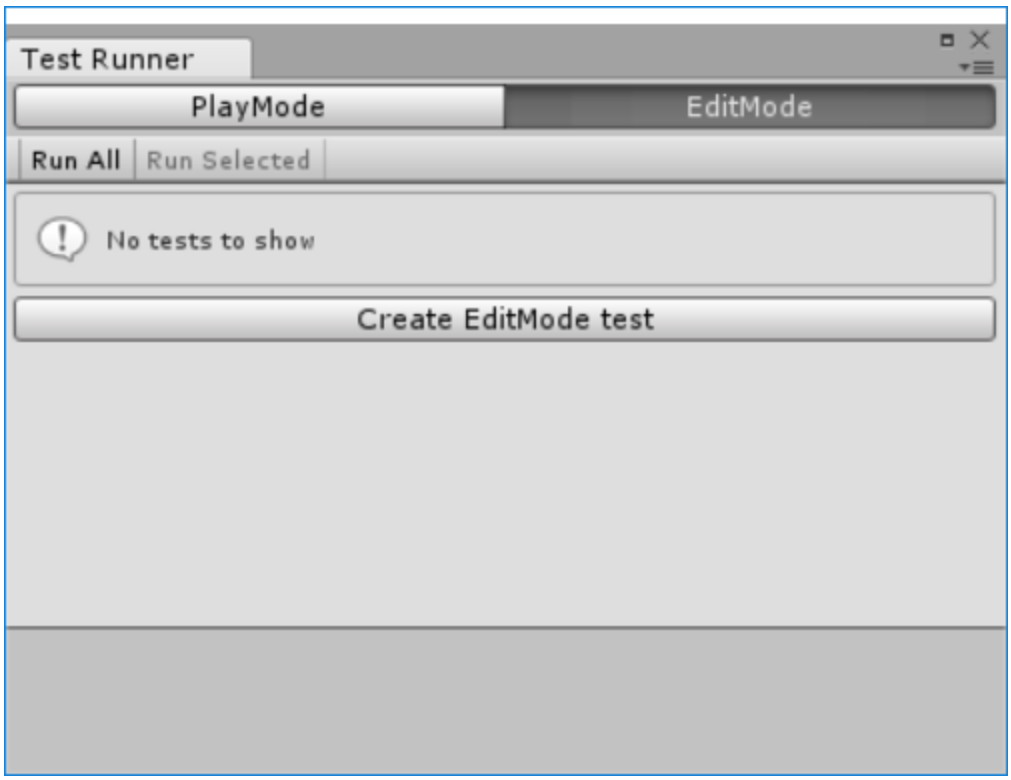
This document is now available at:
https://docs.unity3d.com/Manual/testing-editortestsrunner.html where it will be maintained and updated

This Google Doc version of the documentation will be removed at some point in the near future.

Unity Test Runner

The Unity Test Runner is a tool that tests your code in both Edit mode and Play mode, and also on target platforms such as Standalone, Android, or iOS.

The Unity Test Runner can be accessed via **Window** > **Test Runner**.



The Test Runner window

The Unity Test Runner uses a Unity integration of the NUnit library, which is an open-source unit testing library for .Net languages. More information about NUnit can be found on the official NUnit website and the NUnit documentation on GitHub.

`UnityTestAttribute` is the main addition to the standard NUnit library for the Unity Test Runner. This is a type of unit test that allows you to skip a frame from within a test (which allows background tasks to finish). Execute `UnityTestAttribute` as a coroutine when running in Play mode and in the `EditorApplication.update` callback loop when running in Edit mode.

Known issues and limitations

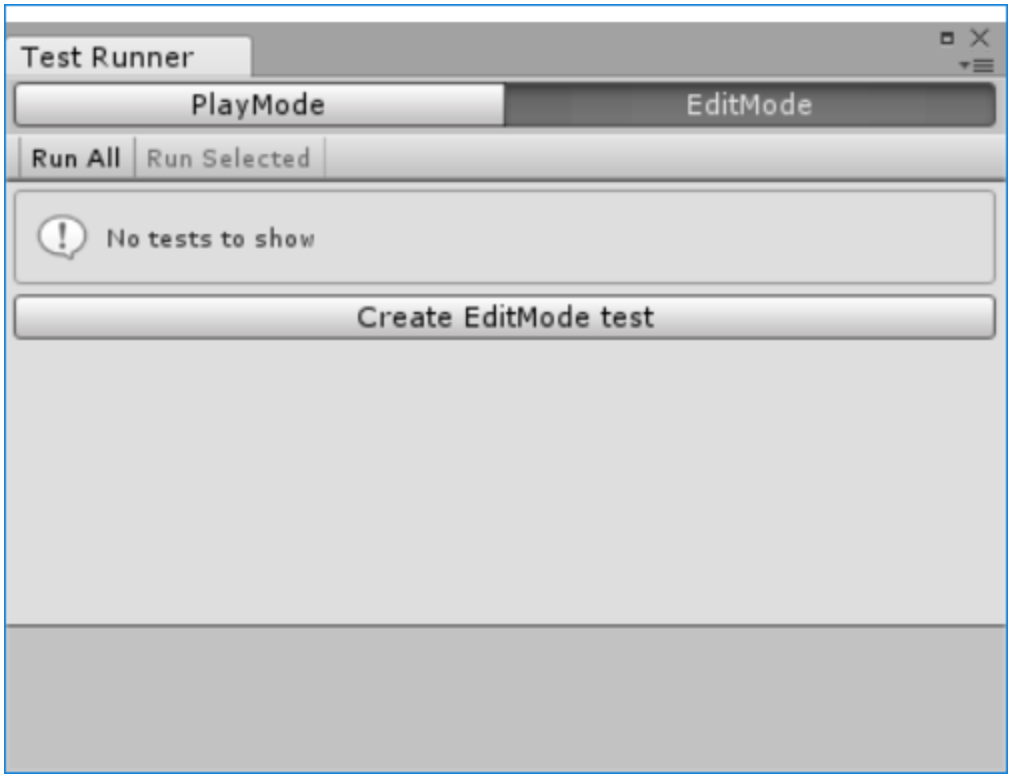
The following are known issues and limitations of the Unity Test Runner:

- `UnityTestAttribute` is not supported on WebGL and WSA platform.
- Test runner doesn't currently support AOT platforms.
- Parameterized tests are not supported for `UnityTest` (except for ValueSource).
- Automated tests in platform players (for example Standalone, Android, or iOS) run from the command line are not currently supported.
- When making EditMode tests, you must create a folder name **Editor** to store them in.

How to use Unity Test Runner

The documentation on this page assumes the reader has basic knowledge of unit testing and NUnit. If you are new to NUnit or would like more information, refer to the NUnit documentation on GitHub.

To use the Unity Test Runner, open the Test Runner window and navigate to **Window** > **Test Runner**.



The Test Runner window

If no tests are present in your Project, you can click the **Create EditMode test** button to create a basic test script.

You can also create test scripts by navigating to **Assets** > **Create** > **Testing**, and selecting either **EditMode Test C# Script** or **PlayMode Test C# Script**.

Testing in Edit mode

When in Edit mode, tests run from the Test Runner window, as seen in the screenshot above.

Make sure the **EditMode** button is selected, and click the **Create EditMode test** button to create a basic test script. Open and edit this in MonoDevelop - or your preferred integrated development environment (IDE) - as required.

Execute `UnityTestAttribute` in the `EditorApplication.update` callback loop when running in Edit mode.

Testing in Play mode

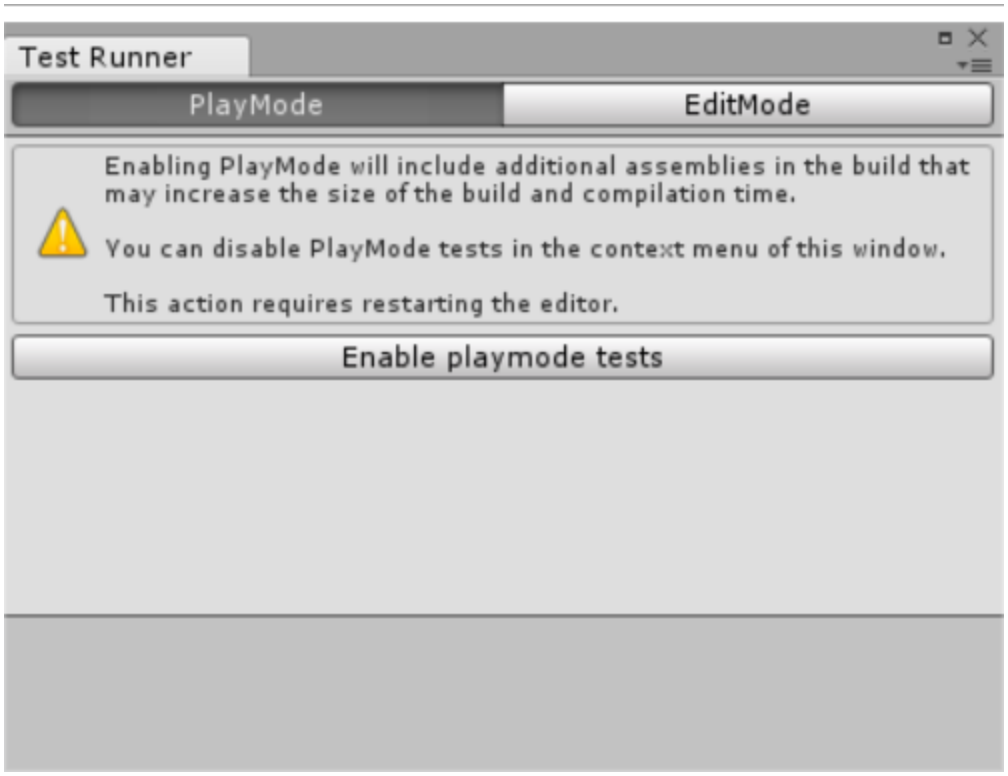
Before using the Unity Test Runner in Play mode, enable it from the Test Runner window.

To do this:

1. Navigate to **Window** > **Test Runner**.

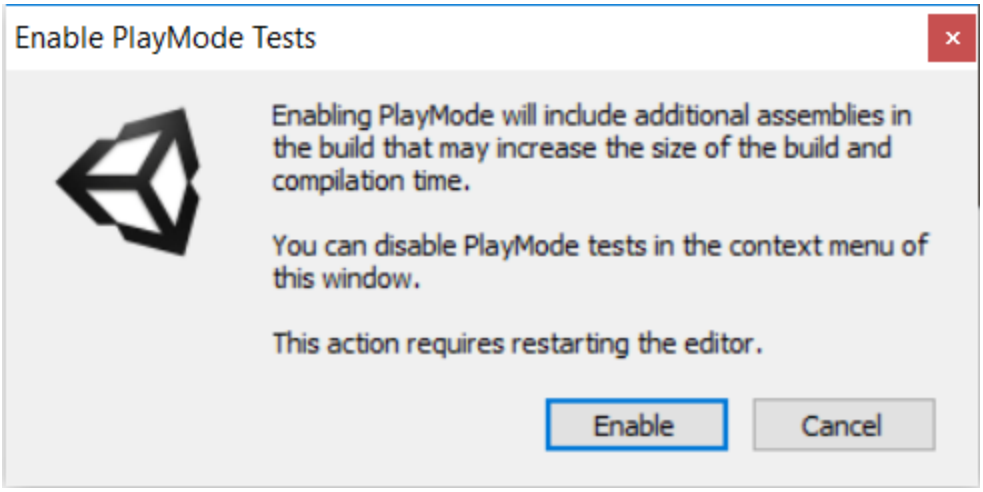
2. Click the **PlayMode** button.

3. Click the **Enable playmode tests** button.



*The Test Runner window with the **PlayMode** button selected*

4. In the resulting dialog box (seen in the screenshot below), click **Enable**.



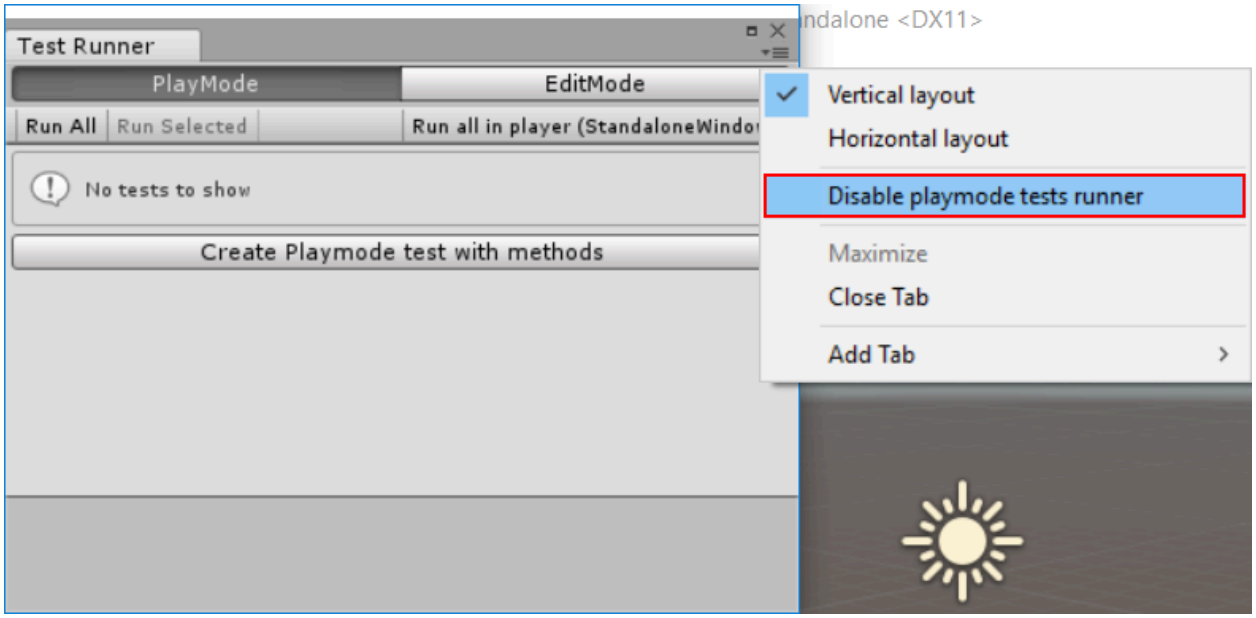
*The **Enable PlayMode Tests** confirmation dialog box*

5. A dialog box tells you to restart the Editor. Click the **Ok** button and manually restart the Editor (make sure to save your Project before restarting).

Create PlayMode test scripts by selecting the **PlayMode** button in the Test Runner window and clicking the **Create Playmode test with methods** button. This creates a basic test script that you can open and edit in MonoDevelop - or your preferred IDE - as required.

Note that enabling Play mode testing includes additional assemblies in your Project's build, which can increase your Project's size as well as build time.

Disable testing in Play mode by clicking the context button at the top-right of the Test Runner window and then selecting **Disable playmode tests runner** from the drop-down menu.



*The Test Runner window with the context button drop-down menu open and the **Disable playmode tests runner** option selected*

Execute `UnityTestAttribute` as a coroutine when running in Play mode.

Writing and executing tests in Unity Test Runner

The Unity Test Runner tests your code in Edit mode and Play mode as well as on target platforms such as Standalone, Android, or iOS.

The documentation on this page discusses writing and executing tests in the the Unity Test Runner, and assumes the reader has knowledge of both scripting and the Unity Test Runner.

Note: `UnityTestAttribute` is not supported on WebGL and AOT platforms.

UnityTestAttribute

`UnityTestAttribute` requires you to return `IEnumerator`. In Play mode, execute the test as a coroutine. In Edit mode, you can yield null from the test, which skips the current frame.

Regular NUnit test (works in Edit mode and Play mode)

```
[Test]
public void GameObject_CreatedWithGiven_WillHaveTheName()
{
    var go = new GameObject("MyGameObject");
    Assert.AreEqual("MyGameObject", go.name);
}
```

Example in Play mode

```
[UnityTest]
public IEnumerator
GameObject_WithRigidBody_WillBeAffectedByPhysics()
{
    var go = new GameObject();
```

```
    go.AddComponent<Rigidbody>();
    var originalPosition = go.transform.position.y;

    yield return new WaitForFixedUpdate();

    Assert.AreNotEqual(originalPosition, go.transform.position.y);
}
```

Example in Edit mode

```
[UnityTest]
public IEnumerator EditorUtility_WhenExecuted_ReturnsSuccess()
{
    var utility = RunEditorUtilityInTheBackgroud();

    while (utility.isRunning)
    {
        yield return null;
    }

    Assert.IsTrue(utility.isSuccess);
}
```

PrebuildSetupAttribute

Use `PrebuildSetupAttribute` if you need to perform any extra setup before the test starts. To do this, specify the class type that implements the `IPrebuildSetup` interface. If you need run the setup code for the whole class (for example if you want to execute some code before the test starts, such as Asset preparation or setup required for a specific test), implement the `IPrebuildSetup` interface in the class for tests.

```
public class TestsWithPrebuildStep : IPrebuildSetup
{
    public void Setup()
    {
        // Run this code before the tests are executed
    }

    [Test]
    //PrebuildSetupAttribute can be skipped because it's
implemented in the same class
```

```
    [PrebuildSetup(typeof(TestsWithPrebuildStep))]
    public void Test()
    {
        (...)
    }
}
```

Execute the `PrebuildSetup` code before entering Play mode or building a player. Setup can use UnityEditor namespace and its function, but in order to avoid compilation error, you must place it either in the “editor” folder or it must be guarded with `#if UNITY_EDITOR` directive.

AssertLog

A test fails if a message other than a regular log or warning message is logged. Use the `AssertLog` class to make a message expected in the log and prevent the test from failing.

If an expected message doesn’t appear, the test also reports as failed. The test also fails if any regular log or warning messages don’t appear.

Example

```
[Test]
public void LogAssertEample()
{
    //Expect a regular log message
    LogAssert.Expect(LogType.Log, "Log message");
    //A log message is expected so without the following line
    //the test would fail
    Debug.Log("Log message");
    //An error log is printed
    Debug.LogError("Error message");
    //Without expecting an error log, the test would fail
    LogAssert.Expect(LogType.Error, "Error message");
}
```

MonoBehaviourTest

`MonoBehaviourTest` is wrapper for writing MonoBehaviour tests, and also a coroutine. Yield `MonoBehaviourTest` from `UnityTest` to instantiate the specified MonoBehaviour and wait for it to finish executing. Implement the `IMonoBehaviourTest` interface to indicate when the test is done.

Example

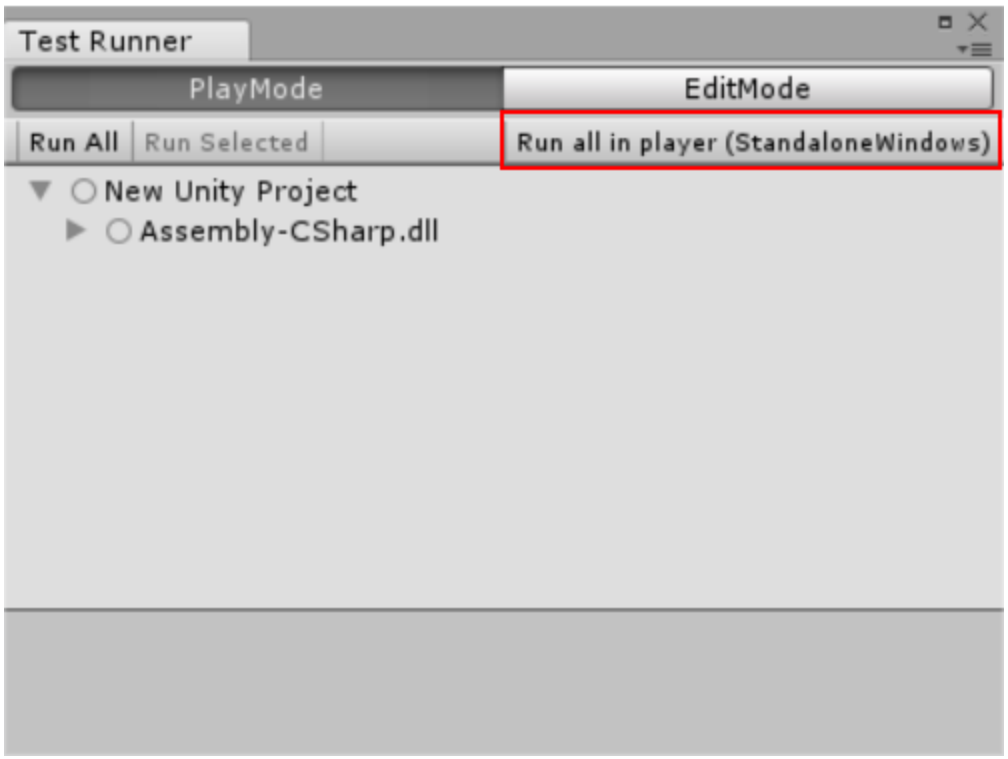
```
[UnityTest]
public IEnumerator MonoBehaviourTest_Works()
{
    yield return new MonoBehaviourTest<MyMonoBehaviourTest>();
}

public class MyMonoBehaviourTest : MonoBehaviour,
IMonoBehaviourTest
{
    private int frameCount;
    public bool IsTestFinished
    {
        get { return frameCount > 10; }
    }

     void Update()
     {
        frameCount++;
     }
}
```

Running tests on platforms

You can run tests on specific platforms in Play mode.

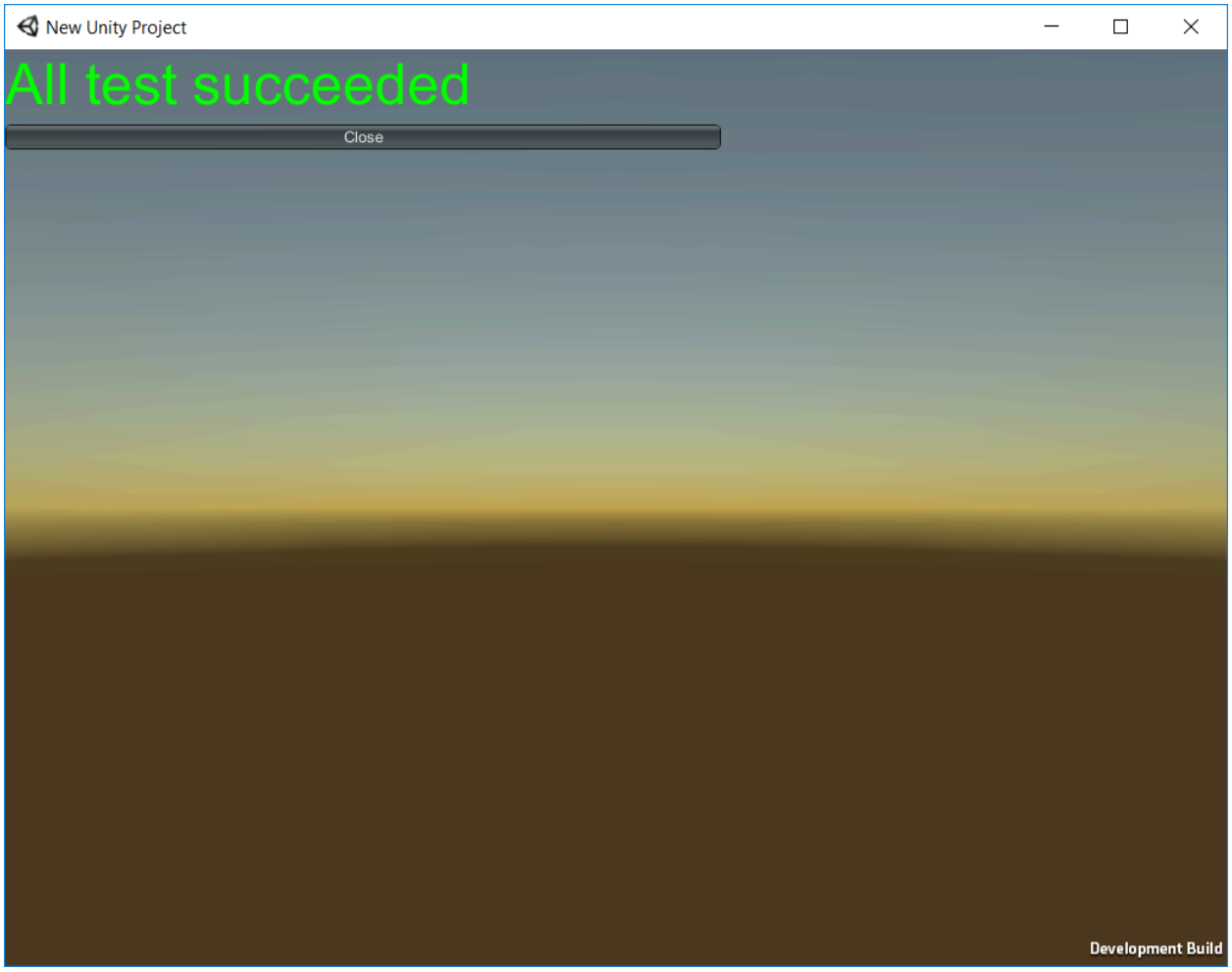
To do this, select the **PlayMode** button in the Test Runner window and then click the **Run all in player** button.

Note that your current platform displays in brackets on the button - for example, in the screenshot below the button reads **Run all in player (StandaloneWindows)** as the current platform is Windows.



*The Test Runner window with the **Run all in player** button highlighted*

Click the **Run all in the player** button to build and run your tests on the currently active target platform. Test results display following execution.



The Player following a successful test run

Running from the command line

You can also run tests from the command line.

To do this, run Unity with following arguments:

- `runTest` - Executes tests in the Project.
- `testPlatform` - The platform you want to run tests on. Available platforms are `playmode` and `editmode`. If unspecified, `editmode` tests execute by default.
- `testResults` - The path indicating where the result file should be saved. The result file is saved in Project's root folder by default.

Example

```
>Unity.exe -runTests -projectPath PATH_TO_YOUR_PROJECT -testResults
C:\temp\results.xml -testPlatform editmode
```

Note: This differs depending on your operating system - the above example shows a command line argument on Windows.