*unity*

# 1.3 High Speed Chase

**Steps:**

*Step 1: Add a speed variable for your vehicle*

*Step 2: Create a new script for the camera*

*Step 3: Add an offset to the camera position*

*Step 4: Make the offset into a Vector3 variable*

*Step 5: Edit the playmode tint color*

*Example of project by end of lesson*



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|---|---|
| **Length:** | 50 minutes |
| **Overview:** | Keep your eyes on the road! In this lesson you will code a new C# script for your camera, which will allow it to follow the vehicle down the road and give the player a proper view of the scene. In order to do this, you'll have to use a very important concept in programming: variables. |
| **Project Outcome:** | The camera will follow the vehicle down the road through the scene, allowing the player to see where it's going. |
| **Learning Objectives:** | By the end of this lesson, you will be able to:<br>- Declare variables properly and understand that variables can be different data types (float, Vector3, GameObject)<br>- Initialize/assign variables through code or through the inspector to set them with appropriate values<br>- Use appropriate access modifiers (public/private) for your variables in order to make them easier to change in the inspector |

# Step 1: Add a speed variable for your vehicle

*We need an easier way to change the vehicle's speed and allow it to be accessed from the inspector. In order to do so what we need is something called a variable.*

1. In PlayerController.cs, add *public float speed = 5.0f;* at the top of the **class**
2. Replace the **speed value** in the Translate method with the **speed variable**, then test
3. **Save** the script, then edit the speed value in the **inspector** to get the speed you want

- **New Concept:** Floats and Integers
- **New Concept:** Assigning Variables
- **New Concept:** Access Modifiers

```
public float speed = 20;

void Update()
{
  transform.Translate(Vector3.forward * Time.deltaTime * 20 speed);
}
```

# Step 2: Create a new script for the camera

*The camera is currently stuck in one position. If we want it to follow the player, we have to make a new script for the camera.*

1. Create a new **C# script** called FollowPlayer and attach it to the **camera**
2. Add *public GameObject player;* to the top of the script
3. Select the **Main Camera, then**, **drag** the player object onto the **empty player variable** in the Inspector
4. In *Update()*, assign the camera's position to the player's position, then test

- **Warning:** Remember to capitalize your script name correctly and rename it as soon as the script is created!
- **Warning:** It's really easy to forget to assign the player variable in the inspector
- **Don't worry:** The camera will be under the car... weird! We will fix that soon

```
public GameObject player;

void Update()
{
  transform.position = player.transform.position;
}
```

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# Step 3: Add an offset to the camera position

*We need to move the camera's position above the vehicle so that the player can have a decent view of the game.*

1. In the line in the Update method add *+ new Vector3(0, 5, -7)*, then test

- **New Concept:** Vector3 in place of coordinates
- **Tip:** You need "new Vector3()" because 3 numbers in a row could mean anything
- **New Concept:** FixedUpdate
- **Warning:** Remember to update your comments and maintain their accuracy!

```csharp
public GameObject player;

void Update()
{
  transform.position = player.transform.position + new Vector3(0, 5, -7);
}
```

# Step 4: Make the offset into a Vector3 variable

*We've fixed the camera's position, but we may want to change it later! We need an easier way to access the offset.*

1. At the top of **FollowPlayer.cs**, declare *private Vector3 offset;*
2. Copy the *new Vector3()* code and **assign** it to that variable
3. **Replace** the original code with the *offset* variable
4. **Test** and **save**

- **Don't worry:** Pay no mind to the read only warning
- **Tip:** Whenever possible, make variables! You never want hard values in the middle of your code

```csharp
public GameObject player;
private Vector3 offset = new Vector3(0, 5, -7);

void Update()
{
  transform.position = player.transform.position + new Vector3(0, 5, -7) offset;
}
```

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# Step 5: Edit the playmode tint color

*If we're going to be creating and editing variables, we need to make sure we don't accidentally try to make changes when in "Play mode"*

1. From the top menu, *go to Edit > Preferences* (**Windows**) or *Unity > Preferences* (**Mac**)
2. In the left menu, choose **Colors**, then edit the "**Playmode tint**" color to have a *slight* color
3. **Play** your project to test it, then close your preferences

- **Tip:** Try editing a variable in play mode, then stopping - it will revert
- **Warning:** Don't go crazy with the colors or it will be distracting
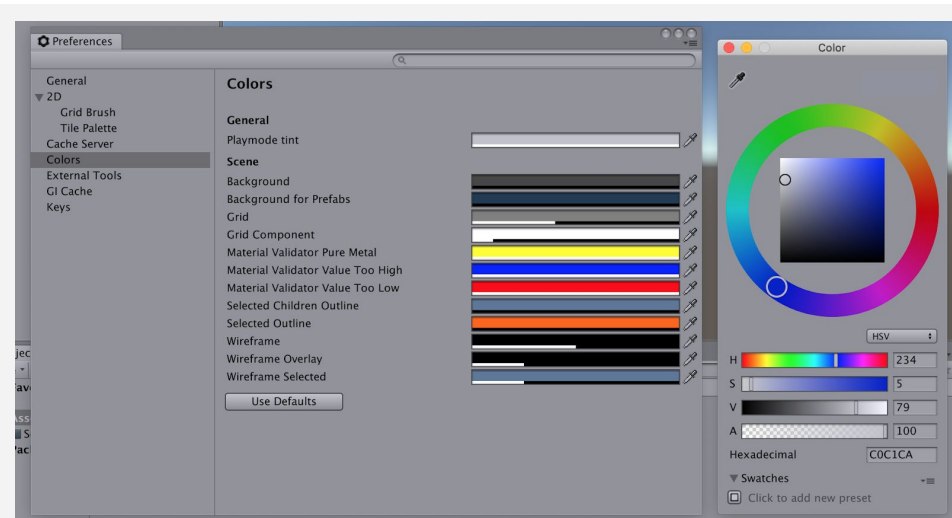


# Lesson Recap

| | |
|---|---|
| **New Functionality** | ● Camera follows the vehicle down the road at a set offset distance |
| **New Concepts and Skills** | ● Variables<br>● Data types<br>● Access Modifiers<br>● Declare and initialize variables |
| **Next Lesson** | ● In the next lesson, we'll add our last lines of code to take control of our car and be able to drive it around the scene. |