

# User Guide

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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 might require upgraded and/or separately purchased hardware, drivers, software or BIOS update to take full advantage of Windows functionality. Windows 10 is automatically updated, which is always enabled. ISP fees might apply and additional requirements might apply over time for updates. Go to http://www.microsoft.com for details.

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

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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

⚠ **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:** 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 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 39.
- If you haven't already done so, connect to a wired or wireless network. See details in Connecting to a network on page 8.
- Become familiar with the computer hardware and software. For more information, see Getting to know your computer on page 4 and Enjoying entertainment features on page 12.

## 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)

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. To adjust your monitor to a comfortable viewing light, follow the next steps.

1. Open the HP Display Control app.
2. Select a setting:
   - **Low Blue Light:** TUV certified. Reduces the blue light for improved eye comfort.
   - **Night:** Adjusts to the lowest blue light and reduces the impact on sleep.
   - **Reading:** Optimizes blue light and brightness for indoor viewing.

⚠ **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

**Table 1-1 Getting information**

| Tasks | Instructions |
|---|---|
| • Set up your computer | *Setup Instructions* or *Quick Setup* poster<br>– or –<br>See Getting to know your computer on page 4. |
| • Connect to the internet | See Connecting to a network on page 8. |
| • Recover factory settings | See Backing up, restoring, and recovering on page 39. |
| • 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<br>• Find Windows password information<br>• Find links to driver updates<br>• Read frequently asked questions | Get Help app:<br>▲ Select the **Start** button, and then select the **Get Help** app. |
| • Troubleshoot the most common computer hardware and software issues | See Troubleshooting on page 28. |

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

| Tasks | Instructions |
|---|---|
| • 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 **User Guides**. |
| • Order parts and find additional troubleshooting help<br>• Upgrade or replace components of your computer<br>• 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.<br>▲ Type `support` in the taskbar search box, and then select the **HP Support Assistant** app.<br>– or –<br>Select the question mark icon in the taskbar.<br>– or –<br>See Maintaining your computer on page 22. |
| • Find safety and regulatory notices | *Regulatory, Safety, and Environmental Notices*<br>To access this document:<br>▲ Type `HP Documentation` in the taskbar search box, and then select **HP Documentation**. |
| • Find ergonomic information | *Safety & Comfort Guide*<br>To access this guide:<br>▲ Type `HP Documentation` in the taskbar search box, and then select **HP Documentation**.<br>– or –<br>▲ Go to http://www.hp.com/ergo.<br>**IMPORTANT:** You must be connected to the internet to access the latest version of the user guide. |
| • Find computer warranty information | *Limited Warranty**<br>To access this document:<br>▲ Type `HP Documentation` in the taskbar search box, and then select **HP Documentation**.<br>– or –<br>▲ Go to http://www.hp.com/go/orderdocuments.<br>**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.

# 2 Getting to know your computer

## Locating hardware

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

To find out what hardware is installed on your computer:

▲ Type `device manager` in the taskbar search box, and then select the **Device Manager** app.

A list displays all the devices installed on your computer.

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

⚠ **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 in which 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.

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 **User Guides**.

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.

**NOTE:** A security solution is designed as a deterrent, but it might not be able to prevent theft, mishandling, or software attacks.

## Shutting down (turning off) the computer

**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

Although you can turn off the computer with the power button, the recommended procedure is to use the Windows Shut down command.

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

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.

## USB ports

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

**Table 2-1 USB ports and descriptions**

| Component | | Description |
|---|---|---|
|  | USB port | Connects a USB device, provides data transfer, and (for select products) charges small devices when the computer is on or in Sleep mode. |
|  | USB port with HP Sleep and Charge | Connects a USB device, provides high-speed data transfer, and charges small devices, even when the computer is off. |
|  | USB SuperSpeed port | Connects a USB device, provides high-speed data transfer, and (for select products) charges small devices when the computer is on or in Sleep mode. |
| <br>– or –<br> | USB SuperSpeed Plus port | Connects a USB device, provides high-speed data transfer, and (for select products) charges small devices when the computer is on or in Sleep mode. |
|  | USB Type-C port | Connects a USB device, provides data transfer, and (for select products) charges small devices when the computer is on or in Sleep mode.<br>**NOTE:** Cables, adapters, or both (purchased separately) might be required. |
|  | USB Type-C SuperSpeed port | Connects a USB device, provides high-speed data transfer, and (for select products) charges small devices when the computer is on or in Sleep mode.<br>**NOTE:** Cables, adapters, or both (purchased separately) might be required. |
| <br>– or –<br> | USB Type-C SuperSpeed Plus port | Connects a USB device, provides high-speed data transfer, and (for select products) charges small devices when the computer is on or in Sleep mode.<br>**NOTE:** Cables, adapters, or both (purchased separately) might be required. |
|  | USB Type-C Thunderbolt port with HP Sleep and Charge | Connects a USB device, provides high-speed data transfer, and charges small devices, even when the computer is off.<br>– and –<br>Connects a display device that has a USB Type-C connector, providing DisplayPort™ output.<br>**NOTE:** Your computer might also support a Thunderbolt™ docking station. |

**Table 2-1 USB ports and descriptions (continued)**

| Component | | Description |
|---|---|---|
| | | **NOTE:** Cables, adapters, or both (purchased separately) might be required. |
| | USB Type-C SuperSpeed port and DisplayPort connector | Connects a USB device, provides high-speed data transfer, and (for select products) charges small devices when the computer is on or in Sleep mode.<br>**NOTE:** Cables, adapters, or both (purchased separately) might be required.<br>– and –<br>Connects a DisplayPort device that has a USB Type-C connector, providing display output. |

# 3 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 of the following wireless devices:

- WLAN device—Connects the computer to wireless local area networks (commonly referred to as Wi-Fi networks, wireless LANs, or WLANs) 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 more 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 **Open Network & Internet settings**.

– or –

▲ On the taskbar, select the network status icon, and then select **Network & Internet settings**.

## Connecting to a WLAN

**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.

To connect to a WLAN, follow these steps:

1. Be sure that the WLAN device is on.
2. On the taskbar, select the network status icon, and then 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 **Open Network & Internet settings**.

      – or –

      On the taskbar, select the network status icon, and then select **Network & Internet settings**.
   2. Under the **Change your network settings** section, select **Network and Sharing Center**.
   3. Select **Set up a new connection or network**.

      A list of options is displayed, which allows you to manually search for and connect to a network or to create a new network connection.
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.

– or –

1. On the taskbar, select the network status icon.
2. Select **Network & Internet settings**.
3. Under the **Network & Internet** section, select **Cellular**, and then select **Advanced Options**.

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.

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 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 location is enabled under the Location setting.

▲ Type `location` in the taskbar search box, select **Location privacy settings**, and then select a setting.

## 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 such as the following:

- 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. Type `bluetooth` in the taskbar search box, and then select **Bluetooth and other devices settings**.
2. Enable **Bluetooth**, if it is not already enabled.

3. Select **Add Bluetooth or other device**, and then in the **Add a 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 if you want to connect the computer directly to a router in your home (instead of working wirelessly) or if you want to connect to an existing network at your office.

If there is no RJ-45 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.



# 4 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 4.

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 27 for details about using Windows Hello.

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

## 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 17. Before connecting speakers, lower the volume setting.

### Connecting headphones

⚠ **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:

▲ Type `HP Documentation` in the taskbar search box, and then select **HP Documentation**.

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

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

⚠ **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:

- Type `HP Documentation` in the taskbar search box, and then select **HP Documentation**.

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.

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.

To view or change sound settings:

- Type `control panel` in the taskbar search box, select **Control Panel**, select **Hardware and Sound**, and then select **Sound**.

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.

- Type `control panel` in the taskbar search box, select **Control Panel**, select **Hardware and Sound**, 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)

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

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

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



2. Connect the other end of the cable to the external DisplayPort device.
3. Press f4 to cycle through 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 f4 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)

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

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

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 f4 to cycle through 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 f4 the display state changes.

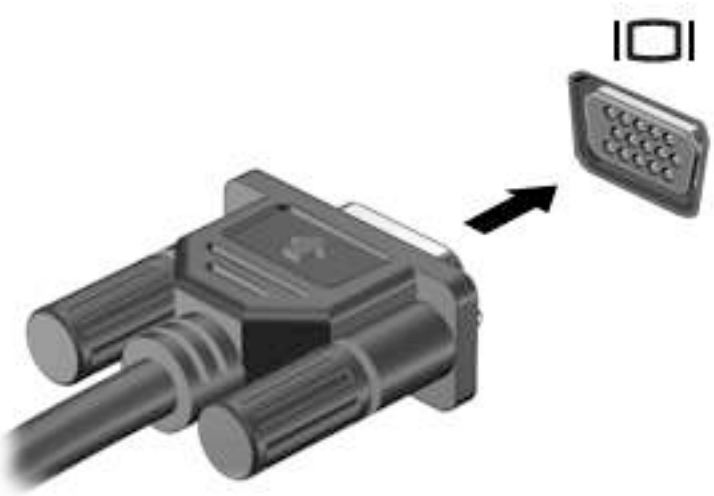
**NOTE:** For best results, especially if you choose the **Extend** option, increase the screen resolution of the external device, as follows. Select the **Start** button, select **Settings**, and then select **System**. Under **Display**, select the appropriate resolution, and then select **Keep changes**.

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

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

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.

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



2. Press f4 to cycle through 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 f4, 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**.

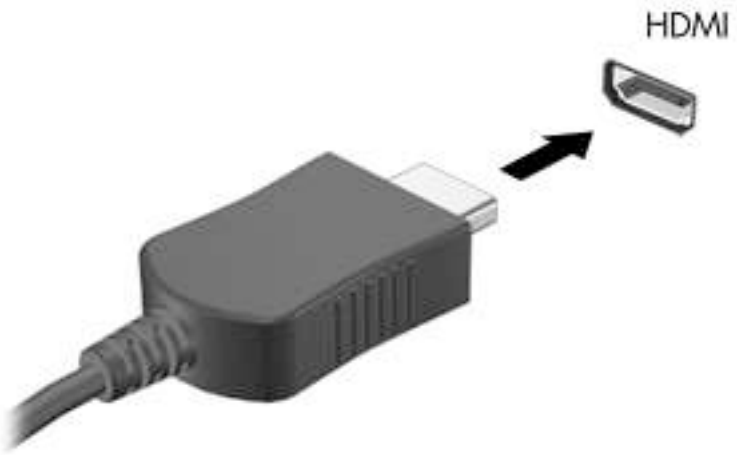
## Connecting video devices using an HDMI cable (select products only)

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

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

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 f4 to cycle through 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 f4, 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. After you connect an HDMI TV to the computer, you can then turn on HDMI audio by following these steps:

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**.

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)

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

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

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



2. Connect the other end of the cable to the digital display device.
3. Press f4 to cycle through 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 f4, 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)

To discover and connect to Miracast®-compatible wireless displays without leaving your current apps, follow the next steps.

To open Miracast:

- Type `project` in the taskbar search box, and then select **Project to a second screen**. Select **Connect to a wireless display**, 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.

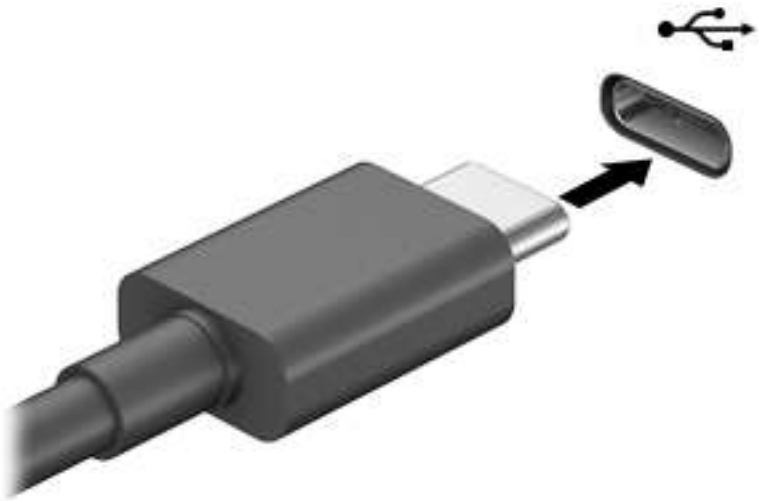
**IMPORTANT:** Be sure that the external device is connected to the correct port on the computer, using the correct cable. Follow the device manufacturer's instructions.

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)

**NOTE:** 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.

# 5 Navigating the screen

You can navigate the computer screen in the following ways:

- Using touch gestures (select products only)
- 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.

Type `control panel` in the taskbar 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. The keyboard also allows you to 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 computer model, your keyboard might support the following keys.

**Table 5-1 Action keys**

| Icon | Description |
|---|---|
|  | Opens the “How to get help in Windows 10” 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.<br>**NOTE:** A wireless network must be set up before a wireless connection is possible. |
|  | Turns the airplane mode and wireless feature on or off.<br>**NOTE:** The airplane mode key is also referred to as the wireless button.<br>**NOTE:** A wireless network must be set up before a wireless connection is possible. |

# 6 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. Type `defragment` in the taskbar 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. Type `disk` in the taskbar 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 either of the following 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.

To update programs and drivers, choose one of the following methods:

- Updating using Windows 10 on page 23
- Updating using Windows 10 S on page 23

## Updating using Windows 10

To update programs and drivers:

1. Type `support` in the taskbar search box, and then select the **HP Support Assistant** app.

   – or –

   Select the question mark icon in the taskbar.
2. Select **My notebook**, select the **Updates** tab, and then select **Check for updates and messages**.
3. Follow the on-screen instructions.

## Updating using Windows 10 S

To update programs:

1. Select **Start**, and then select **Microsoft Store**.
2. Select your account profile picture next to the search box, and then select **Downloads and updates**.
3. On the **Downloads and updates** page, make the selection for updates and follow the on-screen instructions.

To update drivers:

1. Type `windows update settings` in the taskbar search box, and then select **Windows Update settings**.
2. Select **Check for updates**.

**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, debris, and harmful bacteria. Use the following information to clean most computer surfaces. For computers with wood veneer, see Caring for wood veneer (select products only) on page 25.

## Using HP Easy Clean (select products only)

HP Easy Clean helps you to avoid accidental input while you clean the computer surfaces with germicidal wipes. 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 devices are disabled for a short period, use germicidal wipes to safely disinfect all exposed surfaces of your computer, including the keyboard, display, touchpad, and case. Follow the manufacturer's directions for using the wipes.

**IMPORTANT:** If you are not sure that a cleaning product is safe for your computer, check the product contents to make sure that ingredients such as these are not included in the product:

- Alcohol
- Acetone
- Ammonium chloride
- Methylene chloride
- Hydrocarbons
- Any petroleum-based materials such as benzene or thinner

**NOTE:** Keep the computer open until you have allowed it to completely air dry.

3. When the surface is dry:
   a. Connect AC power.
   b. Connect all powered external devices.
   c. Turn on the computer.

## Removing dirt and debris from non-HP Easy Clean computers

If HP Easy Clean is not preinstalled on your computer, follow these steps:

1. Turn off the computer to prevent electric shock or damage to components.
   a. Disconnect AC power.
   b. Disconnect all powered external devices.
2. Wipe the exterior of the computer with a soft, water-dampened cloth to remove the soil as needed.

- The cloth should be of dry microfiber or a chamois (static-free cloth without oil), or static-free cloth wipes.
- The cloth should be moist but not wet. Water dripping into the ventilation or other points of ingress can cause damage.
- Do not use fibrous materials, such as paper towels, which can scratch the computer. Over time, dirt and cleaning agents can get trapped in the scratches.

3. Allow the unit to air dry before using the computer or performing additional cleaning with germicidal wipes.
4. When you are finished cleaning and the surface is dry:
   a. Connect AC power.
   b. Connect all powered external devices.
   c. Turn on the computer.

## Caring for wood veneer (select products only)

Your product might feature high-quality wood veneer. As with all natural wood products, proper care and handling are important to ensure the 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, chlorine, acetone, turpentine, or other mineral spirits.
- 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.

# Traveling with or shipping your computer

If you have to 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 are allowed to 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.

# 7 Securing your computer and information

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.

## Computer security features

**Table 7-1 Computer risks and security features**

| Computer risk | Computer feature |
|---|---|
| Unauthorized use of the computer or user account | User password<br><br>A *password* is a group of characters that you choose to authorize access to your computer information.<br><br>– or –<br><br>Windows Hello (select products only)<br><br>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.<br><br>To set up Windows Hello:<br><br>1. Select the **Start** button, select **Settings**, select **Accounts**, and then select **Sign-in options**.<br>2. To add a password, select **Password**, and then select **Add**.<br>3. Under **Windows Hello Fingerprint** or **Windows Hello Face**, select **Set up**.<br>4. Select **Get Started**, and then follow the on-screen instructions to enroll your fingerprint or facial ID and set up a PIN.<br><br>**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.<br><br>**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<br><br>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. |
| Unauthorized access to data and ongoing threats to the computer | Firewall software<br><br>• Windows includes firewall software preinstalled on the computer.<br>• The antivirus software, which is preinstalled on the computer, includes firewall software.<br><br>Windows critical security updates<br><br>Updates to the Windows operating system |

# 8 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

**Table 8-1 Computer symptoms and solutions**

| Symptom | Possible solution |
|---|---|
| Error message: hard drive error | 1. Restart the computer.<br>a. Press ctrl+alt+delete.<br>b. Select the **Power** icon, and then select **Restart**.<br>– or –<br>Press and hold the power button on the computer for 10 or more seconds to turn off the computer, and then press the button to turn on the computer.<br>2. If Windows opens, immediately back up all important data to a backup hard drive.<br>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 29. |
| Computer is not responding | 1. Press ctrl+alt+delete.<br>2. Select **Task Manager**.<br>3. Select any programs that are not responding, and then select **End task**. |
| | If closing programs does not resolve the problem, restart the computer.<br>1. Press ctrl+alt+delete.<br>2. Select the **Power** icon, and then select **Restart**.<br>– or – |

**Table 8-1 Computer symptoms and solutions (continued)**

| Symptom | Possible solution |
|---|---|
| | Press and hold the power button on the computer for 10 or more seconds to turn off the computer. Then press the power 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

**Table 8-2 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.<br>• Be sure that computer air vents are not blocked.<br>**NOTE:** If your computer has an internal fan, be sure that the internal fan is running. |

# Monitor (select products only)

**Table 8-3 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. |
| 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.<br>• If any of the pins are bent, replace the monitor cable.<br>• 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.<br>▲ 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)

**Table 8-4 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.<br>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).<br>3. Repeat step 1 and step 2 to save changes in all open programs.<br>4. Press the power button to turn off the computer.<br>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)

**Table 8-5 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 re-synchronization.<br>• 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.<br>• Replace the batteries in the keyboard, mouse, or both. |

# Speakers and sound

**Table 8-6 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. Type `control panel` in the taskbar search box, and then select **Control Panel**. Select **System and Security**.<br>2. Under **Security and Maintenance**, select **Troubleshoot common computer problems**, and then select **Playing Audio**. |

**Table 8-6 Speaker symptoms and solutions (continued)**

| Symptom | Possible solution |
|---|---|
| | 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

**Table 8-7 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.<br>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 (also called a network interface card, or NIC). A modem uses a standard telephone cable, whereas 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.<br>1. Type `control panel` in the taskbar search box, and then select **Control Panel**. Select **Network and Internet**, and then select **Network and Sharing Center**.<br>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.<br>2. Select **Troubleshoot problems**. |
| No network connection icon in the notification area | 1. Type `repair` in the taskbar search box, and then select **Identify and repair network problems**.<br>2. Follow the on-screen instructions. |

# Software troubleshooting

**Table 8-8 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.<br>• Update the drivers. See “Updating device drivers” in this table.<br>• Restore your computer to a configuration that was in use before the software was installed. See "Microsoft System Restore" in this table.<br>• Reinstall the software program or hardware driver. See “Software program and hardware driver reinstallation” in this table.<br>• 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 39. |
| Software programs are slow to respond | • Close unnecessary software programs.<br>• 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.<br>1. Type `msconfig` in the taskbar search box, and then select **System Configuration**.<br>**NOTE:** If you are prompted for an administrator password or confirmation, type the password or provide confirmation.<br>2. From the **General** tab, select **Selective startup**.<br>3. Select the **Startup** tab, and then select **Open Task Manager**.<br>4. Select the startup items that you want to prevent from loading, and then select **Apply**.<br>**NOTE:** If you are unsure about an item, do not disable it.<br>5. If prompted, select **Restart** to restart the computer.<br>**NOTE:** To enable a program to load at startup, restart the computer and reverse these steps. |
| | Disable nonessential graphics capabilities.<br>1. Type `file explorer` in the taskbar search box, and then select **File Explorer**.<br>2. Right-click **This PC**, and then select **Properties**.<br>3. Select **Advanced system settings**.<br>**NOTE:** If you are prompted for an administrator password or confirmation, type the password or provide confirmation.<br>4. From the **Advanced** tab under **Performance**, select **Settings**.<br>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.<br>1. Type `device manager` in the taskbar search box, and then select **Device Manager**.<br>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).<br>3. Double-click the specific item (for example, HP DVD Writer 640b).<br>4. Select the **Driver** tab.<br>5. To update a driver, select **Update Driver**, and then follow the on-screen instructions.<br>– or – |

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

| Symptom | Possible solution |
|---|---|
| | 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.<br>**IMPORTANT:** Always use this System Restore procedure before you use the System Recovery procedure. |
| | For more information and steps, see the Get Help app.<br>▲ Select the **Start** button, and then select the **Get Help** app. |
| 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).<br>**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.<br>▲ Select the **Start** button, and then select the **Get Help** app. |

# 9 Using HP PC Hardware Diagnostics

## 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, first you must download and install it. To download HP PC Hardware Diagnostics Windows, see Downloading HP PC Hardware Diagnostics Windows on page 34.

After HP PC Hardware Diagnostics Windows is installed, follow these steps to access it from HP Help and Support or HP Support Assistant.

1. To access HP PC Hardware Diagnostics Windows from HP Help and Support:

   a. Select the **Start** button, and then select **HP Help and Support**.

   b. Select **HP PC Hardware Diagnostics Windows**.

   – or –

   To access HP PC Hardware Diagnostics Windows from HP Support Assistant:

   a. Type `support` in the taskbar search box, and then select the **HP Support Assistant** app.

      – or –

      Select the question mark icon in the taskbar.

   b. Select **Troubleshooting and fixes**.

   c. Select **Diagnostics**, and then select **HP PC Hardware Diagnostics Windows**.

2. 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**.

When HP PC Hardware Diagnostics Windows detects a failure that requires hardware replacement, a 24-digit Failure ID code is generated. The screen displays one of the following options:

- A Failure ID link is displayed. Select the link and follow the on-screen instructions.
- Instructions for calling support are displayed. Follow those instructions.

### 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

To download HP PC Hardware Diagnostics Windows, 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 a location on your computer or a USB flash drive.

The tool downloads to the selected location.

– or –

You can use the following steps to download the HP PC Hardware Diagnostics Windows from the Microsoft Store:

1. Select the Microsoft app on your desktop or enter `Microsoft Store` in the taskbar search box.
2. Enter `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)

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

To download HP PC Hardware Diagnostics Windows by product name or number, follow these steps:

1. Go to http://www.hp.com/support.
2. Select **Get 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, follow these steps:

▲ 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

**NOTE:** For Windows 10 S computers, 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 36.

HP PC Hardware Diagnostics UEFI (Unified Extensible Firmware Interface) 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.

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

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:

- 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.

  – or –

  Contact support, and provide the Failure ID code.

**NOTE:** To start diagnostics on a convertible computer, your computer must be in notebook mode, and you must use the attached keyboard.

**NOTE:** If you need to stop a diagnostic test, press esc.

## Starting HP PC Hardware Diagnostics UEFI

To start HP PC Hardware Diagnostics UEFI, follow these steps:

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 36.

   b. Hard drive

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

## 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 the following 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:

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)

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

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

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 execute 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

**NOTE:** 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

To download the latest Remote HP PC Hardware Diagnostics UEFI version, follow these steps:

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

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

To download HP Remote PC Hardware Diagnostics UEFI by product name or number, follow these steps:

1. Go to http://www.hp.com/support.
2. Select **Get 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 the following 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**.
- 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**, and then **Save Changes and Exit** to save your settings.

Your changes take effect when the computer restarts.

# 10 Backing up, restoring, and recovering

This chapter provides information about the following processes, which are standard procedure for most products:

- **Backing up your personal information**—You can use Windows tools to back up your personal information (see Using Windows tools on page 39).
- **Creating a restore point**—You can use Windows tools to create a restore point (see Using Windows tools on page 39).
- **Creating recovery media** (select products only)—You can use the HP Cloud Recovery Download Tool (select products only) to create recovery media (see Using the HP Cloud Recovery Download Tool to create recovery media (select products only) on page 39).
- **Restoring and recovery**—Windows offers several options for restoring from backup, refreshing the computer, and resetting the computer to its original state (see Using Windows tools on page 39).

**IMPORTANT:** If you will be 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

### Using Windows tools

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

You can use Windows tools to back up personal information and create system restore points and recovery media.

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

For more information and steps, see the Get Help app.

1. Select the **Start** button, and then select the **Get Help** app.
2. Enter the task you want to perform.

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

### 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/support, 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.

# Restoring and recovery

## Restoring, resetting, and refreshing using Windows tools

Windows offers several options for restoring, resetting, and refreshing the computer. For details, see Using Windows tools on page 39.

## Recovering using HP Recovery media

You can use HP Recovery media to recover the original operating system and software programs that were installed at the factory. On select products, it can be created 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 39.

**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.

## Changing the computer boot order

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

To change the boot order:

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

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 hold down the volume up button, and then select **f9**.

     – or –

     Turn on or restart the tablet, quickly hold down 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 OS recovery solution built into the hardware and firmware. 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. Select **Find your product**, and then follow the on-screen instructions.

# 11 Specifications

## Operating specifications

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

**Table 11-1 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 |

# 12 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.

# 13 Accessibility

## 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 45.

### 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 stand-alone 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

The following links provide information about accessibility features and assistive technology, if applicable, included in various HP products. These resources will help you select the specific assistive technology features and product(s) most appropriate for your situation.

- HP Elite x3–Accessibility Options (Windows 10 Mobile)
- HP PCs–Windows 7 Accessibility Options
- HP PCs–Windows 8 Accessibility Options
- HP PC's–Windows 10 Accessibility Options
- HP Slate 7 Tablets–Enabling Accessibility Features on Your HP Tablet (Android 4.1/Jelly Bean)
- HP SlateBook PCs–Enabling Accessibility Features (Android 4.3, 4.2/Jelly Bean)
- HP Chromebook PCs–Enabling Accessibility Features on Your HP Chromebook or Chromebox (Chrome OS)
- HP Shopping–peripherals for HP products

If you need additional support with the accessibility features on your HP product, see Contacting support on page 48.

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

- Microsoft Accessibility information (Windows 7, Windows 8, Windows 10, Microsoft Office)
- Google Products accessibility information (Android, Chrome, Google Apps)

- Assistive Technologies sorted by impairment type
- Assistive Technology Industry Association (ATIA)

# Standards and legislation

## Standards

Section 508 of the Federal Acquisition Regulation (FAR) standards was created by the US Access Board 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 EN 301 549 standard was created by the European Union within Mandate 376 as the basis for an online toolkit for public procurement of ICT products. The standard specifies the functional accessibility requirements applicable to ICT products and services, together with a description of the test procedures and evaluation methodology for each accessibility 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 following links provide information about key legislation, regulations, and standards.

- United States
- Canada
- Europe
- Australia
- Worldwide

# Useful accessibility resources and links

The following organizations might be good resources for 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

- 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

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

## Other disability resources

- 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

Our contact webform

HP comfort and safety guide

HP public sector sales

# Contacting support

**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, choose one of the following options:
  - Call (888) 259-5707 Monday through Friday, 6 a.m. to 9 p.m. Mountain Time.
  - Complete the Contact form for people with disabilities or age-related limitations.

# 14 Support information

## How to get help

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.

Before contacting HP support, it's important to have the following information handy:

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

Write down your product information for future reference.

The first four items on the list (model number, product number, serial number, and software build number) can be viewed by using HP Support Information. Type `support` in the taskbar search box, and then select the **HP Support Assistant** app.

– or –

Select the question mark icon in the taskbar.

Don't forget to register at http://www.hp.com/apac/register.

## Where to get help

- Use the Get Help app for help with hardware and software questions. Select the **Start** button, and then select the **Get Help** app.
- Use HP Support Assistant. Type `support` in the taskbar search box, and then select the **HP Support Assistant** app.

  – or –

  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.

Telephone assistance to get started is covered for 30 days from the time you purchase your computer. After 30 days, there might be a charge, but the helpful support is still available.

# Customer support for repairs

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

- Many parts are considered consumer replaceable. 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.)
- If a repair 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 4. 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. This must be done first 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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