

## Challenge 3 - Spawning and Destroying Asteroids

Refer to “About the Challenges and Solutions” in Session 1 for more information about readings of this type.

### Scenario:

With the PlayerShip and Bullets implemented, it's now time to work on Asteroids and their behavior so that the player has something to shoot at.

### Challenge:

Implement instantiation, management, and destruction of procedural Asteroids. Read the Requirements Document carefully and watch the challenge video to make sure you understand the Asteroid behavior.

### Tasks to complete:

As always, watch the video to see what these should look like when you're done:

- Implement spawning of procedural Asteroids. What makes them procedural is that they should be constructed of different combinations of the three different Asteroid models in different positions each time.
- The base Asteroid models should be stored in a ScriptableObject so that the art department could replace them at will.
- Asteroids should collide with the PlayerShip and Bullets but not each other.
- Each Asteroid should spawn as a cluster: a parent Asteroid should spawn two children, and each of those children should spawn two children (progressing from an initial Size of 3 to a Size of 1).
- The size of an Asteroid should also affect its initial speed and rotation velocity (per the Requirements Doc).
- When a Bullet collides with an Asteroid, the Asteroid and Bullet should both be destroyed.
- When an Asteroid that has children is destroyed, each of the children should be promoted to top-level Asteroids and given their own velocity (OffScreenWrapper will also need to be modified to keep these now-top-level Asteroids on screen if they were off screen when promoted [see below for more info]).
- Child Asteroids should be smaller in size and should have a higher maximum velocity.

- Asteroids should screen wrap like everything else in the game.

## Bonus Challenge

If an Asteroid's child Asteroids are outside of the ScreenBounds when their parent is destroyed, it can cause all sorts of issues depending on your implementation OffScreenWrapper.

- Bonus Challenge: Fix all of the issues caused by an Asteroid's parent being destroyed while the child Asteroid is off screen. Because the child Asteroid is completely outside of the ScreenBounds trigger, its OffScreenWrapper script will never receive an OnTriggerExit call, and it will continue drifting away from the screen.

Start by downloading the Unity project files for this Challenge available in the Session Resources. Download the zipped file, unzip it to a local folder, and open the project using Unity version 2020.3 LTS.

When you're finished, complete the Self-Evaluation coursework before continuing to the instructor's solution.