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ASSIGNMENT-5

**Collider** components define the shape of a GameObject

for the purposes of physical collisions.

A collider, which is invisible, does not need to be the exact same shape as the GameObject’s mesh.

The simplest colliders are primitive collider types. In 3D, these are the

1)Box Collider

2)Sphere Collider

3)Capsule Collider

**Compound colliders:**

When you create a compound collider like this, you should only use one Rigidbody

component, placed on the root GameObject in the hierarchy.

**Static colliders:**

You can add colliders to a GameObject without a Rigidbody component to create floors, walls and other motionless elements of a Scene. These are referred to as *static* colliders. At the opposite, colliders on a GameObject that has a Rigidbody are known as *dynamic* colliders. Static colliders can interact with dynamic colliders but since they don’t have a Rigidbody, they don’t move in response to collisions.

## **Physics materials:**

When colliders interact, their surfaces need to simulate the properties of the material they are supposed to represent. For example, a sheet of ice will be slippery while a rubber ball will offer a lot of friction and be very bouncy. Although the shape of colliders is not deformed during collisions, their friction and bounce can be configured using physics material.

**Trigger:**

The scripting system can detect when collisions occur and initiate actions the using OnCollisionEnter function. However, you can also use the physics engine simply to detect when one collider enters the space of another without creating a collision. A collider configured as a Trigger (using the Is Trigger property) does not behave as a solid object and will simply allow other colliders to pass through.

On the first physics update where the collision is detected, the **OnCollisionEnter** function is called. During updates where contact is maintained, **OnCollisionStay** is called and finally, **OnCollisionExit** indicates that contact has been broken. Trigger colliders call the analogous OnTriggerEnter, OnTriggerStay and OnTriggerExit functions.

## **Collider interactions:**

### **Static Collider**

A static collider is a GameObject that has a Collider but no Rigidbody. Static colliders are mostly used for level geometry which always stays at the same place and never moves around. Incoming Rigidbody objects collide with static colliders but don’t move them.

### **Rigidbody Collider**

This is a GameObject with a Collider and a normal, non-kinematic Rigidbody attached. Rigidbody colliders are fully simulated by the physics engine and can react to collisions and forces applied from a script.

### **Kinematic Rigidbody Collider**

This is a GameObject with a Collider and a *kinematic* Rigidbody attached (ie, the *IsKinematic* property of the Rigidbody is enabled). You can move a kinematic rigidbody object from a script by modifying its **Transform Component** but it will not respond to collisions and forces like a non-kinematic rigidbody.