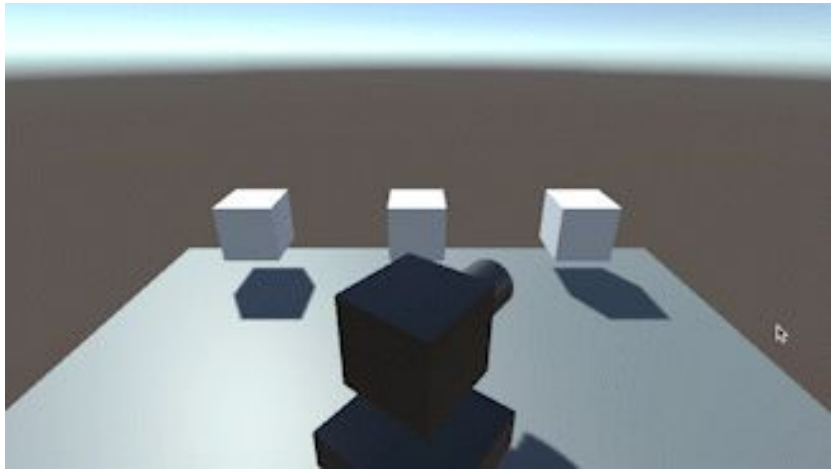
3D Shooter 製作

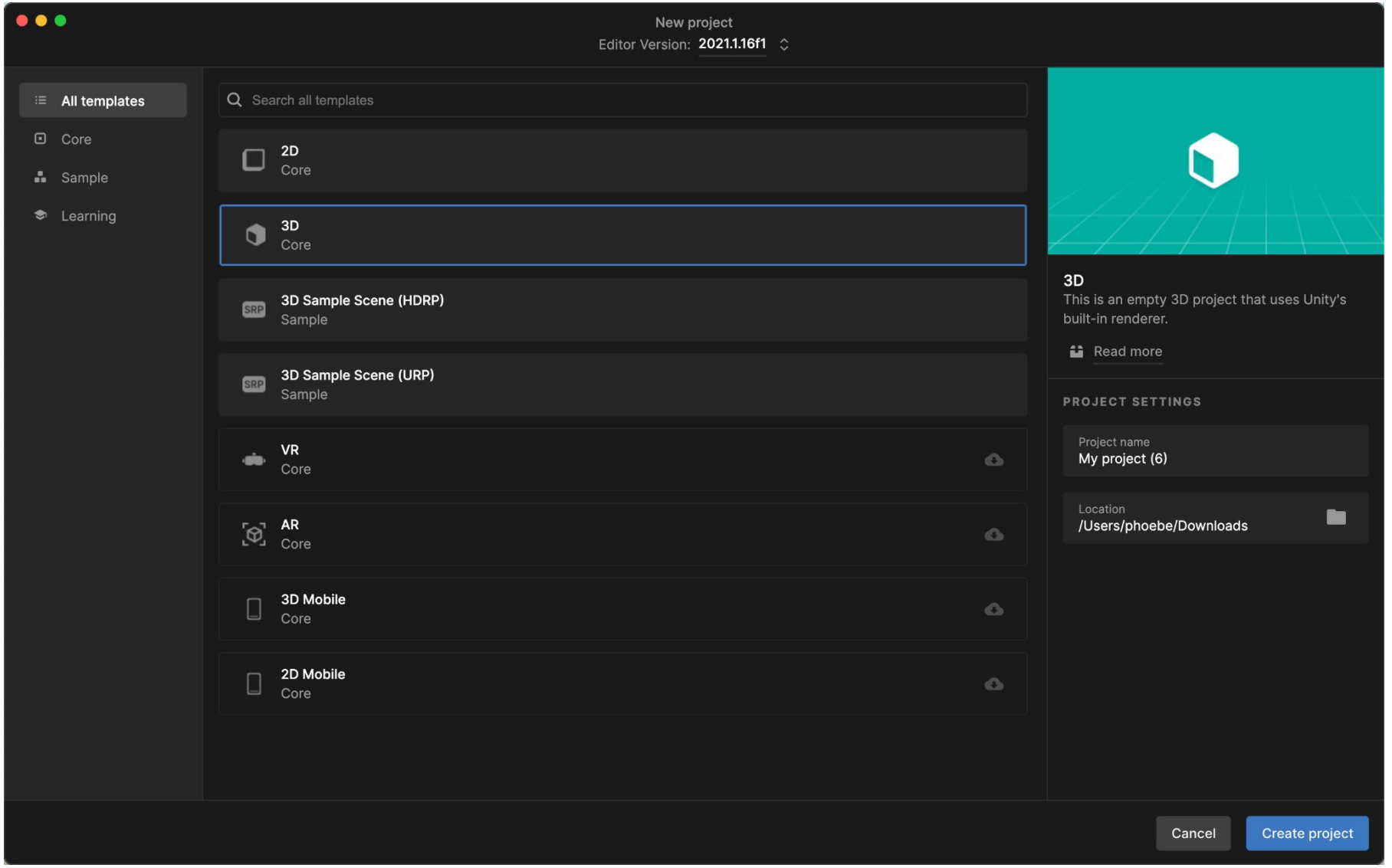
用多個基本元件製作砲台, 並發射砲彈

Outline



- 創建 3D scene
- **創建砲台 - Material / Object with hierarchy sub-object** / 設定旋轉
- **子彈設定 - Material / Prefab / 物理性質 / 飛行**
- 碰撞事件 - 子彈碰到目標消失
- 未碰到目標的子彈自行消失

建立3D專案


New project
Editor Version: 2021.1.16f1
All templates
Core
Sample
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2D
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3D
Core
3D Sample Scene (HDRP)
Sample
3D Sample Scene (URP)
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VR
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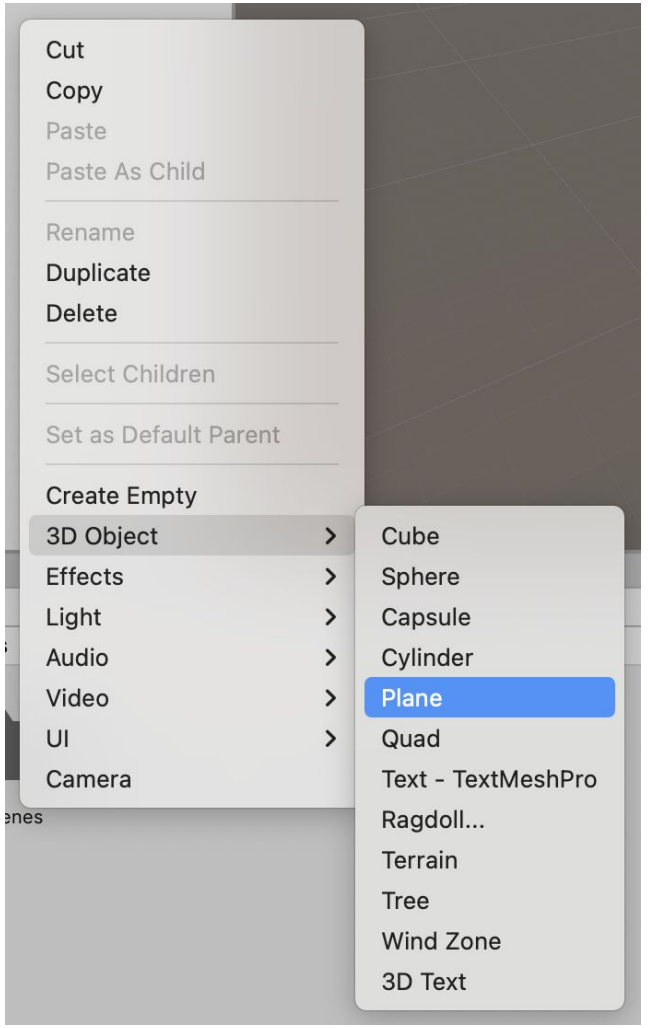
2D Mobile
Core
3D
This is an empty 3D project that uses Unity's built-in renderer.
Read more
PROJECT SETTINGS
Project name
My project (6)
Location
/Users/phoebe/Downloads
Cancel
Create project

場景設置

- 加入3D Object 裡的Plane作為場地地板
- 調整攝影機位置跟角度，能看到完整畫面即可

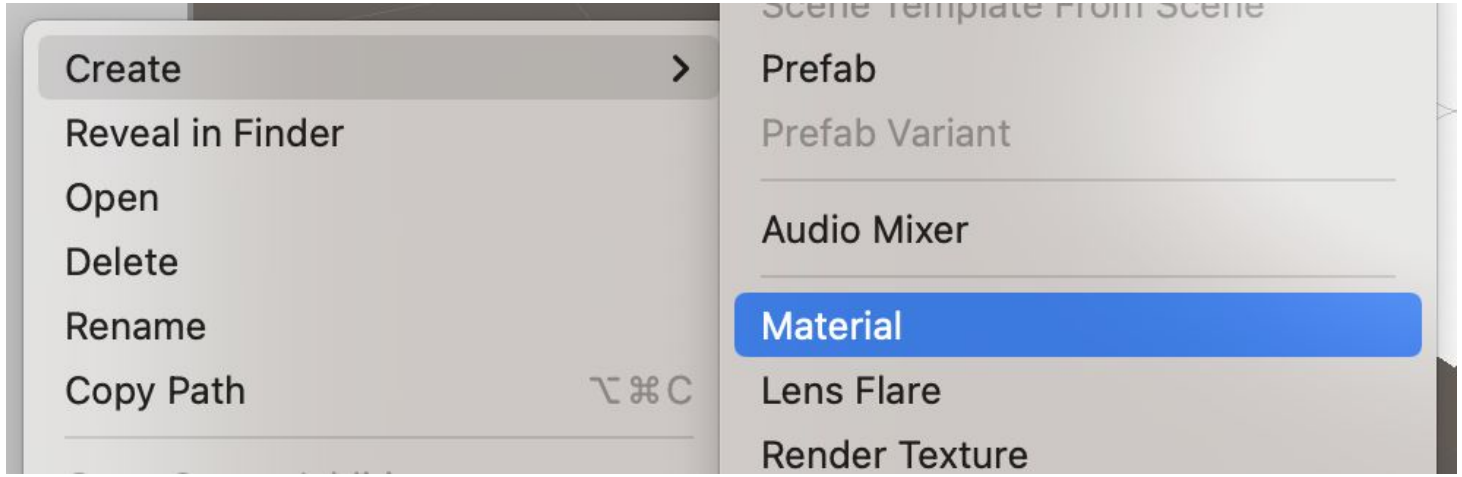


重要！！

- 3D物件生成時請養成reset Position的習慣

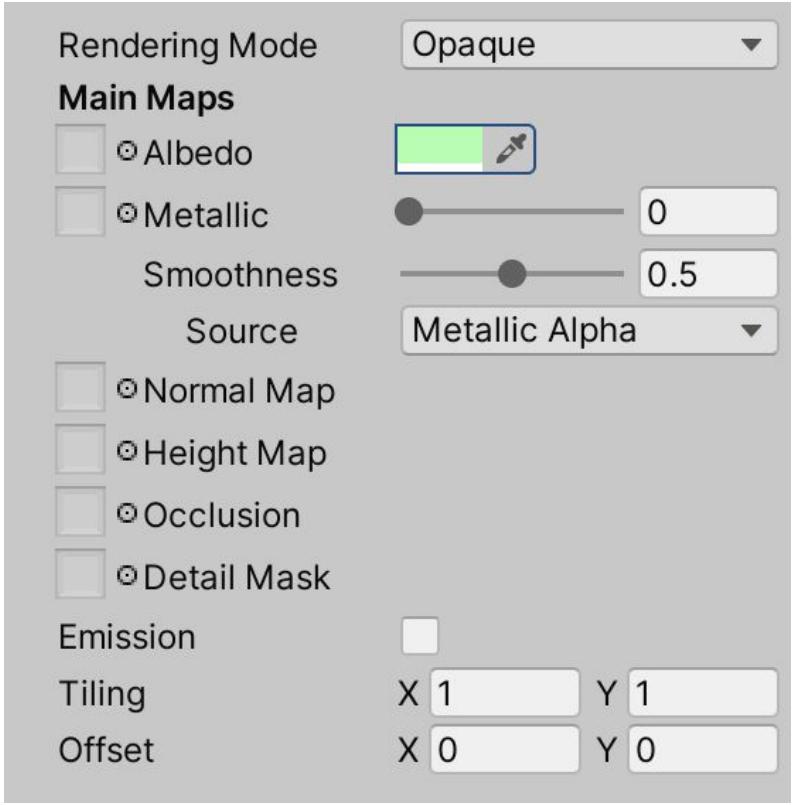
材質(顏色)製作

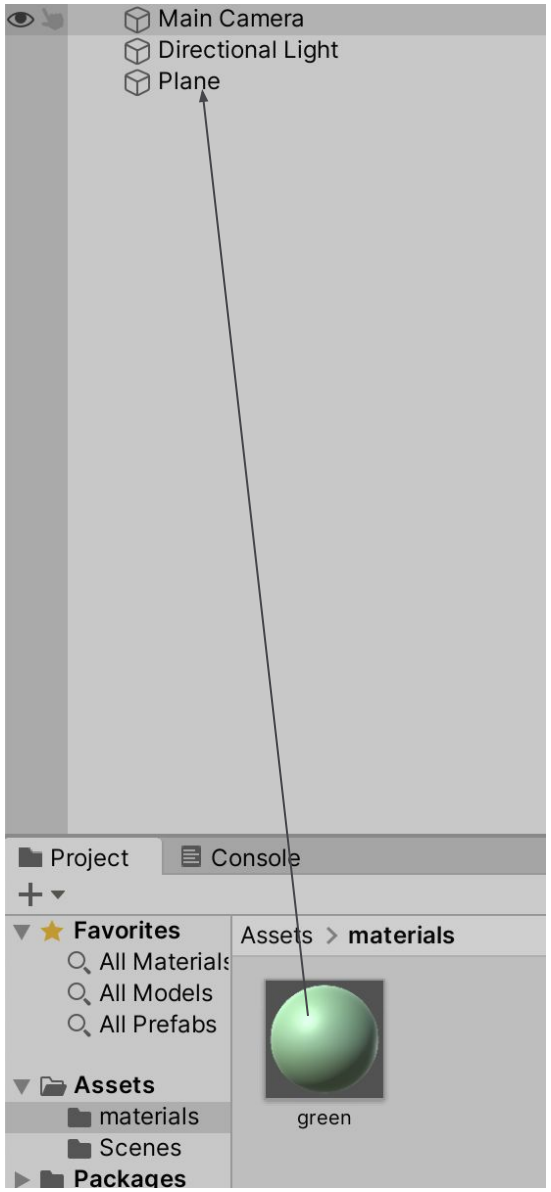
- 在 Assets 底下右鍵新增一個資料夾
- 在裡面右鍵新增 Material



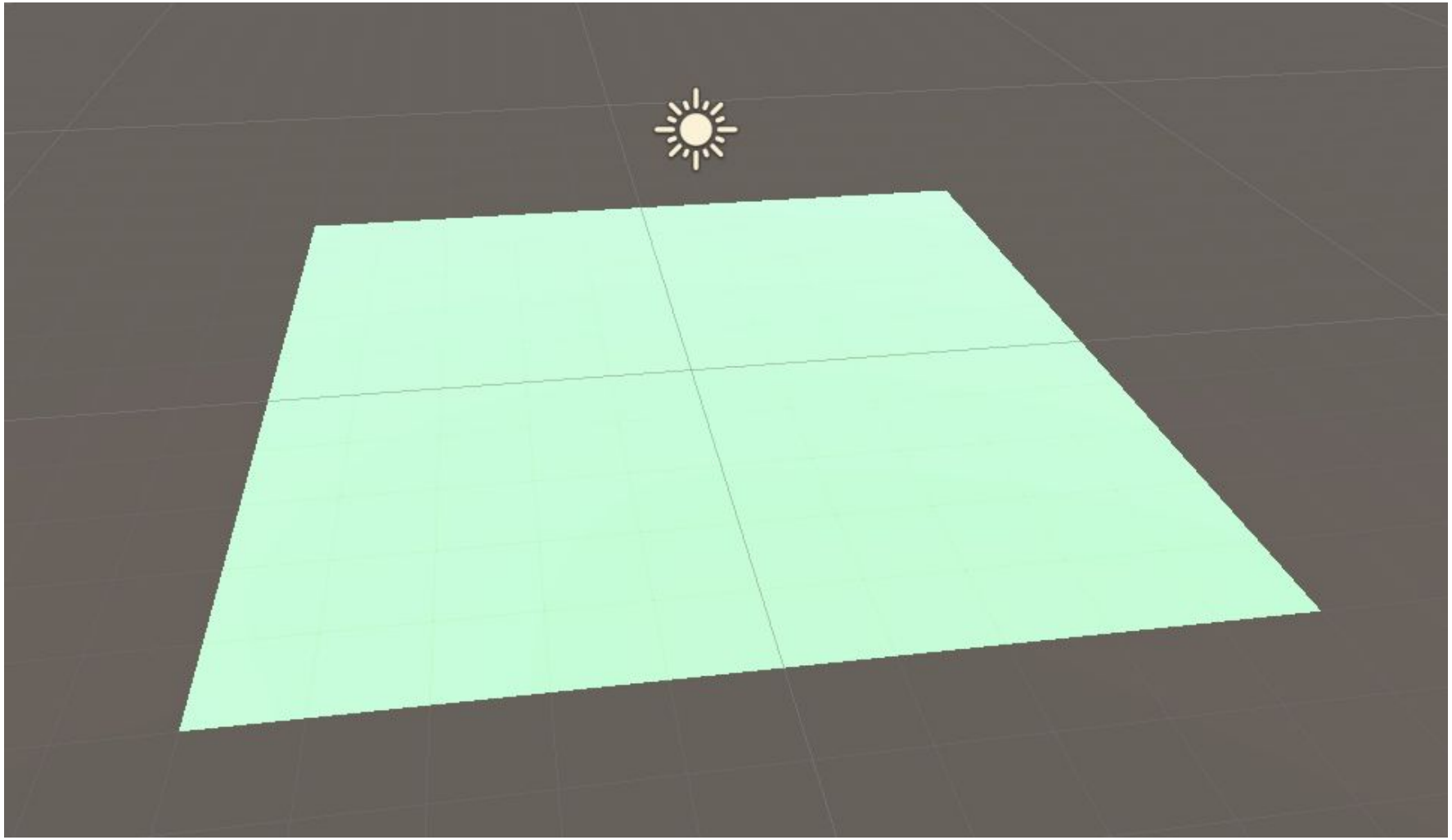
材質(顏色)製作

- 設定想要的顏色與材質
- 將材質拖到物件上即可使用





材質(顏色)製作

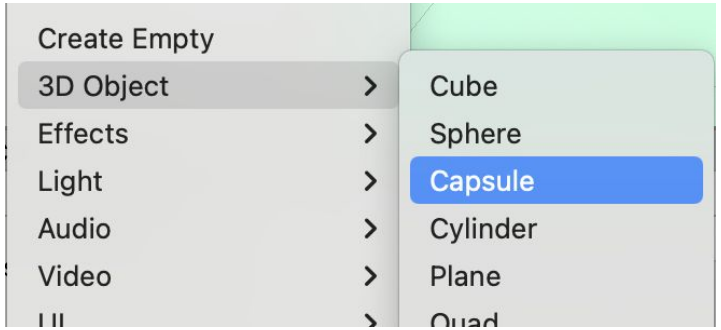


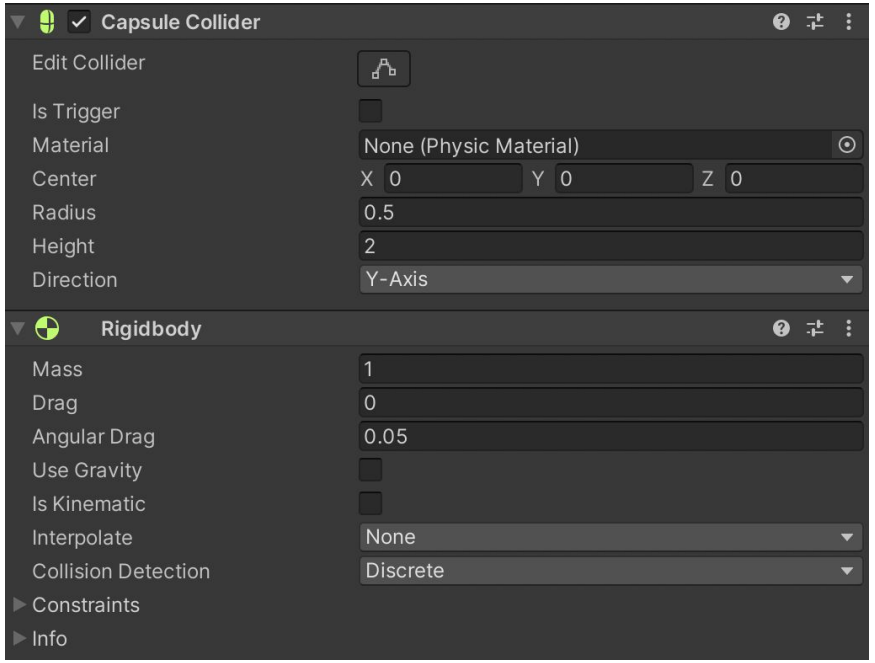
實作時間(5min)

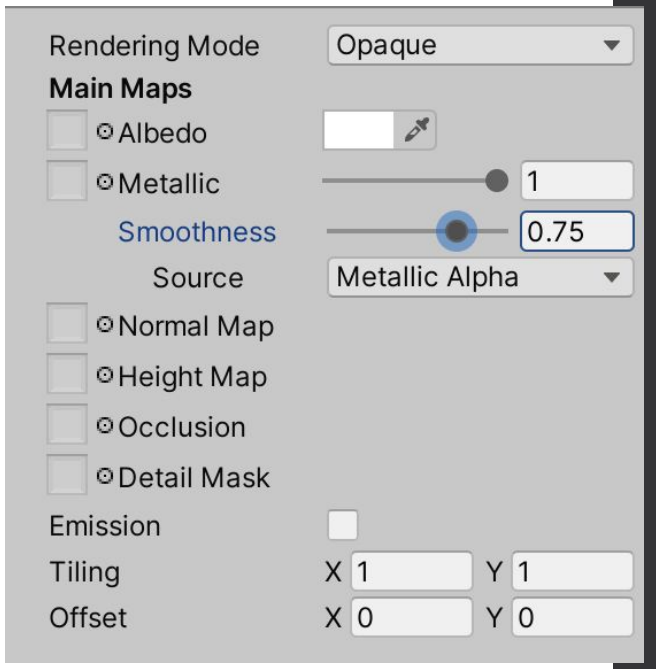
1. 建立3D專案
2. 設置場景:新增地板
3. 新增材質:地板材質

製作子彈

- 製作Object:右鍵Create Capsule
- 增加物理性質: Rigidbody (without gravity) + Capsule Collider
- 新增子彈material並調整



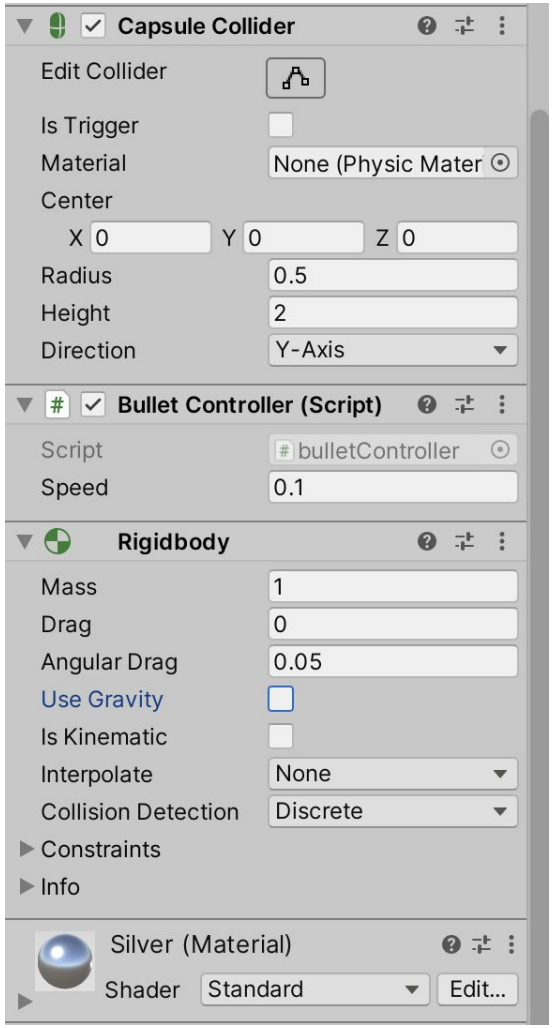




製作子彈scripts

- 在子彈上加入Script讓子彈會飛行
- 宣告一個變數為每次Update時移動的距離
- 讓子彈朝Y軸飛行
- Tip : 變數設成public可以在unity上調整

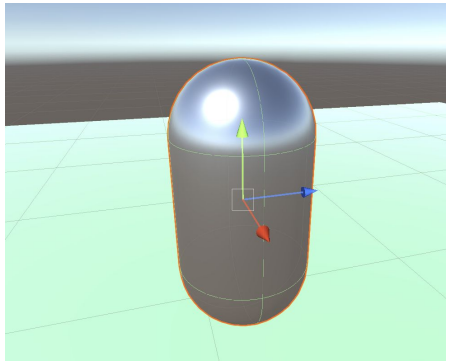
```
1 reference
public float speed = 0.1f;
// Use this for initialization
0 references
void Start() {

}

// Update is called once per frame
0 references
void Update() {
    this.transform.Translate(new Vector3(0, -speed, 0));
}
```

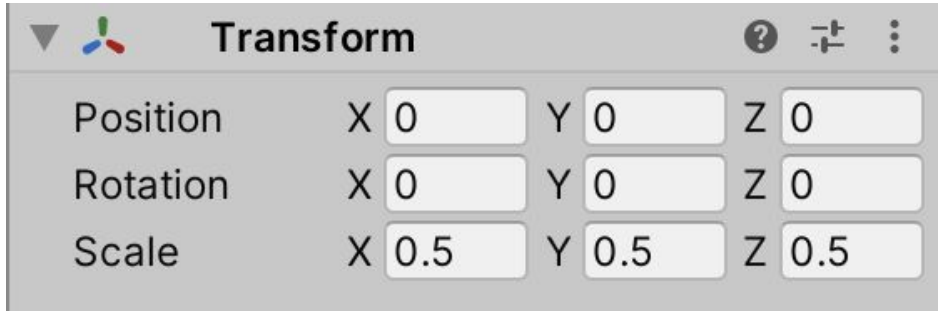


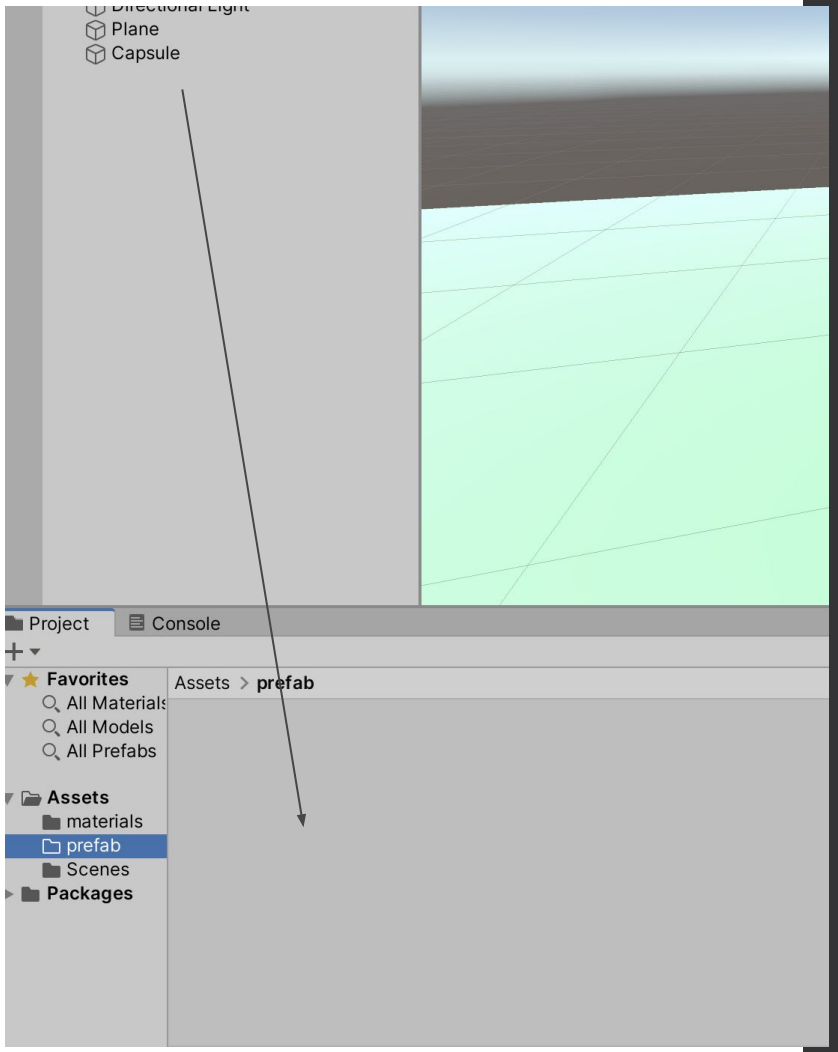
製作Prefabs

Prefab：預先製作的物件，可以動態生成並重複使用。完成後只要直接修改裡面的內容就會套用到所有生成的物件

- 調整一下子彈大小
- 把子彈丟到project tab
- 把子彈Rotate x -90





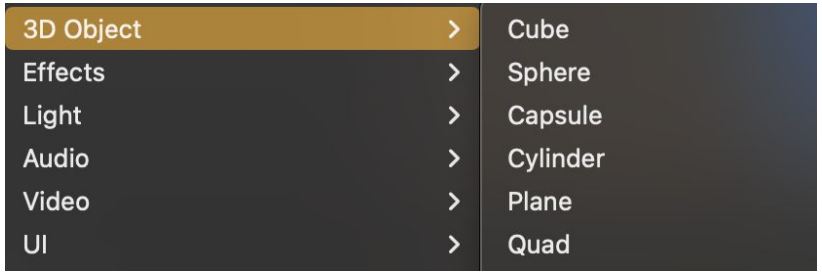


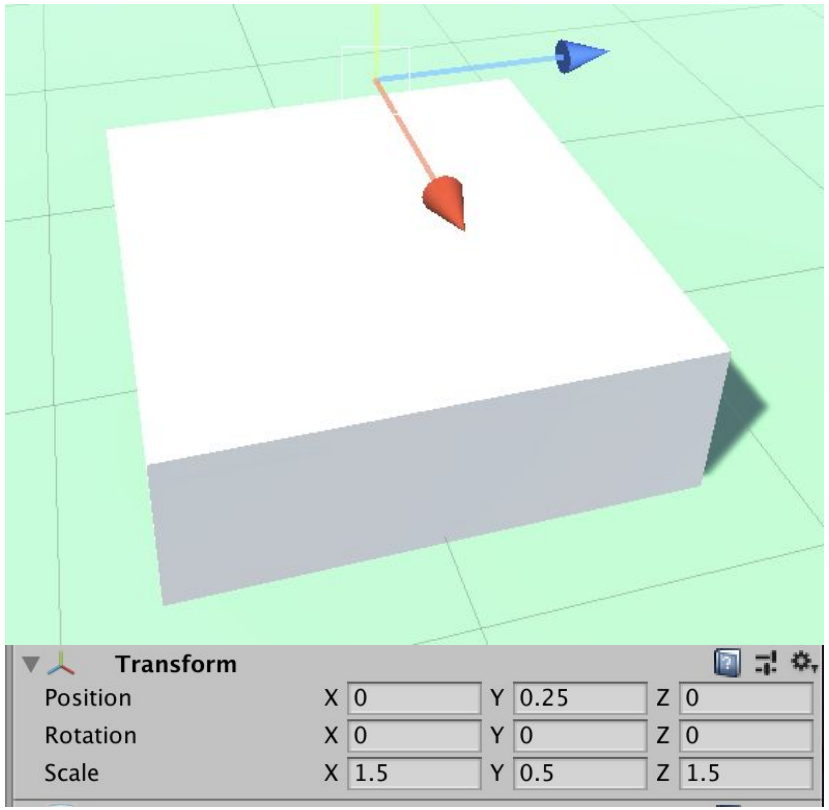
實作時間(5min)

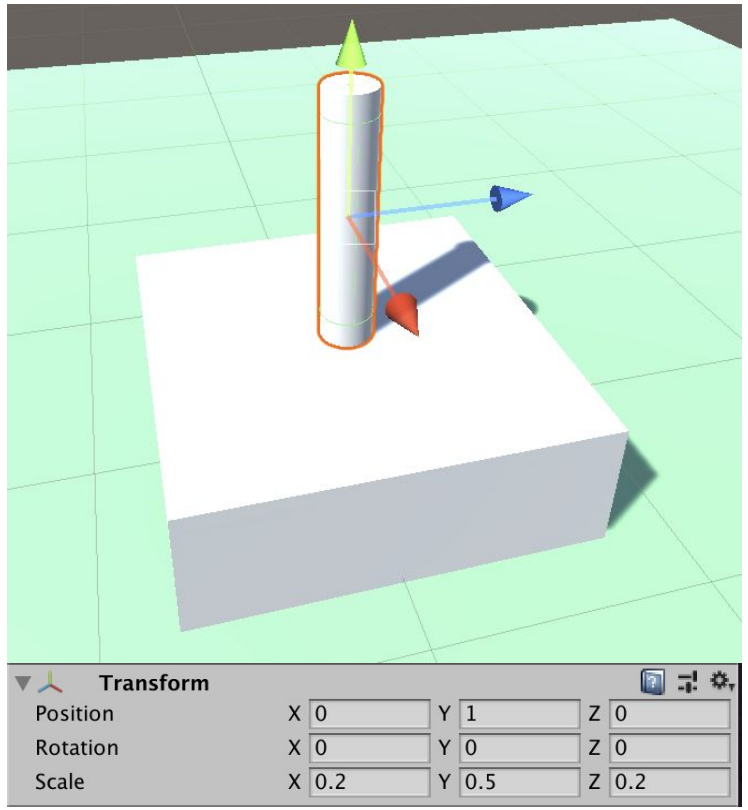
1. 製作子彈
2. 設定子彈物理性質
3. 設定子彈材質
4. 替子彈設定速度
5. 將子彈設定成Prefab

製作砲台

- 新增Cube：製作砲台底座
- 新增Cylinder：製作基座

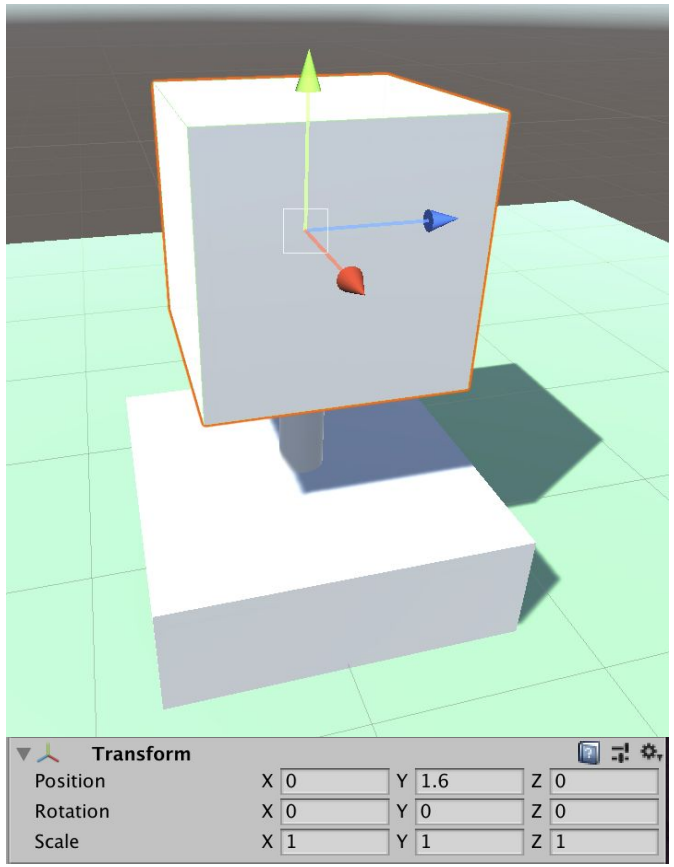


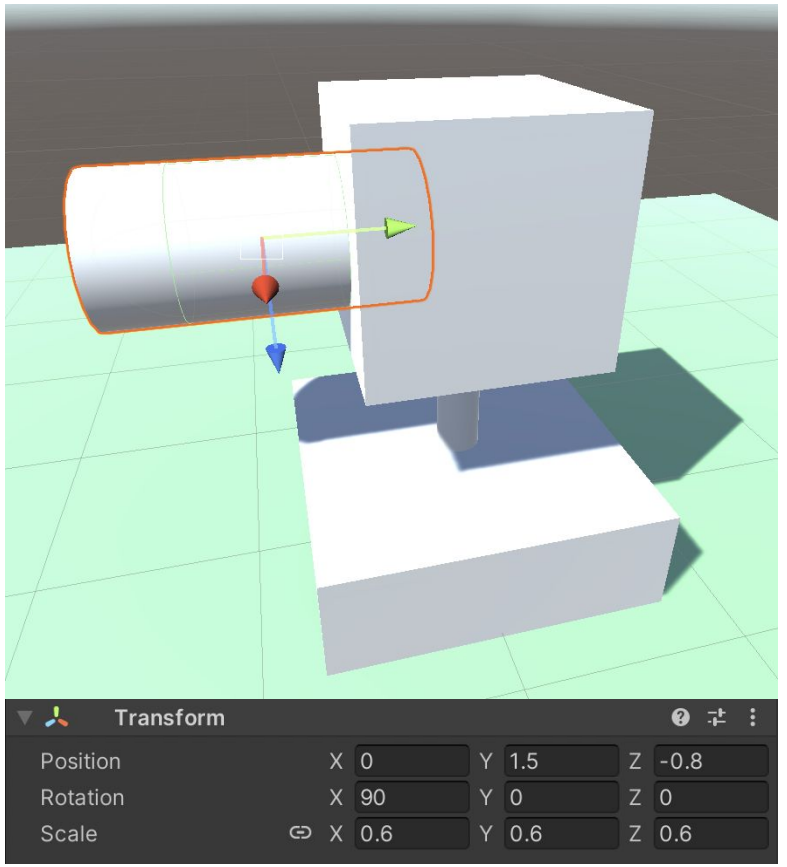




製作砲台

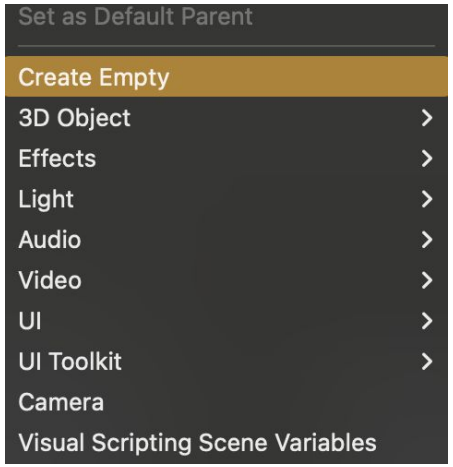
- 新增Cube:製作砲身
- 新增Cylinder:製作砲管

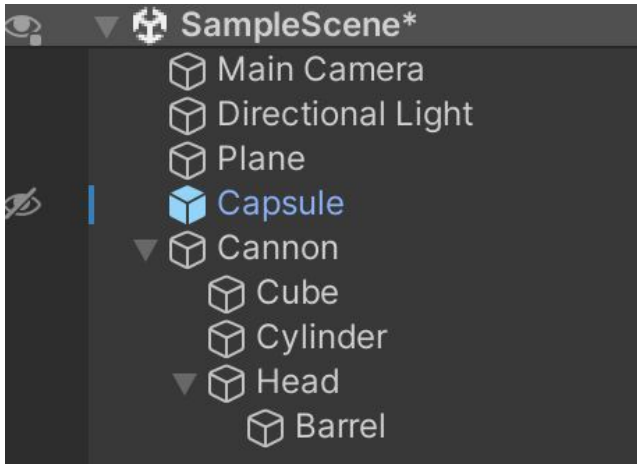


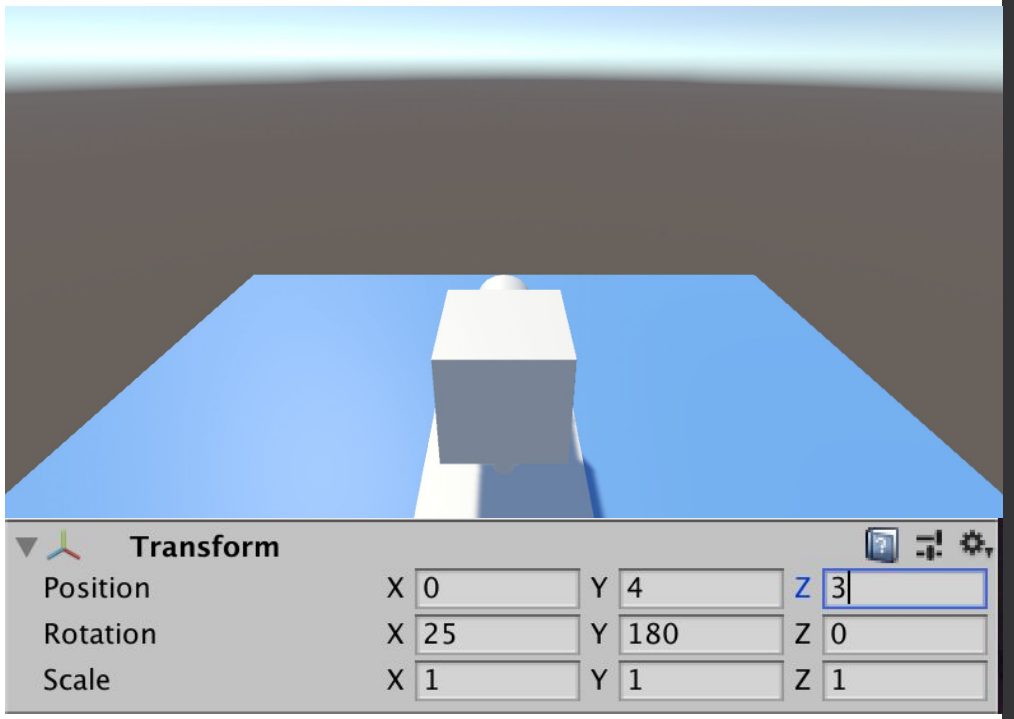


製作砲台

- Concept：
  - ☺ 製造物件時，移動旋轉通常都會發生在物件的中心點，如果要以邊旋轉就讓邊成為另外一個物件的中心即可
  - ☺ 如果有巢狀或多關節的物體，位移跟旋轉用相對位置去計算
- 在Hierarchy中設定砲台物件層級

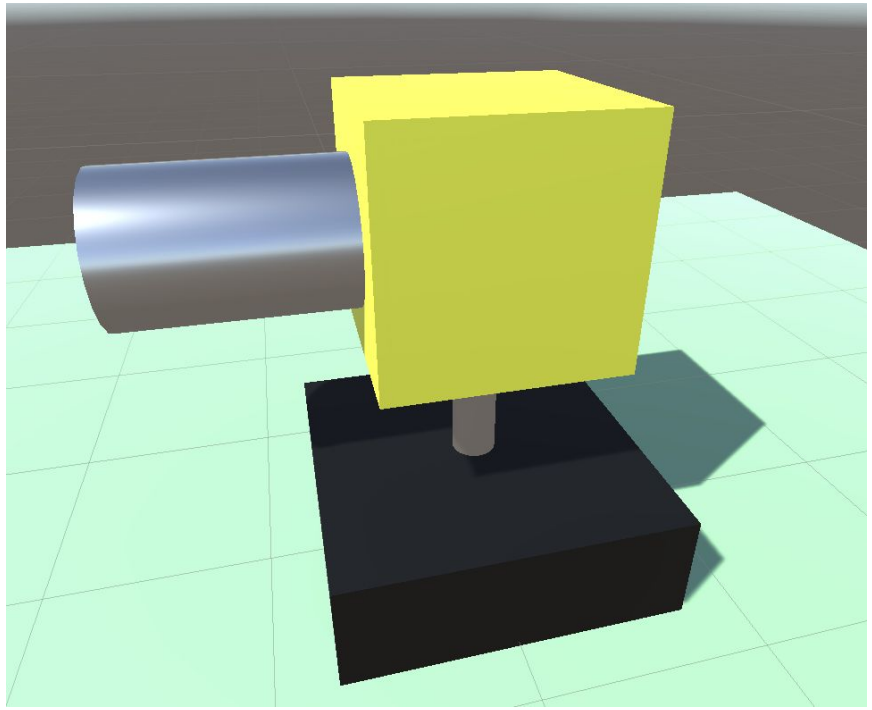


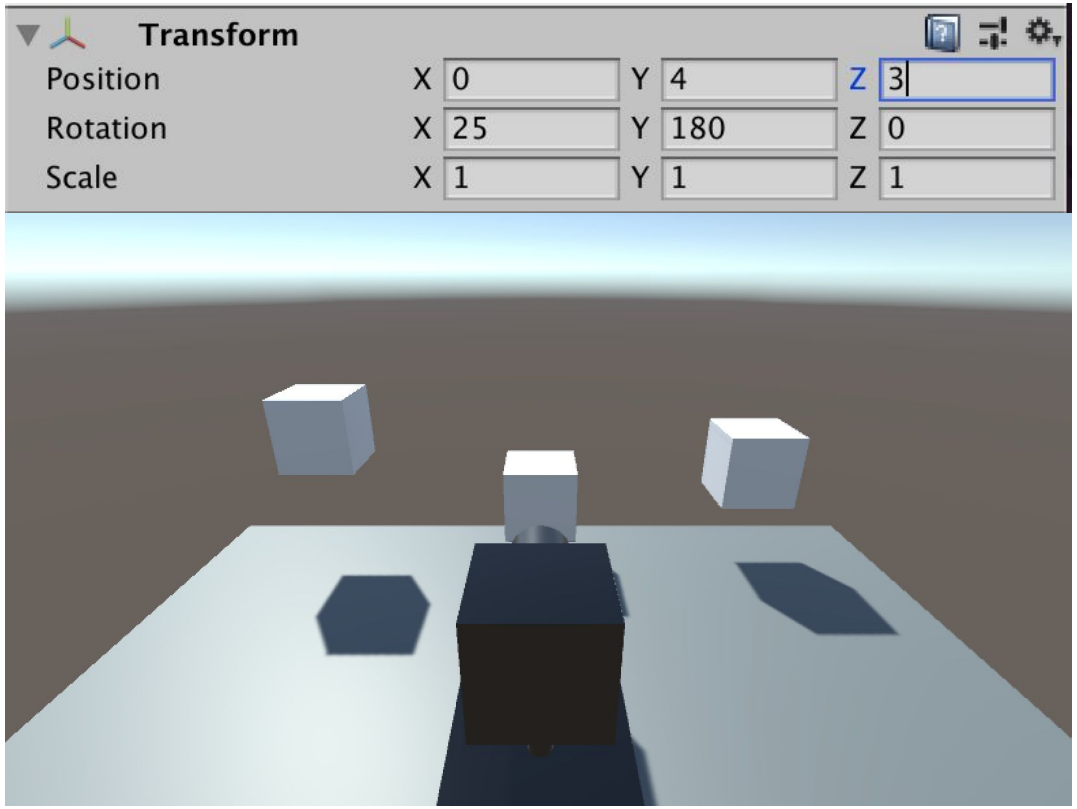




砲台材質

- 替砲台加上Materials
- 調整Camera





實作時間（5min）

1. 建造砲台
2. 調整砲台物件層級
3. 設置砲台Materials

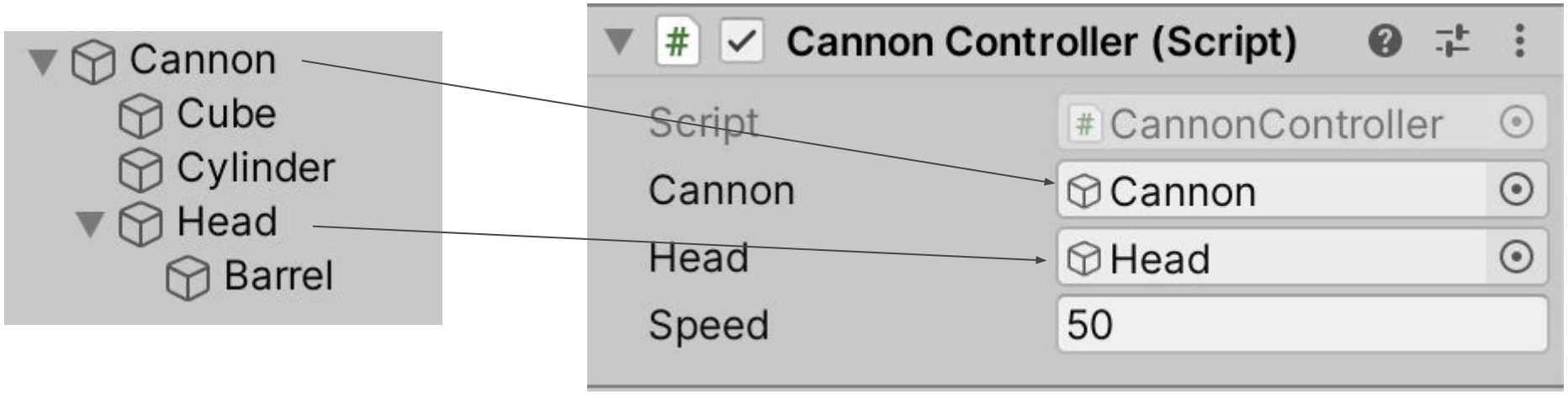
旋轉砲台

- 在砲台加入上下/左右旋轉(沿著X/Y軸)的Script
- 將此Script加入砲台(Cannon)中

```
1 reference
public GameObject Cannon;
1 reference
public GameObject Head;
2 references
public float speed = 50f;
// Use this for initialization
0 references
void Start() {

}

// Update is called once per frame
0 references
void Update() {
    float h = Input.GetAxisRaw("Horizontal") * speed * Time.deltaTime;
    float v = Input.GetAxisRaw("Vertical") * speed * Time.deltaTime;
    Head.transform.Rotate(new Vector3(v, 0, 0));
    Cannon.transform.Rotate(new Vector3(0, h, 0));
}
```

旋轉砲台

- 將Script加入砲台裡，並將Cannon和Head物件拉到剛才Script設為Public的地方

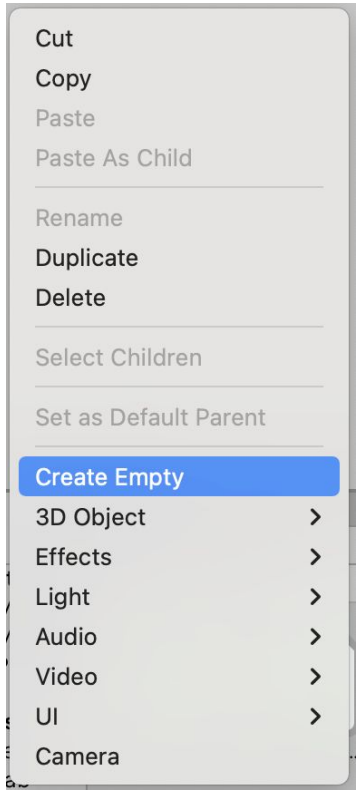


實作時間(3min)

1. 設定砲台旋轉

製作發射點

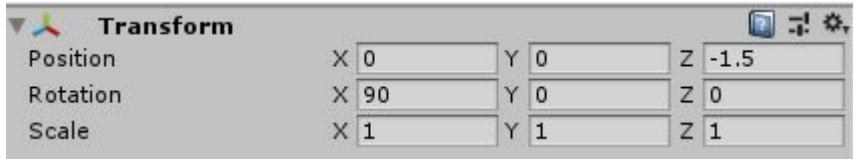
- 先將發射點放到砲台之中
- 設定發射點位置



Hierarchy

GameObject為發射點

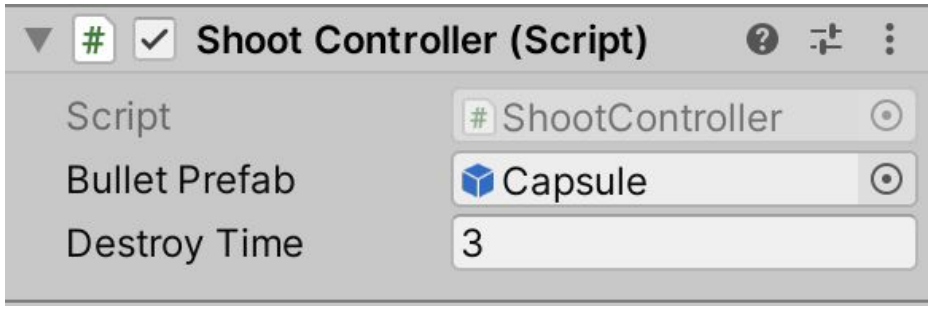
發射點位置



間隔時間發射

使用time來讓發射有冷卻時間

- 發射後歸零
- 將Script加入剛才的發射點
- 設定發射的物件(必為Prefab




```
1 reference
public GameObject BulletPrefab;
3 references
float time = 0f;
0 references
public float destroyTime = 3f;
// Use this for initialization
0 references
void Start() {

}

// Update is called once per frame
0 references
void Update() {
    time += Time.deltaTime;
    if (Input.GetKeyUp(KeyCode.Space)) {
        if (time > 0.5f) {
            Instantiate(BulletPrefab, this.transform.position, this.transform.rotation);
            time = 0;
        }

    }
}
```

製作發射點

- 在砲管head上新增一個Empty，移動到發射砲彈的位置
- if (Input.GetKeyUp(KeyCode.Space))

  > 當空白鍵被按下放開的時候觸發

  - GetKey:按著一直觸發
  - GetKeyDown:按下觸發
- Instantiate(Object, Position, Rotation)

  > 在指定位置跟角度生成該物件

- 物件要設成public才能在unity決定要生成甚麼物件

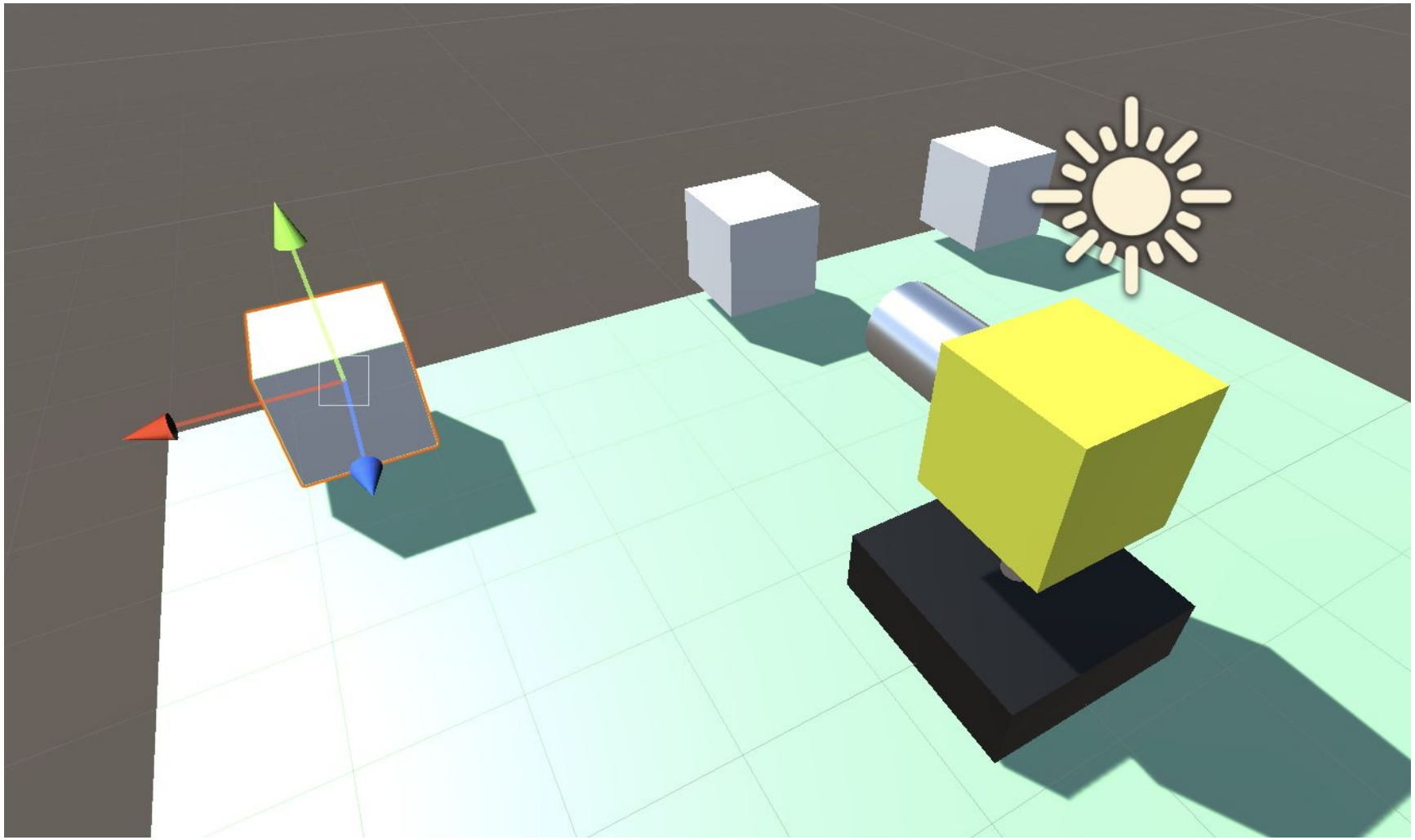
實作時間(3min)

1. 新增空物件
2. 設定發射位置
3. 指定發射物件
4. 設定間隔時間

碰撞與消失

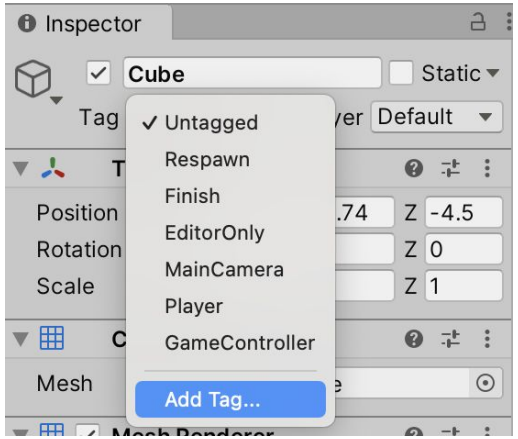
- 子彈生成後會一直存在，所以必須要摧毀它
- 如果沒有發生碰撞，子彈飛一段時間後消失
- 如果發生碰撞，可能消滅目標一起消失或者撞到牆自我毀滅等等
  - Destroy(gameObject): 馬上摧毀
  - Destroy(gameObject, 秒數): 幾秒後摧毀

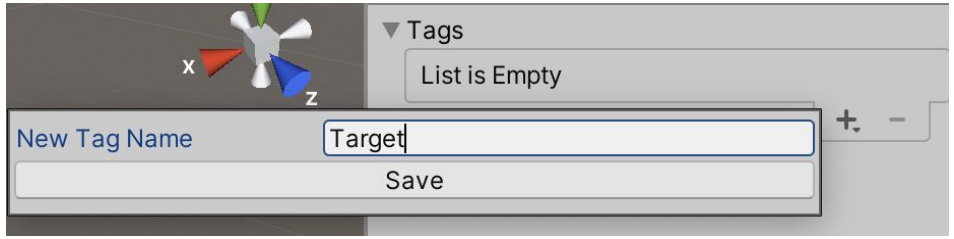
製作目標物件

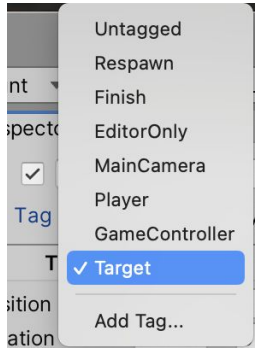


目標物件加入tag

- 把子彈跟想要碰撞的物體(像是邊界、方塊等)有可以被碰撞的屬性並在被碰撞到的物體加入tag分類即可
- 要碰撞的物體要加入RigidBody
- 新增Tag - Target
- 將目標物加入Target的Tag



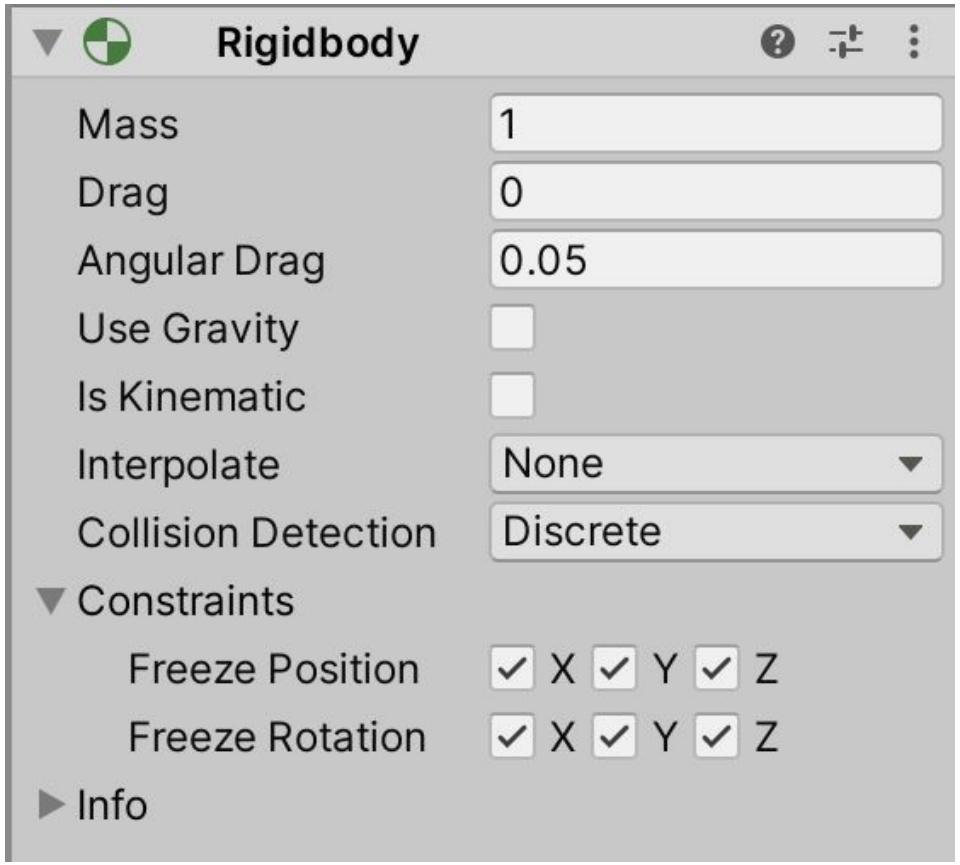




目標物加入Target的Tag

子彈物理屬性

- 設定Bullet的物理屬性
  - ☺ 加入Constraints避免子彈旋轉與不必要的亂動



子彈碰撞事件

在Bullet的Script裡加入碰撞事件
（注意！！不是加在Update裡）

- private void OnCollisionEnter(Collision collision){ }:
  - 當碰撞發生的時候觸發，後面參數為碰撞到的目標
- 在裡面加入條件判定就可以決定碰到不同物體有不一樣的動作

```
private void OnCollisionEnter(Collision collision) {
    if (collision.gameObject.tag == "Target") {
        Destroy(this.gameObject);
        Destroy(collision.gameObject);
    }
}
```

Garbage collection

沒有打到目標的子彈會一直留在hierarchy上

- 在子彈的script中start()加入
  - Destroy(this.gameObject, 3.0f);

```
1 reference
public float speed = 0.1f;
// Use this for initialization
0 references
void Start() {
    Destroy(this.gameObject, 3.0f);
}

// Update is called once per frame
0 references
void Update() {
    this.transform.Translate(new Vector3(0, -speed, 0));
}
```

實作時間(8min)

1. 新增目標物件
2. 設定Tag
3. 設定子彈物理屬性
4. 碰撞事件:消失
5. 未碰撞的子彈自行消失

新增更多功能

可以自行新增不同功能，例如

- 砲管旋轉限制
- 前後移動
- 相機視角
- 套用Asset Store的模型

Thanks For Listening