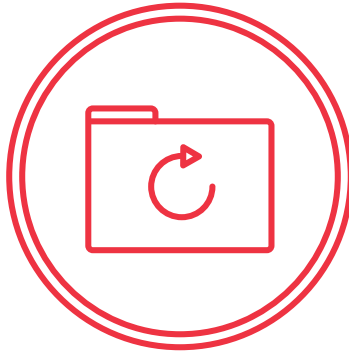


# Have a Backup



TRAINER RESOURCE

This document is a reference and preparation sheet for the trainer, and a companion to the lesson plan.

The Learning Objectives summarize the knowledge that learners should have gained by the time they reach the end of the module.

The Background and Detail for Trainer provides greater details on the content, and links to references. It will allow trainers to learn more about the topic so they can lead discussions or answer questions confidently without being limited to the classroom content. Each item in the Background supports a section in the Lesson Script.

## Learning objectives

- > An understanding of the importance of backing up and archiving
- > Ability to prepare a backup plan
- > Ability to set up automatic backups
- > Ability to restore from backup



## Background and Detail for Trainer

### 1 The importance of backing up

#### 1.1 In Brief

Backups are important. Copy (back up) your data frequently in case something happens to the original.

#### 1.2 In Detail

- There are two processes, archiving and backing up. Archiving moves a file to storage, backing up makes a copy of a file.
- The processes are more important than the storage medium. Ideally you will have a drive for back up and a drive for archive; they could be the same type of drive.
- A backup is a copy of the information stored on your computer, tablet or phone.
  - Make backups to avoid losing information in case something happens to your devices.
  - It is like photocopying important documents in case you lose the originals.
  - It is a very regular process, so you can have many copies.
  - There is software to manage this for you.
- Archiving is moving a file to a safe place, the file won't be on the computer anymore.
  - Archiving is like filing a document in a filing cabinet.
  - The document isn't on your desk any more and is safe from prying eyes.
  - If you want the document you will have to retrieve it.
  - This is an occasional process, often done manually (copy and delete).
- Backing up data on a computer is becoming more and more important because people often don't have other copies of their information.
  - Photos, music and documents are on our computers—and nowhere else.
  - Having only one single copy of important files is very risky.
    - The devices within the computer that store the information wear out with use and time. Eventually, they will fail.
    - The software that stores and retrieves the data may also fail.
  - Perhaps the biggest risk to your information is from software created with malicious intentions (malware).



- Malware affects how the computer functions and could lead to a loss of data.
- Ransomware is a type of malware that prevents access to stored information or the computer from responding to commands. It then demands payment to restore normal access.
- Backing up your information regularly solves many problems, and can save time, money and heartache in the event of a computer problem.

## 1.3 In Practice

DO back up your computer and data frequently.

## 2 The importance of archiving

### 2.1 In Brief

Archiving (moving files to a storage unit not connected to the computer system and deleting them from your computer) makes more space on your computer and reduces the risk of data loss and theft.

### 2.2 In Detail

- Choose what to archive.
  - Prioritize unique and high-value files over those that exist elsewhere or are less important.
    - The decreasing cost of storage media means that, for home use, you probably have room to archive everything.
    - If information is not used very often, it can be advantageous to archive it.

This will:

      - Free up system disk space in your computer for information you use more often (delete the data from your computer to free up this space);
      - Reduce the size of the backup;
      - Reduce the amount of personal information at risk from malware. (Information in an archive is not directly accessible to hackers so it will not be lost or exposed if the computer is compromised); and
      - Reduce the damage from a complete failure. It is possible to lose both a computer and its backup at the same time.
- Archiving keeps your data safe from prying eyes.
  - A Remote Access Trojan (RAT) is a type of malware that gives an intruder access to a computer over the Internet without the knowledge of its owner.
    - The intruder can have access to files, see what is happening on the screen and even access the computer's microphone, camera and speaker.



- Files that are archived will not be accessible to such malware.
- Archiving protects you against the impact of Ransomware.
  - Ransomware is a type of malware that locks your data and demands that you pay a ransom before a key is given to unlock it. Some ransomware will lock backups as well. An archive provides an alternative to paying or losing all of your data.

## 2.3 In Practice

DO take the time to archive frequently.

## 3 Selecting backup media

### 3.1 In Brief

A hard disk drive is generally the best option for home backups. Mobile devices can be backed up to the cloud or through a home computer.

### 3.2 In Detail

- At home, you can do backups with an external hard disk drive.
  - A hard disk provides a substantial amount of storage for a reasonable cost.
  - The large amount of data on home computers has made the use of a hard disk drive the most appropriate option.
  - Hard disk drives allow for a large number of reliable rewrites compared with other types of media.
  - Hard disk drives can be connected to the computer directly through an external port or indirectly over a Wi-Fi connection.
  - When buying a hard disk drive, consider the following criteria:
    - Speed is not a concern, as you will not be interacting with the files on the drive on a regular basis.
    - The capacity of the disk and the reliability of the drive are more important.
      - Reliability is not guaranteed on consumer grade disks; however, you should stick to well-established manufactures such as Western Digital or Seagate that offer warranties.
      - Choose a drive that has twice the capacity of the drive in your computer. If your computer disk is 256 Gb, a 500 Gb external disk is a good solution. This will allow the backup drive to hold:
        - A full copy of the contents of your computer; and
        - Many system “snapshots” to counteract data loss and system failures.



- An external hard disk drive will connect (plug in) to the computer at an external port.
  - Check which ports your computer has before shopping (they are at the side of a laptop or at the back of a desktop computer).
    - A USB drive is the best option for most computers.
    - A USB port on your computer will often be marked with this symbol:



- USB ports are rectangular and are a little over a centimeter: (about ½ inch) wide.



> *USB 3.0 Ports*



*USB 2.0 Ports*



*Thunderbolt & USB 3.0 Ports*

- The standard of USB is not of great importance either. A USB 3.0 disk will provide faster data transfer when connected to a USB 3.0 port, but the difference in speed will not make a practical difference to the operation of a backup.
- You may use a Thunderbolt connection for a Mac computer.
  - Drives using Thunderbolt connections are generally more expensive and the difference in connection speed is no real advantage.
- You can back up your information to a cloud service.
  - A cloud service provides storage space on a server in another location on the Internet.
  - Drop Box, Google Drive and Apple iCloud are a few examples of Cloud Service Providers. Other examples can be found in the Consumer Report<sup>1</sup> below.
    - Often the physical location of a service is not particularly important.
      - If something happens to your equipment (like a flood or a fire), the copy on the cloud is safe.
      - Your data may be stored in other countries and be managed by an external company and its employees. This might be a risk.

Although reputable companies place importance on the security of your data, it is possible that someone accesses the data.

- Set up good passwords and authentication for a cloud service backup.

<sup>1</sup> <http://www.consumerreports.org/cro/2013/11/cloud-storage-services-comparison/index.htm>



- Cloud services are useful for mobile devices.
  - o They provide a frequently updated copy of the information on the device because they don't rely on connecting to a particular machine or network.
  - o Mobile devices can also be backed up to a computer where configured to do so.
    - The management app for syncing the phone with the computer will provide the option to back up the device as well.
- Choosing a backup medium depends on how you use the device or computer.
  - If it is generally in the home or very regularly in the home, a backup to a disk is a good option for most situations.
  - If the device is out of the home for long periods of time, then a cloud service could be more appropriate, because the backup can happen wirelessly.
  - If you have highly sensitive data on the device, a backup to a hard disk drive is a better option than the cloud. Keep in mind that if the backup disk is in the same physical location as the computer, harm (e.g., fire, flood, theft) could happen to both simultaneously, leaving you with no copies.

### 3.3 In Practice

DO select a backup medium that is appropriate for your device and its use.

## 4 Prepare a backup plan

### 4.1 In Brief

A frequent, automatic backup, combined with a less regular manual archive is a safe plan.

### 4.2 In Detail

- Creating backups should prepare you for two types of problems:
  - Loss or alteration of files on an operating computer.
    - o This could be the accidental deletion of a file, a change in configuration or the introduction of malware to the system.
    - o This kind of problem might be immediately apparent or take some time before becoming noticeable.
    - o A regular backup (e.g. every hour) is the best solution as it records the working state of the system very frequently.
      - These can be set up to operate automatically. It is best to have them happen as frequently as is practical.
      - These are known as 'incremental backups' as they usually only store the changes made since the last backup.



- Application (program) failures.
  - o These happen through corrupt updates or the introduction of malware to the system that might go unnoticed for a time but can affect the whole system.
  - o A backup can take the system back to a previous state.
- Keeping a series of backups that represent the functioning system state at various dates will allow you to restore the system to the date you want.
- Keeping a separate system of archives provides alternative solutions in case system failures affect the entire system including connected backup systems.
  - These are generally less regular backups, often performed manually.
- Therefore, you normally need two external hard disks.
  - An incremental backup that happens often and stores multiple points for restoration; and
  - An offline archive that is performed periodically and is not connected to the machine constantly (to avoid getting corrupted).
- A formal written plan for these backups includes:
  - A regular (perhaps monthly) time to check that a backup is turned on and has made a recent copy of the data on the disk;
  - A less regular time (perhaps once a season, biannually or annually) to manually move data to an archive.

## 4.3 In Practice

DO have a plan for backing up. Making a formal (written) plan is a good idea.

## 5 Configuring automatic backups


### 5.1 In Brief

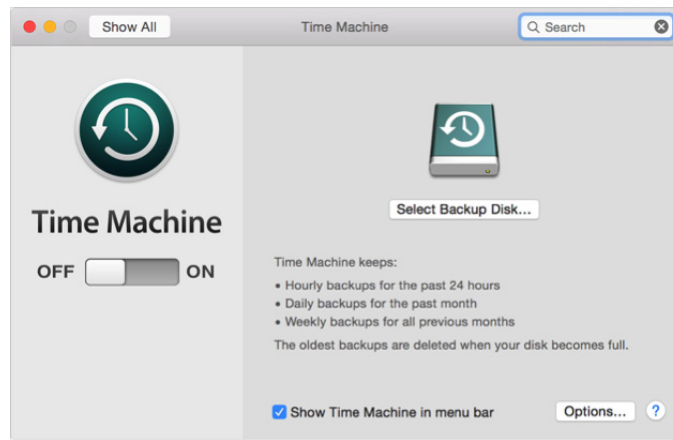
Automatic backups run by themselves frequently and keep a very recent copy of your files. Windows and Apple computers both include a feature for automatic backups.




### 5.2 In Detail

- The backup systems on Windows and Apple computers are different.
  - Apple computers have a combined backup and restore system called Time Machine.
    - o Apple
      - If Time Machine doesn't ask you to choose a backup disk:

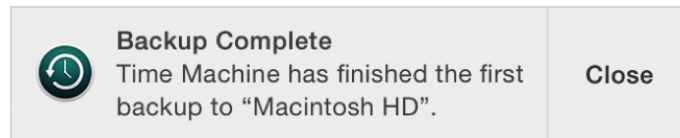



- Open **Time Machine** preferences from the **Time Machine menu**  in the menu bar. Or choose **Apple menu > System Preferences**, then click **Time Machine**.
- Click **Select Backup Disk**.
- Select an external hard drive, **Time Capsule**, or other storage solution from the list, then click **Use Disk**.
- After you choose a backup disk, optionally click **Add** or **Remove Backup Disk** to add more backup disks for extra security and convenience.



- Back up using Time Machine:
  - After you set up Time Machine, it automatically makes hourly backups of the past 24 hours, daily backups for the past month, and weekly backups for all previous months. The oldest backups are deleted when your backup drive is full.
  - To back up now instead of waiting for the next automatic backup, choose **Back Up Now** from the Time Machine menu.
  - To stop automatic backups, **turn off** Time Machine in **Time Machine preferences**. You can still back up manually by choosing **Back Up Now** from the **Time Machine menu**.
  - To pause a backup, choose **Stop Backup** from the Time Machine menu. To resume, choose **Back Up Now**.
  - To check the status of a backup, use the **Time Machine menu**. The icon shows when Time Machine is backing up , whether it is idle until the next automatic backup , or unable to complete the backup.
  - To exclude items from your backup, open **Time Machine preferences** from the Time machine menu, click **Options**, then click **Add**  and select the item to exclude.





- Your first backup may take a long time, depending on how many files you have.
- You can continue using your Mac while a backup is under way.
- Some Mac computers make backups even when asleep.
- Time Machine backs up only the files that changed since the previous backup, so future backups will be faster.<sup>2 3</sup>
- o Windows computers have a function called File History and a separate function for system recovery.
  - These are configured separately. Unfortunately all the versions of Windows are configured slightly differently. Windows 7 computers call File History 'Backup'.
  - Windows 10
    - o Set up your backup.
      - Select the Start button , then select **Settings > Update & Security > Backup > Add a drive**, and choose an external drive or network location for your backups.
      - Every hour, Windows backs up everything in your user folder (C:\Users\username). To change which files get backed up or how often backups happen, go to More options.<sup>4</sup>
      - File History only backs up files in the Documents, Music, Pictures, Videos and Desktop folders and the OneDrive files available offline on your PC. If you want files or folders located elsewhere to be backed up, add them to one of these folders.
    - o To set up a drive for File History:
      - If you are going to use a new external drive, connect it to your PC.
      - If you see a notification asking if you want to configure the drive for **File History**, tap or click it, and then **turn on File History** on the screen that appears.
      - Otherwise, follow these steps to choose either a network drive or an external drive that's already connected to your PC.

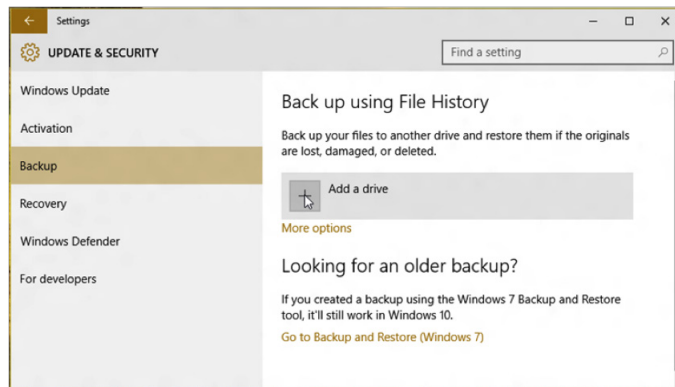
<sup>2</sup> French version: <https://support.apple.com/fr-ca/HT201250>



<sup>3</sup> English version: <https://support.apple.com/en-us/HT201250>

<sup>4</sup> See <http://windows.microsoft.com/en-ca/windows-10/getstarted-back-up-your-files>





- Swipe in from the right edge of the screen, then tap **Search** (If you are using a mouse, point to the lower-right corner of the screen, move the mouse pointer up, and then click **Search**).
- Enter **File History settings** in the search box, then tap or click **File History settings**.
- Tap or click **Select a drive**, and choose the network or external drive you want to use.
- Turn on **File History**.<sup>5</sup>



- Windows 7
  - o To create a new, full backup:
    - After you create your first backup, Windows Backup will add new or changed information to your subsequent backups.
    - If you are saving your backups on a hard drive or network location, Windows Backup will create a new, full backup for you automatically when needed.
    - If you are saving your backups on CDs or DVDs and can't find an existing backup disc, or if you want to create a new backup of all of the files on your computer, you can create a full backup.
  - o To create a full backup:
    - Open Backup and Restore by clicking the **Start** button , clicking **Control Panel**, clicking **System and Maintenance**, and then clicking **Backup and Restore**.
    - In the left pane, click **Create new, full backup**.
  - o To back up your files:
    - Open Backup and Restore by clicking the **Start** button , clicking **Control Panel**, clicking **System and Maintenance**, and then clicking **Backup and Restore**.

<sup>5</sup> See: <http://windows.microsoft.com/en-ca/windows-8/set-drive-file-history>



- Do one of the following:
  - If you've never used Windows Backup before, click **Set up backup**, then follow the steps in the wizard.  If you are prompted for an administrator password or confirmation, type the password or provide confirmation.
  - If you've created a backup before, you can wait for your regularly scheduled backup or manually create a new backup by clicking **Back up now**.  If you are prompted for an administrator password or confirmation, type the password or provide confirmation.<sup>6</sup>

## 5.3 In Practice


DO set up regular automatic backups.

## 6 Retrieving a file from backup

### 6.1 In Brief

You can restore a single file or the complete system from your backup.

### 6.2 In Detail

- Apple
  - Restore from a Time Machine backup:
    - Restore specific files:
    - Choose from the Time Machine menu , or click **Enter Time Machine** in the Dock.
    - Find the files to restore:
      - Use the timeline on the edge of the screen to see the files in your Time Machine backup as they were at that date and time. The timeline may also include local snapshots.
      - Use the onscreen up and down arrows to jump to the last time the contents of the window changed. You can also use the search field in a window to find a file, then move through time while focused on changes to that file.
      - Select a file and press the space bar to preview the file and make sure it is the one you want.
    - Click **Restore** to restore the selected file or Control-click the file for other options.<sup>7</sup>

<sup>6</sup> See <http://windows.microsoft.com/en-ca/windows/back-up-files#1TC=windows-7>

<sup>7</sup> See : <https://support.apple.com/en-ca/HT201250>



- Recover an Apple system by holding down the command and R keys at start up with the backup drive connected.<sup>8</sup>



- Windows 10

- To restore files or folders:
  - o Swipe in from the right edge of the screen, tap **Search** (or if you are using a mouse, point to the upper-right corner of the screen, move the mouse pointer down, and then click **Search**), enter "restore your files" in the search box, and then tap or click Restore your files with File History.
  - o Enter the name of file you're looking for in the search box, or use the left and right arrows to browse through different versions of your folders and files.
  - o Select what you want to restore to its original location, and then tap or click the **Restore** button. If you want to restore your files to a different location than the original, press and hold or right-click the **Restore** button, tap or click **Restore To**, and then choose a new location.<sup>9</sup>
- To restore your PC to an earlier point in time:
  - o Swipe in from the right edge of the screen, then tap **Search** (If you are using a mouse, point to the upper-right corner of the screen, move the mouse pointer down, and then click **Search**).
  - o Enter Control Panel in the search box, and tap or click **Control Panel**.
  - o Enter Recovery in the Control Panel search box, and then tap or click **Recovery**.
  - o Tap or click **Open System Restore**, and then follow the instructions.<sup>10</sup>

## 6.3 In Practice

DO know how to restore files from your backup.

<sup>8</sup> See: <https://support.apple.com/en-ca/HT201314>

<sup>9</sup> See <http://windows.microsoft.com/en-ca/windows-8/how-use-file-history>

<sup>10</sup> See: <http://windows.microsoft.com/en-CA/windows-8/restore-refresh-reset-pc>



## Glossary of Terms

<b>Archive</b>	Information moved to a safer location where it can be accessed if need be.
<b>Backup</b>	A copy of your information kept in case something happens to the original.
<b>Cloud</b>	A resource accessible over the Internet in a manner that the exact location of the services is not the user's concern.
<b>Hard disk drive</b>	A storage medium containing a spinning solid disk that is able to store magnetic charges in a way that represents information.
<b>Malware</b>	Software designed primarily for malicious purposes.
<b>Syncing</b>	Synchronize data between two or more devices.
<b>System Snapshot</b>	A copy of everything on a system (computer) at a specific time, like a photograph.
<b>Thunderbolt</b>	A high speed connection type that allows for the connection of multiple types devices for data transfer and the connection of external displays.
<b>Time Machine</b>	The name for Apple's back up service. Backups can be made to an attached external disk, or over Wi-Fi to a disk connected to an Apple Extreme Wi-Fi hub, or an Apple Time capsule Wi-Fi hub.
<b>USB</b>	A connection that allows for the connection of nearly any type of device and the transfer of data and power over a short cable (Universal Serial Bus).