

Solutions for Chapter 1: Taking a Computer Apart and Putting It Back Together

CompTIA A+ Core 1 Exam: Guide to Computing Infrastructure (10th Edition), ISBN 9780357108529

[EOC A HD] Thinking Critically

1. You purchase a new desktop computer that does not have wireless capability, and then you decide that you want to use a wireless connection to the Internet. What are the two least expensive ways (*choose two*) to upgrade your system to wireless?
 - a. Trade in the computer for another computer that has wireless installed.
 - b. Purchase a second computer that has wireless capability.
 - c. Purchase a wireless expansion card and install it in your system.
 - d. Purchase a USB wireless adapter and connect it to the computer by way of a USB port.

Answers:

- c. Purchase a wireless expansion card and install it in your system.**
 - d. Purchase a USB wireless adapter and connect it to the computer by way of a USB port.**
2. What type of computer is likely to use SO-DIMMs, have an internal power supply, and use a desktop processor socket?

Answer: An all-in-one computer.

3. When troubleshooting a computer hardware problem, which tool might help with each of the following problems?
- You suspect the network port on a computer is not functioning.
 - The system fails at the beginning of the boot and nothing appears on the screen.
 - A hard drive is not working and you suspect the Molex power connector from the power supply might be the source of the problem.

Answers:

a. Loopback plug

b. POST diagnostic card

c. Multimeter

4. You disassemble and reassemble a desktop computer. When you first turn it on, you see no lights and hear no sounds. Nothing appears on the monitor screen. What is the most likely cause of the problem? Explain your answer.
- A memory module is not seated properly in a memory slot.
 - You forgot to plug in the monitor's external power cord.
 - A wire in the case is obstructing a fan.
 - Power cords to the motherboard are not connected.

Answer: d. Power cords to the motherboard are not connected. All the other answers would still cause the system to start the boot, even though it might fail. If the motherboard is not getting power, it will not start the boot.

5. You are looking to buy a laptop on a budget that requires you to service and repair the laptop yourself, and you want to save money by not purchasing an extended service agreement beyond the first year. To limit your search, what should you consider when choosing manufacturers? Which manufacturers would you choose and why?

Answer: You want to be able to maintain and repair the laptop on your own after the warranty expires. You will need access to documentation and new parts. Consider that two manufacturers, Lenovo and Dell, provide their service manuals online free of charge. They also provide documentation about how their laptops are disassembled and options to purchase proprietary parts without first being an authorized service center.

6. A four-year-old laptop will not boot and presents error messages on screen. You have verified with the laptop technical support that these error messages indicate the motherboard has failed and needs replacing. What is the order of steps you should take to prepare for the repair?
 - a. Ask yourself if replacing the motherboard will cost more than purchasing a new laptop.
 - b. Find a replacement motherboard.
 - c. Find the service manual to show you how to replace the motherboard.
 - d. Ask yourself if the laptop is still under warranty.

Answers: The correct order of steps to take is d., a., c., and b.

7. Why are laptops usually more expensive than desktop computers with comparable power and features?

Answer: Laptops use compact hard drives that can withstand movement even during operation, and small memory modules and CPUs that require less voltage than regular components. In general, it costs more to make similar components that take up less space and require less power.

8. When a laptop internal device fails, what three options can you use to deal with the problem?

Answers:

Return the laptop to a service center for repair.

Substitute an external component for the internal component.

Replace the internal component.

9. A friend was just promoted to a new job that requires part-time travel, and he has also been promised a new laptop after his first month with the company. He needs an easy way to disconnect and reconnect all his peripheral devices to his old laptop. Devices include two external monitors (one HDMI, one DVI), a USB wireless mouse, USB wireless keyboard, Ethernet network, USB printer, headphones, and microphone. He has a budget of \$100. What kind of device would best suit his needs? Why? Research online to find a recommendation for a device that will work best for him. What is your recommendation and why?

Answer: A port replicator is most likely to best suit his needs because most docking stations are outside his budget, and a port replicator will not require him to purchase a second device once his laptop is upgraded. The recommended port replicator needs to include, at minimum, ports for: 1 × HDMI, 1 × DVI, 3 × USB, 1 × RJ-45, and 2 × audio (audio output and mic).

10. Your laptop LCD panel is blank when you boot up. You can hear the laptop turn on, and the keyboard backlight is on. You have checked the brightness using the function keys, and that is not the problem. What is an easy next step to determine if the LCD panel has failed? Describe how that next step can also help if the LCD panel has failed, but the replacement components won't arrive for a week and you still need to use your laptop.

Answer: Connect an external monitor to a video port on the laptop. If the screen works, you can use this temporary solution until replacement components arrive.

11. A foreign exchange student brought his desktop computer from his home in Europe to the United States. He brought a power adapter so that the power cord would plug into the power outlet. He tried turning on his computer, but it wouldn't power on. What is likely the problem? What should you warn him about when he returns home at the end of the year?

Answer: The voltage switch needs to be moved from 220 V, which is used in Europe, to 115 V, which is used in the United States. Warn him that when he takes his computer back home, he should move the switch before plugging in his computer. Otherwise, his computer will likely be "fried" because it will be receiving more voltage than the setting allows.

12. You're building a new desktop computer from parts you picked out and purchased. You invested a good deal of money in this computer and want to be sure to protect your investment while you assemble it. What precautions should you take to protect your computer from damage and electrostatic discharge?

Answer: Remove loose jewelry, wear an ESD strap, don't touch sensitive parts on components, handle them by the edges, and use appropriate tools.

13. Your friend asks for your help because her laptop screen is too dim to read anything.

What is the first step you should take to fix the problem?

Answer: Use the function keys to make sure the screen brightness is set high enough.

14. Your boss asks you to give a presentation and you need to use a projector to show a slideshow. What are the steps to display the slideshow on both your laptop and the projector simultaneously?

Answer: Connect the projector using one of the video ports on your laptop. Use the function keys to toggle to the dual screen function for presentation.

15. After troubleshooting a problem, you decide that the wireless card has failed in a laptop. What do you do first before you disassemble the laptop?

Answer: Research teardown instructions specific to this laptop. Resources might include the user manual, manufacturer's website, or online videos.

[EOC A HD] Hands-On Projects

Answers will vary.

[EOC A HD] Real Problems, Real Solutions

Answers will vary.

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[A HD] Lab 1.1 Record Your Work and Make Deliverables

[B HD] *Activity*

The Windows Snipping Tool lets you take screenshots or snips of the entire Windows desktop, a window, or any region of the desktop. Follow these steps to explore the Control Panel and System windows and take snips of your work on the desktop:

1. To open Control Panel, enter **Control Panel** in the Windows 10 search box on the taskbar. In Windows 8, right-click **Start** and click **Control Panel**. In Windows 7, click **Start** and click **Control Panel**.
2. Drill down into the links, icons, and options in the Control Panel window and familiarize yourself with all the icons and options in both Icons view (also called Classic view on the A+ exam) and in Category view. Figure 1-1 shows Control Panel in Small icons view in Windows 10. Explain in your own words the difference between Classic view and Category view:

Answers may vary. For example, Classic view shows one long list of utilities, and Category view shows a list of categories and individual items within each category. Each of these items might include multiple utilities.

3. In Large or Small icons view, click the **System** icon.
4. Examine the System window. What is the operating system and system type running on your computer? What processor is installed and how much installed memory (RAM) do you have on your computer?

Answers may vary. For example:

- **Windows 10 Pro, 64-bit Operating System**
- **Intel Core i7-3612QM CPU**
- **12.0 GB**

5. Leave the System window open as your active window. In Windows 10, press **Win+S** and enter **Snipping Tool** in the search box. In Windows 8, enter **Snipping Tool** in the search box. In Windows 7, click **Start**, and in the Search programs and files box, enter **Snipping Tool**. The Snipping Tool dialog box opens.
6. In the Snipping Tool dialog box, click the **Mode** drop-down arrow. (In Windows 8/7, click the **New** drop-down arrow.) What are the four types of snips you can take using the Snipping Tool?

Answer: For Windows 10, Free-form Snip, Rectangular Snip, Window Snip, Full-screen Snip

7. Select **Free-form Snip** from the drop-down list. Click and hold the mouse button, drag your cursor around the edges of the System window, and then release the mouse button. The Snipping Tool window opens, showing your snip.
8. On the menu bar, click **File**, and then click **Save As**.

9. Save the file on your desktop using naming and file compression standards (usually in .jpg or .png format) as directed by your instructor.
10. Email the file to your instructor, or upload it to your online interface.
11. Close all windows.

[B HD] *Review Questions*

1. What are the eight categories in the Category view in Control Panel?

Answer: System and Security; Network and Internet; Hardware and Sound; Programs; User Accounts and Family Safety; Appearance and Personalization; Clock, Language, and Region; Ease of Access

2. What are the four file types that can be used to save a snip using the Windows Snipping Tool?

Answer: PNG, GIF, JPG, and MHT

3. What is the purpose of the Win+S keystroke shortcut in Windows 10?

Answer: In Windows 10, the shortcut opens Cortana, the search feature of Windows 10.

4. Search the web for information about the price of Windows 10. How much would it cost to buy your current edition (such as Home, Professional, etc.) of the Windows 10 operating system as an upgrade from Windows 8?

Answer: \$69 to \$130 for an upgrade, depending on the edition

[A HD] **Lab 1.2 Gather And Record System Information**

[B HD] *Activity*

[C HD] Part 1: Explore the Physical System and Windows Settings

Observe the physical characteristics of your system, and answer the following questions:

1. Does the outside of the case have any identification indicating manufacturer, model, or component information? If so, list this information here:

Answers may vary. For example, Lenovo IdeaPad N580

2. How many optical drives does your system have?

Answers may vary. For example, 1 optical drive

3. Describe the shape or type of the connection your mouse uses:

Answers may vary. For example, PS/2 port, USB port, or touchpad on a laptop

4. How many USB ports are in the back of your system? How many are in the front?

Answers may vary. For example, for a laptop, 2 on each side. For a desktop, 2 on the front and 4 on the back.

Most versions of Windows allow users to customize the display of information to suit their tastes. Complete the following steps to restore Windows defaults to your system:

1. Boot your system and log on, if necessary. In Windows 10, enter **Control Panel** in the search box. In Windows 8, right-click **Start**, and then click **Control Panel**. In Windows 7, click **Start**, and then click **Control Panel**.)
2. If Large icons or Small icons view has been enabled, click the **View by** drop-down menu and select **Category**. Figure 1-2 shows Control Panel in Category view for Windows 8.

3. With Category view enabled, click the **Appearance and Personalization** category.
The Appearance and Personalization window opens.
4. In the Appearance and Personalization window, click **File Explorer Options** (called **Folder Options** in Windows 8/7) to open the File Explorer Options dialog box.
5. On the General tab of the File Explorer Options dialog box, click the **Restore Defaults** button (see Figure 1-3), and then click **Apply**.
6. Click the **View** tab in the File Explorer Options dialog box. Click the **Restore Defaults** button, and then click **OK** to apply the settings and close the dialog box.
7. In the Appearance and Personalization window, click the **Taskbar and Navigation** icon (called **Taskbar and Start Menu** in Windows 7). The Taskbar and Navigation properties dialog box opens.
8. On the Taskbar tab, verify that **Lock the taskbar** is on or selected. For Windows 10, verify that **Automatically hide the taskbar in desktop mode** is off. (For Windows 8/7, verify that **Auto-hide the taskbar** is not checked.) Also verify that **Use small taskbar buttons** is off or not selected. Click **Apply** if any changes were made. Click **OK** to close the Taskbar and Navigation dialog box. Close the Control Panel window.
9. To manage Start menu settings, do one of the following:
 - In Windows 10, press **Win+I** to open the **Settings** window. Click **Personalization** and then **Start**. Verify that the **Show most used apps**, **Show recently added apps**, and **Show recently opened items in Jump Lists on Start or the taskbar** options are turned **On**. Close the Settings dialog box.
 - In Windows 8, open **Control Panel**, open the **Appearance and Personalization**

window, and then open the **Taskbar and Navigation** dialog box. Click the **Jump Lists** tab. Verify that both check boxes under Privacy are selected. Click **OK** to apply the settings. Close all open windows.

- In Windows 7, open the **Appearance and Personalization** window and then open the **Taskbar and Start Menu Properties** dialog box. Click the **Start Menu** tab in the dialog box. Verify that both check boxes under Privacy are selected. Click **OK** to apply the settings. Close all open windows.

When you are responsible for several computers—or when several people share that responsibility—a base inventory and running record of each system’s characteristics and maintenance are fundamental for quick reference. Do the following to document your system’s configuration:

1. If your instructor hasn’t already provided the Computer Inventory and Maintenance form, download and print it from *cengage.com*. For detailed instructions on how to use the website, see the Preface.
2. **Computer identification:** Fill in the first page of the Inventory form with information about your computer. Also fill in the administrator account name and password under the Windows and Windows Settings heading. (Because this information is confidential, you must be careful to protect this form from unauthorized viewing.)
3. **System:** Open **Control Panel** in Classic view and open the **System** window. Using the information shown in Figure 1-4 for Windows 10, fill in the System subsection under the Windows and Windows Settings heading of your Inventory form. Note that in Windows 7, this window also links to the Windows Experience Index, which rates your system’s

performance on a scale from 1.0 to 7.9. Close the Control Panel window.

4. **Windows Update:** To find update settings, do one of the following:

- In Windows 10, press **Win+I** to open the Settings window. Click **Update & Security**, **Windows Update**, and **Advanced options**. Record how updates are installed on your Inventory form. Close the Settings window.

Answers may vary. For example, the system is set to receive updates for other Microsoft products when you update Windows, and to restart this device as soon as possible when a restart is required to install an update.

- In Windows 8/7, open the **System** window and click **Windows Update**. In the Windows Update window, click **Change settings** in the left pane. The Change settings window shows the schedule for updates to Windows. Record this information in your Inventory form. Close all windows.

5. **File History or Backup and Restore:** To find backup settings, open Control Panel in Classic view. In Windows 10, click **Backup and Restore (Windows 7)**. In Windows 8, click **File History**. In Windows 7, click **Backup and Restore**. If your computer is set to back up automatically, record the information requested in your Inventory form in the File History/Backup and Restore subsection.

Answers may vary. For example, the system is scheduled to perform a backup each Monday evening at 11:00PM. The backup is stored on the network drive J: in the \Backup folder.

6. Notice at the top of the Control Panel window that you'll always see a path in the address bar for whatever window is active. You can click on various parts of this path to go to those

levels of Control Panel. The Inventory form lists the corresponding path for each section's information. To return to the main Control Panel window, click **Control Panel** at the beginning of the path.

7. **User accounts:** To complete the Windows and Windows Settings section of the Inventory form, click **User Accounts**, and then click **Manage another account**. (For Windows 7, click **User Accounts and Family Safety** and then click **Add or remove user accounts**). The Manage Accounts window shows all local user accounts in the system. Record this information on your Inventory form.

Answers may vary. For example, there is one local user administrator account named John Doe. The account has a password: Passw0rd

[C HD] Part 2: Explore Network Settings

Follow these steps to gather information about network settings:

1. To access the network settings on your computer, return to **Control Panel** in Classic view and click **Network and Sharing Center**.
2. In the Network and Sharing Center window, click **Change adapter settings** in the left pane to access the Network Connections window.
3. **Network TCP/IP settings:** Right-click the active network connection, whether it's an Ethernet connection or a Wi-Fi connection, and then click **Properties** from the shortcut menu to open the connection's Properties dialog box. Select **Internet Protocol Version 4 (TCP/IPv4)**, and then click the **Properties** button to view the Internet Protocol Version 4 (TCP/IPv4) Properties dialog box, shown in Figure 1-5. If the radio button for *Obtain an IP address automatically* is selected, then the connection has a dynamic configuration, meaning

Windows will request an IP address from a server each time it connects to the network. If the radio button for *Use the following IP address* is selected, an administrator has assigned a static IP address that the computer will always use when connecting to this network. Add the appropriate information in this subsection of your Inventory form, and then click **Cancel** twice to return to the Network Connections window. Repeat this step for any other available network connection.

Answers may vary. For example, Obtain an IP address automatically, Obtain DNS server address automatically

4. **Wireless security settings:** Complete the following if your computer is currently connected to a wireless network; if not, skip to Step 5. To return to the Network and Sharing Center, click **Network and Internet** in the address bar path, and then click the **Network and Sharing Center** category. Under View your active networks, click the wireless connection and then click **Wireless Properties**.

Click the **Security** tab to find the security information for this network to fill in the Wireless Network Connection subsection of your Inventory form. You can select the **Show characters** check box, as shown in Figure 1-6, to see the Network security key. Click **Cancel** and then click **Close** to return to the Network and Sharing Center.

Answers may vary. For example, Security type WPA2-Personal, Encryption type: AEA, Network security key: MySecurityKey

5. **Homegroup settings:** Click the **Back** button in the Control Panel window to return to the Network and Internet window. Click **HomeGroup** to view the HomeGroup window and determine whether your computer belongs to a homegroup. If it does, click **View or print**

the homegroup password and record this information on your Inventory form. Click **Cancel** to close the View and print your homegroup password window.

Answers may vary. For example, no homegroup password present.

6. **Internet Options:** Click **Network and Internet** in the address bar to return to the Network and Internet window. Click **Internet Options** to open the Internet Properties dialog box. Using the information on the General tab, record the home page or pages on your Inventory form. Click **Cancel** to close the Internet Properties dialog box.

Answers may vary. For example, <http://google.com>

[C HD] Part 3: Explore Applications Installed

Follow these steps to gather information about installed applications:

1. **Applications installed:** Control Panel provides access to a list of all programs installed on the system. Open **Control Panel** in Classic view and click **Programs and Features**. Scroll down to find the version of Microsoft Office installed on your computer and enter this information on your Inventory form. Search the list for anti-malware software, such as McAfee, Norton, or Microsoft Security Essentials for Windows 7. (Note that Windows Defender is embedded in Windows 10/8 and will not appear in the list of installed applications.) Also look for web browsers, such as Mozilla Firefox and Google Chrome. Then list any other productivity applications (like Dropbox or a graphic design program) installed on the computer, along with their publishers. When you are finished, close the Programs and Features window.

Answers may vary. For example, Android Studio, Camtasia Studio 8, Dropbox, Inc., Zoom, Google Chrome

2. **Anti-malware software:** If applicable, open an anti-malware program you found on the list of programs and determine whether the program updates automatically and, if so, when scans are scheduled to occur. Often, this information will be on the program's home page or in the Settings menu. Record this information on your Inventory form. Close the program when you are finished.

[C HD] Part 4: Explore Hardware Installed

The System Information Utility provides additional information about hardware components and configuration of your system. Do the following to gather this information:

1. **System manufacturer and model:** To open the System Information Utility, enter **msinfo32.exe** in the Windows 10/7 search box or the Windows 8 Run box. (To open the Run box in Windows 8, right-click **Start** and click **Run**.) The System Information window opens. On the System Summary page, find your system's manufacturer and model number and record this information on your Inventory form.

Answers may vary. For example, Sony Corporation, SVS151190X

2. **Drives:** Click the + sign next to the Components node on the navigation tree in the left pane. Click the + sign next to the Storage node, and then click **Drives**, as shown in Figure 1-7. Add the information requested on your Inventory form for this subsection.

Answers may vary. For example, Drive C:, Local Fixed Disk, 578.35 GB, Volume name missing, Volume Serial Number 0EE5E9FF

3. **Disks:** Click **Disks** in the navigation tree and add the remaining information requested for the System Information Utility section. Close the System Information window.

Answers may vary. For example, Hitachi HTS777777A99999EE, 5 partitions, 596.17 GB

Use Device Manager to complete the next portion of Part 4.

1. To open Device Manager, right-click **Start** and click **Device Manager**. The Device Manager console opens, as shown in Figure 1-8.
2. Expand **Display adapters**, and record the name of the adapter(s) on the Computer Inventory and Maintenance form.

Answers may vary. For example, NVIDIA GeForce GT 640M LE

3. Right-click the adapter name, and then click **Properties** to open the adapter's Properties dialog box. (If you have more than one display adapter, use the first adapter listed.)
4. Click the **Driver** tab, and record the driver version on the form.

Answers may vary. For example, Driver Version 10.18.13.6822

5. On the Driver tab, click **Driver Details** to view the driver file names and the paths to those files. Record that information for up to three files on the Computer Inventory and Maintenance form.

Answers may vary. For example:

- **C:\Program Files (x86)\NVIDIA Corporation\coprocmanager\detoured.dll**
- **C:\Program Files (x86)\NVIDIA Corporation\coprocmanager\Nvd3d9wrap.dll**
- **C:\Program Files (x86)\NVIDIA Corporation\coprocmanager\Nvdxgiwrap.dll**

6. Repeat the same procedure to collect similar information on your computer's wired and wireless network adapters and its sound controller. Record that information on the form.

Answers may vary. For example:

- **Realtek PCIe GBE Family Controller**
- **Driver Version 9.1.410.2015**

- **C:\WINDOWS\system32\DRIVERS\rt640x64.sys**

To complete Part 4, open the computer case and use visual observations of connected hardware to record information about the monitor, video adapter if installed, and any installed network adapters.

[C HD] Part 5: Explore BIOS/UEFI Settings

BIOS/UEFI is firmware on the motherboard that manages basic hardware components and the boot process before Windows is launched. Complete the following steps to access BIOS/UEFI settings:

1. To enter the UEFI setup utility from Windows 10, do the following:
 - a. Open the **Settings** app and click **Update & Security**. In the left pane, click **Recovery**. Under Advanced startup, click **Restart now**. The computer restarts into the Windows Recovery Environment.
 - b. In Windows RE, click **Troubleshoot**, and then click **Advanced options**. On the Advanced options screen, click **UEFI Firmware Settings**, and then click **Restart**. The computer reboots into UEFI setup. When you attempt to access UEFI setup and password protection has been enabled, you must enter a valid password to continue.
2. For Windows 10/8/7, follow these steps to access BIOS/UEFI setup:
 - a. Shut down Windows.
 - b. Turn on the computer and press the key(s) that launches the BIOS/UEFI setup

utility. The key(s) to press usually appears on the screen early in the boot process—for example, “Press Del or F2 to enter setup.”

3. Browse through the BIOS/UEFI screens and fill in all the information required in the BIOS/UEFI Settings and Data section of the Computer Inventory and Maintenance form.

Answers may vary. For example:

- **Version 2.10.1208 American Megatrends, Inc.**
- **Processor Intel Core i7 870**
- **2.93 GHz**
- **Total memory 32768MB, Quadruple-Channel**
- **Slot 1: 8192 MB (DDR3-2400)**
- **Slot 2: 8192 MB (DDR3-2400)**
- **Slot 3: 8192 MB (DDR3-2400)**
- **Slot 4: 8192 MB (DDR3-2400)**
- **Wake on LAN is off**
- **Boot device priority is Hard drive, Optical drive, Removable drive, USB boot**
- **Supervisor and Power-on passwords are not set**

4. Exit BIOS/UEFI setup without saving any changes to prevent saving any accidental changes made while you were exploring the BIOS/UEFI setup utility.

Record today’s date and your name in the Routine Maintenance section of the Computer Inventory and Maintenance form beginning on page 5, next to Initial Inventory taken. Make a habit of documenting all maintenance and troubleshooting activities for any computer you work on.

[B HD] *Challenge Activity*

Programs are available to collect most, if not all, of the configuration information about a computer for you. One of the more popular programs is Belarc Advisor, which compiles information on system components, including manufacturer names, license numbers, and product keys. The program also analyzes your system for weaknesses and may suggest improvements or maintenance. To download and use Belarc Advisor, do the following:

1. Go to **www.belarc.com/free_download.html** and click the free download icon.
2. When the file has completed downloading, use File Explorer (Windows Explorer in Windows 7) to find the .exe file that you just downloaded. At the time of this writing, the file name was **advisorinstaller.exe**. What is the exact path and name of the downloaded file?

Answer: advisorinstaller (1).exe

3. Double-click the file to install the program. If a UAC box appears, click **Yes**.
4. When the License Agreement window appears, click **I Agree**. Click **Install**.
5. If the program asks to check for new definitions, click **Yes**. When it reports that it is up to date, click **OK**.
6. The program creates a profile for your system and proceeds with the analysis. The process might take a few minutes. Once the analysis is presented in your browser, print your analysis and file it with your other documentation for this computer. See Figure 1-9 for a sample report.

[B HD] *Review Questions*

1. List two categories available in Control Panel that were not mentioned in the lab:

Answer: Answers may include:

- Hardware and Sound
- Clock, Language, and Region
- Ease of Access

2. (Windows 7 only) Based on the Windows Experience Index, what component of your computer would you upgrade first? Why?

Answer: Answers may vary based on student experience and might include the processor, RAM, graphics card, or hard drive.

3. Based on what you found while taking inventory of your computer's system, what maintenance does this computer currently need?

Answer: Answers may vary based on student experience and might include a backup, malware scan, OS updates, securing a network, or software updates.

4. Besides the Computer Inventory and Maintenance form, what other documentation should you keep on each computer? How might you store that information?

Answer: Any documentation that came with the computer, any product guides printed from the web, and any receipts from purchases related to the computer should be kept together near the computer itself, perhaps in a manila envelope or notebook.

5. What differences, if any, are there between a list of components derived from a physical inspection and a list of components derived from Control Panel and System Properties?

Answer: The lists could differ substantially because of such things as BIOS/UEFI upgrades, non-brand-name components, drive partitioning, or components disabled in BIOS/UEFI.

6. Why is it important for IT technicians to keep documentation on computers for which they are responsible?

Answer: Answers may vary depending on student experiences. Documentation can be useful when a computer is lost or stolen, the hard drive has failed, Windows becomes corrupted, or other problems arise. A user might accidentally change a setting or forget a password.

[A HD] Lab 1.3 Identify Computer Parts

[B HD] *Activity*

Using the assorted computer parts your instructor has prepared and displayed, fill in the following chart:

Answers may vary depending on the parts the instructor displayed. For example:

Identify the Part	Describe the Computer Component and its Use
1. Video card	Inserts into an expansion slot to provide video ports for a monitor
2. Hard drive	Secondary storage for a computer, used to hold the OS installation
3. RAM	Primary storage for a computer, used for working memory while programs and data are in progress

4. Motherboard	Main component in a system where all other computers communicate; holds the processor
5. Optical drive	Holds CDs, DVDs, and Blu-ray optical discs
6. CPU	The main processing power for a computer

Next, observe the external physical characteristics of your computer system and answer the following questions:

1. What is the size of your monitor? Use your measuring tape or ruler to measure from the upper-left corner to the lower-right corner (the diagonal) on the monitor screen. Is the measurement what you expected based on the size of the monitor?

Answers may vary. For example, 17 inches. Yes.

2. What other external components does your computer have (speakers, printer, and so forth)? Describe each component with as much detail as you can.

Answers may vary. For example, keyboard for typing input and mouse for pointer and clicking input.

3. Look at the back of your computer and locate all the cables and cords connected to ports and other connections. Fill in the following chart:

Answers may vary. For example:

Describe the Port or Connector to Which	Purpose of the Cable or Cord
--	-------------------------------------

the Cable or Cord is Connected	
1. Network	Connection to local network
2. Power	Provides power to the system
3. DVD	DVD video cable connected to monitor
4. PS/2	Connects mouse
5. USB	Connects keyboard
6. USB	Printer

4. What other ports on the computer are not being used? List them:

Answers may vary. For example, second PS/2 port, USB ports, VGA port, HDMI port

Next, you'll open the computer case and examine the components inside. As you work, make sure you do not touch anything inside the case unless you're wearing an ESD strap that's clipped to the case, so that any electrical difference between you and the case is dissipated.

To remove the computer cover when it's attached with screws, follow these steps:

1. Power down the computer and unplug it. Next, unplug the monitor, the printer, and any other device that has its own external power supply. After all power sources are unplugged, press the power button on the computer for three seconds to drain any remaining power.

2. The method required to open a computer case varies depending on the manufacturer. Many newer cases require that you remove the faceplate on the front of the case first. Other cases require removing a side panel first, and very old cases require removing the sides and top as a single unit first. Study your case for the correct approach.
3. For a desktop or tower case, locate and remove the screws on the back of the case on the opposite side from the ports. Be careful not to unscrew any screws besides the ones attaching the cover. The other screws are probably holding the power supply in place.
4. After you remove the cover screws, slide the side panel back to remove it from the case, as shown in Figure 1-10.

To remove the cover from a tower computer that has no visible case screws, follow these steps:

1. Power down the computer and unplug it from its power outlet. Next, unplug the monitor and any other device with an external power source from the power outlet. After all power sources are unplugged, press the power button on the computer for three seconds to drain any remaining power.
2. On some cases, you must pop the front panel off the case before removing the side panels. Look for a lever on the bottom of the panel and hinges at the top. Squeeze the lever to release the front panel and lift it off the case (see Figure 1-11). Then remove any screws holding the side panel in place, as shown in Figure 1-12, and slide the side panel to the front and then off the case.

With the cover removed, you're ready to look for some components. As you complete the following, you might want to refer to drawings and photos on the Internet for additional information on the specific components in your system:

1. Put on your ESD strap and connect the clip to the side of the computer case.
2. Identify and describe the following major components. List any other components you find inside the case. Fill in the following chart. For any drives you find installed, describe the type of interface used (for example, SATA or IDE):

Answers may vary. For example:

Component	Description—Include the Manufacturer and Model Name (if Listed) as Well as its Distinguishing Characteristics
Power supply	Sentry 525W XPLUS power supply providing SATA, Molex, P1, PCIe, and 4-pin and 8-pin auxiliary connectors.
Motherboard	Asus Prime Z370-P with Intel Z370 chipset. Two PCIe × 16 slots, 4 PCIe × 4 slots, 3 DIMM slots, ATX form factor
Hard drive(s)	One hard drive, SATA interface
CD/DVD drive(s)	Plextor DVD drive with SATA interface
RAM	Two 288-pin DDR4 DIMMs with heat sinks

System fan (not inside the power supply)	White fan installed on side of case with a Molex power connector
Video card (if not integrated)	MSI video card fits in a PCIe × 16 slot, and has one DVI video port and one 15-pin VGA port
Network card (if not integrated)	The network adapter is integrated in the motherboard
Sound card (if not integrated)	The sound adapter is integrated in the motherboard

[B HD] *Review Questions*

1. How did you decide which expansion card was the video card?

Answer: This answer is dependent on student research and experience. The ports on the rear of an expansion card are generally used to identify the purpose of the card.

2. How did you identify the type of CPU you have?

Answer: This answer is dependent on student research and experience.

3. Does your system have much room for adding new components? What types of expansion slots are available for adding new cards?

Answer: This answer is dependent on student research and experience.

4. Is there space for upgrading the RAM? If there isn't, what could you do instead to upgrade?

Answer: This answer is dependent on student research and experience. An old smaller module can be replaced by a new module that holds more RAM.

5. Where (specifically) would you go on the Internet to download a PDF of the motherboard manual or system manual? What information would you need to identify which manual to download?

Answer: Answers may vary but will most likely include the manufacturer's website. The motherboard's make and model number are required, although some systems can also be identified by a unique service tag.

[A HD] Lab 1.4 Identify Form Factors

[B HD] *Activity*

1. Open your browser and go to your favorite search engine, such as *google.com*.
2. Use the Internet to research the main differences between ATX and microATX and list them here:

Answers may vary. For example:

- **ATX boards are larger than microATX boards**
- **ATX provides up to 7 slots and microdata has only 4 slots**

3. Now explain the main differences between ATX and Mini-ITX (also known as ITX):

Answers may vary. For example:

- **ATX boards are larger than Mini-ITX boards**
- **Mini-ITX boards use less power than ATX boards**
- **Mini-ITX boards provide only 2 RAM slots**

4. Each form factor comes in several sizes. How could you tell whether a system was regular ATX, microATX, or Mini-ITX?

Answers may vary. For example, measure the exact size of the board:

- **ATX is 12 inches by 9.6 inches**
- **Micro-ATX is 9.6 inches by 9.6 inches**
- **Mini-ITX is 6.7 inches by 6.7 inches**

5. Form factors are also available in various shapes. What slimline form factor is similar to but not compatible with ATX?

Answers may vary. For example, NLX

6. Now turn the computer off and unplug the power cord.
7. Disconnect all peripherals and remove the case cover.
8. Examine the case, motherboard, and power supply.
9. What is the form factor of this system?

Answers may vary. For example, ATX.

10. Close the case, reattach the peripherals, and test the system to make sure it boots without errors.

[B HD] *Review Questions*

1. Why is it important that your case and motherboard share a compatible form factor?

Answer: It allows the components to fit together and function properly.

2. When might you want to use a slimline form factor?

Answer: You might want to use it when a thinner profile is required, such as with a media center under a TV.

3. What advantages does ATX have over microATX?

Answer: Answers can include more expansion slots and better heat dissipation.

4. What are two operating systems that can be installed in systems using a Mini-ITX motherboard?

Answer: Mini-ITX motherboards can support either Microsoft or Linux operating systems.

5. Is it possible to determine the form factor without opening the case?

Answer: Yes, the form factor can usually be determined by the shape of the case.

[A HD] Lab 1.5 Take a Computer Apart and Put It Back Together

[B HD] *Activity*

Follow the procedure outlined in the following steps to remove the case cover and expansion cards. (If you're working with a tower case, lay it on its side so that the motherboard is on the bottom.)

1. Remove the cover from your computer and attach your ESD strap to the side of the case.
2. To make reassembly easier, take notes or make a sketch (or take a picture) of the current placement of boards and cables and identify each board and cable. You can use a marker to indicate the location of a cable on an expansion card or the motherboard. Note the orientation of the cable. Each cable for an IDE hard drive or optical drive has a colored marking on one side of the cable called the "edge color." This color marks pin 1 of the cable. On the board, pin 1 is marked with the number 1 or 2 beside the pin or with a square soldering pad on the back side of the board, as shown in Figure 1-13. You might not be able to see this soldering pad now.
3. Remove any cables from the expansion cards. There's no need to remove the other end of the cable from its component (hard drive or optical drive). Lay the cable over the top of the

component or case.

4. Remove the screw holding the first expansion card to the back of the case.
5. Grasp the card with both hands and remove it by lifting straight up and rocking the card from end to end (not side to side). Rocking the card from side to side might spread the slot opening and weaken the connection. When you remove the card, be sure you don't touch the edge connectors on the card. (Oil from fingers can tarnish or corrode these connectors.)
6. If the card had a cable attached, examine the card connector for the cable. Can you identify pin 1? Lay the card aside on a flat surface. Don't stack cards.
7. Remove any other expansion cards the same way.
8. In some proprietary systems, a riser card assembly attaches to the motherboard, with each card attached to the assembly. If your system has this arrangement, remove it now. It's probably held in place by screws or clips and may or may not have a rail guide you can use to locate the assembly in the case.
9. Unplug any case fans.

In some systems, it's easier to remove the drives first and then the motherboard. In other systems, it's easier to remove the motherboard first. In these instructions, to make sure you don't risk dropping a drive on the motherboard when removing the drive, you're directed to remove the motherboard first and then the drives. Your instructor, however, might prefer that you remove the drives first and then the motherboard.

1. Begin removing the motherboard by removing any remaining wires or cables such as power cables, audio wires, or wires from the front of the case. Be sure to make notes or label the cables so that you can reinstall them correctly.
2. Finish removing the motherboard by removing the screws holding the board to the spacers or

standoffs. Usually six to nine screws attach the motherboard to the case. Be careful not to gouge the board or damage components with the screwdriver. Because the screws on the motherboard are often located between components, they can be hard to reach. Be very careful not to damage the motherboard. See Figure 1-14.

3. The motherboard should now be free and you can carefully remove it from the case. See Figure 1-15.
4. To remove drives, remove the data cable if it's still attached. Many cases have a removable drive bay. The drives are attached to this bay, and the bay can be removed with all the drives attached. This arrangement makes it easy to get to the drive-mounting screws that hold the drives in place. If your case has a removable drive bay, this removal method is preferred. Otherwise, remove each drive separately. Be careful not to jar the drive as you remove it from the case.
5. Remove any CD, DVD, or Blu-ray drives from the case. These drives are usually in the 5-inch drive bays and are normally held in place by 2 or 4 screws. After the screws are removed, the drive slides out the front of the case.
6. Support the power supply with one hand, and remove the screws attaching it to the case. You can then remove the power supply from the case.
7. Remove any other components, such as a case fan.

Now that you have removed all the components, you're ready to reassemble the computer.

Replace each component carefully. Take care to install each component firmly without overtightening the screws. Don't force components to fit. If a component won't fit easily the way it should, look for some obstruction preventing it from falling into place. Look carefully for the reason the component won't fit correctly and make any small adjustments as necessary. The

following steps outline the assembly procedure, which is essentially the reverse of the disassembly procedure:

1. Install the case fan.
2. Install the power supply, and replace the screws holding it in position.
3. Install the drives in their bays and then install the motherboard, unless your instructor prefers that you install the motherboard first.
4. Connect wires from the front of the case to the front panel header on the motherboard.
5. Connect the power cables from the power supply to the drives and the motherboard. Double-check to make sure all the power supply connectors to the motherboard are connected correctly.
6. Place each card in its slot (it doesn't have to be the same slot, just the same type of slot), and replace the screw. If possible, don't place a video card near the power supply; otherwise, electromagnetic interference (EMI) from the power supply might affect the video picture. Also, because video cards produce so much heat, don't place another card adjacent to it; leave room for airflow.
7. Replace any cables to expansion cards, being sure to align the colored edge with pin 1. (In some cases, it might work better to connect the cable to the card before you put the card in the expansion slot.)
8. Check to make sure no cables are interfering with any fan's ability to turn. A common cause of an overheated system is a fan that can't move air because a cable is preventing it from spinning.
9. When all components are installed, you should have refitted all the screws you removed earlier. If some screws are missing, it's important to turn the case upside down and gently

shake it to dislodge any wayward screws. Any screw left lying on a board has the potential to short out that board when power is applied. Don't use a magnet to try to find missing screws in the case because you might damage data on hard drives.

10. Plug in the keyboard, monitor, and mouse.
11. In a classroom environment, have the instructor check your work before you power up.
12. Plug in the power cord to the computer and to the power outlet or surge protector. Verify that any voltage selector switch on the rear of the case is set to 115 V and turn on the power switch.
13. Using the power button on the front of the case, turn on the power and check that the computer is working properly before you replace the cover. Don't touch the inside of the case while the power is on.
14. If all is well, turn off the computer and replace the cover and its screws. If the computer doesn't work, don't panic. Turn off the power, and then go back and check each cable connection and each expansion card. You probably haven't seated a card solidly in the slot. After you have double-checked everything, try again.

[B HD] *Review Questions*

1. When removing the cover, why should you take care to remove only the screws that hold the cover on?

Answer: The power supply retention screws are often accessible from the outside of the case; if they are removed from the power supply, the screws could damage other components by falling on them.

2. How should you rock a card to remove it from its slot? Why is it important to know how

to rock a card correctly?

Answer: Rock the card lengthwise. If you rock the wrong way, you could damage the card or slot.

3. What should you do to help you remember which components connect to which cables?

Answer: Take notes, make a sketch, take a photo, attach labels, and so forth.

4. What marking on a ribbon cable identifies pin 1?

Answer: A colored stripe on one side of the cable identifies pin 1.

5. What component(s) defines the system's form factor?

Answer: Answers may vary and might include the power supply, the backplate, the spacing of the mounts for the motherboard, the size of the motherboard, and the position of the expansion slots in relation to the CPU.

6. What form factor does your computer use?

Answer: The answer is based on the actual system being used.

7. Why would an IT technician ever have to change out a computer's motherboard?

Answer: The motherboard might need replacing if it becomes damaged, such as when a trace on the board or a chip is damaged. Also, the board might need replacing when the CPU is upgraded or additional features are needed. For example, the motherboard could be upgraded to support DDR4 memory.

[A HD] Lab 1.6: Investigate Computer Teardown Procedures

[B HD] *Activity*

Complete the following steps to investigate different procedures for taking apart a computer and putting it back together:

1. Review the portions of the chapter that discuss the proper procedures for taking apart and reassembling a computer. Pay particular attention to the safety precautions, and take notes as

needed.

2. Search the web to find a video that shows the entire process of taking apart a desktop or tower computer and putting it back together. Some videos can be found on *youtube.com*. Try to find a video that is done well, with good camera angles and useful discussion about the parts shown in the video. What is the URL for the video you selected?

Answers may vary. To find videos of computer disassemble on YouTube.com, use this search string: “disassemble a computer site:youtube.com” or “disassemble a laptop site:youtube.com”

3. Describe at least four mistakes made by the technician in the teardown or reassembly process. Sometimes the technician will notice a mistake himself, such as missing screws that should have been loosened before attempting to remove the motherboard. Sometimes the technician doesn't seem to be aware—or chooses to ignore—that he is risking damage to expensive parts or taking unnecessary safety risks.

Answers may vary. For example:

- **Not wearing an ESD strap**
 - **Touching edge connectors of expansion cards or RAM cards**
 - **Touching the pads and pins on the CPU socket or CPU housing**
 - **Laying expansion cards or RAM cards on top of each other**
 - **Laying a system on carpet on the floor to work on it, which can cause ESD**
 - **After power cable is unplugged, failing to press the power button to dissipate power**
4. Identify the possible consequences of each mistake along with ways to prevent those mistakes in the future:

Answers may vary. For example, not using an ESD strap can cause damage to components,

which can then cause a catastrophic system failure or, more likely, intermittent failures.

Problems caused by intermittent hardware failures are often very difficult to troubleshoot.

These failures can be prevented by carefully protecting a system from ESD as you work.

5. Identify at least two significant differences between the system you worked on for Lab 1.5 and the system shown in the video. Are there different drives in the case, such as multiple hard disk drives or optical drives? Was there a graphics card or a riser card? Was a different order of steps needed because of component placement inside the case?

Answers may vary. For example, one system uses IDE interfaces for storage devices and the other system uses SATA interfaces.

6. Select a video showing the disassembly and reassembly of a laptop computer. What is the URL for the video you selected?

Answers may vary. To find videos on YouTube.com to disassemble a laptop, use this search string: “disassemble a laptop site:youtube.com”

7. What are three significant differences you notice about the parts or their arrangement inside a laptop compared to the desktop computer you worked with in Lab 1.5? What is one significant difference about the process of taking apart a laptop compared to taking apart a desktop?

Answers may vary. For example:

Parts inside a laptop compared to a desktop:

- **Parts are smaller and placed more closely together**
- **Some parts cannot be seen until other parts are removed**
- **A laptop’s power supply is external to the laptop and is part of the AC adapter cord.**

One difference in taking apart a laptop and a desktop is that having the service manual

available is important with a laptop so that you know the order of disassemble and how to disassemble.

[B HD] *Review Questions*

1. What are three notable characteristics of the system shown in the first video you selected? For example, was this an older or newer system? How can you tell? Who is the manufacturer of the system, the case, and/or the components? What drives or other optional components were included in the system?

Answer: Answers will vary, depending on student experience.

2. What tools did the technician use in each video? What additional tools would you recommend having on hand to take apart and reassemble a computer?

Answer: Answers will vary, depending on student experience. Possible tools include a screwdriver, ESD strap, tweezers, pliers, a multimeter, zip ties, and a flashlight.

3. Which two components of a computer should be treated as “black boxes” and not opened without specialized training?

Answer: The power supply and the monitor

4. What are two methods for keeping track of screws during disassembly so that reassembly goes more smoothly?

Answer: Answers may vary. Two possible answers include:

- **Keep screws and spacers in small cups or a tray.**
- **Tape screws to a piece of paper and label them on the paper.**

[A HD] Lab 1.7 Compare Laptops and Desktops

[B HD] *Activity*

Pretend you are about to buy a computer. The two most important criteria to determine which computer to buy are usually how it will be used and the price. Do the following to determine your requirements for your new computer:

1. You first need to decide how the computer will be used. Answer the following questions:

- For what purposes will the computer be used? (Possible uses include office applications, video playback, high-end gaming, and software development.)

Answers may vary. For example, office applications, video playback, high-end gaming, software development, video editing, and web browsing

- What features are required to make the computer usable for its intended purpose? Include in your list the amount of memory and hard drive space you want. (Some features you might consider include wireless [Wi-Fi, Bluetooth, or cellular] support, the display or screen type, software packages supported, and I/O ports.)

Answers may vary. For example, minimum 32 GB RAM, Wi-Fi, HDMI port

- List any additional features you would like to have but don't require:

Answers may vary. For example, solid-state hard drive (SSD)

- Which operating system do you want to use with your computer?

Answers may vary. For example, Windows 10 or macOS

2. Use computer manufacturers' websites or comparison websites (such as *cnet.com* or *pricewatch.com*) to find one laptop and one desktop computer that fulfill as many of your requirements as possible and are as similar to each other as possible. Summarize your

findings in Table 1-1. Save or print the webpages that support your gathered information.

Table 1-1 Desktop and laptop computer specifications

Answers may vary. Below is an example for one desktop and one laptop computer:

Features	Desktop Computer	Laptop Computer
Manufacturer and model	Dell XPS 8930 Tower Desktop	Dell XPS 15 Laptop
Processor type and frequency	Intel Core i7-8700 6- Core, 4.6 GHz	Intel Core i7-9750H 6- Core, 4.5 GHz
Memory installed	32 GB DDR4	32 GB DDR4
Hard drive space	2 TB SATA hard drive	1 TB M.2 PCIe NVMe SSD
Operating system	Windows 10 Pro (64 bit)	Windows 10 Pro (64 bit)
Video card	Nvidia GeForce GTX 4 GB integrated graphics	NVIDIA GeForce GTX 1650 4 GB
Optical drive	Slimline DVD+/-RW	None
Display size	NA	15.6"

External ports	USB Stereo sound HDMI DisplayPort 3-in-1 card reader (SD, SDXC, SDHC) Ethernet	SD card slot USB HDMI Thunderbolt DisplayPort VGA HDMI Headset jack
Preinstalled applications	NA	Microsoft Office trial McAfee LiveSafe 12 month
Price	\$1,786.67	\$1,809.99

3. Online reviews of a computer can help you find out what others think of the computer, how it performs, and what problems to expect. Find two or three reviews for each of the two computers you researched in Step 2, and summarize the best review you found for each computer:

- For the desktop computer, what is the URL of the review?

Answers may vary. For example, for the Dell desktop in Step2, review URL:

<https://www.toptenreviews.com/dell-xps-8930-desktop-pc-review>

- List the major points in the review about the desktop computer:

Answers may vary. For example, for the Dell desktop in Step 2, powerful,

compact, upgradable, toolless access to the innards, more space inside the case, good airflow and cooling, front-mounted sockets and slots.

- How does this review affect your opinion of this desktop computer, its warranty, online support of the desktop, or the computer's manufacturer?

Answers may vary. For example, the review affirms my decision.

- For the laptop computer, what is the URL of the review?

Answers may vary. For example, for the Dell laptop in Step 2, review URL:

<https://www.techradar.com/reviews/dell-xps-15-2020>

- List the major points in the review about the laptop:

Answers may vary. For example, a review said the laptop is extremely powerful, stylish, light, fast performance, amazing speakers, beautiful design, comfy keyboard, eye-catching design, and the best laptop for its price on the market.

- How does this review affect your opinion of this laptop, its warranty, online support of the laptop, or the computer's manufacturer?

Answers may vary. For example, affirmed my decision.

4. If the desktop computer package does not include the monitor, keyboard, and mouse, you need to include the price of these peripherals so that you can make a fair comparison between the cost of a desktop and the cost of a laptop. Answer the following:

- Are the monitor, keyboard, and mouse included in the desktop computer package?

Answers may vary. For example, the mouse and keyboard are included, but the monitor is not included.

- If not, what is the total price of these three peripherals? Provide webpages to support your

answer.

Answers may vary. For example, a 22" Dell monitor costs \$120.

5. Based on your requirements and the research you recorded in Table 1-1, would you buy the desktop computer or the laptop? Explain your answer.

Answers may vary. For example, the laptop because it is portable, takes up less space in an office, and has its own backup power supply.

6. How did the reviews of the desktop and laptop affect your decision? Explain your answer.

Answers may vary. For example, the review of the laptop was so positive, it helped me decide to go for the laptop.

7. For an operating system, you might want to consider using Windows by Microsoft or macOS by Apple. Compare two laptop computers that are similar in features except that one uses Windows and the other uses macOS. Fill in Table 1-2 with the results of your research. You may use the laptop from Table 1-1.

Table 1-2 Windows and macOS laptop computer comparison

Answers may vary. Below is an example for one Dell laptop and one Apple laptop computer:

Installed Features	Windows	macOS
Website (URL)	www.dell.com	www.apple.com
Brand and model	Dell XPS 15 Laptop	16-inch MacBook Pro
Operating system	Windows 10 Pro	macOS

	(64 bit)	
Processor type	Intel Core i7-9750H 6-Core	Intel Core i9 8-Core
Processor speed	4.5 GHz	4.8 GHz
RAM	32 GB DDR4	32 GB DDR4
Hard drive type/speed	1 TB M.2 PCIe NVMe SSD	1 TB SSD
Optical drive type	None present	None present
Networking	Wi-Fi 802.11AC	Wi-Fi 802.11ac
I/O ports	SD card slot USB HDMI Thunderbolt DisplayPort VGA HDMI Headset jack	USB Thunderbolt DisplayPort Headphone
Warranty	1 year hardware	1 year hardware

	service	service
Other features		
Installed software	Microsoft Office trial McAfee LiveSafe 12 month	iMovie, GarageBand
Price	\$1,809.99	\$3,199.00

8. Based on the research you recorded in Table 1-2, which is the better buy, a Windows laptop or a macOS laptop? Explain your answer.

Answers may vary. For example, a macOS laptop generally costs more than a Windows laptop. When deciding which is a better buy, it's good to consider the applications software you plan to use and user preferences and training.

[B HD] *Review Questions*

1. What are the two most important criteria when deciding which computer to buy?

Answer: How the computer will be used and the price

2. Why do laptop computers cost more than desktop computers?

Answer: Laptop components must be small and weigh less, yet they must have the same power as desktop components. Laptop components must also be durable enough to withstand movement and jostling while the computer is in use.

3. List three reasons why it is easier to upgrade a desktop computer than a laptop computer.

Answer: Answers may vary and might include:

- Because the desktop has more room in the case for expansion
- Because desktop components are not proprietary, as are many laptop components
- Because disassembling a laptop is more difficult than disassembling a desktop computer

4. Other than price, what factors might someone consider when deciding whether to buy a Windows laptop or a macOS laptop?

Answer: Answers may vary and might include:

- Applications software availability
- User experience
- Ease of sharing data files with users of other computers

5. In this lab, was it easier comparing a desktop computer to a laptop, or comparing a Windows laptop to a macOS laptop? Explain your answer.

Answer: Answers will vary depending on student experience.

Module 1 Practice Mode: Advanced Hardware Lab Simulations

Solutions for: [Lab 1-3: Practice Mode: Identify Internal Components of a Computer](#)

Step 1:

Lab 1-3: Practice Mode: Identify Internal Components of a Computer

Identify internal components of a computer

Introduction
Instruction
Inventory
Notepad
Magnifier
Contrast

eSATA
HDMI
RJ-11
USB
DisplayPort
RJ-45
S/PDIF
VGA
PS/2
DVI
sound ports

Submit

Step 2:

Identify internal components of a computer

Introduction
Instruction
Inventory
Notepad
Magnifier
Contrast

audio
video
multipurpose
keyboard/mouse
Ethernet

S/PDIF
audio
sound ports
audio
DisplayPort
video
audio
RJ-45
Ethernet
USB
multipurpose
DVI
video
VGA
video
PS/2
keyboard/mouse
HDMI
audio
video

Submit

Q1:

Identify internal components of a computer

Question 1 of 5

Which of these ports transmits digital video? (Select two.)

- VGA
- DVI
- S/PDIF
- DisplayPort

Navigation icons: back, refresh, forward

Left sidebar icons: introduction, instruction, inventory, notepad, magnifier, contrast

Step 3:

Identify internal components of a computer

Navigation icons: back, refresh, forward

Instruction: Computers communicate with various devices through their external ports. Select the following devices: DVI monitor, PS/2 keyboard, USB mouse, 3.5 mm headset, and a wireless SOHO router.



Inventory window: << All

Submit button

Step 4:

Identify internal components of a computer

Introduction
Instruction
Inventory
Notepad
Magnifier
Contrast




Instruction 👁️ ✕
Computers communicate with various devices through their external ports. Attach the following devices to the correct ports on this computer: DVI monitor, PS/2 keyboard, USB mouse, 3.5 mm headset, and a wireless SOHO router.

Submit

Step 5:

Identify internal components of a computer

Introduction
Instruction
Inventory
Notepad
Magnifier
Contrast



Instruction 👁️ ✕
Drag each external port on the rear side of this computer to the correct label.

HDMI	RJ-45	S/PDIF
eSATA	RJ-11	sound ports
VGA	DVI	USB
PS/2	DisplayPort	

Submit

Step 6:

Identify internal components of a computer

Introduction, Instruction, Inventory, Notepad, Contrast

keyboard/mouse, video, multipurpose, audio, Ethernet

RJ-45: Ethernet

sound ports: audio

HDMI: video, audio

PS/2: keyboard/mouse

DVI: video

USB: multipurpose

Instruction: Match each port type to its function(s).

Submit

Step 7:

Identify internal components of a computer

Introduction, Instruction, Inventory, Notepad, Magnifier, Contrast

« All

Instruction: Select the following devices: HDMI monitor, PS/2 keyboard, PS/2 mouse, USB speaker set, and a wireless SOHO router.

Submit

Step 8:

Identify internal components of a computer

introduction
instruction
inventory
notepad
magnifier
contrast



Instruction

Attach the following devices to the correct ports on this computer: HDMI monitor, PS/2 keyboard, PS/2 mouse, USB speaker set, and a wireless SOHO router.



Submit

Q2:

Identify internal components of a computer

introduction
instruction
inventory
notepad
magnifier
contrast

Question 2 of 5

Which of the following are true about DVI and HDMI technology? (Select two.)

- DVI can transmit audio data.
- HDMI can transmit video in either digital or analog.
- HDMI can transmit audio data.
- DVI can transmit video in either digital or analog.

Step 9:

Identify internal components of a computer



power cords

RAM

solid-state drive

SATA data cables

CPU fan

optical drive

power supply

network card

graphics card

motherboard

hard disk drive

introduction

instruction

inventory

notepad

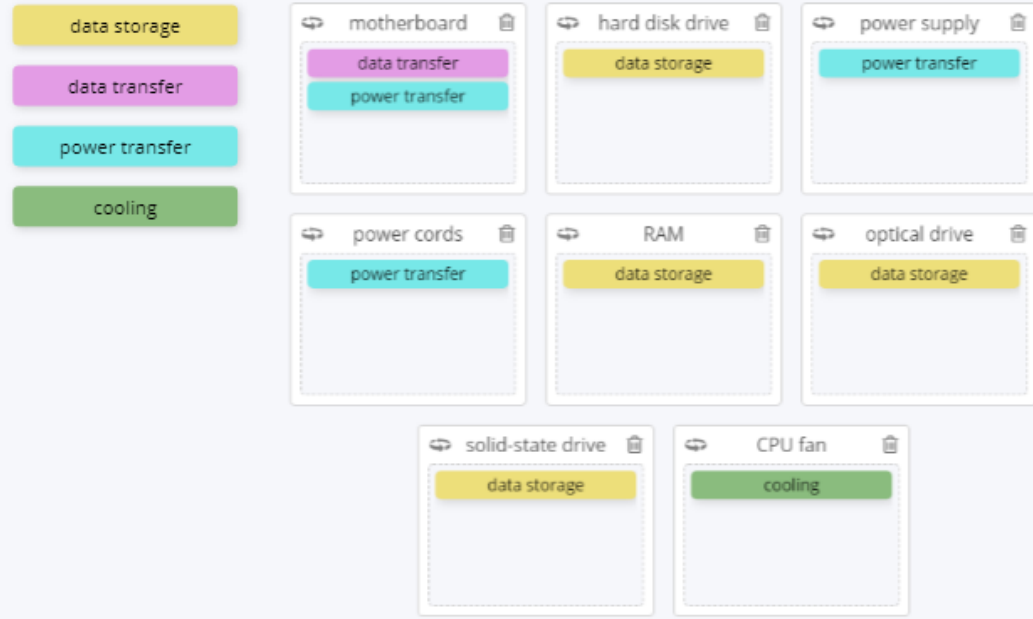
magnifier

contrast

Submit

Step 10:

Identify internal components of a computer



data storage

data transfer

power transfer

cooling

motherboard

hard disk drive

power supply

power cords

RAM

optical drive

solid-state drive

CPU fan

introduction

instruction

inventory

notepad

magnifier

contrast

Submit

Q3:

Identify internal components of a computer



introduction



instruction



inventory



notepad



magnifier



contrast

Question 3 of 5

If a computer system does not have a graphics card installed in a motherboard's PCIe slot, which component handles video calculations?

- The hard drive and memory cards
- The CPU or a chip on the motherboard
- The solid-state drive or the memory cards
- The optical drive

Step 11:

Identify internal components of a computer



introduction



instruction



inventory



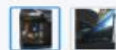
notepad



magnifier



contrast



hard disk drive	network card	optical drive
SATA data cables	CPU fan	motherboard
solid-state drive	RAM	graphics card
power supply	power cords	

Step 12:

Identify internal components of a computer



introduction
instruction
inventory
notepad
magnifier
contrast

- data storage
- data processing
- data transfer
- power transfer
- cooling

CPU fan: cooling

RAM: data storage

graphics card: data processing, data transfer

power cords: power transfer

power supply: power transfer

solid-state drive: data storage

optical drive: data storage

motherboard: power transfer, data transfer

Submit

Q4:

Identify internal components of a computer



introduction
instruction
inventory
notepad
magnifier
contrast

Question 4 of 5

What feature do you need on a computer if you want to take it with you on vacation to another continent?

- Cable lock
- Dual inline memory module
- Dual-voltage selector switch
- Expansion card

Step 13:

Identify internal components of a computer

This screenshot shows a computer motherboard with several empty boxes for identifying components. The motherboard is an ASRock Fatal1ty Z97 Killer. The component boxes are:

- RAM slots
- rear ports
- PCI slot
- PCIe x16 slot
- PCIe x1 slot
- CPU slot

On the left side, there is a toolbar with icons for: introduction, instruction, inventory, notepad, magnifier, and contrast. At the bottom right, there is a green 'Submit' button.

Step 14:

Identify internal components of a computer

This screenshot shows the same computer motherboard as in Step 13, but with components identified in colored boxes. The component boxes are:


- processor
- external attachments
- memory
- expansion cards
- PCIe x1 slot: expansion cards
- PCI slot: expansion cards
- CPU slot: processor
- RAM slots: memory
- rear ports: external attachments
- PCIe x16 slot: expansion cards

On the left side, there is a toolbar with icons for: introduction, instruction, inventory, notepad, magnifier, and contrast. At the bottom right, there is a green 'Submit' button.

Step 15:

Identify internal components of a computer

Introduction
Instruction
Inventory
notepad
magnifier
contrast




Gigabyte Radeon RX480
Core clock: 1266 MHz
Memory size: 8 GB
Ports: 1 DVI, 1 HDMI, 3 DisplayPort

Submit

Step 16:

Identify internal components of a computer

Introduction
Instruction
Inventory
notepad
magnifier
contrast



rear ports
PCIe x1 slot
CPU slot
PCI slot
PCIe x16 slot
RAM slots

Submit

Step 17:

Identify internal components of a computer

processor

memory

external attachments

expansion cards

PCIe x16 slot

expansion cards

rear ports

external attachments

PCIe x1 slot

expansion cards

RAM slots

memory

CPU slot

processor

Q5:

Identify internal components of a computer

Question 5 of 5


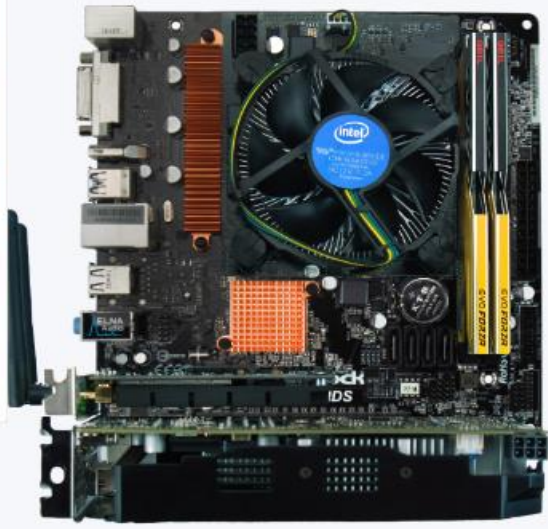
Which of the following is a difference between memory and storage?

- Memory is stored on optical discs; storage is stored on a solid-state drive.
- Memory holds data and programs; storage holds data and instructions.
- Memory is temporary; storage is permanent.
- Nothing: they are essentially the same thing.

Step 18:

Identify internal components of a computer

introduction
instruction
inventory
notepad
magnifier
contrast



TP-Link wireless adapter
Standards: 802.11 a/b/g/n/ac
Frequencies: 2.4 GHz, 5 GHz
Security: WEP, WPA-PSK/WPA2-PSK, 802.1x
Interface: PCIe x1

Submit

The image shows a computer motherboard with an Intel fan and a TP-Link wireless adapter. The motherboard is a Gigabyte H110M-D3S, featuring an Intel Core i3-6100 processor, 8GB DDR4 RAM, and a 240GB SSD. The TP-Link wireless adapter is a TL-WN722N, which is a PCIe x1 wireless network card. The interface is a PCIe x1 slot. The adapter supports 802.11 a/b/g/n/ac standards, with frequencies of 2.4 GHz and 5 GHz. It also supports WEP, WPA-PSK/WPA2-PSK, and 802.1x security protocols.