**Objectives**

1. Research information about software for a specific operating system (OS) environment. You will be assigned one of the operating systems form the list of: Windows, Mac OS, Linux. You will also be provided with a list of topics to investigate.

2. Organize your rough research information into a list of topics, sub-topics and facts. This process will involve identifying sub-topics, rearranging your rough research notes, and selecting (or highlighting) interesting facts.

3. Report a summary of your research in the form of a “concept map”. Use the PowerPoint template provided as a starting point. The concept map should only include the best and most interesting information from your organized research notes.

Your assigned operating system is:

· Windows

· Mac OS

· Linux

· iOS

· Android

A concept map can be created using the “Smart Ideas” application or PowerPoint or other applications.

**Level 1 – Rough Research**

Research information about the software for your assigned operating system (OS) environment.

· Guide your research according to the suggested topic list below

· Feel free to copy-and-paste as long as you keep track of your bibliographic references.

· Do not be too picky or concerned about formatting as you will organize this information later in step 2

· Select things that look interesting and don’t forget to include graphics images as well

· Upload your rough research notes to your repository when you are done.

Topic A – Productivity, Entertainment & Other Software Applications

## Software development

* [BASICA](https://en.wikipedia.org/wiki/BASICA)
* Citus Data
* [CLR Profiler](https://en.wikipedia.org/wiki/CLR_Profiler)
* [GitHub](https://en.wikipedia.org/wiki/GitHub)
* [GW-BASIC](https://en.wikipedia.org/wiki/GW-BASIC)
* [IronRuby](https://en.wikipedia.org/wiki/IronRuby)
* [IronPython](https://en.wikipedia.org/wiki/IronPython)
* [JScript](https://en.wikipedia.org/wiki/JScript)
* [Microsoft Liquid Motion](https://en.wikipedia.org/wiki/Microsoft_Liquid_Motion)
* [Microsoft BASIC](https://en.wikipedia.org/wiki/Microsoft_BASIC), also licensed as:
  + [Altair BASIC](https://en.wikipedia.org/wiki/Altair_BASIC)
  + [AmigaBASIC](https://en.wikipedia.org/wiki/AmigaBASIC)
  + [Applesoft BASIC](https://en.wikipedia.org/wiki/Applesoft_BASIC)
  + [Commodore BASIC](https://en.wikipedia.org/wiki/Commodore_BASIC)
  + [Color BASIC](https://en.wikipedia.org/wiki/Color_BASIC)
  + [MBASIC](https://en.wikipedia.org/wiki/MBASIC)
  + [Spectravideo Extended BASIC](https://en.wikipedia.org/wiki/Spectravideo)
  + [TRS-80 Level II BASIC](https://en.wikipedia.org/wiki/TRS-80#BASIC)
* [Microsoft Macro Assembler](https://en.wikipedia.org/wiki/Microsoft_Macro_Assembler)
* [Microsoft Small Basic](https://en.wikipedia.org/wiki/Microsoft_Small_Basic)
* [Microsoft Visual SourceSafe](https://en.wikipedia.org/wiki/Microsoft_Visual_SourceSafe)
* [Microsoft XNA](https://en.wikipedia.org/wiki/Microsoft_XNA)
* [Microsoft WebMatrix](https://en.wikipedia.org/wiki/Microsoft_WebMatrix)
* [MSX BASIC](https://en.wikipedia.org/wiki/MSX_BASIC)
* [NuGet](https://en.wikipedia.org/wiki/NuGet)
* [QBasic](https://en.wikipedia.org/wiki/QBasic) and [QuickBASIC](https://en.wikipedia.org/wiki/QuickBASIC)
* [Team Foundation Server](https://en.wikipedia.org/wiki/Team_Foundation_Server)
* [VBScript](https://en.wikipedia.org/wiki/VBScript)
* [Visual Studio](https://en.wikipedia.org/wiki/Visual_Studio)
  + [Microsoft Visual Studio Express](https://en.wikipedia.org/wiki/Microsoft_Visual_Studio_Express)
  + [Visual Basic](https://en.wikipedia.org/wiki/Visual_Basic)
  + [Visual Basic .NET](https://en.wikipedia.org/wiki/Visual_Basic_.NET)
  + [Visual Basic for Applications](https://en.wikipedia.org/wiki/Visual_Basic_for_Applications)
  + [Visual C++](https://en.wikipedia.org/wiki/Visual_C%2B%2B)
    - [C++/CLI](https://en.wikipedia.org/wiki/C%2B%2B/CLI)
    - [Managed Extensions for C++](https://en.wikipedia.org/wiki/Managed_Extensions_for_C%2B%2B)
  + [Visual C#](https://en.wikipedia.org/wiki/Visual_C_Sharp)
  + [Visual FoxPro](https://en.wikipedia.org/wiki/Visual_FoxPro)
  + [Visual J++](https://en.wikipedia.org/wiki/Visual_J%2B%2B)
  + [Visual J#](https://en.wikipedia.org/wiki/Visual_J_Sharp)
  + [Visual Studio Code](https://en.wikipedia.org/wiki/Visual_Studio_Code)
  + [Visual Studio Lab Management](https://en.wikipedia.org/wiki/Visual_Studio_Lab_Management)
  + [Visual Studio Team Services](https://en.wikipedia.org/wiki/Microsoft_Visual_Studio#Team_Services)
  + [Visual Studio Tools for Office](https://en.wikipedia.org/wiki/Visual_Studio_Tools_for_Office)
  + [Visual Studio Tools for Applications](https://en.wikipedia.org/wiki/Visual_Studio_Tools_for_Applications)
  + [VSTS Profiler](https://en.wikipedia.org/wiki/VSTS_Profiler)
* [Windows API](https://en.wikipedia.org/wiki/Windows_API)
* [Windows SDK](https://en.wikipedia.org/wiki/Windows_SDK)
* [WordBASIC](https://en.wikipedia.org/wiki/WordBASIC)
* [Xbox Development Kit](https://en.wikipedia.org/wiki/Xbox_Development_Kit)

**Apps and Features only Unique to Windows:**

## **Alarms & Clock**

There are three tools under the Windows 8/8.1 Alarms app: Alarm, Timer and Stopwatch. The renamed Alarms & Clock in Windows 10 Technical Preview adds a fourth, World Clock. For some reason, the app doesn’t feature the bold circular UI graphics of the old app.

**Calculator**

Here’s an app that will certainly work much better on a desktop and notebook computer because it’ll launch inside a resizable window on the Windows 10 desktop. The Windows 8/8.1 Calculator app comes with three modes: Standard, Scientific and Converter. The new one will add a fourth, Programmer. The user interface for the Converter has been redone. The measurements that can be converted will all be listed in a sidebar, not in a drop-down menu

## **Calendar**

The Calendar app gets a completely overhauled GUI and look that, thankfully, makes it far more usable on desktop and notebook systems. It will have feature integration with the also new Mail app.

## **Camera**

You’ll be able to change the resolution and frame rate for capturing video with the webcam of your Windows 10 device.

## **Food & Drink, Health & Fitness, Money, News, Sports, Travel, Weather**

We’ve never cared for this mess of apps, because they mostly do the same thing: Showing you live-updated information in their respective categories. Yet these are installed as 7 separate apps on Windows 8/8.1. In the Windows 10 Technical Preview, some of these categories (news, travel and weather) show up under the search box for Cortana, Microsoft’s personal digital assistant, which is placed on the taskbar to the right of the Start button. Otherwise, we think all of the information presented in these 7 apps could be combined into one app, from which you could choose the category (or categories) you want its tile to show on the Start Menu.

## **Mail**

Coinciding with Calendar, the interface of the new Mail makes this app much more comfortable for use with a keyboard and mouse. It has a direct link and integration with the new Calendar app.

## **Maps**

The new Maps in Windows 10 Technical Preview works mostly the same as in Windows 8/8.1, with several new things added: the ability to rotate a map clockwise or counter-clockwise, and to view it at an angle tilted toward the horizon. There’s now a large selection of cities included that you can view as 3D maps. Another feature is you can download and install regional maps so you can use this app completely offline.

## **Music**

The Windows 10 Technical Preview doesn’t include this new Music app preinstalled; it has to be downloaded separately from the beta version of the new Windows Store app. Under the name Music Preview, this app has a planer GUI over its Windows 8/8.1 predecessor, and lacks any link to an online store to buy music as downloads or streams. A music store will likely be restored in the final release.

## **Photos**

Photos in Windows 8/8.1 lets you view images stored on your local device or OneDrive account and do simple edits and enhancements. The latest Windows 10 Technical Preview has the same features, but is a work-in-progress: When you click its “Albums” buttons, the app tells you this function isn’t available yet. What are available are three “games”: These are actually tools Microsoft devised to improve their image enhancement, face recognition, and eye detection software. With your permission, you can allow Microsoft to analyze and test your photos for these three purposes. You can also play images as a Slideshow and delete, copy or share multiple photos in one go.

## **Video**

Like Music, the new Video app is available as a separate download from the Windows Store beta, and has an identical, bare-looking GUI. It has a link to a store, which launches the Windows Store beta, but the Windows Store beta currently doesn’t sell video downloads or streams.

## **Voice Recorder**

Sound Recorder in Windows 8/8.1 has been renamed Voice Recorder. It still has the same features, but its UI now has a lighter-colored theme (like the revised Alarms & Clock and Calculator apps).

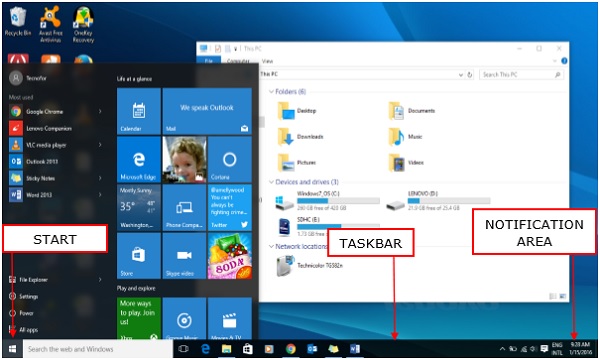
## **Windows Store**

Windows 10 Technical Preview includes a new version of the Windows Store app. For now, the primary difference over the current Windows Store app is that its layout is designed to be scrolled through vertically. So it’s better suited for browsing on a desktop or notebook with a mouse. Apparently because this app isn’t able to switch its UI between desktop/notebook and tablet modes, the latest releases of the Windows 10 Technical Preview come with both this new and current Windows Store.

In February 2018, Microsoft announced that [Progressive Web Apps](https://en.wikipedia.org/wiki/Progressive_Web_Apps) would begin to be available in the Microsoft Store, and Microsoft would automatically add selected quality progressive web apps through the [Bing](https://en.wikipedia.org/wiki/Bing_(search_engine)) crawler or allow developers to submit Progressive Web Apps to the Microsoft Store.

Topic B – User Interface (Window Management & Input Devices)

Once you get to the Windows Desktop screen, here are some basic features you will see.



One of the most important parts of your Desktop is the Taskbar. By default, it sits at the bottom of your screen giving you access to the Start Menu, several application icons, and the Notification Area.

## Windows

In Windows 10, if an application is active or opened, you will see a green line below its icon. Clicking the icon will bring the application window up.



Every open window features three buttons in the upper-right corner. These are used to minimize, maximize, or close the window −

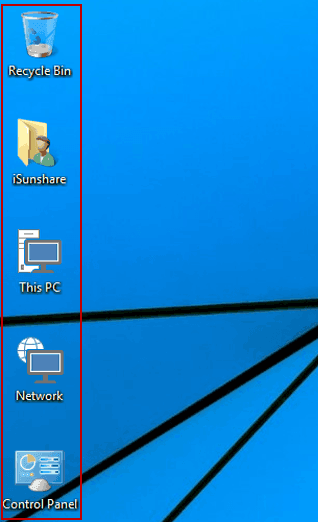
* Minimizing means that the window will hide in the Taskbar.
* Maximizing will bring the window to a full-screen size.

Windows can be moved around or resized as you please −

* To move a window, just click on its Title Bar on the upper side of the window and drag it.
* To resize a window, move your mouse to any corner until you see a double-sided arrow. Then click and drag until you reach the desired size.

## Icons

Most Windows versions will feature different icons on the background. An icon is simply a graphic representation of an application or a file. To open or access an icon, just double click on it.



Although the amount and type of icons will vary, depending on the computer, you can add more icons by following these steps −

Step 1 − Right-click on the Desktop Background.

Step 2 − Choose “New” and “Shortcut”.

Step 3 − Browse for the application or file you want to create a shortcut to.

Step 4 − Assign a name to the shortcut and click “Finish”.

Icons can also be moved around by clicking on them and dragging them to another place in the screen.

## 

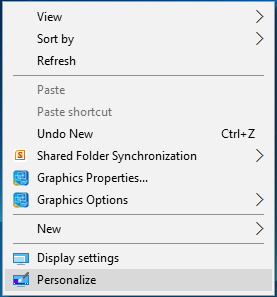
## 

## Desktop Background

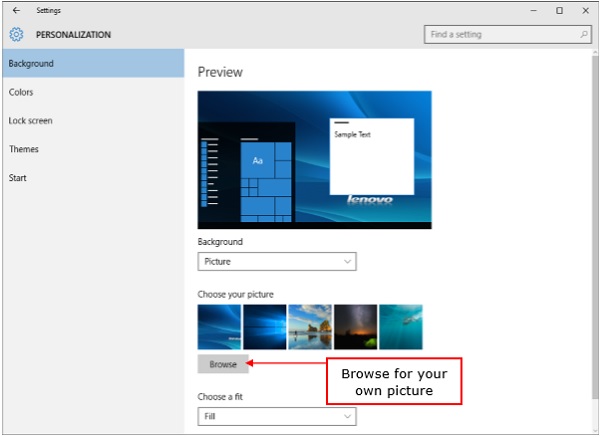
Another component of your Desktop is the Background. This is simply an image that appears at the back of your screen. Most computers come with a pre-selected background, but you can change it to any image you want.

To change the background, follow these steps −

Step 1 − Right-click on the background and choose “Personalize”.



Step 2 − From the Personalization window, choose from a series of pre-selected pictures or browse for your own.



Topic C – Memory Allocation, Management,& Devices

**Management:** Each process on 32-bit Microsoft Windows has its own virtual address space that enables addressing up to 4 gigabytes of memory. Each process on 64-bit Windows has a virtual address space of 8 terabytes. All threads of a process can access its virtual address space. However, threads cannot access memory that belongs to another process, which protects a process from being corrupted by another process. In COM, many, if not most, interface methods are called by code written by one programming organization and implemented by code written by another. Many of the parameters and return values of these functions are of types that can be passed around by value. Sometimes, however, it is necessary to pass data structures for which this is not the case, so it is necessary for both caller and called to have a compatible allocation and deallocation policy. COM defines a universal convention for memory allocation, because it is more reasonable than defining case-by-case rules and so that the COM remote procedure call implementation can correctly manage memory.

The methods of a COM interface always provide memory management of pointers to the interface by calling the [AddRef](https://msdn.microsoft.com/en-us/library/ms691379(v=VS.85).aspx) and [Release](https://msdn.microsoft.com/en-us/library/ms682317(v=VS.85).aspx) functions found in the [IUnknown](https://docs.microsoft.com/en-us/windows/desktop/api/Unknwn/nn-unknwn-iunknown) interface, from which all other COM interfaces derive. (See [Rules for Managing Reference Counts](https://docs.microsoft.com/en-us/windows/desktop/com/rules-for-managing-reference-counts) for more information.)

This section describes only how to allocate memory for parameters that are not passed by value — not pointers to interfaces, but more mundane things like strings, pointers to structures, and so forth.

**Virtual Address Space:** The virtual address space for a process is the set of virtual memory addresses that it can use. The address space for each process is private and cannot be accessed by other processes unless it is shared.

A virtual address does not represent the actual physical location of an object in memory; instead, the system maintains a *page table* for each process, which is an internal data structure used to translate virtual addresses into their corresponding physical addresses. Each time a thread references an address, the system translates the virtual address to a physical address.

The virtual address space for 32-bit Windows is 4 gigabytes (GB) in size and divided into two partitions: one for use by the process and the other reserved for use by the system. For more information about the virtual address space in 64-bit Windows, see [Virtual Address Space in 64-bit Windows](https://msdn.microsoft.com/en-us/library/Aa384271(v=VS.85).aspx).

**Memory Pools:** The memory manager creates the following memory pools that the system uses to allocate memory: nonpaged pool and paged pool. Both memory pools are located in the region of the address space that is reserved for the system and mapped into the virtual address space of each process. The nonpaged pool consists of virtual memory addresses that are guaranteed to reside in physical memory as long as the corresponding kernel objects are allocated. The paged pool consists of virtual memory that can be paged in and out of the system. To improve performance, systems with a single processor have three paged pools, and multiprocessor systems have five paged pools.

The handles for [kernel objects](https://msdn.microsoft.com/en-us/library/ms724485(v=VS.85).aspx) are stored in the paged pool, so the number of handles you can create is based on available memory.

The system records the limits and current values for its nonpaged pool, paged pool, and page file usage. For more information, see [Memory Performance Information](https://docs.microsoft.com/en-us/windows/desktop/memory/memory-performance-information).

Topic D – Process / Task Scheduling and Management (System Startup)

**Task Scheduling:**

The Task Scheduler is a tool included with [Windows](https://www.computerhope.com/jargon/w/windows.htm) that allows predefined actions to be automatically executed whenever a certain set of conditions is met. For example, you can schedule a task to run a backup script every night, or send you an email whenever a certain [system event](https://www.computerhope.com/jargon/e/event.htm) occurs. The picture below is an example of what the Task Scheduler looks like in Microsoft Windows 7.

The following Task Scheduler changes are introduced in Windows 10:

* When battery saver is on, Windows Task Scheduler tasks are triggered only if the task is:
  + Not set to Start the task only if the computer is idle... (task doesn't use [IdleSettings](https://docs.microsoft.com/en-us/windows/desktop/api/taskschd/nf-taskschd-itasksettings-get_idlesettings))
  + Not set to run during automatic maintenance (task doesn't use [MaintenanceSettings](https://docs.microsoft.com/en-us/windows/desktop/api/Taskschd/nf-taskschd-itasksettings3-get_maintenancesettings))
  + Is set to Run only when user is logged on (task [LogonType](https://docs.microsoft.com/en-us/windows/desktop/api/taskschd/nf-taskschd-iprincipal-get_logontype) is TASK\_LOGON\_INTERACTIVE\_TOKEN or TASK\_LOGON\_GROUP)
* All other triggers are delayed until battery saver is off. For more information about accessing battery saver status in your application, see [SYSTEM\_POWER\_STATUS](https://msdn.microsoft.com/library/windows/desktop/aa373232).

**Updates:**

Windows Update is a free Microsoft service that's used to provide updates like service packs and patches for the Windows operating system and other Microsoft software. Windows Update can also be used to update drivers for popular hardware devices.

Windows Update is a [Microsoft Service](https://en.wikipedia.org/wiki/Microsoft) for the [Windows 9x](https://en.wikipedia.org/wiki/Windows_9x) and [Windows NT](https://en.wikipedia.org/wiki/Windows_NT) families of operating system, which automates downloading and installing [Microsoft Windows](https://en.wikipedia.org/wiki/Microsoft_Windows) [software updates](https://en.wikipedia.org/wiki/Software_update) over the [Internet](https://en.wikipedia.org/wiki/Internet). The service delivers software updates for Windows, as well as the various Microsoft [antivirus products](https://en.wikipedia.org/wiki/Antivirus_software), including [Windows Defender](https://en.wikipedia.org/wiki/Windows_Defender) and [Microsoft Security Essentials](https://en.wikipedia.org/wiki/Microsoft_Security_Essentials). Since its inception, Microsoft has introduced two extensions of the service: Microsoft Update and Windows Update for Business. The former expands the core service to include other Microsoft products, such as [Microsoft Office](https://en.wikipedia.org/wiki/Microsoft_Office) and [Microsoft Expression Studio](https://en.wikipedia.org/wiki/Microsoft_Expression_Studio). The latter is available to business editions of [Windows 10](https://en.wikipedia.org/wiki/Windows_10) and permits postponing updates or receiving updates only after they have undergone rigorous testing.

As the service has evolved over the years, so have its client software. For a decade, the primary client component of the service was the Windows Update [web app](https://en.wikipedia.org/wiki/Web_app) that could only be run inside [Internet Explorer](https://en.wikipedia.org/wiki/Internet_Explorer). Starting with [Windows Vista](https://en.wikipedia.org/wiki/Windows_Vista), the primary client component became Windows Update Agent, an integral component of the operating system.

The service provides several kinds of updates. *Security updates* or *critical updates*mitigate vulnerabilities against [security exploits](https://en.wikipedia.org/wiki/Exploit_(computer_security)) against Microsoft Windows. *Cumulative updates* are updates that bundle previously released updates. Cumulative updates were introduced with [Windows 10](https://en.wikipedia.org/wiki/Windows_10) and have been backported to [Windows 7](https://en.wikipedia.org/wiki/Windows_7) and [Windows 8.1](https://en.wikipedia.org/wiki/Windows_8.1).

Microsoft routinely releases updates on the second Tuesday of each month (known as the [Patch Tuesday](https://en.wikipedia.org/wiki/Patch_Tuesday)), but can provide them whenever a new update is urgently required to prevent a newly discovered or prevalent exploit. System administrators can configure Windows Update to install critical updates for Microsoft Windows automatically, so long as the computer has an Internet connection.

Topic E – Software Security, Updates & System Tools

## **1. Windows Defender Smart Screen**

The Windows Defender Smart Screen can "block at first sight," according to Microsoft. It helps protect employees if they try to visit sites previously reported as containing phishing or malware, and to stop them from downloading potentially malicious files. It can also help protect against fake advertisements, scam sites, and drive-by attacks.

"This is one of multiple layers of defense in anti-phishing and malware protection strategies," Benoit said.

## **2. Windows Defender Application Guard**

Application Guard offers protection against advanced, targeted threats launched against Microsoft Edge using Microsoft's Hyper-V virtualization technology. The functionality works with whitelisting: Users can designate trusted sites to browse freely. If a site is not trusted, Application Guard will open it in a container, completely blocking access to memory, local storage, other installed applications, corporate network endpoints, or any other resources of interest to the attacker.

## **3. User Account Control**

User Account Control (UAC) protects users by preventing malware from damaging a machine, and helps organizations deploy a better-managed desktop. When this feature is enabled, apps and tasks always run in the security context of a non-administrator account, unless an administrator specifically authorizes administrator-level access to the system. It can also block the automatic installation of unauthorized apps, and prevent accidental changes to system settings.

Each app that requires the administrator access token must prompt for consent. The one exception is the relationship that exists between parent and child processes. Child processes inherit the user's access token from the parent process. Both the parent and child processes, however, must have the same integrity level. Windows 10 protects processes by marking their integrity levels. Integrity levels are measurements of trust. A "high" integrity application is one that performs tasks that modify system data, such as a disk partitioning application, while a "low" integrity application is one that performs tasks that could potentially compromise the operating system, such as a Web browser. Apps with lower integrity levels cannot modify data in applications with higher integrity levels. When a standard user attempts to run an app that requires an administrator access token, UAC requires that the user provide valid administrator credentials.

## **4. Windows Defender Device Guard**

Defender Device Guard involves driver and application whitelisting, Benoit said. The feature changes from a mode where apps are trusted unless blocked by an antivirus solution, to a mode where the OS trusts only apps authorized by an enterprise. It operates on two components: The first, kernel mode code integrity (KMCI) protects kernel mode processes and drivers from zero-day attacks and other vulnerabilities by using HVCI. The second, user mode code integrity (UMCI) is enterprise-grade application whitelisting that achieves PC lockdown for enterprises using only trusted apps.

## **5. Windows Defender Exploit Guard**

Defender Exploit guard includes exploit protection, attack surface reduction rules, network protection, and controlled folder access. It also provides legacy app protection including arbitrary code guard, blocking low-integrity images, blocking untrusted fonts, and exporting address filtering.

"This helps you audit, configure, and manage Windows systems and application exploit mitigations," Benoit said. "It also delivers a new class of capabilities for intrusion prevention."

## **6. Microsoft Bitlocker**

Bitlocker is a full-drive encryption solution provided natively within Windows 10 Professional and Enterprise, Benoit said. It helps mitigate unauthorized data access by enhancing file and system protections, and renders data inaccessible if the computers are decommissioned or recycled.

"This is so important—you don't want to be the guy who got blamed after the CEO's device was lost or stolen and all the data was found on the world wide web," he added.

## **7. Windows Defender Credential Guard**

Defender Credential Guard uses virtualization-based security to isolate secrets, so that only privileged system software can access them—protecting from credential theft attacks. Enabling this feature offers hardware security and better protection against advanced persistent threats.

The overall best security practice? "Educate your users," Benoit said. "They are the ones who click on the things and execute the files. It's the toughest thing to do, but in the very end that's the thing you have to do."

**Updates:**

Windows Update is a free Microsoft service that's used to provide updates like service packs and patches for the Windows operating system and other Microsoft software. Windows Update can also be used to update drivers for popular hardware devices.

**System Tools:**

System tools are computer programs that can be used for implementing different tasks. People download them to the system with specific intentions, such as trying to accomplish needed tasks, seeking to improve its performance and security, getting a better experience while browsing on the Internet or simply fixing specific PC errors. The most of such programs belong to reputable companies, so they are safe and easy-to-use. You can uninstall a system tool from your computer using its uninstall feature.

System tools can be divided into two different categories – legitimate and malicious. Security experts warn people about malicious system tools because they can act on your computer similarly to computer viruses and malware. No matter what is said on such program’s official website, it can start causing unexpected activities right after being installed on a computer. Typically, the questionable versions of system tools cause system slow downs, misleading system scanners, unwanted notifications and pop-up ads, redirects to unknown websites and similar activities. Such system tools can be assigned to “potentially unwanted program” category and should be uninstalled from computer ASAP.

It should be noted that you can find a misleading system tool on your computer without downloading it because such programs have been actively spread in a bundle with other (mostly legitimate) applications. Here, they are presented as optional components that can be noticed if only the user monitors installation of such program. Also, the most of such questionable system tools cannot be uninstalled from your computer in a traditional way because they tend to use specific techniques for hiding themselves from their users. In this case, a reputable anti-spyware is recommended.

Topic F – File System & User Accounts

**User Accounts how are they used?**

The system account and the administrator account (Administrators group) have the same file privileges, but they have different functions. The system account is used by the operating system and by services that run under Windows. There are many services and processes within Windows that need the capability to log on internally (for example during a Windows installation). The system account was designed for that purpose; it is an internal account, does not show up in User Manager, cannot be added to any groups, and cannot have user rights assigned to it. On the other hand, the system account does show up on an NTFS volume in File Manager in the Permissions portion of the Security menu. By default, the system account is granted full control to all files on an NTFS volume. Here the system account has the same functional privileges as the administrator account.

**New Data Recovery**

From a data recovery perspective, however, nothing much has changed from the previous operating systems. Windows 10 uses the default file system NTFS, as does Windows 8 and 8.1. Although a complete change to the new ReFS file system was rumored by professionals in recent months, the last technical build released by Microsoft resulted in no dramatic changes and Windows 10 continuing to use NTFS as the standard file system.

As with Windows 8.1, ReFS is only used in one place of the operating system: the so-called “Storage Space.” This technique allows multiple physical disks to combine into one logical drive. This concept has been transmitted from server technology to the desktop computer. Simply put, you can combine multiple existing hard drives of a computer to a connected storage pool. All hard drives connected in Storage Space are using the new file system, ReFS.

In the case of a data recovery, it all depends on what precisely failed on a Windows 10 computer and which data structures are affected. If it is a standard installation, the data recovery engineers have to work with, among other things, the NTFS structures. With a failed Windows 10 operating system with Storage Space enabled, they have to work with ReFS sometimes including NTFS file systems.

But no matter what file system – both require the detailed experience and know-how in restoring files or complete systems provided by a professional data recovery service Also with Windows 10, the rule is: Users should not attempt to restore data by themselves when the system goes on strike. The wrong technique could cause irreparable damage to existing data. One should contact a professional data recovery service provider such as Kroll Ontrack.

Topic G – Special Features of your OS

## **New Start Menu**

Microsoft has brought back the Start Menu. Now, when you click on the Start button at the bottom left of the screen, you get two panels side by side, with the left column showing pinned, recently and most-used apps.

You also get a power button at the top for options such as Hibernate, Standby and Shutdown, while the right column features a selection of live tiles that you can customize, resize and reorganize. Plus, you can have the Start Menu expand to full screen whenever you want, eliminating the need for a Modern UI Start Screen.

## **2. Cortana Integration**

Windows 10 will bring Microsoft’s voice-controlled digital assistant Cortana to desktop computers, to make it easier for you to interact with your device without lifting a finger. You will be able to search your hard drive for specific files, pull up photos from specific dates, or launch PowerPoint presentations just by telling your PC to do so. You can even get Cortana to send an email while you’re working on a spreadsheet, making multi-tasking much easier.

## **3. Microsoft Edge Web Browser**

Internet Explorer was replaced by Microsoft Edge, which features a new rendering engine called EdgeHTML. Edge also integrates with the Cortana Digital Assistant to provide voice control, search, and personalized info to users.

Users can also use Edge to annotate web pages, and these annotations are stored on OneDrive and can be used with other users. There is also a “Reading List” function that syncs content between devices and a “Reading Mode” that strips out formatting to allow easier reading on devices. Many of the alterations have been made to keep Edge more in line with rival browsers, such as Chrome and Firefox.

## **4. Virtual Desktops**

Unless you have a multi-monitor setup it can be easy to run out of screen space. For that reason, Windows 10 provides multiple desktops that you can work in and quickly switch between. The virtual desktops feature in Windows 10 is called “Task View” and is located on the Taskbar. To add a new desktop, all you need to do is click the Plus sign. You create multiple desktops, and switching between them is just a matter of clicking the Task View button again and moving your mouse over the thumbnail of the one you want. Once the workspace is displayed above, click on it (or click the Task View button again) to start using it.

With virtual desktops, Windows 10 lets you create multiple, separate desktops that each can display different open windows and apps. A simple use for this might be keeping work separate from personal stuff. You could also put all the items that relate to a specific task on one desktop, so that you can better focus on that task. While macOS and Linux have featured virtual desktops for a while—and there have been third-party apps that provided them for Windows—virtual desktops are now built into Windows 10.

## **5. Universal Apps**

To make the transition across devices more seamless, Microsoft is introducing a new category of software called Universal Apps, which use the same code but adapt their interface to the device in your hand. Microsoft is also bundling its own set of Universal apps with the OS, including Photos, Videos, Music, Maps, People & Messaging and Mail & Calendar, which all function the same way on tablets, phones and PCs. The content is stored and synced via Microsoft’s cloud service OneDrive so you can pick up where you left off on another device.

Universal Windows Platforms (UWP) apps[[1]](https://en.m.wikipedia.org/wiki/Universal_Windows_Platform_apps#cite_note-1) (formerly Windows Store apps and Metro-style apps)[[2]](https://en.m.wikipedia.org/wiki/Universal_Windows_Platform_apps#cite_note-Harrel-2) are programs that can be used across all compatible [Microsoft Windows](https://en.m.wikipedia.org/wiki/Microsoft_Windows) devices, including personal computers (PCs), tablets, smartphones, [Xbox One](https://en.m.wikipedia.org/wiki/Xbox_One), [Microsoft HoloLens](https://en.m.wikipedia.org/wiki/Microsoft_HoloLens), and [Internet of Things](https://en.m.wikipedia.org/wiki/Internet_of_Things). UWP software is primarily purchased and downloaded via the [Microsoft Store](https://en.m.wikipedia.org/wiki/Microsoft_Store_(digital)).[[3]](https://en.m.wikipedia.org/wiki/Universal_Windows_Platform_apps#cite_note-3)

Topic H – Limitations of your OS

For over a year we’ve been treated to the fantasy that Windows 10 on ARM was the same as Windows 10 on x86. But it’s a bit more nuanced than that.

Granted, we’ve known some of the differences from the beginning, and we’ve vaguely understood that there would be trade-offs for those moving to this new hardware platform. In particular, the performance of x86 apps, which would need to be emulated.

This week, however, [**Microsoft finally published a more complete list of the limitations of Windows 10 on ARM**](https://docs.microsoft.com/en-us/windows/uwp/porting/apps-on-arm-limitations). And that word—limitations—is interesting. This isn’t how Windows 10 on ARM *differs* from Windows 10 on x86-based systems. It’s how it’s more limited.

And while we absolutely knew about some of these, the items on this list include.

**64-bit apps will not work.** Yes, Windows 10 on ARM can run Windows desktop applications. But it can only run 32-bit (x86) desktop applications, not 64-bit (x64) applications. (The documentation doesn’t note this, but support for x64 apps is planned for a future release.)

**Certain classes of apps will not run.** Utilities that modify the Windows user interface—like shell extensions, input method editors (IMEs), assistive technologies, and cloud storage apps—will not work in Windows 10 on ARM. They will need to be recompiled for ARM, and my guess is that this will not happen in most cases, especially in the next year.

**It cannot use x86 drivers.** While Windows 10 on ARM can run x86 Windows applications, it cannot utilize x86 drivers. Instead, it will require native ARM64 drivers instead. This means that hardware support will be much more limited than is the case with mainstream Windows 10 versions. In other words, it will likely work much like Windows 10 S does today.

**No Hyper-V.** This was a gray area previously—I’ve heard the phrase “it’s just Windows 10, so it will work” several times—but now it’s real: Hyper-V is not supported in Windows 10 on ARM.

**Older games and graphics apps may not work.** Windows 10 on ARM supports DirectX 9, DirectX 10, DirectX 11, and DirectX 12, but apps/games that target older versions will not work. Apps that require hardware-accelerated OpenGL will also not work.

Windows 10 can not upgrade oldest windows versions such as Windows 2000, windows 2001 etc, there is more cost for new PCs with Windows 10, There is no update in Windows media player, It is the same as it was earlier.

Touch-friendly features have been removed from Windows 10, You can no longer close apps by swiping them down from top to bottom, Many [tablet users](https://www.online-sciences.com/technology/the-importance-and-uses-of-tablets-in-education/) are going to face some difficulties in case of the touch control of the operating system.

You can not resize windows using the handle-bars which were present in most of the previous versions of Windows, Grabbing edges of the windows is very difficult if you are using a pen, Windows 10 has removed the functionality to change the volume level using the scroll button present in the taskbar.

If you get fed up with testing Windows 10 and want to revert the PC to the OS you were running before, It won’t be easy, The previous [Windows OS will](https://www.online-sciences.com/computer/microsoft-windows-advantages-and-disadvantages/) have to be reinstalled from the recovery or installation disk—typically a DVD—that came with the PC.

Installing Windows 10 Technical Preview disables the PC’s ability to play DVDs using [Windows Media Player](https://www.online-sciences.com/computer/windows-media-player-features-advantages-and-disadvantages/), and it removes Windows Media Center from PCs running Windows 8 Pro with Media Center.

**Level 2 – Organized Research**

Organize your rough research information to provide more structure and meaning.

· Re-read your rough research to identify (highlight) important sub-topics and facts

· Rearrange (cut–and-paste) your rough research so that related sub topics and facts are next to each other.

· Your finished organization should look like the template provided below.

· Upload your rough research notes to your repository when you are done.

Suggested organization template:

· Topic A – Productivity, Entertainment & Other Software Applications

o Sub-Topic 1

§ Fact 1

§ Fact 2

§ …

o Sub-Topic 2

§ …

o …

· Topic B – User Interface (Window Management & Input Devices)

o …

**Level 3 – Concept Map**

Create a “concept map” as a final report of your organized research.

Use the PowerPoint template provided as a starting point.

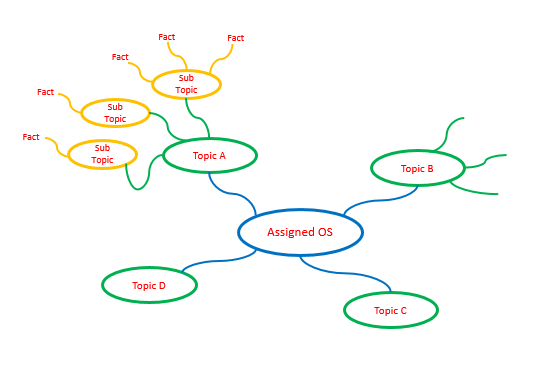
You can use PowerPoint or another concept mapping tool of your choice.

Select the best and most interesting information from your organized research.

Summarize and edit your information to fit on the concept map.

Share your finished concept map with Mr. Nestor at p0079141@pdsb.net

A concept map can be created using the “Smart Ideas” application or PowerPoint or other applications. A concept map template can be downloaded from the “Topic A” folder on the class GitHub repository



Works Cited

<https://www.networkworld.com/article/2907927/inside-windows-10-sneak-peek-at-the-default-apps.html>

<https://www.tutorialspoint.com/windows10/windows10_gui_basics.htm>

<https://docs.microsoft.com/en-us/windows/desktop/memory/virtual-address-space>

<https://docs.microsoft.com/en-us/windows/desktop/memory/about-memory-management>

<https://docs.microsoft.com/en-us/windows/desktop/windows-application-ui-development>

<https://www.techrepublic.com/article/7-windows-10-security-features-that-could-help-prevent-cyberattacks-against-your-business/>

<https://docs.microsoft.com/en-us/windows/security/threat-protection/overview-of-threat-mitigations-in-windows-10#threat-landscape>

<https://www.lifewire.com/what-is-windows-update-2624597>

<https://support.microsoft.com/en-ca/help/120929/how-the-system-account-is-used-in-windows>

<https://en.wikipedia.org/wiki/Microsoft_Store_(digital)>

<https://www.makeuseof.com/tag/10-things-didnt-know-windows-10-photos-app/>

<https://en.wikipedia.org/wiki/Windows_Update>

<https://www.online-sciences.com/technology/windows-10-advantages-and-disadvantages/>