**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

<https://www.networkworld.com/article/2907927/inside-windows-10-sneak-peek-at-the-default-apps.html#slide6>

**Alarms and 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 looks 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 plainer 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 is available are three “games”: This actual tool 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.

**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.

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

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

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.

After choosing a picture, the Background will change automatically.

Topic C – Memory Allocation, Management,& Devices

<https://www.geeksinphoenix.com/blog/post/2016/05/10/how-to-manage-windows-10-virtual-memory.aspx>

Your computer has *two* types of memory, Random Access Memory (*RAM*) and Virtual Memory. All programs use RAM, but when there isn't enough RAM for the program you're trying to run, Windows temporarily moves information that would normally be stored in RAM to a file on your hard disk called a Paging File. The amount of information temporarily stored in a paging file is also referred to as virtual memory. Using virtual memory, in other words, moving information to and from the paging file, frees up enough RAM for programs to run correctly.

The more RAM your computer has, the faster your programs will generally run. If a lack of RAM is slowing your computer, you might be tempted to increase virtual memory to compensate. However, your computer can read data from RAM much more quickly than from a hard disk, so adding RAM is a better solution

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

<https://www.lifewire.com/how-to-access-advanced-startup-options-in-windows-10-or-8-2626229>

The [Advanced Startup Options](https://www.lifewire.com/advanced-startup-options-2625805) menu, available in [Windows 10](https://www.lifewire.com/windows-10-2626217) and [Windows 8](https://www.lifewire.com/windows-8-2626235), is the central fix-it location for the entire [operating system](https://www.lifewire.com/operating-systems-2625912).

From here you can access [Windows](https://www.lifewire.com/brief-history-of-microsoft-windows-3507078) diagnostic and repair tools like [Reset This PC](https://www.lifewire.com/reset-this-pc-2626216), [System Restore](https://www.lifewire.com/what-is-system-restore-2626022), [Command Prompt](https://www.lifewire.com/command-prompt-2625840), Startup Repair, and much more.

Advanced Startup Options is also where you access [Startup Settings](https://www.lifewire.com/startup-settings-2618141), the menu that includes [Safe Mode](https://www.lifewire.com/safe-mode-2626018), among other startup methods that could help you access Windows 10 or Windows 8 if it is having problems starting. In other words, Advanced Startup Options functions as the Windows 8 or Windows 10 boot menu.

The Advanced Startup Options menu should appear automatically after two consecutive startup errors. However, if you need to open it manually, there are six different ways to do so.

The best way to decide which method to use to open Advanced Startup Options is to base your decision on what level of access you have to Windows right now:

If Windows 10/8 starts normally: Use any method, but 1, 2, or 3 will be easiest.

If Windows 10/8 does not start: Use method 4, 5, or 6. Method 1 will also work if you can at least get to the Windows 10 or Windows 8 logon screen.

Time Required: Accessing Advanced Startup Options is easy and can take anywhere from a few seconds to a few minutes, depending on which method you use.

Method 1: SHIFT + Restart

This is by far the easiest way to get this done. Just hold down either SHIFT key while selecting Restart, available from any Power icon.

device to open the Advanced Startup Options menu this way.

Method 2: Settings Menu

* In Windows 10, select the Start button, and then choose the settings button followed by Update & Security.
* In Windows 8, Swipe from the right to open the [charms bar](https://www.lifewire.com/using-windows-8-charms-bar-3506970). Select Change PC settings. Choose Update and recovery from the list on the left (or General prior to Windows 8.1).
* Choose Recovery from the list of options on the left.
* Locate Advanced startup, at the bottom of the list of options on your right.
* Select Restart now.
* Wait through the Please wait message until Advanced Startup Options opens.

Method 3: Shutdown Command

* [Open Command Prompt in Windows 10 or Windows 8](https://www.lifewire.com/how-to-open-command-prompt-2618089).
* Another option is to open Run if you can't get Command Prompt started for some reason, probably related to the issue you're having that has you here in the first place!
* Save any open [files](https://www.lifewire.com/what-is-a-file-2625878) before continuing or you'll lose any changes you've made since your last save.
* Execute the [shutdown command](https://www.lifewire.com/shutdown-command-2618100) in the following way:

Select Close to the You're about to be signed off message that appears a few seconds later.

* After several seconds, during which nothing seems to be happening, Windows 10/8 will then close and you'll see a Please wait message.
* Wait just a few seconds more until the Advanced Startup Options menu opens.

Method 4: Boot From Your Windows 10/8 Installation Media

* Insert into your computer a Windows 10 or Windows 8 DVD or a [flash drive](https://www.lifewire.com/what-is-a-flash-drive-2625794) with the Windows installation files on it.
* [Boot from the disc](https://www.lifewire.com/how-to-boot-from-a-cd-dvd-or-bd-disc-2626090) or [boot from the USB device](https://www.lifewire.com/how-to-boot-from-a-usb-device-2626091), whatever your situation calls for.
* Select Next from the Windows Setup screen.
* Choose Repair your computer at the bottom of the window.
* Advanced Startup Options will start, almost immediately.

Method 5: Boot From a Windows 10/8 Recovery Drive

* Insert your Windows 10 or Windows 8 Recovery Drive into a free [USB](https://www.lifewire.com/universal-serial-bus-usb-2626039) port.
* [Boot your computer from the flash drive](https://www.lifewire.com/how-to-boot-from-a-usb-device-2626091).
* On the Choose your keyboard layout screen, select U.S. or whatever keyboard layout you'd like to use.
* Advanced Startup Options will begin instantly.

Method 6: Boot Directly to Advanced Startup Options

* Start or [restart your computer or device](https://www.lifewire.com/how-to-restart-anything-2624571).
* Choose the [boot](https://www.lifewire.com/what-does-booting-mean-2625799) option for System Recovery, Advanced Startup, Recovery, etc.
* On some Windows 10 and Windows 8 computers, for example, pressing F11 starts System Recovery.
* What this boot option is called is configurable by your [hardware](https://www.lifewire.com/computer-hardware-2625895) maker, so the options mentioned here are just some that we've seen or heard. Whatever the name, it should be clear that what you're about to do is a boot to the advanced recovery features included in Windows.
* Wait for Advanced Startup Options to begin.

What About F8 and SHIFT+F8?

Neither F8 nor SHIFT+F8 is a reliable option for booting to the Advanced Startup Options menu. See [How to Start Windows 10 or Windows 8 in Safe Mode](https://www.lifewire.com/start-windows-8-or-8-1-in-safe-mode-2626256) for more on this.

If you need to access Advanced Startup Options, you can do so with any of the several methods listed above.

How to Exit Advanced Startup Options

Whenever you're finished using the Advanced Startup Options menu, you can choose Continue to restart your computer. Assuming it's working properly now, this will boot you back into Windows 10/8.

Your other option is Turn off your PC, which will do just that.

Topic E – Software Security, Updates & System Tools

## **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.

**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.

## **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.

## **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.

## **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."

## **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.

## **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

<https://docs.microsoft.com/en-us/windows/security/identity-protection/access-control/local-accounts>

**Default local user accounts**

The default local user accounts are built-in accounts that are created automatically when you install Windows.

After Windows is installed, the default local user accounts cannot be removed or deleted. In addition, default local user accounts do not provide access to network resources.

Default local user accounts are used to manage access to the local server’s resources based on the rights and permissions that are assigned to the account. The default local user accounts, and the local user accounts that you create, are located in the Users folder. The Users folder is located in the Local Users and Groups folder in the local Computer Management Microsoft Management Console (MMC). Computer Management is a collection of administrative tools that you can use to manage a single local or remote computer. For more information, see [How to manage local accounts](https://docs.microsoft.com/en-us/windows/security/identity-protection/access-control/local-accounts#sec-manage-accounts) later in this topic.

Default local user accounts are described in the following sections.

### **Administrator account**

The default local Administrator account is a user account for the system administrator. Every computer has an Administrator account (SID S-1-5-*domain*-500, display name Administrator). The Administrator account is the first account that is created during the Windows installation.

The Administrator account has full control of the files, directories, services, and other resources on the local computer. The Administrator account can create other local users, assign user rights, and assign permissions. The Administrator account can take control of local resources at any time simply by changing the user rights and permissions.

The default Administrator account cannot be deleted or locked out, but it can be renamed or disabled.

In Windows 10 and Windows Server 20016, Windows setup disables the built-in Administrator account and creates another local account that is a member of the Administrators group. Members of the Administrators groups can run apps with elevated permissions without using the Run as Administrator option. Fast User Switching is more secure than using Runas or different-user elevation.

Account group membership

By default, the Administrator account is installed as a member of the Administrators group on the server. It is a best practice to limit the number of users in the Administrators group because members of the Administrators group on a local server have Full Control permissions on that computer.

The Administrator account cannot be deleted or removed from the Administrators group, but it can be renamed.

Security considerations

Because the Administrator account is known to exist on many versions of the Windows operating system, it is a best practice to disable the Administrator account when possible to make it more difficult for malicious users to gain access to the server or client computer.

You can rename the Administrator account. However, a renamed Administrator account continues to use the same automatically assigned security identifier (SID), which can be discovered by malicious users. For more information about how to rename or disable a user account, see [Disable or activate a local user account](https://technet.microsoft.com/library/cc732112.aspx) and [Rename a local user account](https://technet.microsoft.com/library/cc725595.aspx).

As a security best practice, use your local (non-Administrator) account to sign in and then use Run as administrator to accomplish tasks that require a higher level of rights than a standard user account. Do not use the Administrator account to sign in to your computer unless it is entirely necessary. For more information, see [Run a program with administrative credentials](https://technet.microsoft.com/library/cc732200.aspx).

In comparison, on the Windows client operating system, a user with a local user account that has Administrator rights is considered the system administrator of the client computer. The first local user account that is created during installation is placed in the local Administrators group. However, when multiple users run as local administrators, the IT staff has no control over these users or their client computers.

In this case, Group Policy can be used to enable secure settings that can control the use of the local Administrators group automatically on every server or client computer. For more information about Group Policy, see [Group Policy Overview](https://technet.microsoft.com/library/hh831791.aspx).

Note

Blank passwords are not allowed in the versions designated in the Applies To list at the beginning of this topic.

Important

Even when the Administrator account has been disabled, it can still be used to gain access to a computer by using safe mode. In the Recovery Console or in safe mode, the Administrator account is automatically enabled. When normal operations are resumed, it is disabled.

### **Guest account**

The Guest account is disabled by default on installation. The Guest account lets occasional or one-time users, who do not have an account on the computer, temporarily sign in to the local server or client computer with limited user rights. By default, the Guest account has a blank password. Because the Guest account can provide anonymous access, it is a security risk. For this reason, it is a best practice to leave the Guest account disabled, unless its use is entirely necessary.

Account group membership

By default, the Guest account is the only member of the default Guests group (SID S-1-5-32-546), which lets a user sign in to a server. On occasion, an administrator who is a member of the Administrators group can set up a user with a Guest account on one or more computers.

Security considerations

When enabling the Guest account, only grant limited rights and permissions. For security reasons, the Guest account should not be used over the network and made accessible to other computers.

In addition, the guest user in the Guest account should not be able to view the event logs. After the Guest account is enabled, it is a best practice to monitor the Guest account frequently to ensure that other users cannot use services and other resources, such as resources that were unintentionally left available by a previous user.

### **DefaultAccount**

The DefaultAccount, also known as the Default System Managed Account (DSMA), is a built-in account introduced in Windows 10 version 1607 and Windows Server 2016. The DMSA is a well-known user account type. It is a user neutral account that can be used to run processes that are either multi-user aware or user-agnostic. The DMSA is disabled by default on the desktop SKUs (full windows SKUs) and WS 2016 with the Desktop.

The DMSA has a well-known RID of 503. The security identifier (SID) of the DMSA will thus have a well-known SID in the following format: S-1-5-21--503

The DMSA is a member of the well-known group System Managed Accounts Group, which has a well-known SID of S-1-5-32-581.

The DMSA alias can be granted access to resources during offline staging even before the account itself has been created. The account and the group are created during first boot of the machine within the Security Accounts Manager (SAM).

**Default local system accounts**

### **SYSTEM**

The SYSTEM account is used by the operating system and by services that run under Windows. There are many services and processes in the Windows operating system that need the capability to sign in internally, such as during a Windows installation. The SYSTEM account was designed for that purpose, and Windows manages the SYSTEM account’s user rights. It is an internal account that does not show up in User Manager, and it cannot be added to any groups.

On the other hand, the SYSTEM account does appear on an NTFS file system volume in File Manager in the Permissions portion of the Security menu. By default, the SYSTEM account is granted Full Control permissions to all files on an NTFS volume. Here the SYSTEM account has the same functional rights and permissions as the Administrator account.

Note

To grant the account Administrators group file permissions does not implicitly give permission to the SYSTEM account. The SYSTEM account's permissions can be removed from a file, but we do not recommend removing them.

### **NETWORK SERVICE**

The NETWORK SERVICE account is a predefined local account used by the service control manager (SCM). A service that runs in the context of the NETWORK SERVICE account presents the computer's credentials to remote servers. For more information, see [NetworkService Account](https://docs.microsoft.com/windows/desktop/services/networkservice-account).

### **LOCAL SERVICE**

The LOCAL SERVICE account is a predefined local account used by the service control manager. It has minimum privileges on the local computer and presents anonymous credentials on the network. For more information, see [LocalService Account](https://docs.microsoft.com/windows/desktop/services/localservice-account).

Topic G – Special Features of your OS

<https://www.laptopmag.com/articles/windows-10-top-features>

## **1. Start Menu Returns**

It's what Windows 8 detractors have been clamoring for, and Microsoft has finally 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, and an all apps option a la Windows 8. The right column features a selection of live tiles that you can customize, resize and reorganize. Not only that, but the search field at the bottom will look up related Internet results in addition to programs and files (as it did on Windows 7).

Even better, you can have the Start Menu expand to full screen whenever you want, eliminating the need for a Modern UI Start Screen.

## **2. Cortana on Desktop**

Being lazy just got a lot easier. 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. Xbox App**

You will soon be able to play any Xbox One game on your PC or tablet, with the [Xbox app for Windows 10](http://news.xbox.com/2015/01/xbox-one-phil-spencer-unveils-new-experiences-for-xbox-one-and-windows-10-gamers). The new operating system will support Xbox game streaming (through your home network), with improved speed and graphics performance thanks to DirectX 12 support. The app also lets you record, edit and share your fragging victories with the Game DVR feature, which lets you grab the previous 30 seconds of your game so you don't miss unexpected wins. You'll also be able to join your friends in games across Windows 10 or the Xbox platforms, and see your friends' activity via Xbox Live

## **4. Project Spartan Browser**

Forget Internet Explorer. The long-derided browser will be replaced by the newly announced Project Spartan. New features include PDF support, a reading mode that improves the layout of long articles, and a new note taking feature. The latter lets you scribble on any page and share your comments with your friends through social networks via a slide-in menu so you won't have to leave the browser. Better yet, Project Spartan will feature Cortana support within the browser, so she can pull contextual information from the sites you're on to do things like navigate to a restaurant you're looking up or pull up an upcoming flight time without having to go into your email.

## **5. Improved Multitasking**

A new Multiple Desktops feature lets you run another set of windows as if on another screen, but without the physical monitor. This is similar to Apple's [Spaces](http://support.apple.com/kb/PH14155) feature on OS X, and helps you manage your multitude of open windows and apps. Instead of having multiple windows open on top of each other on one desktop, you can set up a whole other virtual desktop for those programs to reside in. Set up one specifically for home and leave your apps such as Netflix and Amazon open, and create another desktop for work on which you keep Word, Excel and Internet Explorer open.

With the new desktops comes a new way to keep track of your open apps on Windows 10. On the new operating system, you can either hit the new Task View button on the task bar or swipe in from the left edge of the screen to pull up a one-page view of all your open apps and files. It's not much different from using the Alt-Tab combination shortcut on your keyboard, but this presents a convenient way for touch-oriented users to get an overview of what's running.

Microsoft also updated its Snap View multitasking feature to let you dock windows to the four corners of your screen. While you could split your display between apps before, the number of programs you could have side-by-side was limited by your device's screen resolution. The system will even suggest what other open apps you can use to fill up available space, a feature called Snap Assist.

## **6. 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. The company 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.

Some of these apps, such as Photos, are brand new. Photos will pull your images across your PC and mobile devices and organize, enhance and sync them through OneDrive. The system even detects duplicates and stores just one copy of the same image, and can automatically create good-looking albums for you. The Mail app has also been overhauled and will now be a version of Outlook, complete with an editor based on Microsoft Word.

## **7. Office Apps Get Touch Support**

A new version of Office apps Word, Excel, PowerPoint and Outlook will provide a touch-first interface across phones, tablets and PCs. The persistent function ribbon at the top of the apps is now an app bar that shows up only when you need it. In Outlook, you'll now be able to delete messages from your inbox by swiping each entry to the left. Swiping to the right flags that message. The apps will look and perform the same way on a PC as they do on a mobile device for a more coherent experience.

## **8. Continuum**

With the rise of hybrid laptop-tablet devices, Microsoft wants to make it easier to switch between either mode. The system will detect if you've plugged in a keyboard or mouse and switch modes for more convenient interaction. If you remove the keyboard/mouse, a notification will pop up from the task bar at the bottom, asking if you want to activate Tablet mode. When you do, you are greeted with the more touch-friendly profile. Dock your tablet into the keyboard again, and you'll receive the same prompt, this time asking if you want to exit Tablet mode.

**9. Action Center**

Windows 10 will provide a new way to look at all your notifications in one place. The Action Center appears to replace the Charms menu that slides in from the right on Windows 8 devices. It collects alerts from your device from all your apps, similar to the notifications drawers in iOS and Android. Depending on the app, you can also respond or react from this panel itself, with each notification expanding to show more actions. The Action Center also offers a quick way to toggle connectivity options and other settings such as display brightness and contrast.

## **10. Unified Settings / Control Panel**

Instead of having two apps to control your device settings in Control Panel and PC Settings, Microsoft is making things less confusing by bringing them together in one. You'll be able to manage your device from one place instead of hunting for a specific menu.

Topic H – Limitations of your OS

<https://www.thurrott.com/windows/windows-10/152501/microsoft-finally-documents-limitations-windows-10-arm>

**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.

That’s an interesting list and while it’s not completely damning, my months-long lackluster experiences with Windows 10 S suggest that the first year will be tough for many who do adopt this platform. As is so often the case with platform shifts, you’re best off sticking to new stuff and letting go of legacy, since much of the latter either won’t work, as noted here, or will run slowly.

Like many, I’m very interested in getting my hands on some ARM hardware to see what the experience is really like.

**Level 2 – Organized Research**

Organize your rough research information to provide more stricture 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:

1. Topic A – Productivity, Entertainment & Other Software Applications

<https://www.networkworld.com/article/2907927/inside-windows-10-sneak-peek-at-the-default-apps.html#slide6>

* Alarms and Clock
* Alarm, Timer, Stopwatch
* Alarms & Clock in windows 10
* Calculator
* Launch inside resizable window
* Standard, Scientific, Converter, and Programmer
* Calendar
* GUI is revamped and more accessible
* Integration with the mail app
* Camera
* Change resolution and frame rate for webcams
* Food and drink, Health and Fitness, Money, News, Sports, Travel, Weather
* 7 separate apps
* Show you updated information on their specific category
* Mail
* Integration with calendar app, with a new interface for linking the two
* Maps
* Rotate a map counterclockwise or clockwise
* View at an angle tilted toward the horizon
* 3d maps can enable buildings to be seen
* Regional maps can be downloaded to use offline
* Music
* Not preinstalled, and has to be gotten from the windows store
* Lacks links to buy music or stream
* Photos
* View images stored on your local drive or onedrive account.
* Improve image enhancement, face recognition and eye detection software
* Video
* Separate download, not preinstalled
* Plain GUI, and has a link to the store where there isn’t anything available yet
* Voice recorder
* Used to be sound recorder, and was renamed
* GUI has a lighter coloured theme
* Windows store
* Meant to be scrolled through vertically
* Better suited for a desktop, notebooks and tablets

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

* Taskbar
* Access to start menu, and other applications
* Easily see if an application is opened or closed
* Windows
* Maximize, minimize, or close the window
* Moved around or resized by clicking and dragging
* Desktop
* Background changes, and other personalization
* Icons and shortcuts available
* Icons
* Can be used to open programs or folders
* Graphic presentations of the process executed

1. Topic C – Memory Allocation, Management, & Devices

* Paging file
* Moves unused RAM files over to the hard disk
* Usually when there is not enough RAM for the current processes
* Amount of RAM
* More RAM can make your PC faster
* More available ram for the programs to store cache data to operate

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

* Advanced startup menu setup
* 6 different reliable methods for accessing advanced startup
* Access windows diagnostic repair and much more configuration settings
* Exiting advanced startup
* Choose continue and restart your computer for the changes to take effect

1. Topic E – Software Security, Updates & System Tools

* Windows Defender Smartscreen
* Block sites that were previously reported for malware
* Stop potential malware from being downloaded
* Protect against fake advertisements and scams
* Windows Defender Application Guard
* Helps defend microsoft edge from targeted threats
* Whitelisted sites will be allowed
* Non-whitelisted sites would be opened but blocked from accessing memory, files, or network resources
* User Account Control
* Apps and tasks run in the security context of a non-administrator account
* Administrator has to allow access for the installation of unauthorized apps
* Prevent accidental changes to the settings
* Windows Defender Device Guard
* Driver and application whitelisting
* Apps are only trusted by the apps set by the enterprise
* KMCI(Kernel Mode Code Integrity) protects kernel mode process and drivers from attacks and other vulnerabilities
* User Mode Code Integrity (UMCI) is whitelisting that achieved PC lockdown for using only enterprise trusted applications
* Windows Defender Exploit Guard
* Exploit protection, attack surface reduction rules, network protection, and controlled folder access
* Legacy app protection including arbitrary code guard, blocking low integrity images, untrusted fonts, and exporting address filtering
* Configure and manage windows systems and application exploit mitigations
* Microsoft Bitlocker
* Full drive encryption solution provided natively within windows 10 pro and enterprise
* Enhancing file and system protections, and renders data inaccessible if the computers are recycled
* Windows Defender Credential Guard
* Isolate secrets so only privileged system software can access them
* Better protection against advances system threats
* Updates
* Windows update is used to download updates for your PC
* Provide updates and service pack and patches
* Update drivers for popular hardware
* System Tools
* Seeking to improve performance and security
* Better experience or fixing problems on your computer
* Reputable companies usually distribute the tool needed for these tasks
* Malicious tools do exist, and can control your computer with unexpected activities.
* Pop up ads and unknown applications are signs that the program should be uninstalled immediately
* Programs can be tied into the installations of reputable softwares, and users are advised to either look through the installation procedure or get a reputable antivirus software installed

1. Topic F – File System & User Accounts

* Default local user accounts
* Automatically created when you start windows
* Cannot be removed or deleted
* Do not provide access to network resources
* Used to manage rights and permissions that are assigned to an account
* User accounts are located in the local Microsoft Management Console (MMC)
* Administrator account
* User account for the system administrator
* The first account created during windows installation
* Fullcontrol of files and directories on the local computer
* Can create other users and assign permissions
* Cannot be deleted or locked out, but can be renamed or disabled
* Administrators can run applications as administrator without the run as administrator option
* Group policy can be used to enable secure settings that control the use of administrator permissions
* Administrator accounts can be used to login when disabled
* In recovery console or safe mode, administrator is enabled, but once normal operations resumes, the account disables once again
* Guest account
* Disabled by default upon installation
* Lets users temporarily sign in to the local server or client computer with limited rights
* Blank password by default
* Administrators can set up guest accounts
* Guest account should be monitored by logs and made sure they have no access to other resources
* Default account
* Default System Managed Account (DSMA) is a built in account introduced in windows 10
* Can be used to run processes that are either multi user or user agnostic
* Can be granted access to resources while in offline staging even before the account has been created
* The account and group are created in the first boot of the PC in the Security Accounts Manager (SAM)
* Default local system accounts
* Used by the operating system and services that run under windows
* Many services and applications that need to sign in internally, especially during a windows installation
* The account manages the system account user’s rights, and is an internal account that does not show up on task manager
* Appears on the NTFS file system volume in file manager in the permissions portion of the security menu.
* Account is granted full control to all files
* Same rights as the administrator account
* Network service
* Predefined local accounts by the service control manager (SCM)
* Runs in the context of the network service account
* Presents the computer’s credentials to remote servers
* Local service
* Predefined local account used by the service control manager
* Minimum privileges on the local computer and presets anonymous credentials on the network

1. Topic G – Special Features of your OS

* Start menu
* Two panels showing different items
* Pineed, recent and most used apps
* Power options, and live apps that you can customize via tiles
* Search bar will look up related internet results
* Start menu can be expanded to full screen eliminating the need for a modern UI start screen
* Cortana
* Voice controlled digital assistant
* Search your drives, as well as the internet or launch applications
* Send an email while you’re working on something else
* Xbox app
* Play any x box game on your pc or tablet
* Support x box game streaming
* Improve graphics with directx 12 support
* Record the last 30 seconds of gameplay
* Cross platform joining as well as see activity
* Project spartan browser
* Pdf support
* Reading mode for long articles, and new note taking features
* Scribble on any page and share comments
* Cortana support to display information without opening emails or searching
* Improved multitasking
* Another windows desktop without the second monitor
* Separate programs open for each desktop window
* Task view button or swipe from left to right on touch devices
* Similar to the alt-tab combination
* Snap view for multitasking on one monitor, snap assist
* Universal apps
* New category for internal applications
* One use session of these applications will be stored on microsoft’s cloud, so it picks up where you left off
* Photos, and mail are a brand new application
* Office apps get touch support
* Get touch interfaces such as a ribbon, and delete messages by swiping to the left
* Look and perform the same way on tablets and PC
* Detect if you’ve plugged in a keyboard or mouse, and they will switch modes
* Tablet mode will present a more touch friendly profile, and plug in your mouse or keyboard to exit tablet mode by the prompt
* Action center
* All notifications come in one place
* Action center can also be used to toggle settings such as brightness and contrast
* Unified settings / control Panel
* Control panel is embedded in settings for all your customizations in one place

1. Topic H – Limitations of your OS

* 64-bit apps will not work
* Windows 10 ARM can only run 32 bit programs, and not 64 bit
* Certain classes of apps will not run
* Utilities of user interface and input method assistive technologies won’t work on ARM
* They will have to be recompiled in order to work
* It cannot use x86 drivers
* On windows ARM, it can run x86 applications, but not use their drivers
* They will require ARM64 drivers instead, and hardware would be limited
* No hyper-v
* hyper -v will not be supported on windows 10 ARM
* Older games and graphics apps may not work
* Supports DirectX9-12, and older versions will not work
* Will either not function of run slowly

**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](mailto: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

<https://www.mindomo.com/mindmap/fdee79bd97e44cc09bbc91b55bae6908>

<https://www.mindomo.com/mindmap/fdee79bd97e44cc09bbc91b55bae6908>

<https://www.mindomo.com/mindmap/fdee79bd97e44cc09bbc91b55bae6908>

<https://www.mindomo.com/mindmap/fdee79bd97e44cc09bbc91b55bae6908>

<https://www.mindomo.com/mindmap/fdee79bd97e44cc09bbc91b55bae6908>

If there are any problems accessing the concept map, please tell me so i can fix it asap

I made it so “anyone with the link can view”

