User Guide

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Product notice

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

This computer may require upgraded and/ or separately purchased hardware and/or a DVD drive to install the Windows 7 software and take full advantage of Windows 7 functionality. Go to http://windows.microsoft.com/en-us/windows7/get-know-windows-7 for details.

To access the latest user guide or manuals for your product, go to http://www.hp.com/support, and select your country. Select **Find your product**, and then follow the on-screen instructions.

Software terms

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

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

Safety warning notice

⚠ **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 the International Standard for Safety of Information Technology Equipment (IEC 60950-1).

Processor configuration setting (select models only)

IMPORTANT: Select computer models 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.

Table of contents

1 Starting right 1
Best practices 1
More HP resources 2

2 Getting to know your computer 3
Finding your hardware and software information 3
Right side 4
Left side 6
Display 7
Top 8
TouchPad 8
Lights 9
Button, speakers, and vent 10
Keys 11
Bottom 12
Labels 13

3 Connecting to a network 14
Connecting to a wireless network 14
Using the wireless controls 14
Using the wireless button 14
Using HP Connection Manager (select models only) 15
Using operating system controls 15
Connecting to a WLAN 15
Using Bluetooth wireless devices 16
Sharing data and drives and accessing software 16

4 Enjoying entertainment features 17
Using the camera 17
Using audio 17
Connecting speakers 17
Connecting headsets 17
Using sound settings 18
Using advanced audio features 18
Accessing Audio Control Panel 18
Using video 18

Connecting video devices by using an HDMI cable 18
Setting up HDMI audio (select models only) 19
Using Intel Wireless Display and Wireless Music (select models only) 20

5 Navigating the screen 21
Using TouchPad gestures 21
Tap 21
Two-finger pinch zoom 22
Two-finger scroll 22
Two-finger tap 22
Using the keyboard and optional mouse 23
Using the keys 23
Using the action keys 23
Using ALT GR key combinations 24
Using the integrated numeric keypad 24

6 Managing power 25
Initiating Sleep and Hibernation 25
Manually initiating and exiting Sleep 26
Manually initiating and exiting Hibernation (select models only) 26
Setting password protection on wakeup 26
Using the power meter 27
Selecting a power plan 27
Running on battery power 27
Factory-sealed battery 27
Finding battery information 28
Conserving battery power 28
Identifying low battery levels 28
Resolving a low battery level 28
Resolving a low battery level when external power is available 28
Resolving a low battery level when no power source is available 28
Resolving a low battery level when the computer cannot exit Hibernation 29
Running on external AC power 29
Troubleshooting power problems 29
Shutting down the computer 30

7 Maintenance 31
Improving performance 31
Using HP 3D DriveGuard (select models only) 31
Identifying HP 3D DriveGuard status 31

Using Disk Defragmenter 31
Using Disk Cleanup 32
Updating programs and drivers 32
Cleaning your computer 32
Cleaning procedures 33
Cleaning the display (All-in-Ones or Notebooks) 33
Cleaning the sides or cover 33
Cleaning the TouchPad, keyboard, or mouse 33
Traveling with or shipping your computer 33

8 Securing your computer and information 35
Locating your security software 35
Using passwords 35
Setting Windows passwords 36
Setting Setup Utility (BIOS) passwords 36
Using Internet security software 37
Using antivirus software 37
Using firewall software 37
Installing software updates 37
Installing critical security updates 37
Installing HP and third-party software updates 38
Using HP Touchpoint Manager (select models only) 38
Securing your wireless network 38
Backing up your software applications and information 38
Using an optional security cable 38

9 Using Setup Utility (BIOS) 40
Starting Setup Utility (BIOS) 40
Updating the BIOS 40
Determining the BIOS version 40
Downloading a BIOS update 41

10 Using HP PC Hardware Diagnostics (UEFI) 42
Downloading HP PC Hardware Diagnostics (UEFI) to a USB device 42

11 Backing up, restoring, and recovering 44
Creating backups 44
Creating recovery media to recover the original system 44
What you need to know 44
Creating the recovery media 45

Creating system restore points 45
What you need to know 45
Creating a system restore point 45
Backing up system and personal information 45
Tips for a successful backup 46
What you need to know 46
Creating a backup using Windows Backup and Restore 46
Restore and recovery 47
Restoring to a previous system restore point 47
Restoring specific files 47
Restoring specific files using Windows Backup and Restore 47
Recovering the original system using HP Recovery Manager 47
What you need to know 47
Recovering using HP Recovery partition (select models only) 48
Recovering using the recovery media 48
Changing the computer boot order 48

12 Specifications 50
Input power 50
Operating environment 50

13 Electrostatic Discharge 52

14 Accessibility 53
Supported assistive technologies 53
Contacting support 53

Index 54

1 Starting right

This computer is a powerful tool designed to enhance your work and entertainment. To get the most out of your computer, read this chapter to learn about best practices after setup, and where to go to get more HP resources.

Best practices

After you set up and register the computer, we recommend the following steps to get the most out of your smart investment:

- Back up your hard drive by creating recovery discs or a recovery flash drive. See Backing up, restoring, and recovering on page 44.
- If you haven't already done so, connect to a wired or wireless network. See details in Connecting to a network on page 14.
- Become familiar with the computer hardware and software. Go to Getting to know your computer on page 3 and Enjoying entertainment features on page 17 for information.
- Update or purchase antivirus software. Learn more at Using antivirus software on page 37.

More HP resources

You have already used *Setup Instructions* to turn on the computer and locate this guide. For product details, how-to information, and more, use this table.

Resource	Contents
Setup Instructions	• Overview of computer setup and features.
Help and Support To access Help and Support, select **Start > Help and Support**. For U.S. support, go to http://www.hp.com/go/contactHP. For worldwide support, go to http://welcome.hp.com/country/us/en/wwcontact_us.html.	• A broad range of how-to information and troubleshooting tips.
Worldwide support To get support in your language, go to http://welcome.hp.com/country/us/en/wwcontact_us.html.	• Chat online with an HP technician • Support telephone numbers • HP service center locations
Safety & Comfort Guide To access this guide, select **Start > HP Support Assistant > Next > My computer > User Guides**. – or – Go to http://www.hp.com/ergo.	• Proper workstation setup • Guidelines for posture and work habits that increase your comfort and decrease your risk of injury • Electrical and mechanical safety information
Regulatory, Safety and Environmental Notices To access this guide, select **Start > HP Support Assistant > Next > My computer > User Guides**.	• Important regulatory notices, including proper battery disposal information, if needed.
*Limited Warranty** To access this guide, select **Start > HP Support Assistant > Next > My computer > User Guides**. – or – Go to http://www.hp.com/go/orderdocuments.	• Specific warranty information about this computer
*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 may 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 Hewlett Packard, POD, P.O. 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

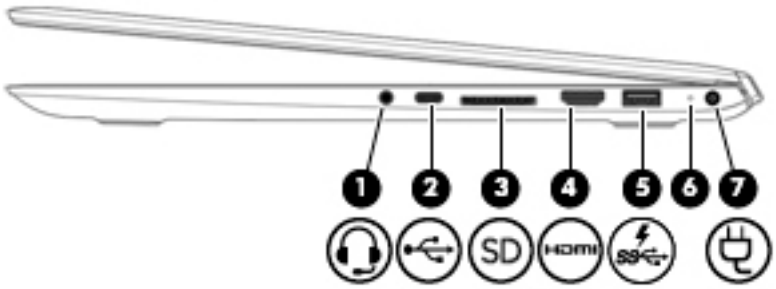
Finding your hardware and software information

▲ Select **Start > Computer**.

A list displays all the devices installed in your computer, including optical drives, solid-state drives (SSD), or a secondary hard drive.

To find out what software is included on your computer, select **Start > All Programs**.

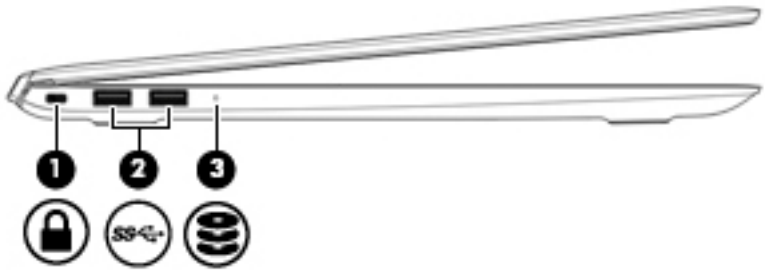
Right side



Component			Description
(1)		Audio-out (headphone)/Audio-in (microphone) combo jack	Connects optional powered stereo speakers, headphones, earbuds, a headset, or a television audio cable. Also connects an optional headset microphone. This jack does not support optional standalone microphones. **WARNING!** To reduce the risk of personal injury, adjust the volume before using headphones, earbuds, or a headset. For additional safety information, refer to the *Regulatory, Safety, and Environmental Notices*. **NOTE:** When a device is connected to the jack, the computer speakers are disabled. **NOTE:** Be sure that the device cable has a 4-conductor connector that supports both audio-out (headphone) and audio-in (microphone).
(2)		USB Type-C port	Connects a USB device with a Type-C connector for high-speed data transfer.
(3)	SD	Memory card reader	Reads optional memory cards that enable you to store, manage, share or access information. To insert a card: 1. Hold the card label-side up, with connectors facing the computer. 2. Insert the card into the memory card reader, and then press in on the card until it is firmly seated. To remove a card: ▲ Press in on the card, and then remove it from the memory card reader.
(4)	HDMI	HDMI port	Connects an optional video or audio device, such as a high-definition television, any compatible digital or audio component, or a high-speed High-Definition Multimedia Interface (HDMI) device.
(5)	SS	USB 3.0 charging (powered) port	Connects an optional USB device, such as a keyboard, mouse, external drive, printer, scanner or USB hub. Standard USB ports will not charge all USB devices or will charge using a low current. Some USB devices require power and require you to use a powered port. **NOTE:** USB charging ports can also charge select models of cell phones and MP3 players, even when the computer is off.

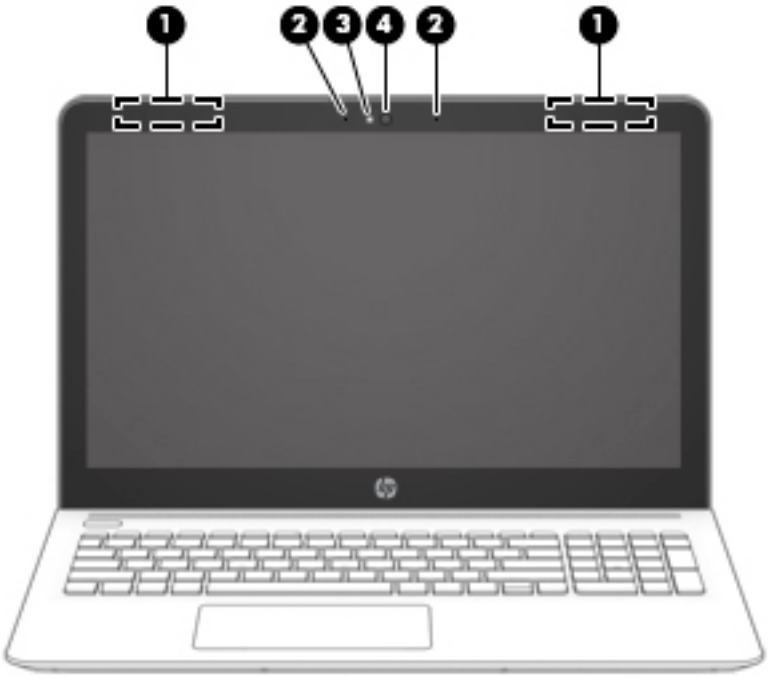
Component		Description
(6)	AC adapter and battery light	• White: The AC adapter is connected and the battery is fully charged. • Blinking white: The AC adapter is disconnected and the battery has reached a low battery level. • Amber: The AC adapter is connected and the battery is charging. • Off: The battery is not charging.
(7)	Power connector	Connects an AC adapter.

Left side



Component			Description
(1)		Security cable slot	Attaches an optional security cable to the computer. **NOTE:** The security cable is designed to act as a deterrent, but it may not prevent the computer from being mishandled or stolen.
(2)		USB 3.0 ports (2)	Connect optional USB devices, such as a keyboard, mouse, external drive, printer, scanner or USB hub.
(3)		Drive light	• Blinking white: The hard drive is being accessed. • Amber: HP 3D DriveGuard has temporarily parked the hard drive. **NOTE:** For information about HP 3D DriveGuard, see Using HP 3D DriveGuard (select models only) on page 31.

Display



Component		Description
(1)	WLAN antennas*	Send and receive wireless signals to communicate with wireless local area networks (WLANs).
(2)	Internal microphones	Record sound.
(3)	Camera light	On: The camera is in use.
(4)	Camera	Allows you to video chat, record video, and record still images. To use your camera: ▲ Select **Start > All Programs > CyberLink YouCam**.

*The antennas are not visible from the outside of the computer, and the antenna location may vary. For optimal transmission, keep the areas immediately around the antennas free from obstructions.

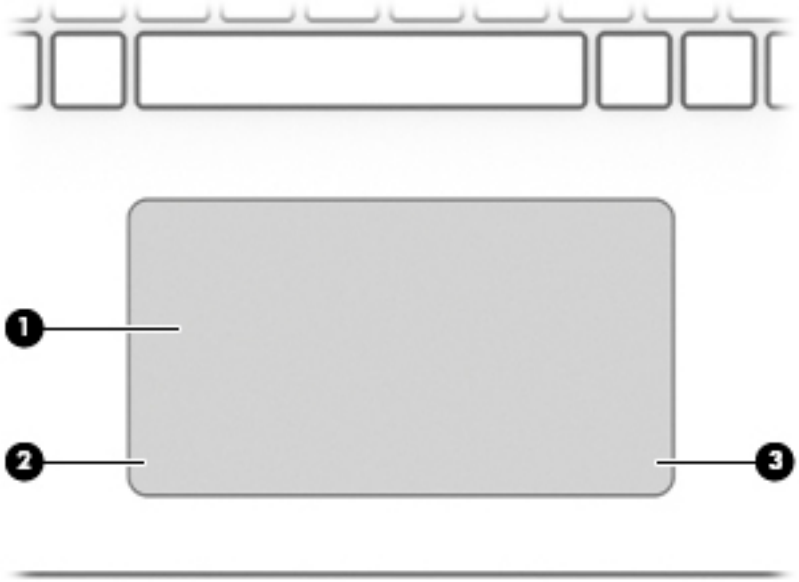
For wireless regulatory notices, see the section of the *Regulatory, Safety, and Environmental Notices* that applies to your country or region.

To access this guide:

▲ Select **Start > HP Support Assistant > Next > My computer > User Guides**.

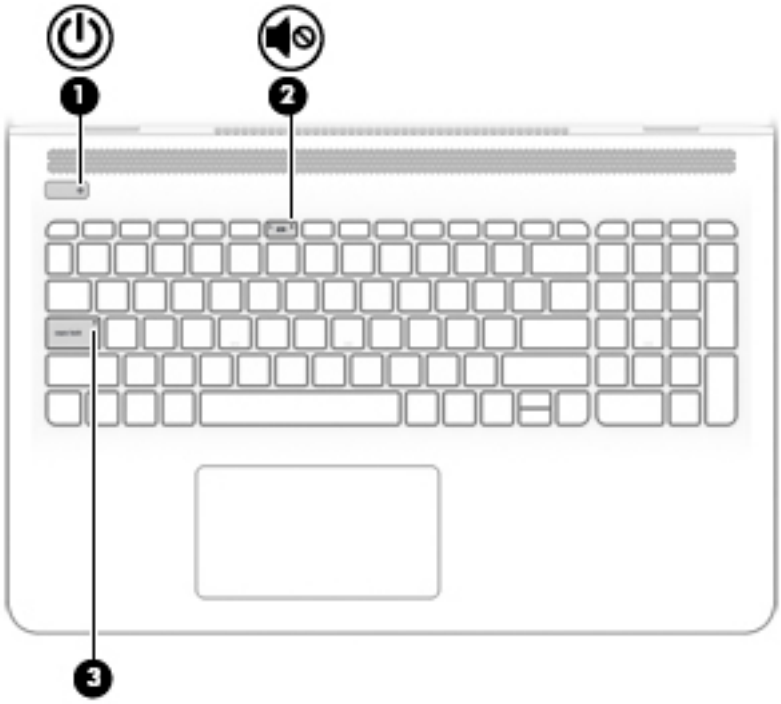
Top

TouchPad



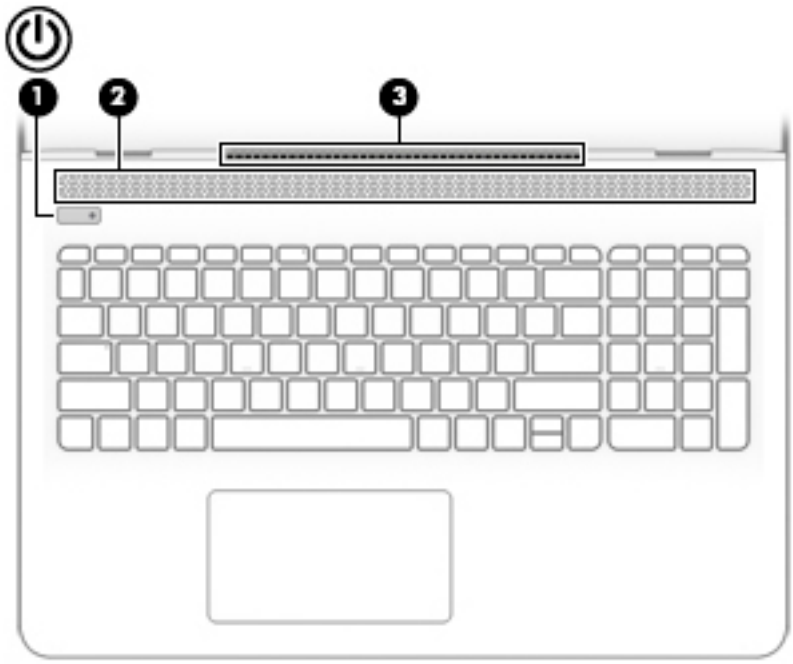
Component		Description
(1)	TouchPad zone	Reads your finger gestures to move the pointer or activate items on the screen.
(2)	Left TouchPad button	Functions like the left button on an external mouse.
(3)	Right TouchPad button	Functions like the right button on an external mouse.

Lights



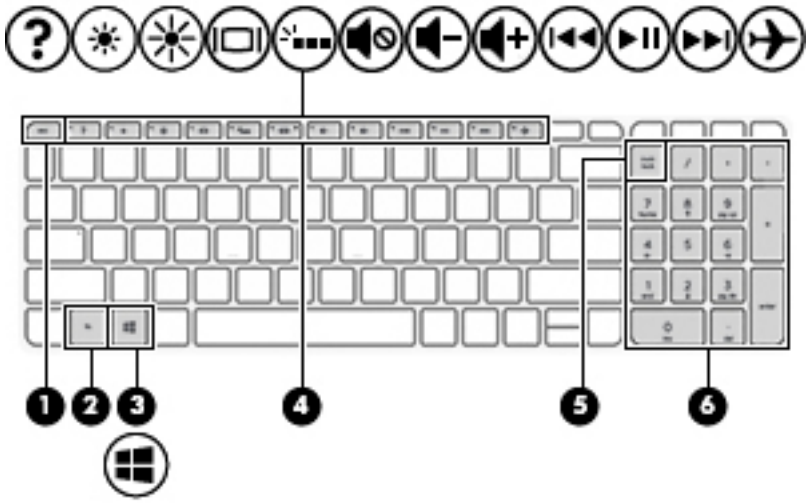
Component		Description
(1)	Power light	• On: The computer is on. • Blinking: The computer is in the Sleep state, which is an energy-saving mode. The computer shuts off power to the display and other unneeded components. • Off: The computer is off or in Hibernation. Hibernation is an energy-saving mode that uses the least amount of power.
(2)	Mute light	• Amber: Computer sound is off. • Off: Computer sound is on.
(3)	Caps lock light	On: Caps lock is on, which switches the keys to all capital letters.

Button, speakers, and vent



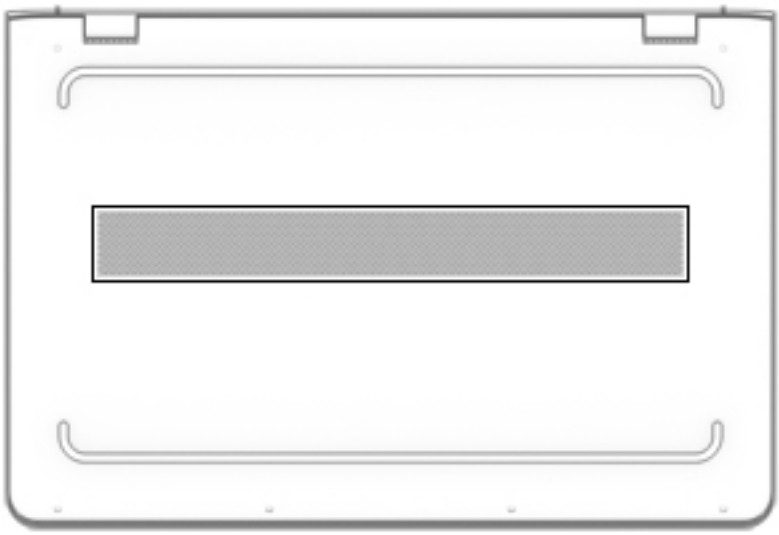
Component		Description
(1)	Power button	• When the computer is off, press the button to turn on the computer. • When the computer is on, press the button briefly to initiate Sleep. • When the computer is in the Sleep state, press the button briefly to exit Sleep. • When the computer is in Hibernation, press the button down briefly to exit Hibernation. **CAUTION:** Pressing and holding down the power button results in the loss of unsaved information. If the computer has stopped responding and Windows shutdown procedures are ineffective, press and hold the power button down for at least 5 seconds to turn off the computer. **NOTE:** For select models, the Intel® Rapid Start Technology feature is enabled at the factory. Rapid Start Technology allows your computer to resume quickly from inactivity. For more information, see Initiating Sleep and Hibernation on page 25. To learn more about your power settings, select **Start > Control Panel > System and Security > Power Options**, or see Managing power on page 25.
(2)	Speakers	Produce sound.
(3)	Vent	Enables airflow to cool internal components. **NOTE:** The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation.

Keys



Component		Description
(1)	esc key	Displays system information when pressed in combination with the fn key.
(2)	fn key	Executes specific functions when pressed in combination with the esc key.
(3)	Windows key	Displays the Windows Start menu.
(4)	Action keys	Execute frequently used system functions. **NOTE:** On select models, the f5 action key turns the keyboard backlight feature off or on.
(5)	num lock key	Alternates between the navigational and numeric functions on the integrated numeric keypad.
(6)	Integrated numeric keypad	When num lock has been enabled, the keypad can be used like an external numeric keypad.

Bottom



Component	Description
Vent	Enables airflow to cool internal components. **NOTE:** The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation.

Labels

The labels affixed to the computer provide information you may need when you troubleshoot system problems or travel internationally with the computer.

IMPORTANT: Check the following locations for the labels described in this section: the bottom of the computer, inside the battery bay, under the service door, or on the back of the display.

- Service label—Provides important information to identify your computer. When contacting support, you will probably be asked for the serial number, and possibly for the product number or the model number. Locate these numbers before you contact support.

  Your service label will resemble one of the examples shown below. Refer to the illustration that most closely matches the service label on your computer.

Component	
(1)	Serial number
(2)	Product number
(3)	Warranty period
(4)	Model number (select models only)

- Microsoft Certificate of Authenticity label (select models only prior to Windows 8)—Contains the Windows Product Key. You may need the Product Key to update or troubleshoot the operating system. HP platforms preinstalled with Windows 8 or Windows 8.1 do not have the physical label, but have a Digital Product Key electronically installed.

  NOTE: This Digital Product Key is automatically recognized and activated by Microsoft Operating Systems on a reinstall of the Windows 8 or Windows 8.1 operating system with HP-approved recovery methods.

- Regulatory label(s)—Provide(s) regulatory information about the computer.
- Wireless certification label(s)—Provide(s) information about optional wireless devices and the approval markings for the countries or regions in which the devices have been approved for use.

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 using your computer and a wired or wireless network connection. This chapter will help you get connected to that world.

Connecting to a wireless network

Wireless technology transfers data across radio waves instead of wires. Your computer may be equipped with one or more of the following wireless devices:

- Wireless local area network (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. In a WLAN, the mobile wireless device in your computer communicates with a wireless router or a wireless access point.
- Bluetooth® device (select models only)—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 meters (approximately 33 feet) of each other.

For more information about wireless technology, the Internet, and networking, see the information and website links provided in Help and Support. Select **Start > Help and Support**

Using the wireless controls

You can control the wireless devices in your computer using these features:

- Wireless button, wireless switch, or wireless key (referred to in this chapter as the wireless button)
- HP Connection Manager software
- Operating system controls

Using the wireless button

The computer has a wireless button, one or more wireless devices, and, on select models, one or two wireless lights. All the wireless devices on your computer are enabled at the factory, and if your computer has a wireless light, the wireless light is on (white) when you turn on the computer.

The wireless light indicates the overall power state of your wireless devices, not the status of individual devices. If the wireless light is white, at least one wireless device is on. If the wireless light is off, all wireless devices are off.

NOTE: On some models, the wireless light is amber when all wireless devices are off.

Because the wireless devices are enabled at the factory, you can use the wireless button to turn on or turn off the wireless devices simultaneously. Individual wireless devices can be controlled through HP Connection Manager.

Using HP Connection Manager (select models only)

HP Connection Manager provides a central location for managing your wireless devices, an interface for connecting to the Internet using HP Mobile Broadband, and an interface for sending and receiving SMS (text) messages. HP Connection Manager allows you to manage the following devices:

- Wireless local area network (WLAN)/Wi-Fi
- Wireless wide area network (WWAN)/HP Mobile Broadband
- Bluetooth

HP Connection Manager provides information and notifications on connection status, power status, subscriber identity module (SIM) card details, and SMS (text) messages. Status information and notifications are provided in the notification area, at the far right of the taskbar.

To open HP Connection Manager, select **Start** and type `connection` in the search field. Select **HP Connection Manager**.

For more details about using HP Connection Manager, see the HP Connection Manager software Help.

Using operating system controls

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

To use operating system controls, select **Start > Control Panel > Network and Internet > Network and Sharing Center**.

For more information, select **Start > Help and Support**.

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 computer to the modem, and test the Internet service.

To connect to the WLAN, follow these steps:

1. Be sure that the WLAN device is on. If the device is on, the wireless light is on. If the wireless light is off, press the wireless button.

   NOTE: On some models, the wireless light is amber when all wireless devices are off.

2. Click the network status icon in the notification area, at the far right of the taskbar.
3. Select your WLAN from the list.
4. Click **Connect**.

   If the WLAN is a security-enabled WLAN, you are prompted to enter a security code. Type the code, and then click **OK** to complete the connection.

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

NOTE: If you do not see the WLAN you want to connect to, click **Open Network and Sharing Center**, and then click **Set up a new connection or network**. A list of options is displayed, allowing you to manually search for and connect to a network or to create a new network connection.

After the connection is made, place the mouse pointer over the network status icon in the notification area, 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 Bluetooth wireless devices

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, PDA)
- Phones (cellular, cordless, smart phone)
- Imaging devices (printer, camera)
- Audio devices (headset, speakers)
- Mouse

Bluetooth devices provide peer-to-peer capability that allows you to set up a personal area network (PAN) of Bluetooth devices. For information about configuring and using Bluetooth devices, see the Bluetooth software Help.

Sharing data and drives and accessing software

When your computer is part of a network, you are not limited to using only the information that is stored in your computer. Network computers can exchange software and data with each other.

NOTE: When a disc like a DVD movie or game is copy-protected, it cannot be shared.

To share on the same network:

1. From the computer you are sharing, select **Start > Computer**.
2. Right-click what you want to share, and click **Properties**.
3. Select the **Sharing** tab, and then select **Advanced Sharing**.
4. Select the **Share this folder** check box.
5. Type a name in the **Share name** text box.
6. Click **Apply**, and then click **OK**.
7. To view the shared drive:
   - ▲ Select **Start > Control Panel > Network and Internet > Network and Sharing Center**.

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 may be front facing, rear facing, or pop up. See Getting to know your computer on page 3 for camera details.

Most cameras allow you to video chat, record video, and record still images. Some also provide HD (high-definition) or 3D capability, apps for gaming, or facial recognition software.

To use your camera:

- Sselect **Start > All Programs > CyberLink YouCam**.

For details about using the camera, select **Start > Help and Support**.

Using audio

On your computer, or on select models using an external optical drive, you can play music CDs, download and listen to music, stream audio content from the web (including radio), record audio, or mix audio and video to create multimedia. 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) 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 (select models only) on page 19. Before connecting speakers, adjust the volume.

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 guide, select **Start > HP Support Assistant > Next > My computer > User Guides**.

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:

- Select **Start > Control Panel > Hardware and Sound > Sound**.

Using advanced audio features

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

Accessing Audio Control Panel

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

- Select **Start > Control Panel > 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, without needing to access a network.

To enhance your viewing enjoyment, use one of the video ports on the computer to connect an external monitor, projector, or TV. Most computers have a high-definition multimedia interface (HDMI) port, which allows you to connect a high-definition monitor or TV.

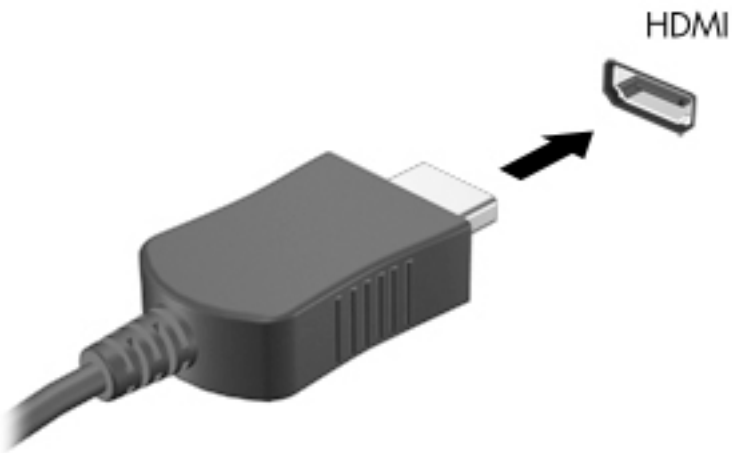
IMPORTANT: Be sure that the external device is connected to the correct port on the computer, using the correct cable. Check the device manufacturer's instructions if you have questions.

Connecting video devices by using an HDMI cable

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.



2. Connect the other end of the cable to the high-definition TV or monitor.
3. Press f4 to alternate the computer screen image between 4 display states:
   - **Computer 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.
   - **External 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. Go to **Start > Control Panel > Appearance and Personalization > Adjust screen resolution**.

Setting up HDMI audio (select models only)

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 **Speaker** icon in the notification area, at the far right of the taskbar, and then click **Playback devices**.
2. On the **Playback** tab, click **Digital Output Device (HDMI)**.
3. Click **Set Default**, and then click **OK**.

To return the audio stream to the computer speakers, follow these steps:

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

Using Intel Wireless Display and Wireless Music (select models only)

Intel® Wireless Display and Wireless Music allow you to transmit your computer content wirelessly to your receive/display device, such as HDTV, monitor, projector, game console, Blu-ray player, or DVR, by using an optional wireless adapter (purchased separately). For details about using the wireless adapter, see the manufacturer's instructions.

To open Intel Wireless Display, select **Start > All Programs > Intel WiDi**.

NOTE: Before using the wireless display feature, be sure that your wireless device is turned on.

5 Navigating the screen

You can navigate the computer screen in the following ways:

- Touch gestures
- Keyboard and mouse

NOTE: An external USB mouse (purchased separately) can be connected to a USB port on the computer.

Select computer models have special action keys or hot key functions on the keyboard to perform routine tasks. Some models have an integrated numeric keypad.

Using TouchPad gestures

The TouchPad helps you navigate the computer screen and control the pointer using simple touch gestures. You can also use the left and right TouchPad buttons as you would use the corresponding buttons on an external mouse.

You can also customize gestures and view demonstrations of how they work. Select **Start > Control Panel > Hardware and Sound > Devices and Printers > Mouse**.

Tap

Use the tap/double-tap gesture to select or open an item on the screen.

- Point to an item on the screen, and then tap one finger on the TouchPad zone to select the item. Double-tap an item to open it.

Two-finger pinch zoom

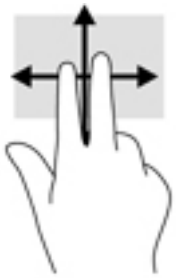
Use the two-finger pinch zoom to zoom out or in on images or text.

- Zoom out by placing two fingers apart on the TouchPad zone and then moving your fingers together.
- Zoom in by placing two fingers together on the TouchPad zone and then moving your fingers apart.

Two-finger scroll

Use the two-finger scroll to move up, down, or sideways on a page or image.

- Place two fingers slightly apart on the TouchPad zone and then drag them up, down, left, or right.



Two-finger tap

Use the two-finger tap to open the menu for an object on the screen.

NOTE: The two-finger tap performs the same function as right-clicking with the mouse.

- Tap two fingers on the TouchPad zone to open the options menu for the selected object.

Using the keyboard and optional 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 key combinations to perform specific functions.

NOTE: Depending on the country or region, your keyboard may have different keys and keyboard functions than those discussed in this section.

Using the keys

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

Using the action keys

An action key performs an assigned function. The icon on each of the function keys illustrates the assigned function for that key.

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

CAUTION: Use extreme care when making changes in Setup Utility (BIOS). Errors can prevent the computer from operating properly.

The action key feature is enabled at the factory. You can disable this feature in Setup Utility (BIOS). See Using Setup Utility (BIOS) on page 40 for instructions on opening Setup Utility (BIOS), and then follow the instructions at the bottom of the screen.

After you have disabled the action key feature, you can still perform each function by pressing the fn key in combination with the appropriate action key.

Icon	Key	Description
	f1	Opens Help and Support, which provides tutorials, information about the Windows operating system and your computer, answers to questions, and updates to your computer. Help and Support also provides automated troubleshooting tools and access to support.
	f2	Decreases the screen brightness incrementally as long as you hold down the key.
	f3	Increases the screen brightness incrementally as long as you hold down the key.
	f4	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.
	f5	On select models, turns the keyboard backlight feature off or on. **NOTE:** To conserve battery power, turn off this feature.
	f6	Mutes or restores speaker sound.
	f7	Decreases speaker volume incrementally as long as you hold down the key.
	f8	Increases speaker volume incrementally as long as you hold down the key.

Icon	Key	Description
	f9	Plays the previous track of an audio CD or the previous section of a DVD or a BD.
	f10	Begins, pauses, or resumes playback of an audio CD, a DVD, or a BD.
	f11	Plays the next track of an audio CD or the next section of a DVD or a BD.
	f12	Turns the Airplane mode and wireless feature on or off. **NOTE:** A wireless network must be set up before a wireless connection is possible.

Using ALT GR key combinations

Some countries have keyboards with an ALT GR key that is used for special key combinations. To type the rupee symbol on a keyboard that includes this key, use the alt gr+4 key combination. Region-specific keyboards in India can use the ctrl+shift+4 keys for the rupee symbol.

To learn about ALT GR key combinations, go to the Microsoft Office website, http://www.office.microsoft.com, and search for ALT GR.

Using the integrated numeric keypad

The computer includes an integrated numeric keypad, and it also supports an optional external numeric keypad or an optional external keyboard that includes a numeric keypad. For more details about the integrated numeric keypad, see Keys on page 11.

Component	Description
num lock key	Turns the integrated numeric keypad on and off. Press the key to alternate between the standard numeric function found on an external keypad (this function is turned on at the factory) and the navigational function (indicated by the directional arrows on the keys). **NOTE:** The keypad function that is active when the computer is turned off is reinstated when the computer is turned back on.
Integrated numeric keypad	Set at the factory to function like an external numeric keypad. To alternate between this numeric function and the navigational function (indicated by the directional arrows on the keys), press the num lock key.

6 Managing power

Your computer can operate on either battery power or external power. When the computer is running on battery power only and an AC power source is not available to charge the battery, it is important to monitor and conserve the battery charge.

Initiating Sleep and Hibernation

Windows has two power-saving states, Sleep and Hibernation.

- Sleep—The Sleep state is automatically initiated after a period of inactivity when running on battery power or on external power. Your work is saved to memory, allowing you to resume your work very quickly. You can also initiate Sleep manually. For more information, see Manually initiating and exiting Sleep on page 26.
- Hibernation—The Hibernation state is automatically initiated if the battery reaches a critical level. In the Hibernation state, your work is saved to a hibernation file and the computer powers down.

NOTE: You can manually initiate Hibernation. See Manually initiating and exiting Sleep on page 26 and Manually initiating and exiting Hibernation (select models only) on page 26.

CAUTION: To reduce the risk of possible audio and video degradation, loss of audio or video playback functionality, or loss of information, do not initiate Sleep while reading from or writing to a disc or an external media card.

NOTE: You cannot initiate any type of networking connection or perform any computer functions while the computer is in the Sleep state or in Hibernation.

Manually initiating and exiting Sleep

You can initiate Sleep in any of the following ways:

- Close the display.
- Select **Start**, click the arrow next to the Shut down button, and then click **Sleep**.

To exit Sleep:

- Briefly press the power button.
- If the display is closed, open the display.
- Press a key on the keyboard.
- Tap the TouchPad.

When the computer exits Sleep, the power lights turn on and your work returns to the screen.

NOTE: If you have set a password to be required on wakeup, you must enter your Windows password before the computer will return to the screen.

Manually initiating and exiting Hibernation (select models only)

You can enable user-initiated Hibernation and change other power settings and timeouts using Power Options.

1. Select **Start > Control Panel > System and Security > Power Options**.
2. In the left pane, click **Choose what the power button does**.
3. Click **Change Settings that are currently unavailable**.
4. In the **When I press the power button** area, select **Hibernate**.
5. Click **Save changes**.

To exit Hibernation:

- Briefly press the power button.

When the computer exits Hibernation, the power lights turn on and your work returns to the screen.

NOTE: If you have set a password to be required on wakeup, you must enter your Windows password before your work will return to the screen.

Setting password protection on wakeup

To set the computer to prompt for a password when the computer exits Sleep or Hibernation, follow these steps:

1. Select **Start > Control Panel > System and Security > Power Options**.
2. In the left pane, click **Require a password on wakeup**.
3. Click **Change Settings that are currently unavailable**.
4. Click **Require a password (recommended)**.

NOTE: If you need to create a user account password or change your current user account password, click **Create or change your user account password**, and then follow the on-screen instructions. If you do not need to create or change a user account password, go to step 5.

5. Click **Save changes**.

Using the power meter

The power meter allows you to quickly access power settings and view the remaining battery charge.

- To display the percentage of remaining battery charge and the current power plan, move the pointer over the Power Meter icon, at the far right of the taskbar.
- To access Power Options, or to change the power plan, click the Power Meter icon and select an item from the list.

Different power meter icons indicate whether the computer is running on battery or external power. The battery icon displays a message if the battery reaches a low or critical battery level.

Selecting a power plan

A power plan manages how the computer uses power and helps you conserve power and maximize performance.

The following power plans are available:

- **HP Recommended**. Automatically balances performance with energy conservation.
- **Power Saver**. Saves power by reducing system performance and screen brightness.
- **High Performance**. Favors performance, but may use more energy.

You can also create your own power plan and customize it to suit your needs.

Use HP Power Manager (select models only) or Windows Control Panel to select a power plan or to create your own plan.

To start HP Power Manager, select **Start > Control Panel > Hardware and Sound > HP Power Manager**.

To access the Power Options in the Control Panel, select **Start > Control Panel > System and Security > Power Options**, and then select a power plan from the list.

Running on battery power

When a charged battery is in the computer and the computer is not plugged into external power, the computer runs on battery power. When the computer is off and unplugged from external power, the battery in the computer slowly discharges. The computer displays a message when the battery reaches a low or critical battery level.

Computer battery life varies, depending on power management settings, programs running on the computer, display brightness, external devices connected to the computer, and other factors.

Factory-sealed battery

The battery(ies) in this product cannot be easily replaced by users themselves. Removing or replacing the battery could affect your warranty coverage. If a battery is no longer holding a charge, contact support.

When a battery has reached the end of its useful life, do not dispose of the battery in general household waste. Follow the local laws and regulations in your area for battery disposal.

Finding battery information

To monitor the status of your battery, or if the battery is no longer holding a charge, run Battery Check in HP Support Assistant. To access battery information, select **Start > HP Support Assistant > Next > Battery and performance > Power and battery > HP Battery Check**.

HP Support Assistant provides the following tools and information about the battery:

- Battery test
- Information about battery types, specifications, life cycles, and capacity

Conserving battery power

Use the following tips for conserving battery power and maximizing battery life:

- Lower the brightness on the display.
- Select the **Power saver** setting in Power Options.
- Turn off wireless devices when you are not using them.
- Disconnect unused external devices that are not plugged into an external power source, such as an external hard drive connected to a USB port.
- Stop, disable, or remove any external media cards that you are not using.
- Before you leave your computer, initiate Sleep or Hibernation, or shut down the computer.

Identifying low battery levels

When a battery that is the sole power source for the computer reaches a low or critical battery level, the power meter icon in the notification area displays a low or critical battery notification.

NOTE: For additional information about the power meter, see Using the power meter on page 27.

The computer takes the following actions for a critical battery level:

- If Hibernation is enabled and the computer is on or in the Sleep state, the computer initiates Hibernation.
- If Hibernation is disabled, and the computer is on or in the Sleep state, the computer remains briefly in the Sleep state and then shuts down and loses any unsaved information.

Resolving a low battery level

Resolving a low battery level when external power is available

- Connect an AC adapter.
- Connect an optional docking or expansion device.
- Connect an optional power adapter purchased as an accessory from HP.

Resolving a low battery level when no power source is available

Save your work and shut down the computer.

Resolving a low battery level when the computer cannot exit Hibernation

When the computer lacks sufficient power to exit Hibernation, follow these steps:

1. Connect the AC adapter to the computer and to external power.
2. Exit Hibernation by pressing the power button.

Running on external AC power

For information about connecting to AC power, refer to the *Setup Instructions* poster provided in the computer box.

The computer does not use battery power when the computer is connected to AC external power with an approved AC adapter or an optional docking/expansion device.

⚠ **WARNING!** To reduce potential safety issues, use only the AC adapter provided with the computer, a replacement AC adapter provided by HP, or a compatible AC adapter purchased from HP.

Connect the computer to external AC power under any of the following conditions:

⚠ **WARNING!** Do not charge the computer battery while you are onboard aircraft.

- When charging a battery
- When installing or modifying system software
- When writing information to a disc (select models only)
- When running Disk Defragmenter on computers with internal hard drives
- When performing a backup or recovery

When you connect the computer to external AC power:

- The battery begins to charge.
- The screen brightness increases.
- The power meter icon on the Windows desktop changes appearance.

When you disconnect external AC power, the following events occur:

- The computer switches to battery power.
- The screen brightness automatically decreases to save battery life.
- The power meter icon on the Windows desktop changes appearance.

Troubleshooting power problems

Test the AC adapter if the computer exhibits any of the following symptoms when it is connected to AC power:

- The computer does not turn on.
- The display does not turn on.
- The power lights are off.

To test the AC adapter:

1. Shut down the computer.
2. Connect the AC adapter to the computer and to the power cord, and then plug the power cord into an AC outlet.
3. Turn on the computer.
   - If the power lights turn *on*, the AC adapter is working properly.
   - If the power lights remain *off*, check the connection from the AC adapter to the computer and the connection from the power cord to the AC outlet to be sure that the connections are secure.
   - If the connections are secure and the power lights remain *off*, the AC adapter is not functioning and should be replaced.

Contact support for information about obtaining a replacement AC power adapter.

Shutting down the computer

CAUTION: Unsaved information is lost when the computer shuts down.

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 are connecting an external hardware device that does not connect to a USB or video port
- When the computer will be unused and disconnected from external power for an extended period

Although you can shut down 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, you must first exit Sleep or Hibernation before shutdown is possible.

1. Save your work and close all open programs.
2. Select **Start > Shut down**.

If the computer is unresponsive and you are unable to use the preceding shutdown procedures, try the following emergency procedures in the sequence provided:

- Press ctrl+alt+delete, and then click the **Shut down** icon on the display.
- Press and hold the power button for at least 5 seconds.
- Disconnect the computer from external power.

7 Maintenance

It is important to perform regular maintenance to keep your computer in optimal condition by using tools like Disk Defragmenter and Disk Cleanup. This chapter also includes ways to update 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 HP 3D DriveGuard (select models 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 the end of one of these events, HP 3D DriveGuard returns the hard drive to normal operation.

NOTE: Because solid state drives (SSDs) lack moving parts, they do not require HP 3D DriveGuard protection.

NOTE: A hard drive in a primary hard drive bay or a secondary hard drive bay is 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.

For more information, see the HP 3D DriveGuard software Help.

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 and/or the drive in a secondary hard drive bay (select models only) is parked. To determine whether a drive is currently protected or whether it is parked, view the icon on the Windows desktop in the notification area, at the far right of the taskbar.

Using Disk Defragmenter

As you use your computer over time, the files on the hard drive become fragmented. A fragmented drive means data on your drive is not contiguous (sequential) and, because of this, the hard drive works harder to locate files, thus slowing down the computer. Disk Defragmenter consolidates (or physically reorganizes) the fragmented files and folders on the hard drive so that the system can run more efficiently.

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

After you start Disk Defragmenter, it works without supervision. However, depending on the size of your hard drive and the number of fragmented files, Disk Defragmenter may take more than an hour to complete.

HP recommends defragmenting your hard drive at least once a month. You may set Disk Defragmenter to run on a monthly schedule, but you can defragment your computer manually at any time.

To run Disk Defragmenter:

1. Connect the computer to AC power.
2. Select **Start > All Programs > Accessories > System Tools > Disk Defragmenter**.
3. Follow the on-screen instructions.

For additional information, access the Disk Defragmenter software Help.

Using Disk Cleanup

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

To run Disk Cleanup:

1. Select **Start > All Programs > Accessories > System Tools > Disk Cleanup**.
2. Follow the on-screen instructions.

Updating programs and drivers

HP recommends that you update your programs and drivers on a regular basis to the latest versions. Updates can resolve issues and bring new features and options to your computer. Technology is always changing, and updating programs and drivers allows your computer to run the latest technology available. For example, older graphics components might not work well with the most recent gaming software. Without the latest driver, you would not be getting the most out of your equipment.

Go to http://www.hp.com/support to download the latest versions of HP programs and drivers. In addition, register to receive automatic update notifications when they become available.

Cleaning your computer

Use the following products to safely clean your computer:

- Dimethyl benzyl ammonium chloride 0.3 percent maximum concentration (for example, disposable wipes, which come in a variety of brands).
- Alcohol-free glass-cleaning fluid
- Water with mild soap solution
- Dry microfiber cleaning cloth or a chamois (static-free cloth without oil)
- Static-free cloth wipes

⚠ **CAUTION:** Avoid strong cleaning solvents that can permanently damage your computer. 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 alcohol, acetone, ammonium chloride, methylene chloride, and hydrocarbons are not included in the product.

Fibrous materials, such as paper towels, can scratch the computer. Over time, dirt particles and cleaning agents can get trapped in the scratches.

Cleaning procedures

Follow the procedures in this section to safely clean your computer.

WARNING! To prevent electric shock or damage to components, do not attempt to clean your computer while it is turned on.

- Turn off the computer.
- Disconnect AC power.
- Disconnect all powered external devices.

CAUTION: To prevent damage to internal components, do not spray cleaning agents or liquids directly on any computer surface. Liquids dripped on the surface can permanently damage internal components.

Cleaning the display (All-in-Ones or Notebooks)

Gently wipe the display using a soft, lint-free cloth moistened with an alcohol-free glass cleaner. Be sure that the display is dry before closing the display.

Cleaning the sides or cover

To clean the sides or cover, use a soft microfiber cloth or chamois moistened with one of the cleaning solutions listed previously or use an acceptable disposable wipe.

NOTE: When cleaning the cover of the computer, use a circular motion to aid in removing dirt and debris.

Cleaning the TouchPad, keyboard, or mouse

WARNING! To reduce the risk of electric shock or damage to internal components, do not use a vacuum cleaner attachment to clean the keyboard. A vacuum cleaner can deposit household debris on the keyboard surface.

CAUTION: To prevent damage to internal components, do not allow liquids to drip between the keys.

- To clean the TouchPad, keyboard, or mouse, use a soft microfiber cloth or a chamois moistened with one of the cleaning solutions listed previously or use an acceptable disposable wipe.
- To prevent keys from sticking and to remove dust, lint, and particles from the keyboard, use a can of compressed air with a straw extension.

Traveling with or shipping your computer

If you have to travel with or ship your computer, here are some tips to keep in mind 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 digital storage cards, from the computer.
  - Turn off, and then disconnect all external devices.
  - Remove any media from the drive before removing the drive from a drive bay.

CAUTION: Perform this action before shipping, storing, or traveling with a drive. This will help reduce the risk of damage to the computer, damage to a drive, or loss of information.

- Shut down the computer.

- Take along 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 in with the rest of your luggage.

CAUTION: 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.”
- If the computer has a wireless device installed, the use of these devices may be restricted in some environments. Such restrictions may apply onboard aircraft, in hospitals, near explosives, and in hazardous locations. If you are uncertain of the policy that applies to the use of a particular device, 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 power the computer with a voltage converter kit sold for appliances.

8 Securing your computer and information

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

IMPORTANT: Some security features listed in this chapter may not be available on your computer.

Computer risk	Security feature
Unauthorized use of the computer	Power-on password
Computer viruses	Antivirus software
Unauthorized access to data	Firewall software
Unauthorized access to Setup Utility (BIOS) settings and other system identification information	Administrator password
Ongoing or future threats to the computer	Software updates
Unauthorized access to a Windows user account	User password
Unauthorized removal of the computer	Security cable lock

Locating your security software

HP Security Assistant (select models only) provides a starting location for quick access to a collection of security software applications that are organized by task. Instead of searching for each application through the Start menu and Control Panel, HP Security Assistant allows you to access the applications for the following security tasks:

- Setting up Internet and antivirus security.
- Backing up and recovering files.
- Managing passwords, user accounts, and parental controls.
- Maintaining your computer and installing the latest HP and Windows updates.

To open HP Security Assistant, select **Start > All Programs > HP Security Assistant**.

Using passwords

A password is a group of characters that you choose to secure your computer information and to protect online transactions. Several types of passwords can be set. For example, when you set up your computer for the first time, you were asked to create a user password to secure your computer. Additional passwords can be set in Windows or in HP Setup Utility (BIOS), which is preinstalled on your computer.

You may find it helpful to use the same password for a Setup Utility (BIOS) feature and for a Windows security feature.

Use the following tips for creating and saving passwords:

- To reduce the risk of being locked out of the computer, record each password and store it in a secure place away from the computer. Do not store passwords in a file on the computer.
- When creating passwords, follow requirements set by the program.
- Change your passwords at least every three months.
- An ideal password is long and has letters, punctuation, symbols, and numbers.
- Before you send your computer for service, back up your files, delete confidential files, and then remove all password settings.

For additional information about Windows passwords, such as screen-saver passwords, select **Start > Help and Support**.

Setting Windows passwords

Password	Function
User password	Protects access to a Windows user account.
Administrator password	Protects administrator-level access to computer contents. **NOTE:** This password cannot be used to access Setup Utility (BIOS) contents.

Setting Setup Utility (BIOS) passwords

Password	Function
Administrator password	• Must be entered each time you access Setup Utility (BIOS). • If you forget your administrator password, you cannot access Setup Utility (BIOS). **NOTE:** The administrator password can be used in place of the power-on password. **NOTE:** Your administrator password is not interchangeable with an administrator password set in Windows, nor is it displayed as it is set, entered, changed, or deleted. **NOTE:** If you enter the power-on password at the first password check, you must enter the administrator password to access Setup Utility (BIOS).
Power-on password	• Must be entered each time you turn on or restart the computer, or exit Hibernation. • If you forget your power-on password, you cannot turn on or restart the computer, or exit Hibernation. **NOTE:** The administrator password can be used in place of the power-on password. **NOTE:** A power-on password is not displayed as it is set, entered, changed, or deleted.

To set, change, or delete an administrator or power-on password in Setup Utility (BIOS):

1. To start Setup Utility (BIOS), turn on or restart the computer, quickly press esc, and then press f10.
2. Use the arrow keys to select **Security**, and then follow the on-screen instructions.

Your changes take effect when the computer restarts.

Using Internet security software

When you use your computer to access email, a network, or the Internet, you potentially expose your computer to computer viruses, spyware, and other online threats. To help protect your computer, Internet security software that includes antivirus and firewall features may be preinstalled on your computer as a trial offer. To provide ongoing protection against newly discovered viruses and other security risks, security software must be kept up to date. It is strongly recommended that you upgrade the security software trial offer or purchase the software of your choice in order to fully protect your computer.

Using antivirus software

Computer viruses can disable programs, utilities, or the operating system, or cause them to function abnormally. Antivirus software can detect most viruses, destroy them, and in most cases, repair any damage they have caused.

To provide ongoing protection against newly discovered viruses, antivirus software must be kept up to date.

An antivirus program may be preinstalled on your computer. It is strongly recommended that you use the antivirus program of your choice in order to fully protect your computer.

For more information about computer viruses, type `viruses` in the Search box in Help and Support.

Using firewall software

Firewalls are designed to prevent unauthorized access to a system or network. A firewall can be software you install on your computer and/or network, or it can be a combination of both hardware and software.

There are two types of firewalls to consider:

- Host-based firewalls—Software that protects only the computer it is installed on.
- Network-based firewalls—Installed between your DSL or cable modem and your home network to protect all the computers on the network.

When a firewall is installed on a system, all data sent to and from the system is monitored and compared with a set of user-defined security criteria. Any data that does not meet those criteria is blocked.

Installing software updates

HP, Windows, and third-party software installed on your computer should be regularly updated to correct security problems and improve software performance. For more information, see Updating programs and drivers on page 32.

Installing critical security updates

⚠ **CAUTION:** Microsoft sends out alerts regarding critical updates. To protect the computer from security breaches and computer viruses, install all critical updates from Microsoft as soon as you receive an alert.

You can choose whether updates are installed automatically. To change the settings, select **Start > Control Panel > System and Security > Windows Update >Change settings**, and then follow the on-screen instructions.

Installing HP and third-party software updates

HP recommends that you regularly update the software and drivers that were originally installed on your computer. To download the latest versions, go to http://www.hp.com/support. At this location, you can also register to receive automatic update notifications when they become available.

If you have installed third-party software after you purchased your computer, regularly update the software. Software companies provide software updates to their products to correct security problems and improve functionality of the software.

Using HP Touchpoint Manager (select models only)

HP Touchpoint Manager is a cloud-based IT solution that enables businesses to effectively manage and secure their company assets. HP Touchpoint Manager helps protect devices against malware and other attacks, monitors device health, and enables you to reduce time spent solving end-user device and security issues. You can quickly download and install the software, which is highly cost effective relative to traditional in-house solutions.

Securing your wireless network

When you set up a WLAN or access an existing WLAN, always enable security features to protect your network from unauthorized access. WLANs in public areas (hotspots) like coffee shops and airports may not provide any security.

Backing up your software applications and information

Regularly back up your software applications and information to protect them from being permanently lost or damaged through a virus attack or a software or hardware failure. For more information, see Backing up, restoring, and recovering on page 44.

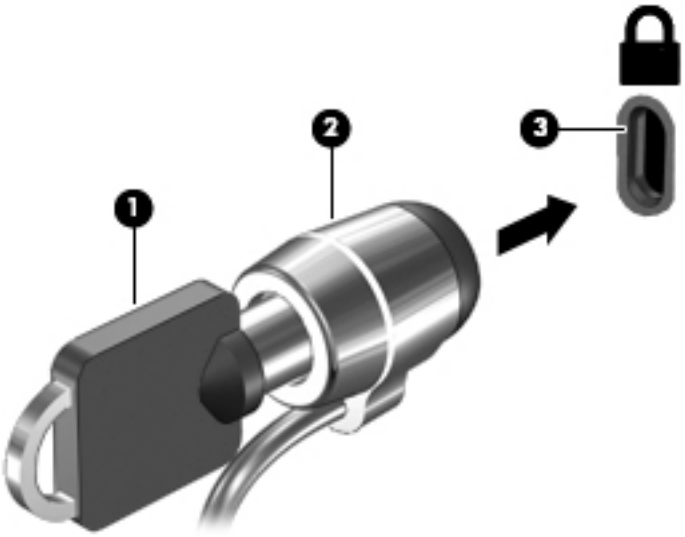
Using an optional security cable

A security cable, which is purchased separately, is designed to act as a deterrent, but it may not prevent the computer from being mishandled or stolen. Security cables are only one of several methods that should be employed as part of a complete security solution to help maximize theft protection.

The security cable slot on your computer may look slightly different from the illustration in this section. For the location of the security cable slot on your computer, see Getting to know your computer on page 3.

1. Loop the security cable around a secured object.
2. Insert the key **(1)** into the security cable lock **(2)**.

3. Insert the security cable lock into the security cable slot on the computer **(3)**, and then lock the security cable lock with the key.



4. Remove the key and keep it in a safe place.

9 Using Setup Utility (BIOS)

Setup Utility, or Basic Input/Output System (BIOS), controls communication between all the input and output devices on the system (such as disk drives, display, keyboard, mouse, and printer). Setup Utility (BIOS) includes settings for the types of devices installed, the startup sequence of the computer, and the amount of system and extended memory.

Starting Setup Utility (BIOS)

▲ To start Setup Utility (BIOS), turn on or restart the computer, quickly press esc, and then press f10.

NOTE: Use extreme care when making changes in Setup Utility (BIOS). Errors can prevent the computer from operating properly.

Updating the BIOS

Updated versions of Setup Utility (BIOS) may be available on the HP website.

Most BIOS updates on the HP website are packaged in compressed files called *SoftPaqs*.

Some download packages contain a file named Readme.txt, which contains information regarding installing and troubleshooting the file.

Determining the BIOS version

To decide whether you need to update Setup Utility (BIOS), first determine the BIOS version on your computer.

BIOS version information (also known as *ROM date* and *System BIOS*) can be accessed by pressing fn+esc (if you are already in Windows) or by using Setup Utility (BIOS).

To use Setup Utility (BIOS):

1. Start Setup Utility (BIOS).
2. Use the arrow keys to select **Main**, and then make note of your current BIOS version.
3. To exit Setup Utility (BIOS) without saving your changes, use the tab key and the arrow keys to select **Exit > Exit Discarding Changes**, and then press enter.

To check for later BIOS versions, see Downloading a BIOS update on page 41.

Downloading a BIOS update

CAUTION: To reduce the risk of damage to the computer or an unsuccessful installation, download and install a BIOS update only when the computer is connected to reliable external power using the AC adapter. Do not download or install a BIOS update while the computer is running on battery power, docked in an optional docking device, or connected to an optional power source. During the download and installation, follow these instructions:

Do not disconnect power from the computer by unplugging the power cord from the AC outlet.

Do not shut down the computer or initiate Sleep or Hibernation.

Do not insert, remove, connect, or disconnect any device, cable, or cord.

1. Select **Start**, type `hp support assistant`, and then select the **HP Support Assistant** program.
2. Follow the on-screen instructions to identify your computer and access the BIOS update you want to download.
3. At the download area, follow these steps:
   a. Identify the BIOS update that is later than the BIOS version currently installed on your computer. If the update is more recent than your BIOS version, make a note of the date, name, or other identifier. You may need this information to locate the update later, after it has been downloaded to your hard drive.
   b. Follow the on-screen instructions to download your selection to the hard drive.

      Make a note of the path to the location on your hard drive where the BIOS update is downloaded. You will need to access this path when you are ready to install the update.

NOTE: If you connect your computer to a network, consult the network administrator before installing any software updates, especially system BIOS updates.

BIOS installation procedures vary. Follow any instructions that are displayed on the screen after the download is complete. If no instructions are displayed, follow these steps:

1. Open Windows Explorer by selecting **Start > Computer**.
2. Double-click your hard drive designation. The hard drive designation is typically Local Disk (C:).
3. Using the hard drive path you recorded earlier, open the folder that contains the update.
4. Double-click the file that has an .exe extension (for example, *filename*.exe).

   The BIOS installation begins.
5. Complete the installation by following the on-screen instructions.

NOTE: After a message on the screen reports a successful installation, you can delete the downloaded file from your hard drive.

10 Using HP PC Hardware Diagnostics (UEFI)

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

When HP PC Hardware Diagnostics (UEFI) detects a failure that requires hardware replacement, a 24-digit Failure ID code is generated. This ID code can then be provided to support to help determine how to correct the problem.

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

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 drive

      NOTE: To download the HP PC Hardware Diagnostics (UEFI) tool to a USB drive, see Downloading HP PC Hardware Diagnostics (UEFI) to a USB device on page 42.

   b. Hard drive

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

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

Downloading HP PC Hardware Diagnostics (UEFI) to a USB device

NOTE: The HP PC Hardware Diagnostics (UEFI) download 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 offered.

There are two options to download HP PC Hardware Diagnostics to a USB device.

Download the latest UEFI version

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

Download any version of UEFI for a specific product

1. Go to http://www.hp.com/support.
2. Select **Get software and drivers**.

3. Enter the product name or number.

   – or –

   Select **Identify now** to let HP automatically detect your product.

4. Select your computer, and then select your operating system.

5. In the **Diagnostic** section, follow the on-screen instructions to select and download the UEFI version you want.

11 Backing up, restoring, and recovering

Your computer includes tools provided by the operating system and HP to help you safeguard your information and retrieve it if ever needed.

Creating backups

1. Use HP Recovery Manager to create recovery media immediately after you set up the working computer.
2. As you add hardware and software programs, create system restore points.
3. As you add photos, video, music, and other personal files, create a backup of your system and personal information.

Creating recovery media to recover the original system

After you successfully set up the computer, you should create recovery discs or a recovery flash drive using HP Recovery Manager. You will need these recovery discs or recovery flash drive to perform a system recovery should the hard drive become corrupted. A system recovery reinstalls the original operating system, and then configures the settings for the default programs.

What you need to know

- Only one set of recovery media can be created. Handle these recovery tools carefully, and keep them in a safe place.
- HP Recovery Manager examines the computer and determines the required storage capacity for the flash drive or the number of blank DVD discs that will be required.

  Use DVD-R, DVD+R, DVD-R DL, DVD+R DL discs or a flash drive. Do not use rewriteable discs such as CD ±RW, DVD±RW, double-layer DVD±RW, and BD-RE (rewritable Blu-ray) discs; they are not compatible with HP Recovery Manager software.
- If your computer does not include an integrated optical drive, you can use an optional external optical drive (purchased separately) to create recovery discs, or you can obtain recovery discs for your computer from the HP website. If you use an external optical drive, it must be connected directly to a USB port on the computer, not to a USB port on an external device, such as a USB hub.
- Be sure that the computer is connected to AC power before you begin creating the recovery media.
- The creation process can take up to an hour or more. Do not interrupt the creation process.
- Store the recovery media in a safe location, separate from the computer.
- If necessary, you can exit the program before you have finished creating the recovery media. The next time you open HP Recovery Manager, you will be prompted to continue the process.

Creating the recovery media

1. Select **Start** and type `recovery` in the search field. Select **HP Recovery Manager** from the list. Allow the action to continue, if prompted.
2. Click **Recovery Media Creation**.
3. Follow the on-screen instructions to continue.

To recover, see Recovering the original system using HP Recovery Manager on page 47.

Creating system restore points

A system restore point is a snapshot of certain hard drive contents saved by Windows System Restore at a specific time. A restore point contains information such as registry settings that Windows uses. Restoring to a previous restore point allows you to reverse changes that have been made to the system since the restore point was created.

Restoring to an earlier system restore point does not affect data files saved or emails created since the last restore point, but it does affect software you may have installed.

For example, if you download a photo from a digital camera and then restore the computer to the state it was on the previous day, the photo remains on the computer.

However, if you install photo viewing software and then restore your computer to the state it was on the previous day, the software will be uninstalled, and you won't be able to use it.

What you need to know

- If you restore to a restore point and then change your mind, you can undo the restoration.
- You should create system restore points:
  - Before you add or change software or hardware
  - Periodically, whenever the computer is running normally
- System Restore also saves shadow copies of files that have been changed since the last restore point was created. For more information about using shadow copies to restore, see Help and Support.

Creating a system restore point

1. Select **Start > Control Panel > System and Security > System**.
2. In the left pane, click **System Protection**.
3. Click the **System Protection** tab.
4. Click **Create**, and follow the on-screen instructions.

To restore, see Restoring to a previous system restore point on page 47.

Backing up system and personal information

Your computer stores information that is important to you, such as files, emails, and photos, and you will want to keep that information even if you download a virus or the system stops working properly. How completely you are able to recover your files depends on how recent your backup is. As you add new software and data files, you should create backups on a regular basis.

Tips for a successful backup

- Number backup discs before inserting them into the optical drive.
- Store personal files in the Documents, Music, Pictures, and Videos libraries, and back up these folders periodically.
- Save customized settings in a window, toolbar, or menu bar by taking a screen shot of your settings. The screen shot can be a time-saver if you have to re-enter your preferences.

To create a screen shot:

1. Display the screen you want to save.
2. Copy the screen image:

   To copy only the active window, press alt+prt sc.

   To copy the entire screen, press prt sc.
3. Open a word-processing document or graphics editing program, and then select **Edit > Paste**. The screen image is added to the document.
4. Save and print the document.

What you need to know

- You can back up your information to an optional external hard drive, a flash drive, a network drive, or discs.
- Connect the computer to AC power during backups.
- Allow enough time for the backup. Depending on files sizes, it may take more than an hour.
- Verify the amount of free space on your backup storage device before you back up.
- You should back up:
  - Before adding or changing software or hardware.
  - Before the computer is repaired or restored.
  - On a regular schedule to be sure you have recent copies of personal information.
  - After you add many files—for example, if you saved videos from a birthday party.
  - Before using antivirus software to remove a malicious program.
  - After adding information that is hard to replace, such as pictures, videos, music, project files, or data records.

Creating a backup using Windows Backup and Restore

Windows allows you to back up files using Windows Backup and Restore. You can select the level you want to back up, from individual folders to drives. The backups are compressed to save space. To back up:

1. Select **Start > Control Panel > System and Security > Backup and Restore**.
2. Follow the on-screen instructions to schedule and create a backup.

NOTE: Windows includes the User Account Control feature to improve the security of the computer. You may be prompted for your permission or password for tasks such as installing software, running utilities, or changing Windows settings. See Help and Support for more information.

To restore, see Restoring specific files using Windows Backup and Restore on page 47.

Restore and recovery

Restoring to a previous system restore point

Sometimes installing a software program causes your computer or Windows to behave unpredictably. Usually uninstalling the software fixes the problems. If uninstalling does not fix the problems, you can restore the computer to a previous system restore point (created at an earlier date and time).

To restore to a previous system restore point, when the computer was running correctly:

1. Select **Start > Control Panel > System and Security > System**.
2. In the left pane, click **System Protection**.
3. Click the **System Protection** tab.
4. Click **System Restore**, and follow the on-screen instructions.

Restoring specific files

If files are accidentally deleted from the hard disk and they can no longer be restored from the Recycle Bin, or if files become corrupt, restoring specific files is useful. Restoring specific files is also useful if you ever choose to recover the original system using HP Recovery Manager. You can only restore specific files that you have backed up before.

Restoring specific files using Windows Backup and Restore

Windows allows you to restore files that were backed up using Windows Backup and Restore:

1. Select **Start > Control Panel > System and Security > Backup and Restore**.
2. Follow the on-screen instructions to restore your backup.

NOTE: Windows includes the User Account Control feature to improve the security of the computer. You may be prompted for your permission or password for tasks such as installing software, running utilities, or changing Windows settings. See Help and Support for more information.

Recovering the original system using HP Recovery Manager

HP Recovery Manager software allows you to repair or recover the computer to its original factory state.

What you need to know

- HP Recovery Manager recovers only software that was installed at the factory. For software not provided with this computer, you must either download the software from the manufacturer's website or reinstall the software from the disc provided by the manufacturer.
- A system recovery should be used as a final attempt to correct computer issues. If you have not already tried restore points (see Restoring to a previous system restore point on page 47) and partial restores (see Restoring specific files on page 47), try them before using HP Recovery Manager to recover your system.
- A system recovery must be performed if the computer hard drive fails or if all attempts to correct any functional computer issues fail.

- If the recovery media do not work, you can obtain recovery discs for your system from the HP website.
- The Minimized Image Recovery option is recommended for advanced users only. All hardware-related drivers and software are re-installed, but other software applications are not. Do not interrupt the process until it is complete, otherwise the recovery will fail.

Recovering using HP Recovery partition (select models only)

The HP Recovery partition (select models only), allows you to restore your system without the need for recovery discs or a recovery flash drive. This type of recovery can only be used if the hard drive is still working.

To check for the presence of a recovery partition, select **Start**, right-click **Computer** then select **Manage > Disk Management**. If the recovery partition is present, a Recovery drive is listed in the window.

NOTE: Recovery discs have been included if your computer did not ship with a recovery partition.

1. Access HP Recovery Manager in either of the following ways:
   - Select **Start** and type `recovery` in the search field. Select **HP Recovery Manager** from the list.

     – or –

   - Turn on or restart the computer, and then press esc while the “Press the ESC key for Startup Menu” message is displayed at the bottom of the screen. Then press f11 while the “F11 (System Recovery)” message is displayed on the screen.
2. Click **System Recovery** in the **HP Recovery Manager** window.
3. Follow the on-screen instructions.

Recovering using the recovery media

1. If possible, back up all personal files.
2. Insert the first recovery disc into the optical drive on your computer or an optional external optical drive, and then restart the computer.

   – or –

   Insert the recovery flash drive into a USB port on your computer, and then restart the computer.

   NOTE: If the computer does not automatically restart in HP Recovery Manager, change the computer boot order. See Changing the computer boot order on page 48.
3. Press f9 at system bootup.
4. Select the optical drive or the flash drive.
5. Follow the on-screen instructions.

Changing the computer boot order

To change the boot order for recovery discs:

1. Restart the computer.
2. Press esc while the computer is restarting, and then press f9 for boot options.
3. Select **Internal CD/DVD ROM Drive** from the boot options window.

To change the boot order for a recovery flash drive:

1. Insert the flash drive into a USB port.
2. Restart the computer.
3. Press esc while the computer is restarting, and then press f9 for boot options.
4. Select the flash drive from the boot options window.

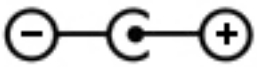
12 Specifications

Input power

The power information in this section may be helpful if you plan to travel internationally with the computer.

The computer operates on DC power, which can be supplied by an AC or a DC power source. The AC power source must be rated at 100–240 V, 50–60 Hz. Although the computer can be powered from a standalone DC power source, it should be powered only with an AC adapter or a DC power source that is supplied and approved by HP for use with this computer.

The computer can operate on DC power within the following specifications. Operating voltage and current varies by platform. The voltage and current for your computer is located on the regulatory label.

Input power	Rating
Operating voltage and current	5 V dc @ 2 A / 12 V dc @ 3 A /15 V dc @ 3 A – 45 W USB-C 5 V dc @ 3 A / 9 V dc @ 3 A / 10 V dc @ 3.75 A / 12 V dc @ 3.75 A / 15 V dc @ 3 A / 20 V dc @ 2.25 A – 45 W USB-C 5 V dc @ 3 A / 9 V dc @ 3A / 10 V dc @ 5 A / 12 V dc @ 5 A / 15 V dc @ 4.33 A / 20 V dc @ 3.25 A – 65 W USB-C 5 V dc @ 3 A / 9 V dc @ 3 A / 10 V dc @ 5 A / 12 V dc @ 5 A / 15 V dc @ 5 A / 20 V dc @ 4.5 A – 90 W USB-C 19.5 V dc @ 2.31 A – 45 W 19.5 V dc @ 3.33 A – 65 W 19.5 V dc @ 4.62 A – 90 W 19.5 V dc @ 6.15 A – 120 W 19.5 V dc @ 7.70 A – 150 W 19.5 V dc @ 10.3 A – 200 W
DC plug of external HP power supply (select products only)	

NOTE: This product is designed for IT power systems in Norway with phase-to-phase voltage not exceeding 240 V rms.

Operating environment

Factor	Metric	U.S.
Temperature		
Operating	**5°C to 35°C**	41°F to 95°F

Factor	Metric	U.S.
Nonoperating	**-20°C to 60°C**	-4°F to 140°F
Relative humidity (noncondensing)		
Operating	**10% to 90%**	10% to 90%
Nonoperating	**5% to 95%**	5% to 95%
Maximum altitude (unpressurized)		
Operating	**-15 m to 3,048 m**	-50 ft to 10,000 ft
Nonoperating	**-15 m to 12,192 m**	-50 ft to 40,000 ft

13 Electrostatic Discharge

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

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

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

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

14 Accessibility

HP designs, produces, and markets products and services that can be used by everyone, including people with disabilities, either on a stand-alone basis or with appropriate assistive devices.

Supported assistive technologies

HP products support a wide variety of operating system assistive technologies and can be configured to work with additional assistive technologies. Use the Search feature on your device to locate more information about assistive features.

NOTE: For additional information about a particular assistive technology product, contact customer support for that product.

Contacting support

We are constantly refining the accessibility of our products and services and welcome feedback from users. If you have an issue with a product or would like to tell us about accessibility features that have helped you, please contact us at +1 (888) 259-5707, Monday through Friday, 6 a.m. to 9 p.m. North American Mountain Time. If you are deaf or hard-of-hearing and use TRS/VRS/WebCapTel, contact us if you require technical support or have accessibility questions by calling +1 (877) 656-7058, Monday through Friday, 6 a.m. to 9 p.m. North American Mountain Time.

NOTE: Support is in English only.

Index

A

AC adapter 5
AC adapter, testing 29
accessibility 53
action keys
  decrease screen brightness 23
  Help and Support 23
  identifying 11
  increase screen brightness 23
  keyboard backlight 23
  next track or section 24
  play, pause, resume 24
  previous track or section 24
  switch screen image 23
  volume down 23
  volume mute 23
  volume up 23
  wireless 24
antivirus software, using 37
audio 18
audio-out (headphone)/audio-in (microphone) combo jack 4

B

backing up software and information 38
backups 44
battery 5
  conserving power 28
  factory-sealed 27
battery information, finding 28
battery power 27
best practices 1
BIOS
  determining version 40
  downloading an update 41
  updating 40
Bluetooth device 14, 16
Bluetooth label 13
boot order
  changing 48
bottom 13
buttons
  left TouchPad 8
  power 10
  right TouchPad 8

C

camera 17
  identifying 7
camera light, identifying 7
caps lock light, identifying 9
caring for your computer 32
cleaning your computer 32
components
  bottom 12
  display 7
  left side 6
  right side 4
  top 8
connecting to a WLAN 15
connector, power 5
conservation, power 28
corporate WLAN connection 15
critical battery level 28
critical security updates, installing 37

D

deleted files
  restoring 47
Disk Cleanup software 32
Disk Defragmenter software 31
drive light 6

E

electrostatic discharge 52
esc key, identifying 11
external AC power, using 29

F

firewall software 37
fn key, identifying 11

H

hard drive
  HP 3D DriveGuard 31
HDMI
  configuring audio 19
HDMI port
  connecting 18
HDMI port, identifying 4
headsets, connecting 17
Hibernation
  exiting 26
  initiated during critical battery level 28
  initiating 26
high-definition devices, connecting 18, 20
HP 3D DriveGuard 31
HP and third-party software updates, installing 38
HP Connection Manager software 15
HP PC Hardware Diagnostics (UEFI)
  using 42
HP Recovery Manager 47
HP Touchpoint Manager 38

I

input power 50
installing
  critical security updates 37
  optional security cable 38
integrated numeric keypad, identifying 11, 24
Intel Wireless Display 20
Intel Wireless Music 20
internal microphones, identifying 7
Internet security software, using 37

J

jacks
  audio-out (headphone)/audio-in (microphone) 4

K

keyboard backlight action key, identifying 23
keypad, integrated numeric 11
keys
  action 11
  esc 11

fn 11
num lock 11
Windows 11

L
labels
Bluetooth 13
Microsoft Certificate of Authenticity 13
regulatory 13
serial number 13
service 13
wireless certification 13
WLAN 13
lights
AC adapter 5
battery 5
caps lock 9
drive 6
mute 9
power 9

M
maintenance
Disk Cleanup 32
Disk Defragmenter 31
memory card reader, identifying 4
memory card, identifying 4
mouse, external
setting preferences 21
mute light, identifying 9

N
num lock key, identifying 11, 24

O
operating environment 50
original system recovery 47

P
passwords
Setup Utility (BIOS) 36
Windows 36
ports
HDMI 4, 18
Intel Wireless Display 20
Intel Wireless Music 20
USB 3.0 6
USB 3.0 (powered) charging 4
USB Type-C 4
power
battery 27
conserving 28
power button, identifying 10
power connector, identifying 5
power lights, identifying 9
power meter 27
product name and number, computer 13
public WLAN connection 15

R
recovering from the recovery discs 48
recovering the original system 47
recovery 47
HP Recovery Manager 47
recovery discs 44
recovery media 44
recovery, system 47
regulatory information
regulatory label 13
wireless certification labels 13
restore points 45
restoring the original system
creating recovery media 44

S
security cable slot, identifying 6
security cable, installing 38
serial number 13
serial number, computer 13
service labels
locating 13
setting password protection on wakeup 26
Setup Utility (BIOS) passwords 36
shipping the computer 33
shutdown 30
Sleep
exiting 26
initiating 26
slots
memory card reader 4
security cable 6
software
Disk Cleanup 32
Disk Defragmenter 31
HP Connection Manager 15
software updates, installing 37
sound settings, usng 18
speakers
connecting 17
speakers, identifying 10
supported discs 44
system recovery 47
system restore points 45
creating 45

T
tap TouchPad gesture 21
testing an AC adapter 29
TouchPad
buttons 8
TouchPad gestures
tap 21
two-finger pinch zoom 22
two-finger scroll 22
two-finger tap 22
TouchPad zone, identifying 8
traveling with the computer 13, 33
turning off the computer 30
two-finger pinch zoom TouchPad gesture 22
two-finger scroll TouchPad gesture 22
two-finger tap TouchPad gesture 22

U
unresponsive system 30
USB 3.0 charging (powered) port, identifying 4
USB 3.0 port, identifying 6
USB Type-C port, identifying 4
using external AC power 29
using passwords 35
using sound settings 18
using the power meter 27

V
vents, identifying 12
video 18

W
Windows Backup and Restore
restoring files 47
Windows key, identifying 11
Windows passwords 36
wireless button 14
wireless certification label 13

wireless controls
button 14
operating system 14
wireless light 14
wireless network (WLAN)
connecting 15
corporate WLAN connection 15
functional range 16
public WLAN connection 15
wireless network, securing 38
WLAN antennas, identifying 7
WLAN device 13
WLAN label 13