Lesson Objective:

To Setup a Windows 8 App Development Environment

*This will comprise an overview of setting up the environment, downloading Visual Studio 2012 for Windows 8, and getting a free developers license. By the end of this lesson you will have your environment setup and ready to begin development.*

**What are we going to teach today…**

This lesson is designed to introduce Visual Studio 2012 to you, guiding you through the download and install process for Visual Studio Express 2012 for Windows 8. It also covers the additional software included in the Visual Studio Express 2012 for Windows 8 and how it is used to produce Windows Store apps.

In the course of this lesson, we will cover the steps necessary to prepare your environment for development of Windows Store apps and then we will compile one of the sample projects so that you can see the whole process in action.

**Assumptions**

As a specialized lesson in games development for the Windows 8 ‘Modern UI-style’ environment, certain prior knowledge of C++ development and a fully-licensed copy of Windows 8 will be required for the practical tutorial.

Windows 8 can be installed alongside other operating-systems using a boot-loader such as the one included with Windows 8 and Windows 8 Enterprise Edition can be bought pre-installed to a USB device as a Live image using the Windows To Go features.
Introduction to Visual Studio

Visual Studio is an Integrated Development Environment (IDE) by Microsoft which is designed for the development of Graphical User Interface (GUI) and console applications for Microsoft Windows. It also supports a number of other platforms, depending on the version installed.

Visual Studio 2012 is [currently, at the time of writing,] the most recent edition of Visual Studio and includes the ability to develop Windows Store Apps in addition to desktop applications.

The Express Edition for Windows 8, which we will be covering in this lesson, also includes the Blend UI editor, Windows App Certification Kit and Windows Performance Analyzer in the package.

Visual Studio Express

The Express editions of Visual Studio are released free of charge to the general public. They are lightweight IDEs delivered as cut-down versions of the full Visual Express IDE, usually released as single-purpose packages such as platform- or language-specific editions.

The version of Visual Studio we recommend for these tutorials is Visual Studio Express 2012 for Windows 8, which is the appropriate IDE for developing Windows Store apps within Windows 8 and is based on the Visual Studio 2012 IDE.
Installing Windows 8

As you can image, most of the tools for developing games which run on Windows 8 have been designed to run under the Windows 8 operating-system and take advantage of the new features which have been included in this version of Microsoft Windows.

In the course of this lesson, we will be using software which is only available for the Windows 8 operating-system. In case you have not yet installed your copy of Windows 8, we have included this section to guide you through the process.

Introduction to Windows 8

Windows 8 is the latest edition of the Windows family of operating-systems, designed to work well with a touchscreen interface in addition to the mouse and keyboard interface from previous editions. It is also designed to synchronize your settings and files, effortlessly utilizing the cloud to make sure that you can use a single account across all of your PCs and pick up where you left off.

These obvious improvements are complemented by a range of invisible changes, which allow your computer to boot up and switch apps faster, use power more efficiently on tablet or notebook PCs and run more securely than previous editions.

Most importantly though, Windows 8 introduces the Windows Store, an integrated and curated system for downloading and installing software specifically designed to use the features of Windows 8 and its mobile-friendly low-power counterpart, Windows RT.

Over the course of these 12 lessons, we will be developing a game app for the Windows Store which will demonstrate how the Modern UI-style interface differs from the older desktop environment.
Prerequisites

Due to the improvements made over previous version of Windows, Windows 8 has certain specific requirements that differ from earlier editions. These include certain processor-requirements for the security features that Windows 8 uses.

System Specifications

**Processor:** 1 GHz IA-32 or x64 with support for PAE, NX and SSE2, though x64 is recommended.

**RAM:** 1GB for 32-bit processors or 2GB for 64-bit processors, but 4GB is recommended.

**Graphics Card:** DirectX 9 device with WDDM 1.0 drivers, though DirectX 10 is recommended.

**Monitor:** 1024 x 768 is the minimum specification, but 1366x768 is recommended, as Windows 8 is optimized for wide-screen displays.

**Input:** Keyboard and mouse, though a multi-touch display screen is recommended and required to take advantage of the multi-touch functionality.

**Hard Disk:** The 32-bit edition requires 16GB of space, the 64-bit edition 20GB, though many experts recommend between 30GB and 50GB for best performance.

**Other:** Microsoft recommends USB 3.0, UEFI v2.3.1, Trusted Platform Module and an active internet connection.

Windows 8 Upgrade Assistant

If you are using Windows XP, Windows Vista or Windows 7, you can use the Windows 8 Upgrade Assistant to check whether your system will support Windows 8. If you are using Windows 7, you can also use it to carry your settings and files over to Windows 8, if you decide to install over the earlier operating system.

The Windows 8 Upgrade Assistant is available from [http://windows.microsoft.com/en-GB/windows-8/upgrade-to-windows-8](http://windows.microsoft.com/en-GB/windows-8/upgrade-to-windows-8) and will also check connected hardware for compatibility where it can.
Running Multiple Operating-Systems

While many developers will choose to install Windows 8 as the main operating-system, there are a number of reasons why you may not want to replace your main operating-system. Luckily, Microsoft provides three easy ways to use Windows 8 without replacing your existing operating-system, so you may have the choice.

Dual-Boot

When you install Windows 8, as long as you have a free disc partition for Windows 8, you can opt to install it alongside your existing operating-system. You will have to run the installer as a custom install rather than an upgrade, but the installer should detect the existing operating system automatically and install the boot-loader.

You may also install another boot-loader of your choice if you prefer, as long as each operating-system is installed on a separate disk-partition.

Virtual Machine

A virtual machine allows you to install a second operating-system which runs on your PC like an application. It will not run as quickly as it would installed normally, but does not require you to over-write any settings and can be uninstalled if you change your mind.

Oracle VM Virtual Box is a popular choice for running Windows 8 as a virtual machine, with many tutorials available online and a profile for Windows 8 included in the latest release.

Windows To Go

One of the options for Windows 8 is to run it as a live image pre-installed on a USB storage device. While you cannot install Windows 8 to a non-certified device, a number of companies offer USB drives with Windows 8 installed. These devices are set up so that the operating-system is self-contained and can be run on any PC that meets the requirements for installing Windows 8 and can boot from a USB device.

As this option requires a certified USB device, you cannot simply download the image and install to a device you may already own.
Installing Windows 8

Before you start

If you are upgrading from Windows XP, Windows Vista or the Windows 8 preview, you will be unable to keep your previous settings and files on the drive you will install Windows 8 to. For this reason, it is important that you back up your files. Even if you are upgrading from Windows 7, we still recommend backing up anything important, just in case anything goes wrong.

We also recommend that you make an install disc for Windows 8, which you may already have done as part of the install process. This disc will allow you to reset Windows 8 to its initial state, usually keeping your files and settings, if you encounter any issues later. This is a simple case of downloading the .iso file and burning it to a disc.

Windows 8 Upgrade Assistant

The easiest way to install Windows 8 on a compatible device is to use the Windows 8 Upgrade Assistant. It allows you to buy, download and install Windows 8 immediately after checking for system compatibility. This option requires a fair amount of hard-disk space, as it must download the installer, but allows you to migrate your files and settings from Windows 7 to Windows 8 as part of the process.

You may also download the disc-image using the Windows 8 Upgrade Assistant and Install from the disc later. It is recommended that you create an install disc so that you can reinstall or repair Windows 8 at a later date.
**Installing**

For the sake of this lesson, we will assume that you are installing Windows 8 from a DVD rather than using Windows To Go from a USB device or installing to a virtual machine.

The first thing you should do is to insert the DVD into your DVD drive, then restart your PC. If your PC is not set up to boot from a CD or DVD, you will have to go into your BIOS settings and give the highest boot-priority to your DVD drive.

The way you do this varies from one computer to another, so please refer to the documentation which came with your PC for information on modifying your BIOS settings.

Once you restart, your computer should now boot from the DVD.

You will be asked to select your preferred language, formats and keyboard-layout for the install process.

You can now choose whether to install or repair Windows 8.
Click 'Install' and you will be invited to read and agree to the license terms.

The next decision will be whether to perform an upgrade, which will keep your files and settings depending on your current operating-system, or to perform a custom installation without upgrading.

If you wish to set up a dual-boot system, you will need to select a custom installation so that you do not overwrite your existing operating-system.
You can select your chosen partition to prevent overwriting an existing operating-system on the next screen.

The installer will need to restart your PC a number of times before Windows 8 is ready to use and you may see a screen inviting you to select your operating-system if more than one operating-system is available.
You should let your computer boot into Windows 8, which it will do automatically, each time it restarts.

At this point, Windows 8 is practically installed. You will be asked to select a color-scheme, then decide whether to use the default settings (shown on-screen) or set them manually.
**Microsoft Account**

It is recommended that you use a Microsoft account to log into your user account. This is the account-type previously known as a Live ID and is used for a number of Microsoft services, including Xbox Live, Hotmail and Live (formerly MSN) Messenger.

While a Microsoft account is considered optional for Windows 8, it is used by Visual Studio and the Windows Store. For this reason, we strongly recommend that you have a Microsoft account even if you do not use it for your Windows log-in.

You will be shown the sign-in screen, where you can enter your email address.

If you do not already have a Microsoft account, you can sign up for one right now by clicking on ‘Sign up for a new email address’ or choose ‘Sign in without a Microsoft account’ to use a local account.
If you choose to use a Microsoft account, you will now be asked to enter the password for your account to confirm that you own it.

Due to the importance of retaining access to your Microsoft account, you may also be asked to provide security info which will help secure your account and can be used to recover your account if you forget your password.
**Dual Boot**

There are a few details that you should know about if you choose to dual-boot. These instructions have been written for the Microsoft boot loader included with Windows 8 and if you are using a different boot loader, you should refer to the documentation for this software.

If you have set up your PC for dual-booting through the Windows 8 install-disc, you will usually be faced with the 'Choose an operating system' screen every time you start your PC.

![Choose an operating system](image)

Windows 8 will have been set as the default option, but this can be changed by clicking on 'Change defaults or choose other options' at the bottom of the screen to open the Options screen.

![Options](image)

Using the options screen, you can change the default operating-system.
If you change this setting, you may find that it loads a different boot-loader, so please make sure you know how to use the boot-loader for the operating-system you are using.

You can also change the timer, which defines how long you have between the boot-loader opening and the default option being selected.

A shorter time-limit will allow your PC to boot faster, but will give you a shorter period in which to select a different operating-system if you do not wish to use the default option.
**Windows Update**

Once you log into your account for the first time, Windows 8 will begin to run Windows Update. It may take a few minutes before you are invited to install updates, but you should install software and driver updates before continuing to use Windows 8, as they will improve the reliability and security of your system.

Updates may be listed in one of a number of categories, depending on how critical they are to the running of the PC.

The Windows Update service keeps track of updates ranging from peripheral drivers to security hot-fixes and you will be kept informed of any essential updates when they are found.
Installing Visual Studio Express 2012 for Windows 8

Visual Studio Express 2012 for Windows 8 is available for download from Microsoft’s website and can be downloaded as either an installer or as a CD / DVD image. Both methods will install the same application, but some users may prefer to have a disc back-up.

**Downloading Visual Studio Express 2012 for Windows 8**

To ensure that you have a genuine copy of the most recent version of the software, you should download Visual Studio Express 2012 for Windows 8 from the Microsoft website and not from third-party providers.

**Either:**


**Or:**

- Navigate to [http://bing.com](http://bing.com) and search for “Visual Studio Express” and select the Visual Studio page hosted on microsoft.com, then navigate to the downloads page.
You should select the section marked “Visual Studio Express 2012 for Windows 8”

Visual Studio Express 2012

Visual Studio Express 2012 products provide free development tools for creating modern applications on the latest platforms.

Choose either the installer or the disc image to download the installation media.
If you have downloaded the installer, you should double-click the executable file to begin the installation process.

If you have downloaded the disc image (with the extension .iso), you should now burn the image to a blank CD or DVD and then insert the disc into your CD or DVD drive. When prompted, run the installer on the disc to begin the installation process.

Whichever method you are using, you should now follow the instructions on-screen.
Product Registration

While your chosen copy of Visual Studio 2012 installs, you should ensure that you have a license for it. If you are installing Visual Studio Express 2012 for Windows 8, you should click the “Register Now” link from the download page.

Developer License (rolling 30-day free)

The Developer License for Visual Studio Express 2012 is a free 30-day license, which can be renewed every 30 days for free. It is linked to your Microsoft Account, which is the login you will use to access most Microsoft services, including Xbox Live, Hotmail and Live (formerly MSN) Messenger.

As part of the license sign-up, you will be asked for your name and e-mail address, together with the intended use of the software, and invited to receive information from Microsoft and their partners.

After selecting whether you will primarily use the software for Academic, Business or Personal use, you may then be asked for further information. While many fields will be mandatory, others may not and you are free to enter only the required information.
After successfully registering your copy of Visual Studio Express 2012, you can acquire the registration key code. Microsoft will also send your registration key to the email address you registered with.

Thank you for registering your copy of Microsoft® Visual Studio® Express 2012 for Windows 8.

Below you will find your product activation key and some additional resources to help you get started.

Your Registration Key:
YYYYY-YYYYY-YYYYY-YYYYY-YYYYY

Enter this key < when prompted at launch>.

Other Licenses

If you are installing a version of Visual Studio 2012 from another source, whether a university or company, you should be sure to check the details of the licensing agreement for the software.

This lesson has been written with Visual Studio Express 2012 for Windows 8 in mind and there will be little or no benefit to using a more feature-rich version of Visual Studio 2012 for this purpose.

Windows Store Developer License

While a Developer License is free, it is limited to development and does not permit you to sell apps through the Windows Store. You will require a Windows Store Developer License before you will be able to submit your apps to the Windows Store.
Applications installed with Visual Studio Express 2012 for Windows 8

Visual Studio Express 2012 for Windows 8

This is the core IDE where you will do the majority of your development.

Over the next 11 lessons you will be developing a game in the Visual Studio 2012 IDE.

Blend for Visual Studio 2012

Blend is a User Interface design tool used to develop XAML-based graphical interfaces for Windows Store apps. As a WYSIWYG editor, it allows graphical elements to be placed visually rather than through code.

You will learn more about Blend during Lesson 9 of this course.

Windows Performance Analyzer

The Windows Performance Analyzer is an application which analyzes your application and gives advice on ways in which you could optimize your code for better use of available resources and identifies possible issues on lower-spec machines.

You will learn more about how the Windows Performance Analyzer is used in the optimization process which will be covered in Lesson 11.

Windows App Certification Kit

The Windows App Certification Kit is used to check whether a Windows Store app is ready to be submitted to the Windows Store. It checks for common errors, allowing developers to spot and correct them before submission, which serves to speed up the submission process for the Windows Store.

You will learn more about the Windows App Certification Kit during lesson 12, where you will learn about the submission process for the Windows Store.
Using Visual Studio

Logging in with your Microsoft Account
The first time you start Visual Studio Express 2012 for Windows 8, you will be asked to sign in with your Microsoft Account.
Note: This must be the Microsoft Account you used to sign up for your license-key.

The IDE Window
The main window for Visual Studio typically consists of the following:

1. **Ribbon** - This is a selection of the most common features you will need.
2. **Main Window** - This typically contains the current file you are working on or the Start page.
3. **Solution Explorer** - This is a list of the files used by the current solution.
4. **Output Window** - This will contain feedback on the current or most recent action.
Your First Project

You are now ready to compile your first app. For this lesson, you will only need to compile the basic Direct3D App template. This template forms the basis of the app you will develop during this course.

### Installing the Windows Developer Content GDC 2013 Direct3D game templates

You should start by downloading the Windows Developer Content GDC 2013 Direct3D game templates, a set of templates for Visual Studio 2012 and Visual Studio Express 2012 for Windows 8 which have been written to form a strong basis for games using DirectX with CoreWindow and XAML.

Don’t worry if that didn’t make complete sense, the meaning of those names will be explained to you in the coming lessons.

Navigate to the MSDN page by going to the following URL and downloading the samples:


Once you have downloaded the ZIP file, you should open the archive and then navigate to the C++ folder to find the install-file. Extract the file named ‘GDC2013GameTemplates.vsix’ and then double-click; as long as you have Visual Studio installed, the samples will be automatically installed.

Restart Visual Studio 2012 if you have it open, then you will be able to access the new templates.
Starting a New Project

To start a new project, you will need to either select “New Project” from the Start Page.

Or the New Project option under the File menu (shortcut: Ctrl+Shift+N) to open the New Project pane.
Once you have opened the New Project pane, you should select the GDC 2013 Game Templates category under the Visual C++ language-heading.

This will open a list of game templates, from which you should select the ‘DirectX game (XAML and CoreWindow)’ template.
At the bottom of the pane, you will be able to select a name, location and solution for your new project. Pick a name and a location to create the project, then click ‘Ok’ to generate the project.

Compile & Run (no need to add code; just compile and run)

At this point, there is no need to add anything to the code. You should now click on the green ‘Run’ button on the ribbon, press F5 or select Start Debugging from the DEBUG menu. If this is the first time you have run the app, you will be told that the project is out of date and will be invited to build it. Do this and it should start as soon as the build has been completed.

At this point, you should see a play button; after pressing it, you will now see a spinning cube in front of you. This means that the code has compiled successfully and you are now seeing a Direct3D app running in the Modern UI-style environment under Windows 8. Click the top of the screen and drag down to close the app and return to Visual Studio as normal.
**Files to consider**

On the right of the Visual Studio window (in the default layout), you will find the Solution Explorer. This lists the files used by the project, including external dependencies.

While it would be a good idea to take a look at all of the files in this folder, there are two non-code files which are of special interest.

**Package.appxmanifest**

This manifest file contains the options for your app, defining its name, Logo images, required capabilities and many other details required by the Windows Store. While the file itself is based on the XML standard, Visual Studio uses a specialized editor-window to modify the file when it is opened from the Solution Explorer.

**Direct3DApp1_TemporaryKey.pfx**

This file is the temporary Certificate produced by Visual Studio to allow you to test your app on a local PC. It should be replaced by a legitimate Windows Store Certificate, which is only available to registered developers with a paid Windows Store Developer License.
Summary

This introductory lesson has guided you through the following:

- Introduction to Visual Studio
  - Visual Studio Express
- Installing Windows 8
  - Required hardware
  - Using Windows 8 with another operating-system
  - First steps after installing
- Installing Visual Studio Express 2012 for Windows 8
  - Downloading Visual Studio Express 2012 for Windows 8
  - Product Registration
    - Developer License (rolling 30-day free)
    - Other Licenses
    - Windows Store Developer License
  - Applications installed with Visual Studio Express 2012 for Windows 8
    - Visual Studio Express 2012 for Windows 8
    - Blend for Visual Studio 2012
    - Windows App Certification Kit
    - Windows Performance Analyzer
- Using Visual Studio
  - Logging in with your Microsoft Account
    - The IDE Window
  - Your First Project
    - Starting a New Project
    - Compile & Run (no need to add code; just compile and run)
    - Files to consider

Appendix

The files that accompany this training material may be found and downloaded from the
following URL www.microsoft.com/faculty. The files may be downloaded individually or as a zipped package file.