# Unit 1- Lesson 7\_1. Simple Collision Detection

**Aim:**

* How do we use the collider and program simple collision detection?

**Objectives:** After the lesson, students should be able to:

* Obtain understanding of collider
* Set up simple collision detection

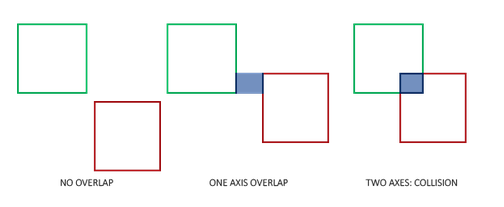
**CLASS PROCEDURE:**

***Do Now:***

Go to public drive :\Qiu1\2019 - 20 Game and App\Unit 1. Introduction to Unity and C#\OpenGL\_CollisionDetection, and double click on Lesson30 application. What do you observe?

***Class Discussion / Presentation:***

1. What is collision detection?



1. What is collider and how do we use the collider component in Unity?

* Collider components define the shape of an object for the purposes of physical collisions. A collider, which is invisible, need not be the exact same shape as the object’s mesh and in fact, a rough approximation is often more efficient and indistinguishable in gameplay.
* The simplest (and least processor-intensive) colliders are the so-called primitive collider types. In 3D, these are the [Box Collider](http://docs.unity3d.com/Manual/class-BoxCollider.html), [Sphere Collider](http://docs.unity3d.com/Manual/class-SphereCollider.html) and [Capsule Collider](http://docs.unity3d.com/Manual/class-CapsuleCollider.html).

1. In Unity, which method shall we use if we want to use the collider as a “trigger”?

<https://docs.unity3d.com/ScriptReference/MonoBehaviour.OnCollisionEnter.html>

OnCollisionEnter is called when this collider/rigidbody has begun touching another rigidbody/collider.

In contrast to [OnTriggerEnter](https://docs.unity3d.com/ScriptReference/MonoBehaviour.OnTriggerEnter.html), [OnCollisionEnter](https://docs.unity3d.com/ScriptReference/MonoBehaviour.OnCollisionEnter.html) is passed the [Collision](https://docs.unity3d.com/ScriptReference/Collision.html) class and not a [Collider](https://docs.unity3d.com/ScriptReference/Collider.html). The [Collision](https://docs.unity3d.com/ScriptReference/Collision.html) class contains information about contact points, impact velocity etc. If you don't use collisionInfo in the function, leave out the collisionInfo parameter as this avoids unneccessary calculations. **Note:** Collision events are only sent if one of the colliders also has a non-kinematic rigidbody attached. Collision events will be sent to disabled MonoBehaviours, to allow enabling Behaviours in response to collisions.

Example:

1. void OnCollisionEnter(Collision col){
2. if (col.gameObject.tag == "Player"){
3. // this rigidbody hit the player
4. }
5. }

***Class Discussion / Pair – sharing Activity #1:***

How can we write a script to make a game object disappear from the screen upon being touched by the rolling sphere?

using UnityEngine;  
using System.Collections;  
  
public class RollSphere : MonoBehaviour {  
  
    public float speed;  
  
    private Rigidbody rb;  
  
    void Start ()  
    {  
        rb = GetComponent<Rigidbody>();  
    }  
  
    void FixedUpdate ()  
    {  
        float moveHorizontal = Input.GetAxis ("Horizontal");  
        float moveVertical = Input.GetAxis ("Vertical");  
  
        Vector3 movement = new Vector3 (moveHorizontal, 0.0f, moveVertical);  
  
        rb.AddForce (movement \* speed);  
    }  
  
  
    void OnCollisionEnter(Collision other)  
    {  
        if (other.gameObject.CompareTag ("Pick Up"))  
        {  
            other.gameObject.SetActive (false);  
        }  
    }  
}

***Pair – sharing Activity #2:***

Work on your project.

1. Find assets of earth, tree, moon, stars and your game character.
2. Use the clock and the fractal classwork as prototype, research and explore on how to make the planets rotate.
3. Design game play and game rules to make your game fun!
4. Add character control combined with the AddForce we explored yesterday, to make your game character “bounce”.
5. Explore the collision detection. If the player controlled character hits a rotating “star”, what would happen? How do you implement it?

**Have fun and happy coding!**

**SGI: Wednesday, 9th and 10th, in room 006. You can also find me in the math office during 5th and 6th period if any questions.**