial projects**
Always a plus for students

Unity 101

▶ Project

The entire game, simulation, interactive experience, etc.

▶ Scene

A file in the project; one environment, or “level”

▶ Asset

File used in the scenes; models, textures, sounds, etc.

▶ Put very simply:

Projects are made of scenes, populated with assets

Unity 101

Scene View

Where you build your environment

Inspector

Shows object details

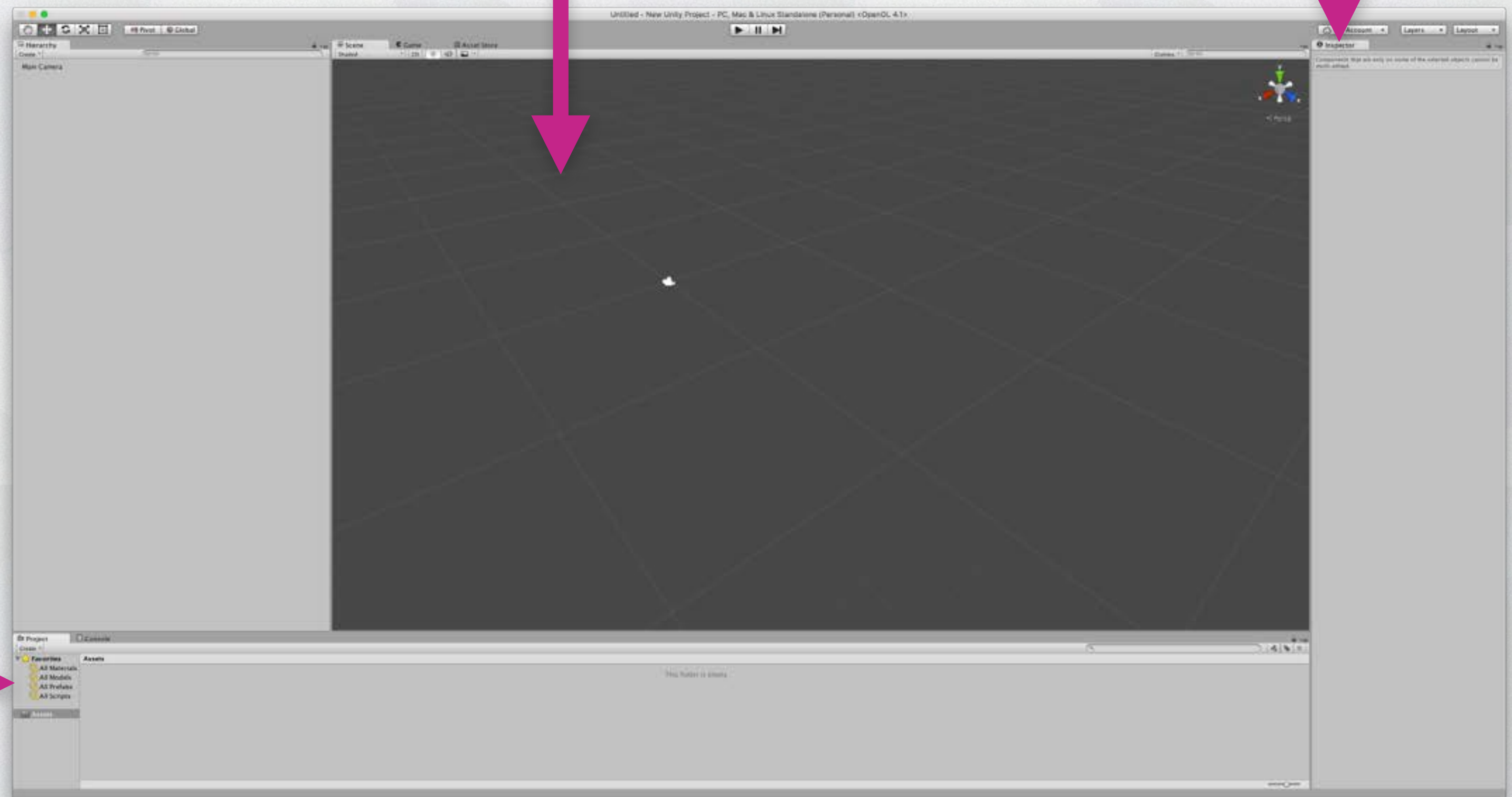
Hierarchy

Lists all objects in the scene



Project Window

Manage all assets of the project (scenes, models, materials, sounds, etc.)

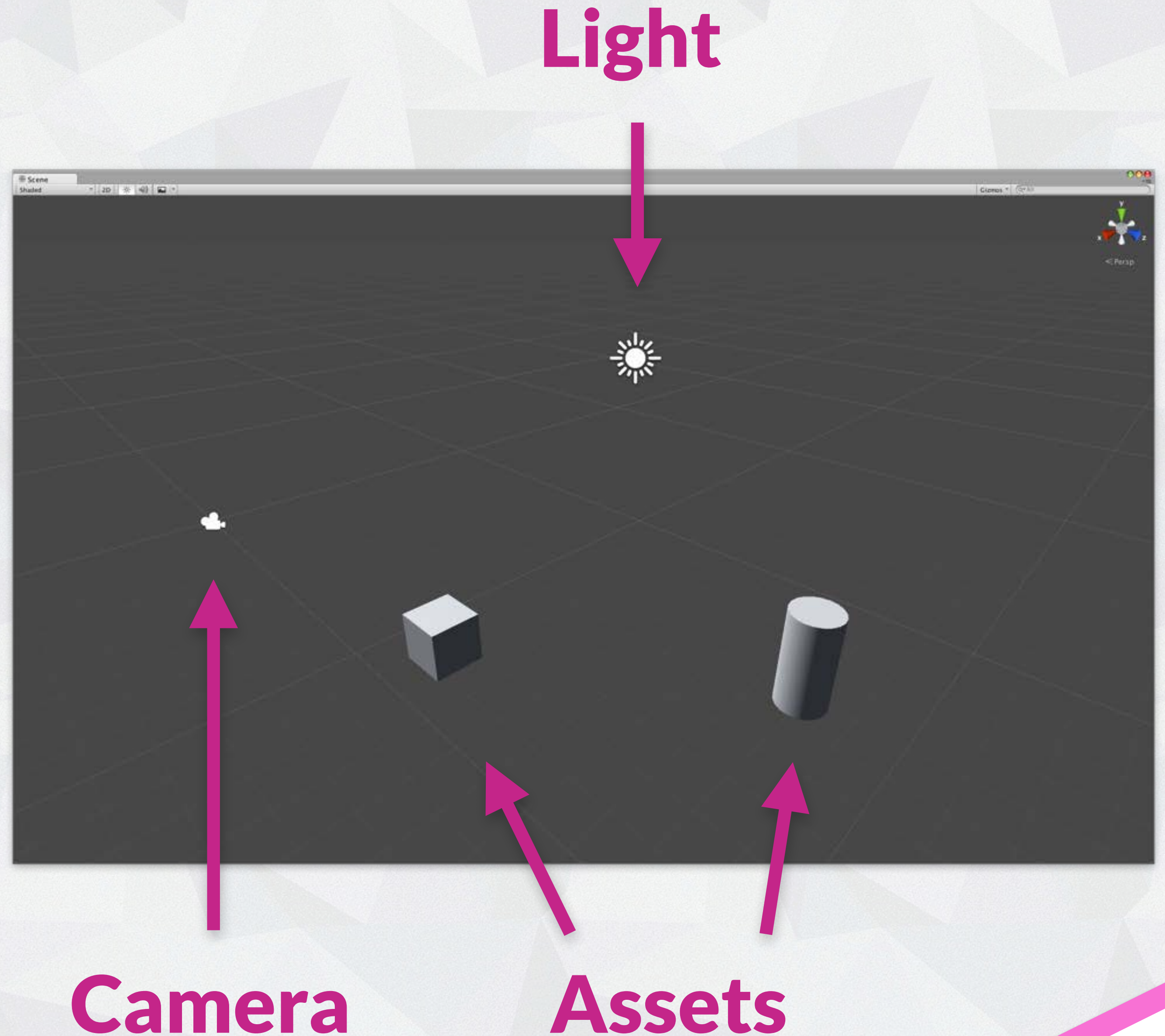


Scene View

When you **open a scene file**, it shows here

You can **move and position objects** to build your worlds

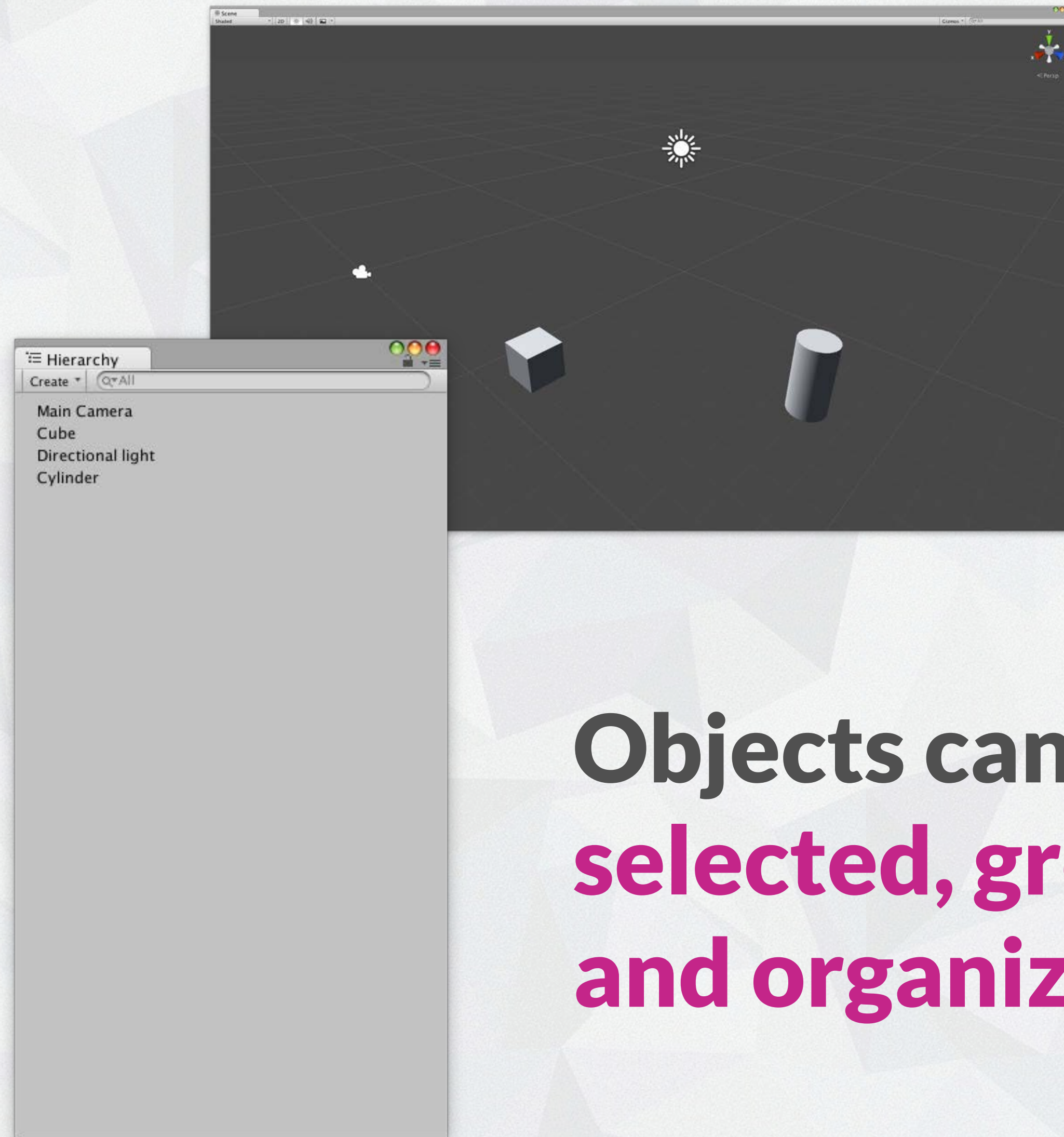
Most of the work is done in this view



Scene Hierarchy

The Hierarchy **lists all the objects in a scene**

It's **easier to find a specific object in the Hierarchy than in the Scene View, especially with complex scenes**



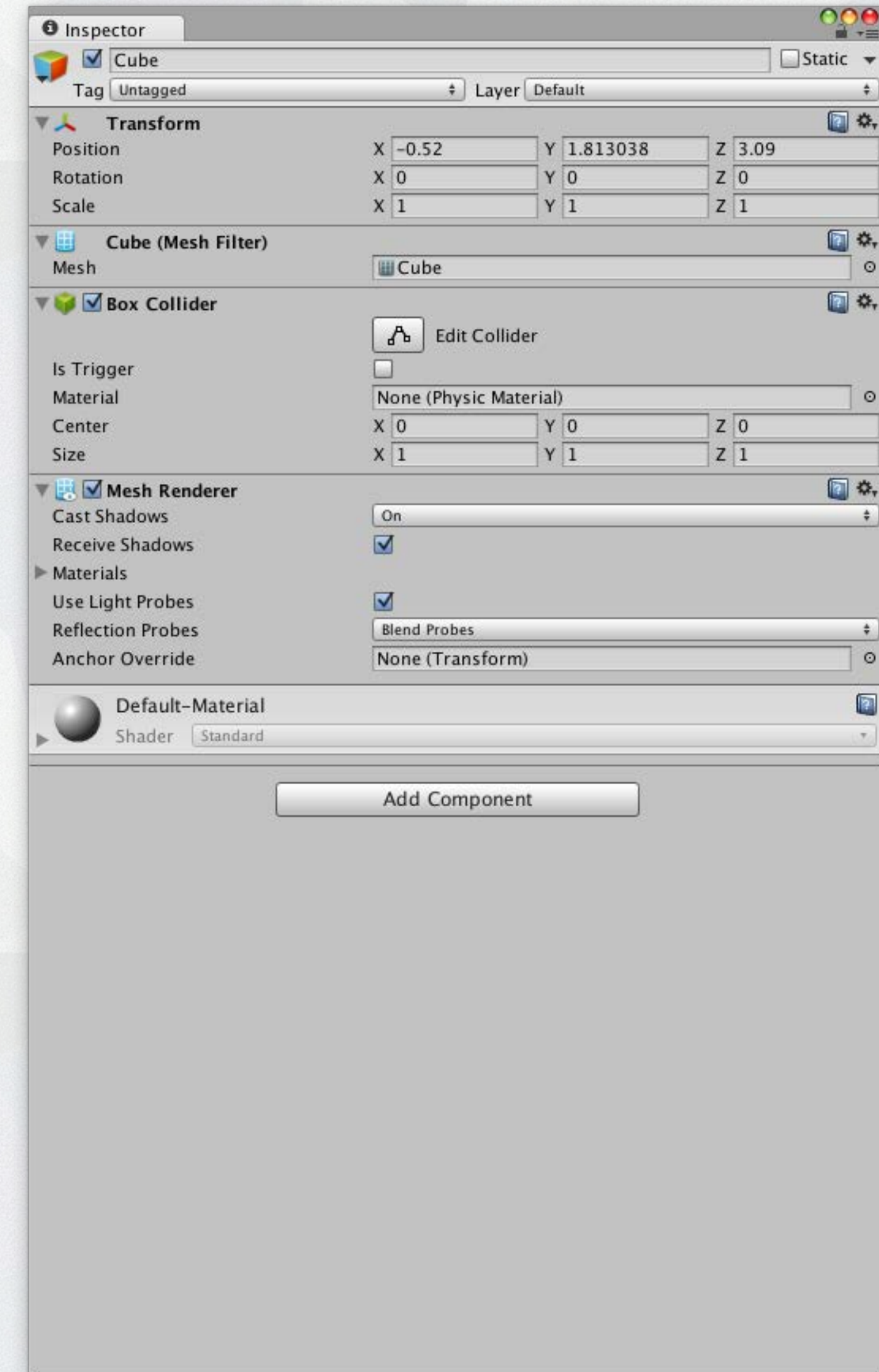
Objects can be **selected, grouped, and organized**

Inspector

The Inspector shows the **details** of a selected object

Objects have **components**, which can be accessed in the Inspector

It gives **precise control** over the **parameters** that define an object

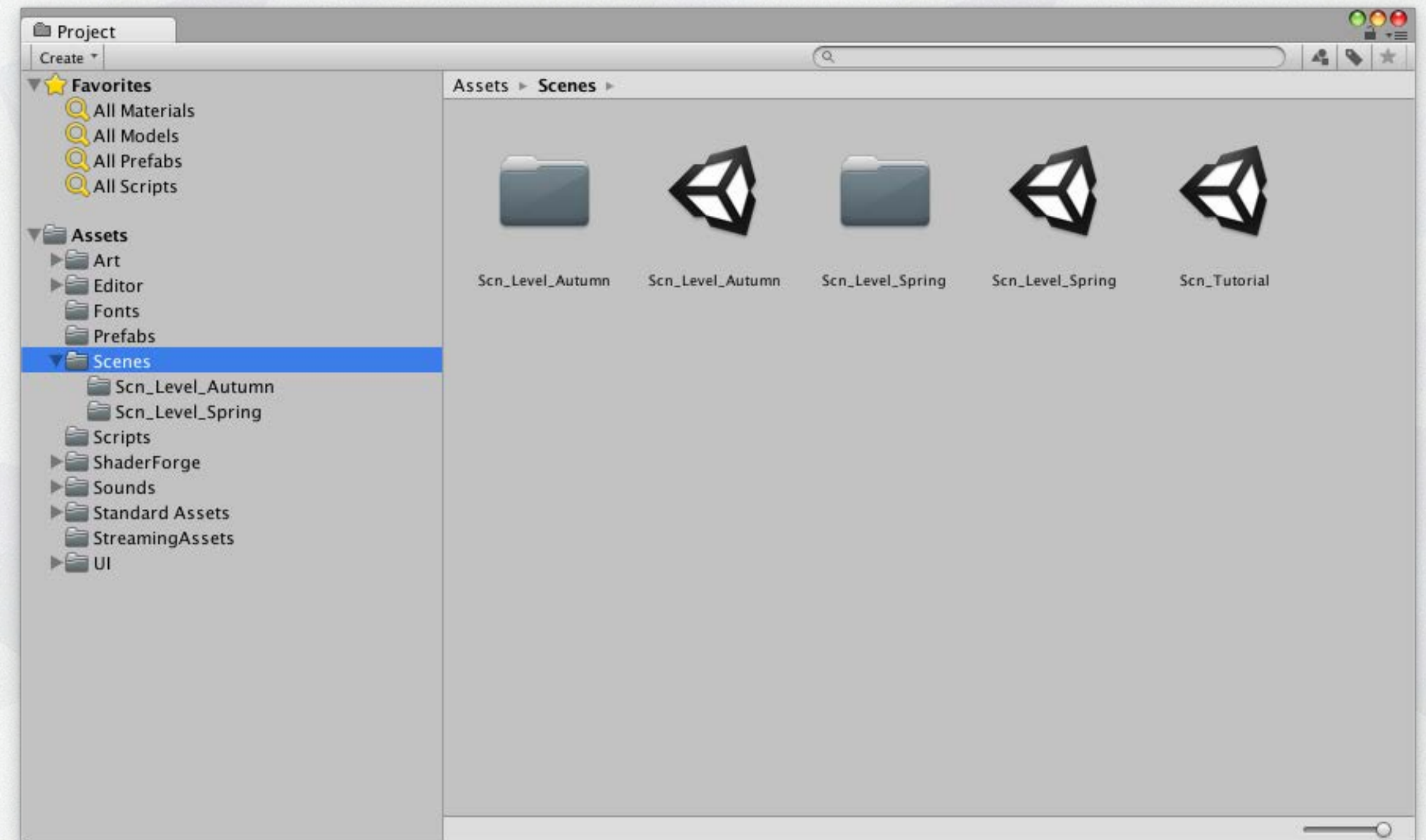


Project Window

The Project Window is where we see **all the files that make up the project**

It gives us access to the project folder on the PC

Contains all files; scenes, models, textures, materials, sounds, plugins, etc.



Game View

The Game View allows us to **test our scene**

It will use the **main camera** as its viewpoint

Unlike the Scene View, which is static, **animations and interactions** will work in this view



In Practice

Unity 5.3.2f1

Projects Getting started SIGN IN

Project name*
New Unity Project

Location*
/Users/Desktop

3D 2D
Asset packages...

Cancel Create project

Let's Get Started!

Contact and Class Materials

Course Website: <http://virtualworlds.dandyus.com>

Course schedule can be found here, as well as class materials uploaded on a weekly basis

Contact: creatingvirtualworlds@gmail.com

Let us know if you can't make it to class, have any feedback, or questions