User Guide

SUMMARY

This guide provides basic information for using and upgrading this product, including topics such as components, features, networks, and HP resources.

Legal information

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Product notice

This guide describes features that are common to most products. Some features might not be available on your computer.

Not all features are available in all editions or versions of Windows. Systems may require upgraded and/or separately purchased hardware, drivers, software or BIOS update to take full advantage of Windows functionality. Windows is automatically updated, which is always enabled. High-speed internet and Microsoft account required. ISP fees may apply and additional requirements may apply over time for updates. See http://www.windows.com. **If your product ships with Windows in S Mode:** Windows in S Mode works exclusively with apps from the Microsoft Store within Windows. Certain default settings, features, and apps cannot be changed. Some accessories and apps that are compatible with Windows may not work (including some antivirus, PDF writers, driver utilities, and accessibility apps), and performance may vary, even if you switch out of S Mode. If you switch to Windows, you cannot switch back to S Mode. Learn more at Windows.com/SmodeFAQ.

To access the latest user guides, go to http://www.hp.com/support, and follow the instructions to find your product. Then select **Manuals**.

Software terms

By installing, copying, downloading, or otherwise using any software product preinstalled on this computer, you agree to be bound by the terms of the HP End User License Agreement (EULA). If you do not accept these license terms, your sole remedy is to return the entire unused product (hardware and software) within 14 days for a full refund subject to the refund policy of your seller.

For any further information or to request a full refund of the price of the computer, please contact your seller.

Safety warning notice

Reduce the possibility of heat-related injuries or of overheating the computer by following the practices described.

⚠ **WARNING!** To reduce the possibility of heat-related injuries or of overheating the computer, do not place the computer directly on your lap or obstruct the computer air vents. Use the computer only on a hard, flat surface. Do not allow another hard surface, such as an adjoining optional printer, or a soft surface, such as pillows or rugs or clothing, to block airflow. Also, do not allow the AC adapter to come into contact with the skin or a soft surface, such as pillows or rugs or clothing, during operation. The computer and the AC adapter comply with the user-accessible surface temperature limits defined by applicable safety standards.

Processor configuration setting (select products only)

Important information about processor configurations.

IMPORTANT: Select products are configured with an Intel® Pentium® N35xx/N37xx series or a Celeron® N28xx/N29xx/N30xx/N31xx series processor and a Windows® operating system. **If your computer is configured as described, do not change the processor configuration setting in msconfig.exe from 4 or 2 processors to 1 processor.** If you do so, your computer will not restart. You will have to perform a factory reset to restore the original settings.

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1 About this guide

This guide provides basic information for using and upgrading this product.

WARNING! Indicates a hazardous situation that, if not avoided, **could** result in serious injury or death.

CAUTION: Indicates a hazardous situation that, if not avoided, **could** result in minor or moderate injury.

IMPORTANT: Indicates information considered important but not hazard-related (for example, messages related to property damage). Warns the user that failure to follow a procedure exactly as described could result in loss of data or in damage to hardware or software. Also contains essential information to explain a concept or to complete a task.

NOTE: Contains additional information to emphasize or supplement important points of the main text.

TIP: Provides helpful hints for completing a task.

2 Getting started

This computer is a powerful tool designed to enhance your work and entertainment. Read this chapter to learn about best practices after you set up your computer, fun things to do with your computer, caring for your safety and comfort, and where to find additional HP resources.

Best practices

After you set up and register the computer, HP recommends the following steps to get the most out of your smart investment.

- Back up your hard drive by creating recovery media. See Backing up, restoring, and recovering on page 48.
- If you haven't already done so, connect to a wired or wireless network. See details in Connecting to a network on page 11.
- Become familiar with the computer hardware and software. For more information, see Getting to know your computer on page 6 and Enjoying entertainment features on page 16.
- **Access HP Support Assistant app**—For quick online support, open the HP Support Assistant app (select products only). HP Support Assistant optimizes computer performance and resolves problems using the latest software updates, diagnostic tools, and guided assistance. Select the **Search** icon in the taskbar, type `support` in the search box, and then select **HP Support Assistant**.

Caring for your safety and comfort

HP is committed to providing high-quality products that will last for years to come. HP is also concerned about your safety and comfort. To avoid eye strain and to relax muscle tension and fatigue, take a break every hour when using your computer.

1. Let your arms relax at your side.
2. Bend your head forward slightly to stretch the neck.
3. Hold for 5 seconds.
4. Keep your arms relaxed at your side.
5. Turn your head to one side and hold for 5 seconds.
6. Repeat for the other side.
7. Keep your arms relaxed at your side.
8. While looking forward, lean your head toward your right shoulder and hold for 5 seconds.
9. Look down as you slowly move your head to center. Roll your head toward your left shoulder while still looking forward.
10. Repeat for the other side.

To learn about other ways to care for your safety and comfort read the *Safety & Comfort Guide*, located on the web at http://www.hp.com/ergo.

Advantages of flicker-free technology (select products only)

Monitors with flicker-free display technology help protect your eyes from fatigue, dryness, itchiness, or irritation. This technology allows you to work on spreadsheets, play games, or watch videos comfortably.

Adjusting low blue light mode (select products only)

Your HP computer offers either a hardware or software solution to decrease the blue light emitting from the monitor.

Low blue light hardware solution

Your computer monitor is shipped from the factory in low blue light mode for improved eye comfort and safety. The monitor automatically adjusts blue light emissions when you use the computer at night or in a low-light setting. A monitor with a low blue light panel follows TÜV Rheinland compliance regulation for the factory default setting mode.

Low blue light software solution

Decreasing the blue light emitting from the monitor reduces the blue light exposure to your eyes. HP computers provide a setting to reduce blue light output and create a more relaxing and less stimulating image while you read content on the screen. Select one of the following apps to adjust your monitor to a comfortable viewing light.

- **HP Display Control App (Select Products Only)**
  1. Open the HP Display Control app.
  2. Select a setting:
     - **Low Blue Light**: Reduces the blue light for improved eye comfort (TÜV certified).
     - **Low Blue Light Models**: Low Blue Light (select products only)
     - **Default**: Optimized for color vibrancy
     - **Web (sRGB)**: Optimized for web browsing
     - **Printing and Imagine (Adobe RGB)**: Optimized for images using Adobe RGB
     - **Photos and Videos (DCI-P3)**: Optimized for photos and movie viewing and editing
     - **Native**: No optimization applied
     - **Night**: Adjusts to the lowest blue light and reduces the impact on sleep.
     - **Reading**: Optimizes blue light and brightness for indoor viewing.
- **myHP App**
  1. Open the myHP app.
  2. Select **Display Controls**.
  3. Select **On** or **Off** to reduce the blue light emitting from the display.

⚠ **WARNING!** To reduce the risk of serious injury, read the *Safety & Comfort Guide*, located on the web at http://www.hp.com/ergo. The guide describes proper workstation setup, and proper posture, health, and work habits for computer users. It also provides important electrical and mechanical safety information.

Restoring monitor brightness to factory default (select products only)

You can use the HP Display Control application to recover the original monitor brightness setting that was set at the factory.

To restore the default brightness setting, follow the next steps.

1. Open the HP Display Control app.
2. Select **Advanced**.
3. Select **Support**.
4. Select **Factory Reset**.

Getting information

To locate resources that provide product details, how-to information, and additional instructions, use this table.

Table 2-1 **Getting information**

Tasks	Instructions
• Set up your computer	Find help using either of these methods: • See the *Setup Instructions* or *Quick Setup* poster. • See Getting to know your computer on page 6.
• Connect to the internet	See Connecting to a network on page 11.
• Recover factory settings	See Backing up, restoring, and recovering on page 48.
• See how-to videos about using the features of your computer	Go to http://www.hp.com/supportvideos (English only).
• Learn how to use the Windows® operating system • Find Windows password information • Find links to driver updates • Read frequently asked questions	Get Help app: ▪ Select the **Start** button, select **All apps**, and then select the **Get Help** app.
• Troubleshoot the most common computer hardware and software issues	See Troubleshooting on page 35.
• Find electronic user guides and specifications for your computer model	To access the latest user guides or manuals for your product, go to http://www.hp.com/support, and follow the instructions to find your product. Then select **Manuals**.

Table 2-1 **Getting information (continued)**

Tasks	Instructions
• Order parts and find additional troubleshooting help • Upgrade or replace components of your computer • Connect to a TV (select products only)	For HP support, go to http://www.hp.com/support.
• Get up-to-date information and help from the Windows community	Go to http://www.hp.com/support/consumer-forum.
• Maintain your computer	HP Support Assistant maintains your computer performance and resolves problems quickly by using automated updates, diagnostic tools, and guided assistance. Open HP Support Assistant using any of these methods: • Select the **Search** icon in the taskbar, type `support` in the search box, and then select the **HP Support Assistant** app. • Select the question mark icon in the taskbar. • See Maintaining your computer on page 27.
• Find safety and regulatory notices	*Regulatory, Safety, and Environmental Notices* To access this document: ▪ Select the **Search** icon in the taskbar, type `HP Documentation` in the search box, and then select **HP Documentation**.
• Find ergonomic information	*Safety & Comfort Guide* To access this guide, use one of these methods: • Select the **Search** icon in the taskbar, type `HP Documentation` in the search box, and then select **HP Documentation**. • Go to http://www.hp.com/ergo. **IMPORTANT:** You must be connected to the internet to access the latest version of the user guide.
• Find computer warranty information	*Limited Warranty** To access this document, use one of these methods: • Select the **Search** icon in the taskbar, type `HP Documentation` in the search box, and then select **HP Documentation**. • Go to http://www.hp.com/go/orderdocuments. **IMPORTANT:** You must be connected to the internet to access the latest version of the user guide.

*You can find your HP Limited Warranty located with the user guides on your product and/or on the CD or DVD provided in the box. In some countries or regions, HP might provide a printed warranty in the box. For countries or regions where the warranty is not provided in printed format, you can request a copy from http://www.hp.com/go/orderdocuments. For products purchased in Asia Pacific, you can write to HP at POD, PO Box 161, Kitchener Road Post Office, Singapore 912006. Include your product name, and your name, phone number, and postal address.

3 Getting to know your computer

Your computer features top-rated components. This chapter provides details about your components, where they're located, and how they work.

IMPORTANT: If your computer has a magnetic dust filter, be sure that the filter is installed. If the filter has been removed, install the filter before using the computer.

Locating hardware

To find out what hardware is installed on your computer, select the **Search** icon in the taskbar, type `device manager` in the search box, and then select the **Device Manager** app.

For information about system hardware components and the system BIOS version number, press fn+esc (select products only).

Locating software

Software can vary by product. To find out what software is installed on your computer, right-click the **Start** button, and then select **Apps and Features**.

Setting up your computer

Follow these steps to set up the computer.

WARNING! To reduce the risk of electrical shock or damage to your equipment:

- Place the computer in a location away from water, dust, moisture, and soot. These environmental factors can increase the temperature inside your computer or cause fire or electrocution.
- Do not disable the power cord grounding pin. The grounding pin is an important safety feature.
- Plug the power cord into an AC outlet that is easily accessible at all times.
- Disconnect power from the equipment by unplugging the power cord from the AC outlet.
- To prevent direct exposure to the laser beam, do not try to open the enclosure of the CD or DVD drive.
- The power supply is preset for the country or region where you purchased your computer. If you move, check the voltage requirements for your new location before plugging the computer into an AC outlet.

To reduce the risk of serious injury read the *Safety & Comfort Guide*. To access this guide, go to http://www.hp.com/ergo.

To shut down your computer, follow these steps:

1. Place the computer so that all ventilation openings are unobstructed and cabling is not in a walkway or where it can be stepped on or damaged by placing furniture on it.

NOTE: The glossy monitor might cause unwanted reflection. Adjust the monitor position, lighting condition, or viewing direction to reduce the reflection.

2. When connecting all power cords from the monitor, computer, and accessories to an uninterruptible power supply (UPS), HP recommends that you use a power surge protection device. If the computer has a television tuner, a modem connection, or a telephone connection, protect the computer by using surge protection with these signal inputs as well. Connect the television cable or the telephone line cord to the surge protection device, and then connect the device to the computer.

3. Turn on the computer, and then follow the on-screen instructions.

4. To access the latest user guides or manuals for your product, go to http://www.hp.com/support, and follow the instructions to find your product. Then select **Manuals**.

5. Look in the computer box for additional printed details or updates.

After you complete the initial computer setup, you might want to install additional hardware devices or software. Check the operating system, memory, and other requirements listed for these items before purchasing them for your computer. Follow the software manufacturer's directions to install the new software.

NOTE: Use only licensed original software. Installing copied software could be illegal and might result in an unstable installation or infect the computer with a virus.

Identifying USB ports

Your computer might have one or more of the listed types of USB ports.

NOTE: Your icons might look slightly different from the illustrations in this section.

Table 3-1 **USB ports and descriptions**

Component		Description
	USB port	Connects a USB device, provides data transfer, and (for select products) charges small devices (such as a smartphone) when the computer is on or in Sleep mode. NOTE: Use a standard USB Type-A charging cable or cable adapter (purchased separately) when charging a small external device.
	USB port with HP Sleep and Charge	Connects a USB device, provides high-speed data transfer, and charges small devices (such as a smartphone), even when the computer is off. NOTE: Use a standard USB Type-A charging cable or cable adapter (purchased separately) when charging a small external device.

Table 3-1 USB ports and descriptions (continued)

Component		Description
	USB port	Connects a USB device, provides high-speed data transfer, and (for select products) charges small devices (such as a smartphone) when the computer is on or in Sleep mode. NOTE: Use a standard USB Type-A charging cable or cable adapter (purchased separately) when charging a small external device.
10 – or –	USB port	Connects a USB device, provides high-speed data transfer, and (for select products) charges small devices (such as a smartphone) when the computer is on or in Sleep mode. NOTE: Use a standard USB Type-A charging cable or cable adapter (purchased separately) when charging a small external device.
	USB Type-C® port	Connects a USB device, provides data transfer, and (for select products) charges small devices (such as a smartphone) when the computer is on or in Sleep mode. NOTE: Use a standard USB Type-C charging cable or cable adapter (purchased separately) when charging a small external device.
	USB Type-C port	Connects a USB device, provides high-speed data transfer, and (for select products) charges small devices (such as a smartphone) when the computer is on or in Sleep mode. NOTE: Use a standard USB Type-C charging cable or cable adapter (purchased separately) when charging a small external device.
10 – or –	USB Type-C port	Connects a USB device, provides high-speed data transfer, and (for select products) charges small devices (such as a smartphone) when the computer is on or in Sleep mode. NOTE: Use a standard USB Type-C charging cable or cable adapter (purchased separately) when charging a small external device.
	USB Type-C Thunderbolt™ port with HP Sleep and Charge	Connects a USB device, provides high-speed data transfer, and charges small devices (such as a smartphone), even when the computer is off. – and – Connects a display device that has a USB Type-C connector, providing DisplayPort™ output. NOTE: Use a standard USB Type-C charging cable or cable adapter (purchased separately) when charging a small external device.

Table 3-1 USB ports and descriptions (continued)

Component		Description
SS	USB Type-C port and DisplayPort connector	Connects a USB device, provides high-speed data transfer, and (for select products) charges small devices (such as a smartphone) when the computer is on or in Sleep mode. NOTE: Use a standard USB Type-C charging cable or cable adapter (purchased separately) when charging a small external device. – and – Connects a DisplayPort device that has a USB Type-C connector, providing display output.

Wireless phone charger (select products only)

Your computer might contain a wireless phone charger as part of the base. You can use this wireless charger to charge a phone or tablet that contains wireless charging technology.

Depending on your model, the wireless charging feature might be enabled or disabled in some or all power states. To enable or disable the wireless charging feature, use one of the following methods:

- BIOS
  1. Turn off the computer.
  2. Turn on the computer and immediately press f10.
  3. Continue pressing f10 until the **BIOS Configuration** screen is displayed.
  4. Use the arrow keys on your keyboard to navigate to the **Power** tab, and then select **Hardware Power Management**.
  5. Set **Wireless Charging in S4/S5** to **Enable**.
  6. Press f10 to save the changes and exit.

  – or –

  1. Turn off the computer.
  2. Turn on the computer and immediately press f10.
  3. Continue pressing f10 until the **BIOS Configuration** screen is displayed.
  4. Use the arrow keys on your keyboard to navigate to the **Configuration** tab.
  5. Change the wireless charging option to **enabled**.
- OSD
  1. Press the OSD button on the bottom edge of the monitor.
  2. After the main menu is displayed, press the OSD button again to open the OSD menu.
  3. Select **Power**.
  4. Under **Power mode**, select **Full-Feature**.

5. Under **Wireless Charging**, select **On** to enable wireless charging.

– or –

1. Press the OSD button on the back cover to open the OSD menu.
2. Select **Power**, and then select **Wireless Charging**.
3. Select **On** to enable wireless charging.

– or –

1. Press the OSD button on the right side of the back of the computer.
2. Select the menu icon to open the OSD menu.
3. Select **Power**, and then select **Wireless Charging**.
4. Select **On** to enable wireless charging or **Off** to disable wireless charging.

Shutting down (turning off) the computer

Although you can turn off the computer with the power button, HP recommends that you use the Windows Shut down command.

IMPORTANT: Unsaved information is lost when the computer shuts down. Be sure to save your work before shutting down the computer.

The Shut down command closes all open programs, including the operating system, and then turns off the display and computer.

Shut down the computer under any of the following conditions:

- When you need to access components inside the computer
- When you are connecting an external hardware device that does not connect to a USB or video port or to a headphone or microphone jack
- When the computer will be unused and disconnected from external power for an extended period

NOTE: If the computer is in the Sleep state or in Hibernation, first exit Sleep or Hibernation by briefly pressing the power button.

To shut down your computer, follow these steps:

1. Save your work and close all open programs.
2. Select the **Start** button, select the **Power** icon, and then select **Shut down**.

If the computer is unresponsive and you cannot use the preceding shutdown procedures, try the following emergency procedures in the sequence provided:

- Press ctrl+alt+delete, select the **Power** icon, and then select **Shut down**.
- Press and hold the power button for at least 10 seconds.
- Disconnect the computer from external power.

4 Connecting to a network

Your computer can travel with you wherever you go. But even at home, you can explore the globe and access information from millions of websites by using your computer and a wired or wireless network connection. This chapter helps you get connected to that world.

Connecting to a wireless network

Your computer might be equipped with one or more wireless devices.

- WLAN device—Connects the computer to wireless local area networks, which are commonly referred to as Wi-Fi networks, wireless LANs, or WLANs. These connections typically occur in corporate offices, your home, and public places such as airports, restaurants, coffee shops, hotels, and universities. The WLAN device in your computer communicates with a wireless router or a wireless access point.
- HP Mobile Broadband Module—Gives you wireless connectivity over a wireless wide area network (WWAN), a much larger area. Mobile network operators install base stations (similar to cell phone towers) throughout large geographic areas, effectively providing coverage across entire states, regions, or even countries.
- Bluetooth® device—Creates a personal area network (PAN) to connect to other Bluetooth-enabled devices such as computers, phones, printers, headsets, speakers, and cameras. In a PAN, each device communicates directly with other devices, and devices must be relatively close together—typically within 10 m (approximately 33 ft) of each other.

Using the wireless controls

You can control the wireless devices in your computer using one or both of these features.

- Airplane mode key (also called *wireless button* or *wireless key*)
- Operating system controls

Airplane mode key

The computer might have an airplane mode key, one or more wireless devices, and one or two wireless lights. All the wireless devices on your computer are enabled at the factory.

The wireless light indicates the overall power state of your wireless devices, not the status of individual devices.

Operating system controls

The Network and Sharing Center allows you to set up a connection or network, connect to a network, and diagnose and repair network problems.

To use operating system controls, on the taskbar, right-click the network status icon, and then select **Network and Internet settings**.

Connecting to a WLAN

Before you can connect to a WLAN with this procedure, you must first set up internet access.

NOTE: When you are setting up internet access in your home, you must establish an account with an internet service provider (ISP). To purchase internet service and a modem, contact a local ISP. The ISP will help set up the modem, install a network cable to connect your wireless router to the modem, and test the internet service.

1. Be sure that the WLAN device is on.
2. On the taskbar, select the network status icon to open the Quick Settings menu. Select the arrow next to the wireless icon, and the connect to one of the available networks.

   If the WLAN is a security-enabled WLAN, you are prompted to enter a security code. Enter the code, and then select **Next** to complete the connection.

   NOTE: If no WLANs are listed, you might be out of range of a wireless router or access point.

   NOTE: If you do not see the WLAN that you want to connect to:

   1. On the taskbar, right-click the network status icon, and then select **Network and Internet settings**.
   2. Select **Wi-Fi**, and then select **Show available known networks**.
   3. Connect to one of the available networks.
3. Follow the on-screen instructions to complete the connection.

After the connection is made, right-click the network status icon at the far right of the taskbar to verify the name and status of the connection.

NOTE: The functional range (how far your wireless signals travel) depends on WLAN implementation, router manufacturer, and interference from other electronic devices or structural barriers such as walls and floors.

Using HP Mobile Broadband (select products only)

Your HP Mobile Broadband computer has built-in support for mobile broadband service. Your new computer, when used with a mobile operator's network, gives you the freedom to connect to the internet, send email, or connect to your corporate network without the need for Wi-Fi hotspots.

You might need the HP Mobile Broadband Module IMEI number, MEID number, or both to activate mobile broadband service. The number might be printed on a label located on the bottom of your computer, inside the battery bay, under the service door, or on the back of the display.

Locating mobile operator settings

To locate mobile operator settings:

1. On the taskbar, right-click the network status icon.
2. Select **Network and Internet settings**.
3. Under the **Network & Internet** section, select **Cellular**, and then, under **More cellular settings** select **Mobile operator settings**.

Some mobile network operators require the use of a subscriber identity module (SIM) card. A SIM card contains basic information about you, such as a personal identification number (PIN), as well as network information. Some computers include a SIM card that is preinstalled. If the SIM card is not preinstalled, it

might be included with the HP Mobile Broadband documents provided with your computer, or the mobile network operator might provide it separately from the computer.

Connecting with HP Mobile Broadband

To connect with HP Mobile Broadband:

1. On the taskbar, select the network icon to open the Quick Settings menu.
2. Select the arrow next to the signal bars icon to connect.

For information about HP Mobile Broadband and how to activate service with a preferred mobile network operator, see the HP Mobile Broadband information included with your computer.

Using eSIM (select products only)

Your computer might be equipped with an eSIM. An eSIM is a programmable version of the commonly used SIM that you can use to download different profiles from selected carriers.

An eSIM lets you connect to the internet over a cellular data connection. With an eSIM, you do not need to get a SIM card from your mobile operator, and you can quickly switch between mobile operators and data plans. For example, you might have one cellular data plan for work and a different plan with another mobile operator for personal use. If you travel, you can connect in more places by finding mobile operators with plans in that area.

You can implement eSIMs using these methods:

- Embed the eSIM chip (eUICC). The notebook then operates as a dual SIM, one as eUICC and the second as standard micro or nano SIM card on a SIM card tray. Only one SIM can be active at a time.
- Place a removable physical eSIM on a SIM card tray, the same as a standard micro or nano SIM card. In this case, the eSIM is not limited to a single carrier (physical blank eSIM).

You must add an eSIM profile to connect to the internet using cellular data. To add a profile, manage SIM profiles, and learn how to use an eSIM, go to https://www.support.microsoft.com , and type `Use an eSIM` in the search bar.

Using GPS (select products only)

Your computer might be equipped with a Global Positioning System (GPS) device. GPS satellites deliver location, speed, and direction information to GPS-equipped systems.

To enable GPS, be sure that location is enabled under the Location setting.

1. Select the **Search** icon in the taskbar, type `location` in the search box.
2. Select **Location privacy settings**, and then make sure that location services are enabled.

Using Bluetooth wireless devices (select products only)

A Bluetooth device provides short-range wireless communications that replace the physical cable connections that traditionally link electronic devices.

- Computers (desktop, notebook)
- Phones (cellular, cordless, smartphone)
- Imaging devices (printer, camera)

- Audio devices (headset, speakers)
- Mouse
- External keyboard

Connecting Bluetooth devices

Before you can use a Bluetooth device, you must establish a Bluetooth connection.

1. In the taskbar, select the **Search** icon, type `bluetooth` in the search box, and then select **Bluetooth and other devices settings**.
2. Enable **Bluetooth**, if it is not already enabled.
3. Select **Add device**, and then in the **Add device** dialog box, select **Bluetooth**.
4. Select your device from the list, and then follow the on-screen instructions.

NOTE: If the device requires verification, a pairing code is displayed. On the device that you are adding, follow the on-screen instructions to verify that the code on your device matches the pairing code. For more information, see the documentation provided with the device.

NOTE: If your device does not appear in the list, be sure that Bluetooth on that device is turned on. Some devices might have additional requirements; see the documentation provided with the device.

Connecting to a wired network—LAN (select products only)

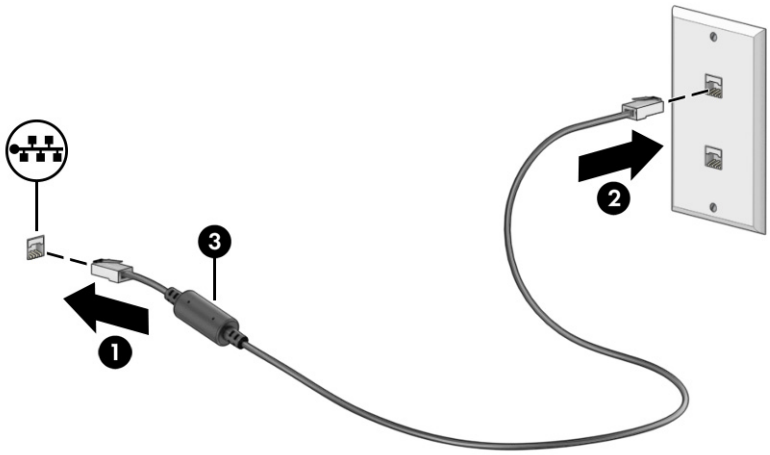
Use a LAN connection to connect the computer directly to a router in your home (instead of working wirelessly) or to connect to an existing network at your office.

If there is no RJ-45 (network) port on the computer, connecting to a LAN requires a network cable and a network jack or an optional docking device or expansion product.

To connect the network cable, follow these steps:

1. Plug the network cable into the network jack **(1)** on the computer.
2. Plug the other end of the network cable into a network wall jack **(2)** or router.

   NOTE: If the network cable contains noise suppression circuitry **(3)**, which prevents interference from TV and radio reception, orient the circuitry end of the cable toward the computer.


1
2
3

5 Enjoying entertainment features

Use your HP computer as an entertainment hub to socialize via the camera, enjoy and manage your music, and download and watch movies. Or, to make your computer an even more powerful entertainment center, connect external devices like a monitor, projector, TV, speakers, or headphones.

Using the camera

Your computer has one or more cameras that enable you to connect with others for work or play. Cameras might be front facing, rear facing, or pop up.

To determine which camera(s) are on your product, see Getting to know your computer on page 6.

Most cameras allow you to video chat, record video, and record still images. Some also provide HD (high-definition) capability, apps for gaming, or facial recognition software like Windows Hello. See Computer security features on page 33 for details about using Windows Hello.

To use your camera, select the **Search** icon in the taskbar, type `camera` in the search box, and then select **Camera** from the list of applications.

NOTE: The first time you select the Camera app, you must select whether Camera can access your precise location.

Using audio

You can download and listen to music, stream audio content (including radio) from the web, record audio, or mix audio and video to create multimedia. You can also play music CDs on the computer (on select products) or attach an external optical drive to play CDs.

To enhance your listening enjoyment, attach external audio devices such as speakers or headphones.

Connecting speakers

You can attach wired speakers to your computer by connecting them to a USB port or to the audio-out (headphone)/audio-in (microphone) combo jack on your computer or on a docking station.

To connect wireless speakers to your computer, follow the device manufacturer's instructions. To connect high-definition speakers to the computer, see Setting up HDMI audio on page 21. Before connecting speakers, lower the volume setting.

Connecting headphones

You can connect wired headphones to the headphone jack or to the audio-out (headphone)/audio-in (microphone) combo jack on your computer.

WARNING! To reduce the risk of personal injury, lower the volume setting before putting on headphones, earbuds, or a headset. For additional safety information, see the *Regulatory, Safety, and Environmental Notices*.

To access this document:

- Select the **Search** icon in the taskbar, type `HP Documentation` in the search box, and then select **HP Documentation**.

To connect wireless headphones to your computer, follow the device manufacturer's instructions.

Connecting a microphone

To record audio, connect a microphone to the microphone jack on the computer. For best results when recording, speak directly into the microphone, and record sound in a setting free of background noise.

Connecting headsets

Headphones combined with a microphone are called *headsets*. You can connect wired headsets to the audio-out (headphone)/audio-in (microphone) combo jack on your computer.

⚠ **WARNING!** To reduce the risk of personal injury, lower the volume setting before putting on headphones, earbuds, or a headset. For additional safety information, see the *Regulatory, Safety, and Environmental Notices*.

To access this document:

- Select the **Search** icon in the taskbar, type `HP Documentation` in the search box, and then select **HP Documentation**.

To connect wireless headsets to your computer, follow the device manufacturer's instructions.

Using sound settings

Use sound settings to adjust system volume, change system sounds, or manage audio devices.

Sound settings

To view or change sound settings, follow these steps.

1. Select the **Search** icon in the taskbar, type `control panel` in the search box, and then select **Control Panel**.
2. Select **Hardware and Sound**, and then select **Sound**.

Audio settings

Your computer might include an enhanced sound system by Bang & Olufsen, B&O Play, or another provider. As a result, your computer might include advanced audio features that can be controlled through an audio control panel specific to your sound system.

Use the audio control panel to view and control audio settings.

- Select the **Search** icon in the taskbar, type `audio control` in the search box, and then select the audio control panel specific to your system.

Using video

Your computer is a powerful video device that enables you to watch streaming video from your favorite websites and download video and movies to watch on your computer when you are not connected to a network.

To enhance your viewing enjoyment, use one of the video ports on the computer to connect an external monitor, projector, or TV.

IMPORTANT: Be sure that the external device is connected to the correct port on the computer, using the correct cable. Follow the device manufacturer's instructions.

For information about using your USB Type-C features, go to http://www.hp.com/support, and follow the instructions to find your product.

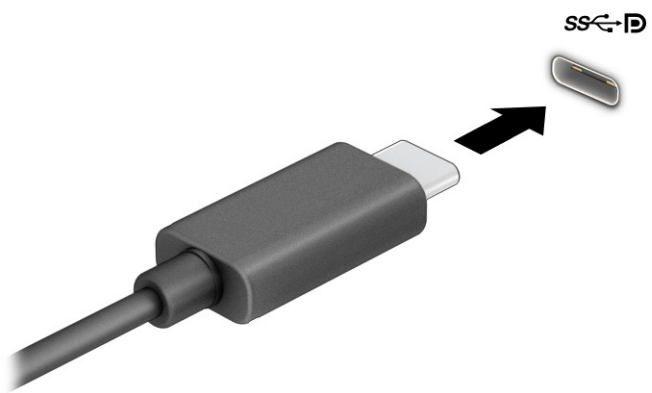
Connecting a DisplayPort device using a USB Type-C cable (select products only)

To see video or high-resolution display output on an external DisplayPort device, connect the DisplayPort device according to the instructions.

NOTE: To connect a USB Type-C DisplayPort (DP) device to your computer, you need a USB Type-C cable, purchased separately.

1. Connect one end of the USB Type-C cable to the USB Type-C port and DisplayPort connector on the computer.

   NOTE: Your connector icon might look slightly different from the illustration in this section.



2. Connect the other end of the cable to the external DisplayPort device.
3. Press the Windows key + p to cycle through one of four display states:
   - **PC screen only:** View the screen image on the computer only.
   - **Duplicate:** View the screen image simultaneously on both the computer and the external device.
   - **Extend:** View the screen image extended across both the computer and the external device.
   - **Second screen only:** View the screen image on the external device only.

Each time you press the Windows key + p, the display state changes.

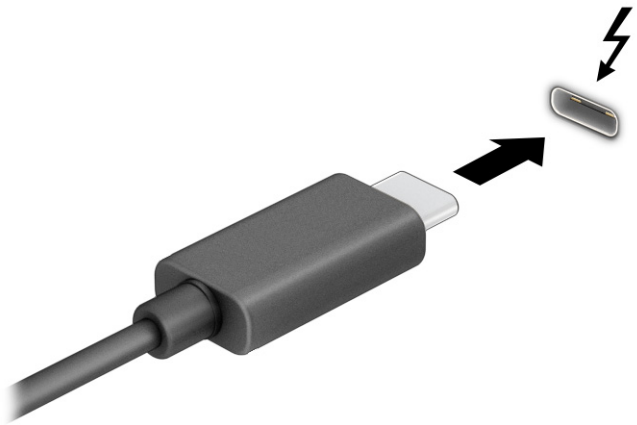
NOTE: For best results, especially if you choose the **Extend** option, increase the screen resolution of the external device, as follows. Select the **Start** button, select **Settings**, and then select **System**. Under **Display**, select the appropriate resolution, and then select **Keep changes**.

Connecting a Thunderbolt device using a USB Type-C cable (select products only)

To see video or high-resolution display output on an external Thunderbolt™ device, connect the Thunderbolt device according to the instructions.

NOTE: To connect a USB Type-C Thunderbolt device to your computer, you need a USB Type-C cable, purchased separately.

1. Connect one end of the USB Type-C cable to the USB Type-C Thunderbolt port on the computer.



2. Connect the other end of the cable to the external Thunderbolt device.
3. Press the Windows key + p to cycle through one of four display states:
   - **PC screen only:** View the screen image on the computer only.
   - **Duplicate:** View the screen image simultaneously on both the computer and external device.
   - **Extend:** View the screen image extended across both the computer and external device.
   - **Second screen only:** View the screen image on the external device only.

   Each time you press the Windows key + p, the display state changes.

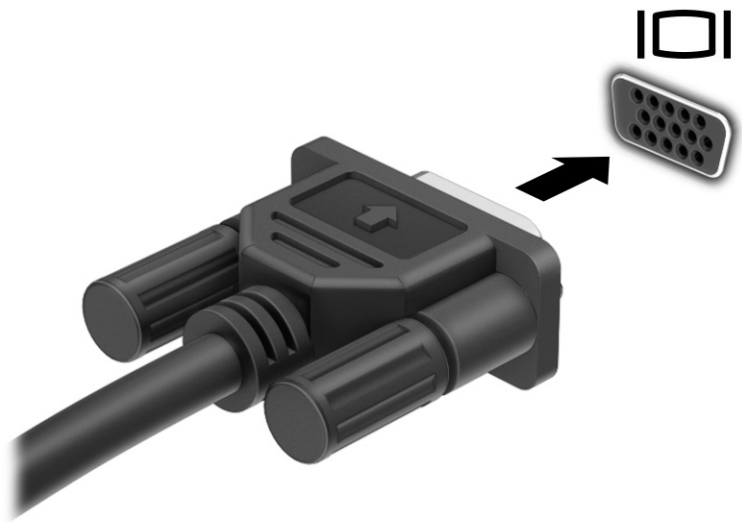
NOTE: For best results, especially if you choose the **Extend** option, increase the screen resolution of the external device, as follows. Select the **Start** button, select **Settings**, and then select **System**. Under **Display**, select the appropriate resolution, and then select **Keep changes**.

Connecting video devices by using a VGA cable (select products only)

To see the computer screen image on an external VGA monitor or projected for a presentation, connect a monitor or projector to the computer's VGA port.

NOTE: To connect a VGA video device to your computer, you need an VGA cable, purchased separately.

1. Connect the VGA cable from the monitor or projector to the VGA port on the computer as shown.



2. Press the Windows key + p to cycle through one of four display states:
   - **PC screen only:** View the screen image on the computer only.
   - **Duplicate:** View the screen image simultaneously on both the computer and the external device.
   - **Extend:** View the screen image extended across both the computer and the external device.
   - **Second screen only:** View the screen image on the external device only.

   Each time you press the Windows key + p, the display state changes.

   NOTE: For best results, especially if you choose the **Extend** option, increase the screen resolution of the external device, as follows. Select the **Start** button, select **Settings**, and then select **System**. Under **Display**, select the appropriate resolution, and then select **Keep changes**.

Connecting video devices using an HDMI cable (select products only)

To connect an HDMI device to your computer, you need an HDMI cable, purchased separately.

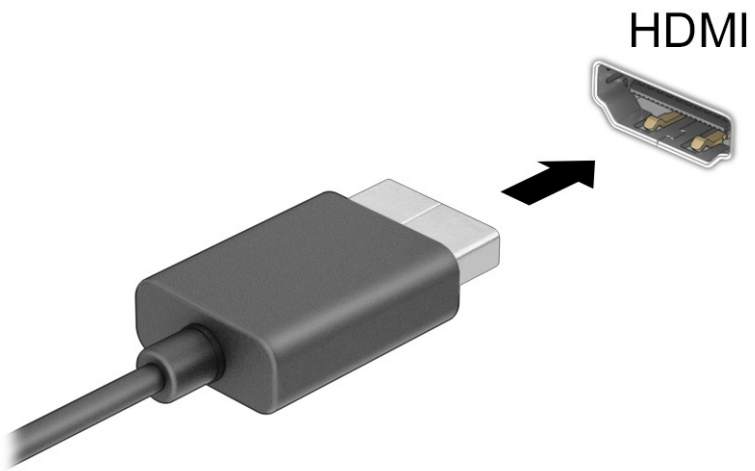
Connecting a high-definition TV or monitor using HDMI

To see the computer screen image on a high-definition TV or monitor, connect the high-definition device according to the instructions.

NOTE: To connect an HDMI device to your computer, you need an HDMI cable, purchased separately.

1. Connect one end of the HDMI cable to the HDMI port on the computer.

   NOTE: HDMI port shape can vary by product.



2. Connect the other end of the cable to the high-definition TV or monitor.
3. Press the Windows key + p to cycle through one of four display states:
   - **PC screen only:** View the screen image on the computer only.
   - **Duplicate:** View the screen image simultaneously on both the computer and the external device.
   - **Extend:** View the screen image extended across both the computer and the external device.
   - **Second screen only:** View the screen image on the external device only.

   Each time you press the Windows key + p, the display state changes.

NOTE: For best results, especially if you choose the **Extend** option, increase the screen resolution of the external device, as follows. Select the **Start** button, select **Settings**, and then select **System**. Under **Display**, select the appropriate resolution, and then select **Keep changes**.

Setting up HDMI audio

HDMI is the only video interface that supports high-definition video and audio.

Turn on HDMI audio

After you connect an HDMI TV to the computer, you can then turn on HDMI audio by following this procedure.

1. Right-click the **Speakers** icon in the notification area, at the far right of the taskbar, and then select **Sounds**.
2. On the **Playback** tab, select the name of the digital output device.
3. Select **Set Default**, and then select **OK**.

Return audio to computer speakers

Follow these steps to return the audio stream to the computer speakers.

1. Right-click the **Speakers** icon in the notification area, at the far right of the taskbar, and then select **Sounds**.
2. On the **Playback** tab, select **Speakers**.
3. Select **Set Default**, and then select **OK**.

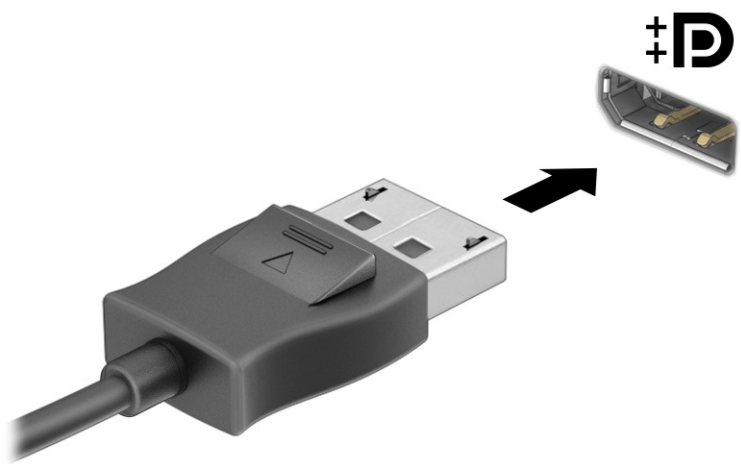
Connecting digital display devices using a Dual-Mode DisplayPort cable (select products only)

The Dual-Mode DisplayPort connector connects a digital display device such as a high-performance monitor or projector. Dual-Mode DisplayPort delivers higher performance than VGA and improves digital connectivity.

NOTE: To connect a digital display device to your computer, you need a Dual-Mode DisplayPort (DP-to-DP) cable, purchased separately.

1. Connect one end of the Dual-Mode DisplayPort cable to the Dual-Mode DisplayPort connector on the computer.

   NOTE: Your connector might look slightly different from the illustration in this section.



2. Connect the other end of the cable to the digital display device.
3. Press the Windows key + p to cycle through one of four display states:
   - **PC screen only:** View the screen image on the computer only.
   - **Duplicate:** View the same screen image simultaneously on both the computer and the external device.
   - **Extend:** View the screen image extended across both the computer and the external device.
   - **Second screen only:** View the screen image on the external device only.

Each time you press the Windows key + p , the display state changes.

NOTE: For best results, especially if you choose the **Extend** option, increase the screen resolution of the external device, as follows. Select the **Start** button, select **Settings**, and then select **System**. Under **Display**, select the appropriate resolution, and then select **Keep changes**.

Discovering and connecting to Miracast-compatible wireless displays (select products only)

Follow these steps to discover and connect to Miracast-compatible wireless displays without leaving your current apps.

1. Select the **Search** icon in the taskbar, type `connect` in the search box, and then select **Connect to a wireless display**.
2. Under **Display**, select **Connect to a wireless display**.
3. Select a setting, and then follow the on-screen instructions.

Using data transfer

Your computer is a powerful entertainment device that enables you to transfer photos, videos, and movies from your USB devices to view on your computer.

To enhance your viewing enjoyment, use one of the USB Type-C ports on the computer to connect a USB device, such as a cell phone, camera, activity tracker, or smartwatch, and transfer the files to your computer.

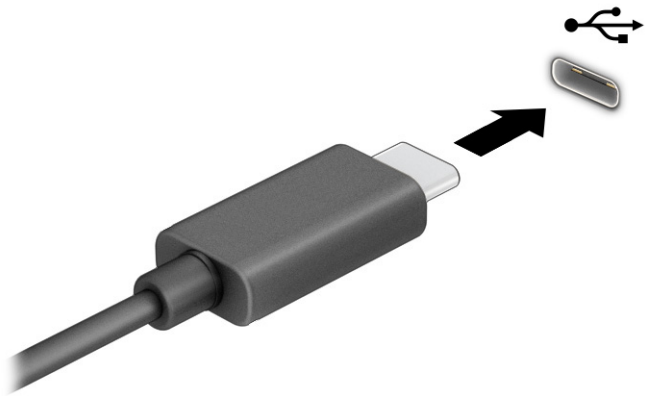
IMPORTANT: Be sure that the external device is connected to the correct port on the computer, using the correct cable. Follow the device manufacturer's instructions.

For information about using your USB Type-C features, go to http://www.hp.com/support, and follow the instructions to find your product.

Connecting devices to a USB Type-C port (select products only)

To connect a USB Type-C device to your computer, you need a USB Type-C cable, purchased separately.

1. Connect one end of the USB Type-C cable to the USB Type-C port on the computer.



2. Connect the other end of the cable to the external device.

6 Navigating the screen

You can navigate the computer screen by using touch gestures (select products only) and by using the keyboard and mouse.

Select computer models have special action keys or hot key functions on the keyboard to perform routine tasks.

Using touch gestures (select products only)

You can customize the touch gestures by changing settings, button configurations, click speed, and pointer options.

Select the **Search** icon in the taskbar, type `control panel` in the search box, and then select **Control Panel**. Select **Hardware and Sound**. Under **Devices and Printers**, select **Mouse**.

NOTE: Touch gestures are not supported in all apps.

Using the keyboard and mouse

The keyboard and mouse allow you to type, select items, scroll, and perform the same functions as you do using touch gestures. With the keyboard, you can use action keys and hot keys to perform specific functions.

TIP: The Windows key on the keyboard allows you to quickly return to the Start screen from an open app or the Windows desktop. Press the key again to return to the previous screen.

NOTE: Depending on the country or region, the keys and keyboard functions of your keyboard might be different from those discussed in this section.

Using the action keys or hot keys

You can quickly access information or perform functions by using certain keys and key combinations.

- **Action keys** perform an assigned function. The icons on the function keys at the top of the keyboard illustrate the assigned function for each key.

  To use an action key, press and hold the key.

- **Hot keys** are a combination of the fn key and another key.

  To use a hot key, briefly press the fn key, and then briefly press the second key of the combination.

Action keys

Depending on the keyboard model, your keyboard might support the keys that are described in the next table.

Table 6-1 Action keys

Icon	Description
?	Opens the “How to get help in Windows” webpage.
	Decreases the screen brightness incrementally as long as you hold down the key.
	Increases the screen brightness incrementally as long as you hold down the key.
	Switches the screen image between display devices connected to the system. For example, if a monitor is connected to the computer, repeatedly pressing this key alternates the screen image from the computer display to the monitor display to a simultaneous display on both the computer and the monitor.
	Turns the keyboard backlight off or on. On select products, you can adjust the brightness of the keyboard backlight. Press the key repeatedly to adjust the brightness from high (when you first start up the computer), to low, to off. After you adjust the keyboard backlight setting, the backlight will revert to your previous setting each time you turn on the computer. The keyboard backlight will turn off after 30 seconds of inactivity. To turn the keyboard backlight back on, press any key. To conserve battery power, turn off this feature.
	Plays the previous track of an audio CD or the previous section of a DVD or a Blu-ray Disc (BD).
	Starts, pauses, or resumes playback of an audio CD, a DVD, or a BD.
	Plays the next track of an audio CD or the next section of a DVD or a BD.
	Stops audio or video playback of a CD, a DVD, or a BD.
	Decreases speaker volume incrementally while you hold down the key.
	Increases speaker volume incrementally while you hold down the key.
	Mutes or restores speaker sound.
	Turns the wireless feature on or off. NOTE: A wireless network must be set up before a wireless connection is possible.
	Turns the airplane mode and wireless feature on or off. NOTE: The airplane mode key is also referred to as the wireless button. NOTE: A wireless network must be set up before a wireless connection is possible.

7 Maintaining your computer

Performing regular maintenance keeps your computer in optimal condition. This chapter explains how to use tools like Disk Defragmenter and Disk Cleanup. It also provides instructions for updating programs and drivers, steps to clean the computer, and tips for traveling with (or shipping) the computer.

Improving performance

You can improve the performance of your computer by performing regular maintenance tasks with tools such as Disk Defragmenter and Disk Cleanup.

Using Disk Defragmenter

HP recommends using Disk Defragmenter to defragment your hard drive at least once a month.

NOTE: It is not necessary to run Disk Defragmenter on solid-state drives.

To run Disk Defragmenter:

1. Connect the computer to AC power.
2. Select the **Search** icon in the taskbar, type `defragment` in the search box, and then select **Defragment and Optimize Drives**.
3. Follow the on-screen instructions.

For additional information, access the Disk Defragmenter software Help.

Using Disk Cleanup

Use Disk Cleanup to search the hard drive for unnecessary files that you can safely delete to free up disk space and help the computer run more efficiently.

To run Disk Cleanup:

1. Select the **Search** icon in the taskbar, type `disk` in the search box, and then select **Disk Cleanup**.
2. Follow the on-screen instructions.

Using HP 3D DriveGuard (select products only)

HP 3D DriveGuard protects a hard drive by parking the drive and halting data requests under some conditions.

- You drop the computer.
- You move the computer with the display closed while the computer is running on battery power.

A short time after one of these events, HP 3D DriveGuard returns the hard drive to normal operation.

NOTE: Only internal hard drives are protected by HP 3D DriveGuard. A hard drive installed in an optional docking device or connected to a USB port is not protected by HP 3D DriveGuard.

NOTE: Because solid-state drives (SSDs) lack moving parts, HP 3D DriveGuard is unnecessary for these drives.

Identifying HP 3D DriveGuard status

The hard drive light on the computer changes color to show that the drive in a primary hard drive bay, the secondary hard drive bay (select products only), or both are parked.

Updating programs and drivers

HP recommends that you update your programs and drivers on a regular basis. Updates can resolve issues and bring new features and options to your computer. For example, older graphics components might not work well with the most recent gaming software. Without the latest driver, you do not get the most out of your equipment.

Updating both programs and drivers

Use this procedure to update both programs and drivers.

1. Select the **Search** icon in the taskbar, type `support` in the search box, and then select the **HP Support Assistant** app.

   – or –

   Select the question mark icon in the taskbar.

2. Under **My notebook**, select **Updates**. The **Software and Drivers** window opens, and Windows checks for updates.

3. Follow the on-screen instructions.

Updating programs only

Use this procedure to update programs only.

1. Select **Start**, and then select **Microsoft Store**.

2. Select the dots next to your profile picture in the top-right corner, and then select **Downloads and updates**.

3. On the **Downloads and updates** page, select **Get updates**, and then follow the on-screen instructions.

Updating drivers only

Use this procedure to update drivers only.

1. Select the **Search** icon in the taskbar, type `windows update settings` in the search box, and then select **Windows Update settings**.

2. Select **Check for updates**, and then follow the on-screen instructions.

NOTE: If Windows does not find a new driver, go to the device manufacturer's website, and follow the instructions.

Cleaning your computer

Cleaning your computer regularly removes dirt and debris so that your device continues to operate at its best. Use the following information to safely clean the external surfaces of your computer.

Enabling HP Easy Clean (select products only)

HP Easy Clean helps you to avoid accidental input while you clean the computer surfaces. This software disables devices such as the keyboard, touch screen, and touchpad for a preset amount of time so that you can clean all computer surfaces.

1. Start HP Easy Clean in one of the following ways:
   - Select the **Start** menu, and then select **HP Easy Clean**.

     – or –
   - Select the **HP Easy Clean** icon in the taskbar.

     – or –
   - Select **Start**, and then select the **HP Easy Clean** tile.
2. Now that your device is disabled for a short period, see Removing dirt and debris from your computer on page 29 for the recommended steps to clean the high-touch, external surfaces on your computer. After you remove the dirt and debris, you can also clean the surfaces with a disinfectant. See Cleaning your computer with a disinfectant on page 30 for guidelines to help prevent the spread of harmful bacteria and viruses.

Removing dirt and debris from your computer

Here are the recommended steps to clean dirt and debris from your computer.

For computers with wood veneer, see Caring for wood veneer (select products only) on page 31.

1. Wear disposable gloves made of latex (or nitrile gloves, if you are latex-sensitive) when cleaning the surfaces.
2. Turn off your device and unplug the power cord and other connected external devices. Remove any installed batteries from items such as wireless keyboards.

   CAUTION: To prevent electric shock or damage to components, never clean a product while it is turned on or plugged in.
3. Moisten a microfiber cloth with water. The cloth should be moist, but not dripping wet.

   IMPORTANT: To avoid damaging the surface, avoid abrasive cloths, towels, and paper towels.
4. Wipe the exterior of the product gently with the moistened cloth.

   IMPORTANT: Keep liquids away from the product. Avoid getting moisture in any openings. If liquid makes its way inside your HP product, it can cause damage to the product. Do not spray liquids directly on the product. Do not use aerosol sprays, solvents, abrasives, or cleaners containing hydrogen peroxide or bleach that might damage the finish.

5. Start with the display (if applicable). Wipe carefully in one direction, and move from the top of the display to the bottom. Finish with any flexible cables, like power cord, keyboard cable, and USB cables.

6. Be sure that surfaces have completely air-dried before turning the device on after cleaning.

7. Discard the gloves after each cleaning. Clean your hands immediately after you remove the gloves.

See Cleaning your computer with a disinfectant on page 30 for recommended steps to clean the high-touch, external surfaces on your computer to help prevent the spread of harmful bacteria and viruses.

Cleaning your computer with a disinfectant

The World Health Organization (WHO) recommends cleaning surfaces, followed by disinfection, as a best practice for preventing the spread of viral respiratory illnesses and harmful bacteria.

After cleaning the external surfaces of your computer using the steps in Removing dirt and debris from your computer on page 29, Caring for wood veneer (select products only) on page 31, or both, you might also choose to clean the surfaces with a disinfectant. A disinfectant that is within HP's cleaning guidelines is an alcohol solution consisting of 70% isopropyl alcohol and 30% water. This solution is also known as rubbing alcohol and is sold in most stores.

Follow these steps when disinfecting high-touch, external surfaces on your computer:

1. Wear disposable gloves made of latex (or nitrile gloves, if you are latex-sensitive) when cleaning the surfaces.

2. Turn off your device and unplug the power cord and other connected external devices. Remove any installed batteries from items such as wireless keyboards.

   CAUTION: To prevent electric shock or damage to components, never clean a product while it is turned on or plugged in.

3. Moisten a microfiber cloth with a mixture of 70% isopropyl alcohol and 30% water. The cloth should be moist, but not dripping wet.

   CAUTION: Do not use any of the following chemicals or any solutions that contain them, including spray-based surface cleaners: bleach, peroxides (including hydrogen peroxide), acetone, ammonia, ethyl alcohol, methylene chloride, or any petroleum-based materials, such as gasoline, paint thinner, benzene, or toluene.

   IMPORTANT: To avoid damaging the surface, avoid abrasive cloths, towels, and paper towels.

4. Wipe the exterior of the product gently with the moistened cloth.

   IMPORTANT: Keep liquids away from the product. Avoid getting moisture in any openings. If liquid makes its way inside your HP product, it can cause damage to the product. Do not spray liquids directly on the product. Do not use aerosol sprays, solvents, abrasives, or cleaners containing hydrogen peroxide or bleach that might damage the finish.

5. Start with the display (if applicable). Wipe carefully in one direction, and move from the top of the display to the bottom. Finish with any flexible cables, like power cord, keyboard cable, and USB cables.

6. Be sure that surfaces have completely air-dried before turning the device on after cleaning.

7. Discard the gloves after each cleaning. Clean your hands immediately after you remove the gloves.

Caring for wood veneer (select products only)

Your product might feature high-quality wood veneer. As with all natural wood products, proper care is important for best results over the life of the product. Because of the nature of natural wood, you might see unique variations in the grain pattern or subtle variations in color, which are normal.

- Clean the wood with a dry, static-free microfiber cloth or chamois.
- Avoid cleaning products containing substances such as ammonia, methylene chloride, acetone, turpentine, or other petroleum-based solvents.
- Do not expose the wood to sun or moisture for long periods of time.
- If the wood becomes wet, dry it by dabbing with an absorbent, lint-free cloth.
- Avoid contact with any substance that might dye or discolor the wood.
- Avoid contact with sharp objects or rough surfaces that might scratch the wood.

See Removing dirt and debris from your computer on page 29 for the recommended steps to clean the high-touch, external surfaces on your computer. After you remove the dirt and debris, you can also clean the surfaces with a disinfectant. See Cleaning your computer with a disinfectant on page 30 for sanitizing guidelines to help prevent the spread of harmful bacteria and viruses.

Traveling with or shipping your computer

If you must travel with or ship your computer, follow these tips to keep your equipment safe.

- Prepare the computer for traveling or shipping:
  - Back up your information to an external drive.
  - Remove all discs and all external media cards, such as memory cards.
  - Turn off and then disconnect all external devices.
  - Shut down the computer.
- Take a backup of your information. Keep the backup separate from the computer.
- When traveling by air, carry the computer as hand luggage; do not check it with the rest of your luggage.

IMPORTANT: Avoid exposing a drive to magnetic fields. Security devices with magnetic fields include airport walk-through devices and security wands. Airport conveyer belts and similar security devices that check carry-on baggage use X-rays instead of magnetism and do not damage drives.

- If you plan to use the computer during a flight, listen for the in-flight announcement that tells you when you can use your computer. In-flight computer use is at the discretion of the airline.
- If you are shipping the computer or a drive, use suitable protective packaging and label the package “FRAGILE.”

- The use of wireless devices might be restricted in some environments. Such restrictions might apply aboard aircraft, in hospitals, near explosives, and in hazardous locations. If you are uncertain of the policy that applies to the use of a wireless device in your computer, ask for authorization to use your computer before you turn it on.
- If you are traveling internationally, follow these suggestions:
  - Check the computer-related customs regulations for each country or region on your itinerary.
  - Check the power cord and adapter requirements for each location in which you plan to use the computer. Voltage, frequency, and plug configurations vary.

    ⚠ **WARNING!** To reduce the risk of electric shock, fire, or damage to the equipment, do not attempt to run the computer from a voltage converter kit that is sold for appliances.

8 Securing your computer and information

Computer security is essential for protecting the confidentiality, integrity, and availability of your information.

Standard security solutions provided by the Windows operating system, HP applications, the Setup Utility (BIOS), and other third-party software can help protect your computer from a variety of risks, such as viruses, worms, and other types of malicious code.

Computer security features

Your computer includes features that help protect the integrity of your system and its data from unauthorized access. Review these features to ensure proper use.

Table 8-1 **Computer risks and security features**

Computer risk	Computer feature
Unauthorized use of the computer or user account	User password A *password* is a group of characters that you choose to authorize access to your computer information. – or – Windows Hello (select products only) On products equipped with a fingerprint reader or an infrared camera, Windows Hello allows you to enroll your fingerprint, your facial ID, and set up a PIN. After enrollment, you can use your fingerprint reader, facial ID, or PIN to sign in to Windows. To set up Windows Hello: 1. Select the **Start** button, select **Settings**, select **Accounts**, and then select **Sign-in options**. 2. If you do not have a password set up, you must add one before you can use other sign-in options. Select **Password**, and then select **Add**. 3. Select **Windows Hello Fingerprint** or **Windows Hello Face**, and then select **Set up**. 4. Select **Get started**, and then follow the on-screen instructions to enroll your fingerprint or facial ID and set up a PIN. IMPORTANT: To prevent fingerprint logon issues, make sure when you register your fingerprint that all sides of your finger are registered by the fingerprint reader. NOTE: The PIN is not limited in length. The default setting is for numbers only. To include alphabetic or special characters, select the **include letters and symbols** check box.
Unauthorized access to Setup Utility, BIOS settings, and other system identification information	Administrator password
Computer viruses	Antivirus software The free trial antivirus software that is preinstalled on your computer can detect most viruses, remove them, and, in most cases, repair damage caused by viruses. For protection against new viruses beyond the trial period, purchase an extended service contract.

Table 8-1 Computer risks and security features (continued)

Computer risk	Computer feature
Unauthorized access to data and ongoing threats to the computer	Your computer has these additional features to protect against external threats: • Firewall software – Windows includes firewall software preinstalled on the computer. – The antivirus software, which is preinstalled on the computer, includes firewall software. • Windows critical security updates • Updates to the Windows operating system

9 Troubleshooting

The following tables present some issues you might encounter while installing, starting up, or using your computer and suggest possible solutions.

For more information or for additional troubleshooting options, go to http://www.hp.com/support, and follow the instructions to find your product.

NOTE: If you have problems using any peripheral devices such as a monitor or a printer with your computer, see the documentation provided by the product manufacturer for more extensive troubleshooting.

Computer does not start

If your computer does not start, refer to the following table for possible solutions.

Table 9-1 **Computer symptoms and solutions**

Symptom	Possible solution
Error message: hard drive error	1. Restart the computer. a. Press ctrl+alt+delete. b. Complete one of these tasks: • Select the **Power** icon, and then select **Restart**. • Press and hold the power button on the computer for 10 or more seconds to turn off the computer, and then press the button again to turn on the computer. 2. If Windows opens, immediately back up all important data to a backup hard drive. 3. Contact support, regardless of whether Windows started or not.
Computer will not turn on or start	Be sure that the cables connecting the computer to the AC outlet are plugged in properly. The green power supply light on the computer should be on. If it is not, try a different AC outlet. If you are still having trouble, contact support.
	Be sure that the operating voltage of the AC outlet is appropriate for the electrical voltage of the computer.
	Test the AC outlet by plugging a different electrical device into it.
	If possible, remove any outlet filters and stabilizers, and then insert the power plug directly into the AC outlet.
	Disconnect all peripheral devices. Press and hold the power button down for at least 15 seconds until the computer turns off. Then press the power button again to turn on the computer.
	If the monitor screen is blank, the monitor might not be properly connected. Connect the monitor to the computer, plug the power cord into an AC outlet, and then turn the monitor on. See Monitor (select products only) on page 36.

Table 9-1 Computer symptoms and solutions (continued)

Symptom	Possible solution
Computer is not responding	1. Press ctrl+alt+delete. 2. Select **Task Manager**. 3. Select any programs that are not responding, and then select **End task**.
	If closing programs does not resolve the problem, restart the computer. 1. Press ctrl+alt+delete. 2. Complete one of these tasks: • Select the **Power** icon, and then select **Restart**. • Press and hold the power button on the computer for 10 or more seconds to turn off the computer, and then press the button again to turn on the computer.
Error message: Invalid system disk or Non-System disk or Disk error	When drive activity stops, remove the optical disc inside the optical drive, and then press the spacebar on the keyboard.

Power

If your computer has power problems, refer to the following table for possible solutions.

Table 9-2 Power symptoms and solutions

Symptom	Possible solution
Computer does not turn off when the power button is pressed	Press and hold the power button until the computer turns off. Then turn the computer on again.
Computer shuts down automatically	• The computer might be in an exceedingly hot environment. Let it cool down. • Be sure that computer air vents are not blocked. NOTE: If your computer has an internal fan, be sure that the internal fan is running.

Monitor (select products only)

If you have monitor problems, refer to the following table for possible solutions.

Table 9-3 Monitor symptoms and solutions

Symptom	Possible solution
Screen is blank, and monitor power light is off	Reconnect the power cable to the back of the monitor and to the AC outlet.
	Press the power button on the monitor.

Table 9-3 Monitor symptoms and solutions (continued)

Symptom	Possible solution
Screen is blank	Press the space bar on the keyboard or move the mouse to redisplay the screen image.
	Press the Sleep button (select products only) or esc to resume from Sleep mode.
	Press the power button to turn on the computer.
	Inspect the monitor cable for bent pins. • If any of the pins are bent, replace the monitor cable. • If no pins are bent, reconnect the monitor cable to the computer.
Images on the screen are too large or too small, or the images are fuzzy	Adjust the monitor resolution setting in Windows. ▪ Select the **Start** button, select **Settings**, and then select **System**. Under **Display**, select the appropriate resolution, and then select **Keep changes**.
NOTE: In addition to the information listed here, see the documentation that came with your monitor.	

Keyboard and mouse (with cable)

If you have wired keyboard and mouse problems, refer to the following table for possible solutions.

Table 9-4 Keyboard and mouse (with cable) symptoms and solutions

Symptom	Possible solution
Keyboard commands and typing are not recognized by the computer	Use the mouse to turn off the computer. Disconnect and reconnect the keyboard to the back of your computer, and then restart your computer.
Mouse (with cable) does not work or is not detected	Disconnect and reconnect the mouse cable to your computer.
	If the mouse is still not detected, turn off the computer, disconnect and reconnect the mouse cable, and then restart the computer.
Cursor does not respond to the arrow keys on the number keypad	Press num lock on the keyboard to turn off num lock, so that the arrow keys on the number keypad can be used.
Cursor does not respond to mouse movement	1. Press alt+tab to navigate to an open program. 2. Press ctrl+s to save your changes in the selected program (ctrl+s is the keyboard shortcut for the Save command on most—not all—programs). 3. Repeat step 1 and step 2 to save changes in all open programs. 4. Press the power button to turn off the computer. 5. After the shutdown is complete, disconnect and reconnect the mouse cable to the back of your computer, and then restart your computer.

Keyboard and mouse (wireless)

If you have wireless keyboard and mouse problems, refer to the following table for possible solutions.

Table 9-5 Keyboard and mouse (wireless) symptoms and solutions

Symptom	Possible solution
Wireless keyboard or mouse does not work or is not detected	• Be sure that you are using the wireless keyboard or wireless mouse within range of the transceiver, approximately 10 meters (32 feet) for normal use, and within 30 cm (12 inches) during initial setup or for resynchronization. • Be sure that the mouse is not in Suspend mode, which occurs after 20 minutes of inactivity. Click the left mouse button to reactivate the mouse. • Replace the batteries in the keyboard, mouse, or both.

Speakers and sound

If you have speaker and sound problems, refer to the following table for possible solutions.

Table 9-6 Speaker symptoms and solutions

Symptom	Possible solution
Volume is very low or unsatisfactory	Be sure that you connected the speakers to the audio-out (black) jack on the back of the computer. (Additional audio jacks are used for multiple-channel speakers.) Detached nonpowered speakers (speakers without a separate power source, such as batteries or a power cord) do not produce satisfactory sound. Replace the nonpowered speakers with powered speakers.
No sound is produced	1. Select the **Search** icon in the taskbar, type `control panel` in the search box, select **Control Panel**, and then select **System and Security**. 2. Under **Security and Maintenance**, select **Troubleshoot common computer problems**, and then select **Additional troubleshooters**. 3. Under **Additional troubleshooters**, select **Playing audio**.
	Be sure that you connected powered speakers and that they are turned on.
	Turn off your computer, and then disconnect and reconnect the speakers. Be sure that the speakers are connected to an audio jack, not a microphone or headphone jack.
	To resume from Sleep mode, press the Sleep button (select products only), or press esc.
	Unplug headphones if they are connected to your computer (or speaker system).

Internet access

If you have internet access problems, refer to the following table for possible solutions.

Table 9-7 **Internet access symptoms and solutions**

Symptom	Possible solution
Cannot connect to the internet	1. Right-click the network status icon in the notification area, at the far right of the taskbar. 2. Select **Troubleshoot problems**.
	Verify that you are using the proper cables for your internet connection type. Your computer might have a dial-up modem and an Ethernet network adapter, which is also called a network interface card, or NIC. A modem uses a standard telephone cable, while the network adapter uses a network cable, to connect to a local area network (LAN). Do not connect a telephone cable to the network adapter, and do not connect a network cable to a telephone line; doing so might damage the network adapter.
	Run the wireless setup wizard. 1. Select the **Search** icon in the taskbar, type `control panel` in the search box, and then select **Control Panel**. Select **Network and Internet**, and then select **Network and Sharing Center**. 2. In the **Network and Sharing Center** window, select **Set up a new connection or network** to open the wizard, and then follow the on-screen instructions.
	If your system has an external antenna, try moving the antenna to a better position. If the antenna is internal, try moving the computer.
	Try to connect again later, or contact your ISP for assistance.
Cannot connect to the internet but there is no error message	1. Right-click the network status icon in the notification area, at the far right of the taskbar. 2. Select **Troubleshoot problems**.
No network connection icon in the notification area	1. Select the **Search** icon in the taskbar, type `repair` in the search box, and then select **Fix problems with your computer**. 2. Follow the on-screen instructions.

Software troubleshooting

If you have software problems, refer to the following table for possible solutions.

Table 9-8 **Software symptoms and solutions**

Symptom	Possible solution
To resolve general software problems, try these methods:	• Turn the computer off completely, and then turn it on again. • Update the drivers. See “Updating device drivers” in this table. • Restore your computer to a configuration that was in use before the software was installed. See "Microsoft System Restore" in this table. • Reinstall the software program or hardware driver. See “Software program and hardware driver reinstallation” in this table. • Erase and reformat the hard drive, and then reinstall the operating system, programs, and drivers. This process erases all the data files that you have created. See Backing up, restoring, and recovering on page 48.

Table 9-8 Software symptoms and solutions (continued)

Symptom	Possible solution
Software programs are slow to respond	• Close unnecessary software programs. • Run virus scans and other system tools when the computer is not in use.
	Stop startup applications, such as messaging software and multimedia applications, from loading. 1. Select the **Search** icon in the taskbar, type `msconfig` in the search box, and then select **System Configuration**. NOTE: If you are prompted for an administrator password or confirmation, type the password or provide confirmation. 2. From the **General** tab, select **Selective startup**. 3. Select the **Startup** tab, and then select **Open Task Manager**. 4. Select the startup items that you want to prevent from loading, and then select **Apply**. NOTE: If you are unsure about an item, do not disable it. 5. If prompted, select **Restart** to restart the computer. NOTE: To enable a program to load at startup, restart the computer and reverse these steps.
	Disable nonessential graphics capabilities. 1. Select the **Search** icon in the taskbar, type `file explorer` in the search box, and then select **File Explorer**. 2. Right-click **This PC**, and then select **Properties**. 3. Select **Advanced system settings**. NOTE: If you are prompted for an administrator password or confirmation, type the password or provide confirmation. 4. From the **Advanced** tab under **Performance**, select **Settings**. 5. From the **Visual Effects** tab, select **Adjust for best performance**, and then select **OK**.
Updating device drivers	Complete the following procedure to update a driver or to revert to an earlier version of the driver if the new one does not solve your problem. 1. Select the **Search** icon in the taskbar, type `device manager` in the search box, and then select **Device Manager**. 2. Select the arrow to expand the list of the type of device you want to update or roll back, for example, DVD/CD-ROM drives. 3. Double-click the specific item, for example, HP DVD Writer 640b. 4. Select the **Driver** tab. 5. Perform one of these tasks: • To update a driver, select **Update Driver**, and then follow the on-screen instructions. • To revert to an earlier version of a driver, select **Roll Back Driver**, and then follow the on-screen instructions.
Microsoft System Restore	If you have a problem that might be caused by software that you have installed on your computer, use System Restore to return the computer to a previous restore point. You can also set restore points manually. IMPORTANT: Always use this System Restore procedure before you use the System Recovery procedure.
	For more information and steps, see the Get Help app. ▪ Select the **Start** button, select **All apps** and then select the **Get Help** app.

Table 9-8 **Software symptoms and solutions (continued)**

Symptom	Possible solution
Software program and hardware driver reinstallation	Before you uninstall a program, be sure that you have a way to reinstall it. Confirm that it is still available from the original source, for example, discs or the internet. NOTE: Some features might not be available on systems that are shipped without a version of Windows.
	For information and steps to uninstall a program, see the Get Help app. ▪ Select the **Start** button, select **All apps** and then select the **Get Help** app.

10 Using HP PC Hardware Diagnostics

You can use the HP PC Hardware Diagnostics utility to determine whether your computer hardware is running properly. The three versions are HP PC Hardware Diagnostics Windows, HP PC Hardware Diagnostics UEFI (Unified Extensible Firmware Interface), and (for select products only) Remote HP PC Hardware Diagnostics UEFI, a firmware feature.

Using HP PC Hardware Diagnostics Windows (select products only)

HP PC Hardware Diagnostics Windows is a Windows-based utility that allows you to run diagnostic tests to determine whether the computer hardware is functioning properly. The tool runs within the Windows operating system to diagnose hardware failures.

If HP PC Hardware Diagnostics Windows is not installed on your computer, you must download and install it. To download HP PC Hardware Diagnostics Windows, see Downloading HP PC Hardware Diagnostics Windows on page 43.

Using an HP PC Hardware Diagnostics Windows hardware failure ID code

When HP PC Hardware Diagnostics Windows detects a failure that requires hardware replacement, a 24-digit failure ID code is generated for select component tests. For interactive tests, such as keyboard, mouse, or audio and video palette, you must perform troubleshooting steps before you can receive a failure ID.

- You have several options after you receive a failure ID:
  - Select **Next** to open the Event Automation Service (EAS) page, where you can log the case.
  - Scan the QR code with your mobile device, which takes you to the EAS page, where you can log the case.
  - Select the box next to the 24-digit failure ID to copy your failure code and send it to support.

Accessing HP PC Hardware Diagnostics Windows

After HP PC Hardware Diagnostics Windows is installed, you can access it from HP Support Assistant or the Start menu.

Accessing HP PC Hardware Diagnostics Windows from HP Support Assistant

After HP PC Hardware Diagnostics Windows is installed, follow these steps to access it from HP Support Assistant:

1. Complete one of the following tasks:
   - Select the **Search** icon in the taskbar, type `support` in the search box, and then select the **HP Support Assistant** app.
   - Select the question mark icon in the taskbar.
2. Select **Fixes & Diagnostics**.

3. Select **Run hardware diagnostics**, and then select **Launch**.
4. When the tool opens, select the type of diagnostic test that you want to run, and then follow the on-screen instructions.

NOTE: To stop a diagnostic test, select **Cancel**.

Accessing HP PC Hardware Diagnostics Windows from the Start menu (select products only)

After HP PC Hardware Diagnostics Windows is installed, follow these steps to access it from the Start menu:

1. Select the **Start** button, and then select **All apps**.
2. Select **HP PC Hardware Diagnostics Windows**.
3. When the tool opens, select the type of diagnostic test that you want to run, and then follow the on-screen instructions.

NOTE: To stop a diagnostic test, select **Cancel**.

Downloading HP PC Hardware Diagnostics Windows

The HP PC Hardware Diagnostics Windows downloading instructions are provided in English only. You must use a Windows computer to download this tool because only .exe files are provided.

Downloading the latest HP PC Hardware Diagnostics Windows version from HP

To download HP PC Hardware Diagnostics Windows from HP, follow these steps:

1. Go to http://www.hp.com/go/techcenter/pcdiags. The HP PC Diagnostics home page is displayed.
2. Select **Download HP Diagnostics Windows**, and then select the specific Windows diagnostics version to download to your computer or a USB flash drive.

The tool downloads to the selected location.

Downloading the HP PC Hardware Diagnostics Windows from the Microsoft Store

You can download the HP PC Hardware Diagnostics Windows from the Microsoft Store:

1. Select the Microsoft Store app on your desktop or select the **Search** icon in the taskbar, and then type `Microsoft Store` in the search box.
2. Type `HP PC Hardware Diagnostics Windows` in the **Microsoft Store** search box.
3. Follow the on-screen directions.

The tool downloads to the selected location.

Downloading HP Hardware Diagnostics Windows by product name or number (select products only)

You can download HP PC Hardware Diagnostics Windows by product name or number.

NOTE: For some products, you might have to download the software to a USB flash drive by using the product name or number.

1. Go to http://www.hp.com/support.
2. Select **Software and Drivers**, select your type of product, and then enter the product name or number in the search box that is displayed.
3. In the **Diagnostics** section, select **Download**, and then follow the on-screen instructions to select the specific Windows diagnostics version to be downloaded to your computer or USB flash drive.

The tool downloads to the selected location.

Installing HP PC Hardware Diagnostics Windows

To install HP PC Hardware Diagnostics Windows, navigate to the folder on your computer or the USB flash drive where the .exe file downloaded, double-click the .exe file, and then follow the on-screen instructions.

Using HP PC Hardware Diagnostics UEFI

HP PC Hardware Diagnostics Unified Extensible Firmware Interface (UEFI) allows you to run diagnostic tests to determine whether the computer hardware is functioning properly. The tool runs outside the operating system so that it can isolate hardware failures from issues that are caused by the operating system or other software components.

NOTE: For some products, you must use a Windows computer and a USB flash drive to download and create the HP UEFI support environment because only .exe files are provided. For more information, see Downloading HP PC Hardware Diagnostics UEFI to a USB flash drive on page 45.

If your PC does not start in Windows, you can use HP PC Hardware Diagnostics UEFI to diagnose hardware issues.

Using an HP PC Hardware Diagnostics UEFI hardware failure ID code

When HP PC Hardware Diagnostics UEFI detects a failure that requires hardware replacement, a 24-digit failure ID code is generated.

For assistance in solving the problem, complete one of these tasks:

- Select **Contact HP**, accept the HP privacy disclaimer, and then use a mobile device to scan the failure ID code that appears on the next screen. The HP Customer Support - Service Center page appears with your failure ID and product number automatically filled in. Follow the on-screen instructions.
- Contact support, and provide the failure ID code.

Starting HP PC Hardware Diagnostics UEFI

To start HP PC Hardware Diagnostics UEFI, follow this procedure.

1. Turn on or restart the computer, and quickly press esc.
2. Press f2.

   The BIOS searches three places for the diagnostic tools, in the following order:

a. Connected USB flash drive

NOTE: To download the HP PC Hardware Diagnostics UEFI tool to a USB flash drive, see Downloading the latest HP PC Hardware Diagnostics UEFI version on page 46.

b. Hard drive

c. BIOS

3. When the diagnostic tool opens, select the type of diagnostic test that you want to run, and then follow the on-screen instructions.

Starting HP PC Hardware Diagnostics UEFI through HP Hotkey Support software (select products only)

This section describes how to start HP PC Hardware Diagnostics UEFI through HP Hotkey Support software.

NOTE: You must disable fast boot to access HP PC Hardware Diagnostics UEFI from the HP System Information application.

To disable fast boot:

1. Turn on or restart the computer, and when the HP logo appears, press f10 to enter Computer Setup.
2. Select **Advanced**, and then select **Boot Options**.
3. Clear **Fast Boot**.
4. Select **Save Changes and Exit**, and then select **Yes**.

To start HP PC Hardware Diagnostics UEFI through HP Hotkey Support software, follow this procedure.:

1. From the **Start** menu, open the HP System Information Application or press fn+esc.
2. In HP System Information screen, select **Run System Diagnostics**, select **Yes** to run the application, and then select **Restart**.

IMPORTANT: To prevent loss of data, save your work in all open apps before restarting your computer.

NOTE: When the restart is complete, the computer opens the HP PC Hardware Diagnostics UEFI Application. Proceed with the troubleshooting tests.

Downloading HP PC Hardware Diagnostics UEFI to a USB flash drive

Downloading HP PC Hardware Diagnostics UEFI to a USB flash drive can be useful in some situations.

- HP PC Hardware Diagnostics UEFI is not included in the preinstallation image.
- HP PC Hardware Diagnostics UEFI is not included in the HP Tool partition.
- The hard drive is damaged.

NOTE: The HP PC Hardware Diagnostics UEFI downloading instructions are provided in English only, and you must use a Windows computer to download and create the HP UEFI support environment because only .exe files are provided.

Downloading the latest HP PC Hardware Diagnostics UEFI version

To download the latest HP PC Hardware Diagnostics UEFI version to a USB flash drive, follow this procedure:

1. Go to http://www.hp.com/go/techcenter/pcdiags. The HP PC Diagnostics home page is displayed.
2. Select **Download HP Diagnostics UEFI**, and then select **Run**.

Downloading HP PC Hardware Diagnostics UEFI by product name or number (select products only)

You can download HP PC Hardware Diagnostics UEFI by product name or number (select products only) to a USB flash drive.

NOTE: For some products, you might have to download the software to a USB flash drive by using the product name or number.

1. Go to http://www.hp.com/support.
2. Enter the product name or number, select your computer, and then select your operating system.
3. In the **Diagnostics** section, follow the on-screen instructions to select and download the specific UEFI Diagnostics version for your computer.

Using Remote HP PC Hardware Diagnostics UEFI settings (select products only)

Remote HP PC Hardware Diagnostics UEFI is a firmware (BIOS) feature that downloads HP PC Hardware Diagnostics UEFI to your computer. It can then run the diagnostics on your computer, and it might upload results to a preconfigured server.

For more information about Remote HP PC Hardware Diagnostics UEFI, go to http://www.hp.com/go/techcenter/pcdiags, and then select **Find out more**.

Downloading Remote HP PC Hardware Diagnostics UEFI

HP Remote PC Hardware Diagnostics UEFI is also available as a SoftPaq that you can download to a server.

Downloading the latest Remote HP PC Hardware Diagnostics UEFI version

You can download the latest HP PC Hardware Diagnostics UEFI version to a USB flash drive.

1. Go to http://www.hp.com/go/techcenter/pcdiags. The HP PC Diagnostics home page is displayed.
2. Select **Download Remote Diagnostics**, and then select **Run**.

Downloading Remote HP PC Hardware Diagnostics UEFI by product name or number

You can download HP Remote PC Hardware Diagnostics UEFI by product name or number.

NOTE: For some products, you might have to download the software by using the product name or number.

1. Go to http://www.hp.com/support.

2. Select **Software and Drivers**, select your type of product, enter the product name or number in the search box that is displayed, select your computer, and then select your operating system.

3. In the **Diagnostics** section, follow the on-screen instructions to select and download the **Remote UEFI** version for the product.

Customizing Remote HP PC Hardware Diagnostics UEFI settings

Using the Remote HP PC Hardware Diagnostics setting in Computer Setup (BIOS), you can perform several customizations.

- Set a schedule for running diagnostics unattended. You can also start diagnostics immediately in interactive mode by selecting **Execute Remote HP PC Hardware Diagnostics UEFI**.
- Set the location for downloading the diagnostic tools. This feature provides access to the tools from the HP website or from a server that has been preconfigured for use. Your computer does not require the traditional local storage, such as a hard drive or USB flash drive, to run remote diagnostics.
- Set a location for storing the test results. You can also set the user name and password that you use for uploads.
- Display status information about the diagnostics run previously.

To customize Remote HP PC Hardware Diagnostics UEFI settings, follow these steps:

1. Turn on or restart the computer, and when the HP logo appears, press f10 to enter Computer Setup.
2. Select **Advanced**, and then select **Settings**.
3. Make your customization selections.
4. Select **Main**, then select **Save Changes and Exit** to save your settings.

Your changes take effect when the computer restarts.

11 Backing up, restoring, and recovering

You can use Windows tools or HP software to back up your information, create a restore point, reset your computer, create recovery media, or restore your computer to its factory state. Performing these standard procedures can return your computer to a working state faster.

IMPORTANT: If you are performing recovery procedures on a tablet, the tablet battery must be at least 70% charged before you start the recovery process.

IMPORTANT: For a tablet with a detachable keyboard, connect the tablet to the keyboard base before beginning any recovery process.

Backing up information and creating recovery media

These methods of creating recovery media and backups are available on select products only.

Using Windows tools for backing up

HP recommends that you back up your information immediately after initial setup. You can do this task either using Windows Backup locally with an external USB drive or using online tools.

IMPORTANT: Windows is the only option that allows you to back up your personal information. Schedule regular backups to avoid information loss.

NOTE: If computer storage is 32 GB or less, Microsoft® System Restore is disabled by default.

Using the HP Cloud Recovery Download Tool to create recovery media (select products only)

You can use the HP Cloud Recovery Download Tool to create HP Recovery media on a bootable USB flash drive.

For details:

- Go to http://www.hp.com, search for HP Cloud Recovery, and then select the result that matches the type of computer that you have.

NOTE: If you cannot create recovery media yourself, contact support to obtain recovery discs. Go to http://www.hp.com/support, select your country or region, and then follow the on-screen instructions.

IMPORTANT: HP recommends that you follow the Restoring and recovery methods on page 49 to restore your computer before you obtain and use the HP recovery discs. Using a recent backup can return your machine to a working state sooner than using the HP recovery discs. After the system is restored, reinstalling all the operating system software released since your initial purchase can be a lengthy process.

Restoring and recovering your system

You have several tools available to recover your system both within and outside of Windows if the desktop cannot load.

HP recommends that you attempt to restore your system using the Restoring and recovery methods on page 49.

Creating a system restore

System Restore is available in Windows. The System Restore software can automatically or manually create restore points, or snapshots, of the system files and settings on the computer at a particular point.

When you use System Restore, it returns your computer to its state at the time you made the restore point. Your personal files and documents should not be affected.

Restoring and recovery methods

After you run the first method, test to see whether the issue still exists before you proceed to the next method, which might now be unnecessary.

1. Run a Microsoft System Restore.
2. Run Reset this PC.

   NOTE: The options **Remove everything** and then **Fully clean the drive** can take several hours to complete and leave no information on your computer. It is the safest way to reset your computer before you recycle it.

3. Recover using HP Recovery media. For more information, see Recovering using HP Recovery media on page 49.

For more information about the first two methods, see the Get Help app:

- Select the **Start** button, select **All apps**, select the **Get Help** app, and then enter the task you want to perform.

NOTE: You must be connected to the internet to access the Get Help app.

Recovering using HP Recovery media

You can use HP Recovery media to recover the operating system and drivers that were installed at the factory. On select products, you can create recovery media on a bootable USB flash drive using the HP Cloud Recovery Download Tool.

For details, see Using the HP Cloud Recovery Download Tool to create recovery media (select products only) on page 48.

NOTE: If you cannot create recovery media yourself, contact support to obtain recovery discs. Go to http://www.hp.com/support, select your country or region, and then follow the on-screen instructions.

To recover your system:

- Insert the HP Recovery media, and then restart the computer.

NOTE: HP recommends that you follow the Restoring and recovery methods on page 49 to restore your computer before you obtain and use the HP recovery discs. Using a recent backup can return your machine to a working state sooner than using the HP recovery discs. After the system is restored, reinstalling all the operating system software released since your initial purchase can be a lengthy process.

Changing the computer boot order

If your computer does not restart using the HP Recovery media, you can change the computer boot order, which is the order of devices listed in BIOS for startup information. You can select an optical drive or a USB flash drive, depending on the location of your HP Recovery media.

IMPORTANT: For a tablet with a detachable keyboard, connect the tablet to the keyboard base before beginning these steps.

To change the boot order:

1. Insert the HP Recovery media.
2. Access the system **Startup** menu.
   - For computers or tablets with keyboards attached, turn on or restart the computer or tablet, quickly press esc, and then press f9 for boot options.
   - For tablets without keyboards, turn on or restart the tablet, quickly press and hold the volume up button, and then select **f9**.

     – or –

     Turn on or restart the tablet, quickly press and hold the volume down button, and then select **f9**.
3. Select the optical drive or USB flash drive from which you want to boot, and then follow the on-screen instructions.

Using HP Sure Recover (select products only)

Select computer models are configured with HP Sure Recover, a PC operating system (OS) recovery solution built into the hardware and software. HP Sure Recover can fully restore the HP OS image without installed recovery software.

Using HP Sure Recover, an administrator or user can restore the system and install:

- Latest version of the operating system
- Platform-specific device drivers
- Software applications, in the case of a custom image

To access the latest documentation for HP Sure Recover, go to http://www.hp.com/support. Follow the on-screen instructions to find your product and locate your documentation.

12 Operating specifications

To determine the exact electrical ratings of your computer, see the computer ratings label, located on the outside of the computer.

Table 12-1 **Operating specifications**

Factor	Metric	U.S.
Operating temperature	**5°C to 35°C**	41°F to 95°F
Storage temperature	**-20°C to 60°C**	-22°F to 149°F
Operating humidity	**15% to 80% @ 26°C**	15% to 80% @ 78°F
Operating altitude	**0 m to 2000 m**	0 ft to 6561 ft
Storage altitude	**0 m to 4572 m**	0 ft to 15000 ft
Gamma correction (select products only)	**2.2**	2.2

13 Electrostatic discharge

Electrostatic discharge is the release of static electricity when two objects come into contact—for example, the shock you receive when you walk across the carpet and touch a metal door knob.

A discharge of static electricity from fingers or other electrostatic conductors may damage electronic components.

IMPORTANT: To prevent damage to the computer, damage to a drive, or loss of information, observe these precautions:

- If removal or installation instructions direct you to unplug the computer, first be sure that it is properly grounded.
- Keep components in their electrostatic-safe containers until you are ready to install them.
- Avoid touching pins, leads, and circuitry. Handle electronic components as little as possible.
- Use nonmagnetic tools.
- Before handling components, discharge static electricity by touching an unpainted metal surface.
- If you remove a component, place it in an electrostatic-safe container.

14 Accessibility

HP's goal is to design, produce, and market products, services, and information that everyone everywhere can use, either on a standalone basis or with appropriate third-party assistive technology (AT) devices or applications.

HP and accessibility

Because HP works to weave diversity, inclusion, and work/life into the fabric of the company, it is reflected in everything HP does. HP strives to create an inclusive environment focused on connecting people to the power of technology throughout the world.

Finding the technology tools you need

Technology can unleash your human potential. Assistive technology removes barriers and helps you create independence at home, at work, and in the community. Assistive technology helps increase, maintain, and improve the functional capabilities of electronic and information technology.

For more information, see Finding the best assistive technology on page 54.

The HP commitment

HP is committed to providing products and services that are accessible for people with disabilities. This commitment supports the company's diversity objectives and helps ensure that the benefits of technology are available to all.

The HP accessibility goal is to design, produce, and market products and services that can be effectively used by everyone, including people with disabilities, either on a standalone basis or with appropriate assistive devices.

To achieve that goal, this Accessibility Policy establishes seven key objectives to guide HP actions. All HP managers and employees are expected to support these objectives and their implementation in accordance with their roles and responsibilities:

- Raise the level of awareness of accessibility issues within HP, and provide employees with the training they need to design, produce, market, and deliver accessible products and services.
- Develop accessibility guidelines for products and services, and hold product development groups accountable for implementing these guidelines where competitively, technically, and economically feasible.
- Involve people with disabilities in the development of accessibility guidelines and in the design and testing of products and services.
- Document accessibility features, and make information about HP products and services publicly available in an accessible form.
- Establish relationships with leading assistive technology and solution providers.
- Support internal and external research and development that improves assistive technology relevant to HP products and services.

- Support and contribute to industry standards and guidelines for accessibility.

International Association of Accessibility Professionals (IAAP)

IAAP is a not-for-profit association focused on advancing the accessibility profession through networking, education, and certification. The objective is to help accessibility professionals develop and advance their careers and to better enable organizations to integrate accessibility into their products and infrastructure.

As a founding member, HP joined to participate with other organizations to advance the field of accessibility. This commitment supports HP's accessibility goal of designing, producing, and marketing products and services that people with disabilities can effectively use.

IAAP will make the profession strong by globally connecting individuals, students, and organizations to learn from one another. If you are interested in learning more, go to http://www.accessibilityassociation.org to join the online community, sign up for newsletters, and learn about membership options.

Finding the best assistive technology

Everyone, including people with disabilities or age-related limitations, should be able to communicate, express themselves, and connect with the world using technology. HP is committed to increasing accessibility awareness within HP and with our customers and partners.

Whether it's large fonts that are easy on the eyes, voice recognition that lets you give your hands a rest, or any other assistive technology to help with your specific situation—a variety of assistive technologies make HP products easier to use. How do you choose?

Assessing your needs

Technology can unleash your potential. Assistive technology removes barriers and helps you create independence at home, at work, and in the community. Assistive technology (AT) helps increase, maintain, and improve the functional capabilities of electronic and information technology.

You can choose from many AT products. Your AT assessment should allow you to evaluate several products, answer your questions, and facilitate your selection of the best solution for your situation. You will find that professionals qualified to do AT assessments come from many fields, including those licensed or certified in physical therapy, occupational therapy, speech/language pathology, and other areas of expertise. Others, while not certified or licensed, can also provide evaluation information. You will want to ask about the individual's experience, expertise, and fees to determine if they are appropriate for your needs.

Accessibility for HP products

These links provide information about accessibility features and assistive technology, if applicable and available in your country or region, that are included in various HP products. These resources will help you select the specific assistive technology features and products most appropriate for your situation.

- HP Aging & Accessibility: Go to http://www.hp.com, type `Accessibility` in the search box. Select **Office of Aging and Accessibility**.
- HP computers: For Windows products, go to http://www.hp.com/support, type `Windows Accessibility Options` in the **Search our knowledge** search box. Select the appropriate operating system in the results.
- HP Shopping, peripherals for HP products: Go to http://store.hp.com, select **Shop**, and then select **Monitors** or **Accessories**.

If you need additional support with the accessibility features on your HP product, see Contacting support on page 57.

Additional links to external partners and suppliers that may provide additional assistance:

- Microsoft Accessibility information (Windows and Microsoft Office)
- Google Products accessibility information (Android, Chrome, Google Apps)

Standards and legislation

Countries worldwide are enacting regulations to improve access to products and services for persons with disabilities. These regulations are historically applicable to telecommunications products and services, PCs and printers with certain communications and video playback features, their associated user documentation, and their customer support.

Standards

The US Access Board created Section 508 of the Federal Acquisition Regulation (FAR) standards to address access to information and communication technology (ICT) for people with physical, sensory, or cognitive disabilities.

The standards contain technical criteria specific to various types of technologies, as well as performance-based requirements which focus on functional capabilities of covered products. Specific criteria cover software applications and operating systems, web-based information and applications, computers, telecommunications products, video and multimedia, and self-contained closed products.

Mandate 376 – EN 301 549

The European Union created the EN 301 549 standard within Mandate 376 as an online toolkit for public procurement of ICT products. The standard specifies the accessibility requirements applicable to ICT products and services, with a description of the test procedures and evaluation methodology for each requirement.

Web Content Accessibility Guidelines (WCAG)

Web Content Accessibility Guidelines (WCAG) from the W3C's Web Accessibility Initiative (WAI) helps web designers and developers create sites that better meet the needs of people with disabilities or age-related limitations.

WCAG advances accessibility across the full range of web content (text, images, audio, and video) and web applications. WCAG can be precisely tested, is easy to understand and use, and allows web developers flexibility for innovation. WCAG 2.0 has also been approved as ISO/IEC 40500:2012.

WCAG specifically addresses barriers to accessing the web experienced by people with visual, auditory, physical, cognitive, and neurological disabilities, and by older web users with accessibility needs. WCAG 2.0 provides characteristics of accessible content:

- **Perceivable** (for instance, by addressing text alternatives for images, captions for audio, adaptability of presentation, and color contrast)
- **Operable** (by addressing keyboard access, color contrast, timing of input, seizure avoidance, and navigability)
- **Understandable** (by addressing readability, predictability, and input assistance)
- **Robust** (for instance, by addressing compatibility with assistive technologies)

Legislation and regulations

Accessibility of IT and information has become an area of increasing legislative importance.

The HP policy landscape website provides information about key legislation, regulations, and standards in the following locations:

- United States
- Canada
- Europe
- Australia

Useful accessibility resources and links

These organizations, institutions, and resources might be good sources of information about disabilities and age-related limitations.

NOTE: This is not an exhaustive list. These organizations are provided for informational purposes only. HP assumes no responsibility for information or contacts you encounter on the internet. Listing on this page does not imply endorsement by HP.

Organizations

These organizations are a few of the many that provide information about disabilities and age-related limitations.

- American Association of People with Disabilities (AAPD)
- The Association of Assistive Technology Act Programs (ATAP)
- Hearing Loss Association of America (HLAA)
- Information Technology Technical Assistance and Training Center (ITTATC)
- Lighthouse International
- National Association of the Deaf
- National Federation of the Blind
- Rehabilitation Engineering & Assistive Technology Society of North America (RESNA)
- Telecommunications for the Deaf and Hard of Hearing, Inc. (TDI)
- W3C Web Accessibility Initiative (WAI)

Educational institutions

Many educational institutions, including these examples, provide information about disabilities and age-related limitations.

- California State University, Northridge, Center on Disabilities (CSUN)
- University of Wisconsin - Madison, Trace Center

- University of Minnesota computer accommodations program

Other disability resources

Many resources, including these examples, provide information about disabilities and age-related limitations.

- ADA (Americans with Disabilities Act) Technical Assistance Program
- ILO Global Business and Disability network
- EnableMart
- European Disability Forum
- Job Accommodation Network
- Microsoft Enable

HP links

These HP-specific links provide information that relates to disabilities and age-related limitations.

HP comfort and safety guide

HP public sector sales

Contacting support

HP offers technical support and assistance with accessibility options for customers with disabilities.

NOTE: Support is in English only.

- Customers who are deaf or hard of hearing who have questions about technical support or accessibility of HP products:
  - Use TRS/VRS/WebCapTel to call (877) 656-7058 Monday through Friday, 6 a.m. to 9 p.m. Mountain Time.
- Customers with other disabilities or age-related limitations who have questions about technical support or accessibility of HP products:
  - Call (888) 259-5707 Monday through Friday, 6 a.m. to 9 p.m. Mountain Time.

15 Support information

HP support can help you get the most from your computer. You will find what you need with tools located on your computer and with information available on the web, by phone, or through your local retailer.

How to get help

.You might need to get professional help for your computer. Before you contact HP support, collect the following information.

- Model number
- Product number
- Serial number
- Software build number
- Operating system
- Purchase date

The operation system and purchase date should already be available to you. To locate the model number, product number, serial number, and software build number, you can find them in the HP Support Assistant.

To open the assistant, complete one of these tasks.

- Select the **Search** icon in the taskbar, type `support` in the search box, and then select the **HP Support Assistant** app.
- Select the question mark icon in the taskbar.

Write down your product information for future reference. Also, be sure to register at http://www.hp.com/apac/register.

After you have gathered the required information about your computer, use these resources to find help.

- Use the Get Help app for help with hardware and software questions. Select the **Start** button, select **All apps**, and then select the **Get Help** app.
- Use HP Support Assistant by completing one of these tasks:
  - Select the **Search** icon in the taskbar, type `support` in the search box, and then select the **HP Support Assistant** app.
  - Select the question mark icon in the taskbar.

  HP Support Assistant provides useful troubleshooting and diagnostics information and includes:
  - Online chat with an HP technician
  - Support telephone numbers

  - HP service center locations
- For help online, go to http://www.hp.com/support.

Customer support for repairs

If your computer needs to be repaired or to have parts replaced, you have two choices.

- Replace the part yourself. This is the fastest method of repair, because many times HP can send the part directly to your home or business in a few days. (This option might not be available in all countries or regions.)
- Have a technician replace the part or repair the computer. If such a service is necessary, HP support will make arrangements to repair your computer.

These services are covered during the warranty period.

There are some limitations and exclusions to the warranty, as well as some important details, which are described in the *HP Worldwide Limited Warranty and Technical Support* guide.

Before upgrading your hardware

If you intend to upgrade any of your hardware, do it only after you set up your new computer.

For instructions on setting up your computer, see the *Setup Instructions* or *Quick Setup* poster or Getting to know your computer on page 6. If you have any problems setting up your system and turning it on, immediately contact HP support using the procedures given earlier in this chapter. You must solve these types of problems before attempting to upgrade your system.

By breaking the security seal on the back of the computer, you confirm that the computer was working properly before you attempted to upgrade your system. After the security seal has been broken, your computer is then, to the extent allowed by local law, covered under the terms and conditions listed in the *HP Worldwide Limited Warranty and Technical Support*.

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