

HP Notebook User Guide

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First Edition: August 2010

Document Part Number: 621596-001

Product notice

This guide describes features that are
common to most models. Some features
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To obtain the latest information in this guide,
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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 contact 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).
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Table of contents

1 Welcome

Finding information	1
---------------------------	---

2 Getting to know your computer

Top	4
TouchPad	4
Lights	4
Button and speakers	6
Keys	7
Right side	8
Left side	9
Display	10
Wireless antennas	11
Bottom	12
Additional hardware	13

3 Networking

Using an Internet service provider (ISP)	15
Identifying wireless and network status icons	16
Creating a wireless connection	16
Turning wireless devices on and off	16
Using the wireless button	16
Using the operating system controls	16
Using a WLAN	16
Connecting to an existing WLAN	17
Setting up a new WLAN	17
Protecting your WLAN	18
Roaming to another network	18
Using Bluetooth wireless devices (select models only)	19
Connecting to a local area network (LAN)	19

4 Pointing devices and keyboard

Using the keyboard	21
Using the TouchPad	23

Setting pointing device preferences	23
---	----

5 Multimedia

Using the media activity controls	24
Audio	25
Adjusting the volume	26
Checking your audio functions	26
Webcam (select models only)	26
Video	27
VGA	27

6 Power management

Shutting down the computer	28
Setting power options	29
Using power-saving states	29
Initiating and exiting Suspend	29
Initiating and exiting Hibernation	29
Using the Power icon	30
Using power management	30
Viewing the current power management settings	30
Changing the current power management settings	30
Using battery power	30
Displaying the remaining battery charge	31
Inserting or removing the battery	32
Charging a battery	33
Maximizing battery life	34
Managing low battery levels	34
Identifying low battery levels	34
Resolving a low battery level	35
Resolving a low battery level when external power is available	35
Resolving a low battery level when a charged battery is available	35
Resolving a low battery level when no power source is available	35
Resolving a low battery level when the computer cannot exit Hibernation	35
Conserving battery power	35
Storing a battery	35
Disposing of a used battery	36
Replacing the battery	36
Using external AC power	36
Testing an AC adapter	37

7 Drives

Handling drives	38
Replacing or upgrading the hard drive	39
Removing the hard drive	39
Installing the hard drive	40
Using optical drives (select models only)	42
Identifying the installed optical drive	42
Playing a CD	42
Removing a CD	42

8 External devices

Using a USB device	44
Connecting a USB device	44
Removing a USB device	46
Using optional external devices	46
Using optional external drives	46

9 Memory modules

10 Security

Protecting the computer	51
Using passwords	51
Setting passwords in the operating system	52

11 Backup and Recovery

Performing a system recovery	54
Backing up your information	55

12 Setup Utility (BIOS)

Starting Setup Utility	56
Using Setup Utility	56
Changing the language of Setup Utility	56
Navigating and selecting in Setup Utility	56
Displaying system information	57
Restoring factory default settings in Setup Utility	57
Exiting Setup Utility	57

Appendix A Troubleshooting and support

Troubleshooting	58
The computer is unable to start up	58
The computer screen is blank	58
Software is functioning abnormally	59

The computer is on but not responding	59
The computer is unusually warm	59
An external device is not working	59
The wireless network connection is not working	60
The optical disc tray does not open for removal of a CD	60
The computer does not detect the optical drive	61
A disc does not play	61
A movie is not visible on an external display	61
The process of burning a disc does not begin, or it stops before completion	62
Contacting customer support	62
Labels	63

Appendix B Routine care

Cleaning the display	65
Cleaning the TouchPad and keyboard	66

Appendix C Specifications

Input power	67
Operating environment	67

Appendix D Electrostatic discharge


Index	70
--------------------	-----------

1 Welcome

- [Finding information](#)

After you set up and register the computer, take the following steps:

- **Connect to the Internet**—Set up your wired or wireless network so that you can connect to the Internet. For more information, refer to [Networking on page 14](#).
- **Get to know your computer**—Learn about your computer features. Refer to [Getting to know your computer on page 3](#) and [Pointing devices and keyboard on page 21](#) for additional information.
- **Find installed software**—Access a list of the software preinstalled on the computer. Select **Computer > More Applications**. The list of preinstalled software is displayed.

 **NOTE:** For details about using the software included with the computer, select **Computer > Help**. You can also refer to the software manufacturer's instructions, which may be provided with the software or on the manufacturer's website.

- **Update programs and drivers**—Update your programs and drivers with the latest versions on a regular basis. When your computer is registered, it will automatically be updated with the latest versions. When you register, you can choose to receive automatic notifications when updates become available. The automatic notifications for operating system updates are available for 90 days. You can also go to <http://www.hp.com/support> to download updates from HP.

Finding information

The computer comes with several resources to help you perform various tasks.

Resources	For information about
<i>Quick Setup</i> poster	<ul style="list-style-type: none">• How to set up the computer• How to identify computer components
Linux Help	<ul style="list-style-type: none">• Computer software
To access the Linux Help, select Computer > Help .	<ul style="list-style-type: none">• Computer settings• Connecting to the Internet• Computer utilities
<i>Regulatory, Safety, and Environmental Notices</i>	<ul style="list-style-type: none">• Regulatory and safety information
To access the notices, select Computer > Help .	<ul style="list-style-type: none">• Battery disposal information

Resources**Safety & Comfort Guide**

To access this guide:

Select **Computer > Help**.

– or –

Go to <http://www.hp.com/ergo>.

For information about

- Proper workstation setup, posture, health, and work habits
- Electrical and mechanical safety information

Worldwide Telephone Numbers booklet

HP support telephone numbers

This booklet is provided with your computer.

HP website

To access this website, go to <http://www.hp.com/support>.

- Support information
- Ordering parts and finding additional help
- Software, driver, and BIOS (Setup Utility) updates
- Accessories available for the device

Limited Warranty*

Warranty information

To access the warranty:

Select **Computer > Help**.

– or –

Go to <http://www.hp.com/go/orderdocuments>.

*You may find the expressly provided HP Limited Warranty applicable to your product located with the electronic guides on your computer and/or on the CD/DVD provided in the box. Some countries/regions may provide a printed HP Limited Warranty in the box. In countries/regions where the warranty is not provided in printed format, you may request a printed copy at <http://www.hp.com/go/orderdocuments> or write to:

- **North America:** Hewlett-Packard, MS POD, 11311 Chinden Blvd, Boise, ID 83714, USA
- **Europe, Middle East, Africa:** Hewlett-Packard, POD, Via G. Di Vittorio, 9, 20063, Cernusco s/Naviglio (MI), Italy
- **Asia Pacific:** Hewlett-Packard, POD, P.O. Box 200, Alexandra Post Office, Singapore 911507

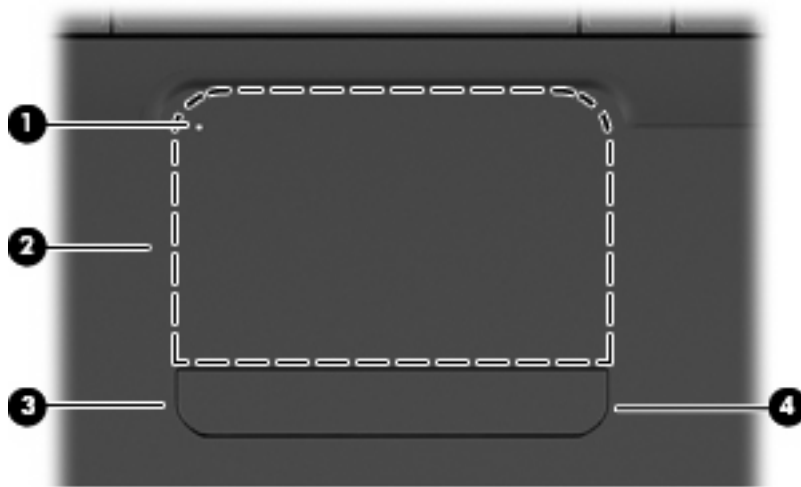
Please include your product number, warranty period (found on your serial number label), name, and postal address.

2 Getting to know your computer

- [Top](#)
- [Right side](#)
- [Left side](#)
- [Display](#)
- [Wireless antennas](#)
- [Bottom](#)
- [Additional hardware](#)

Top

TouchPad




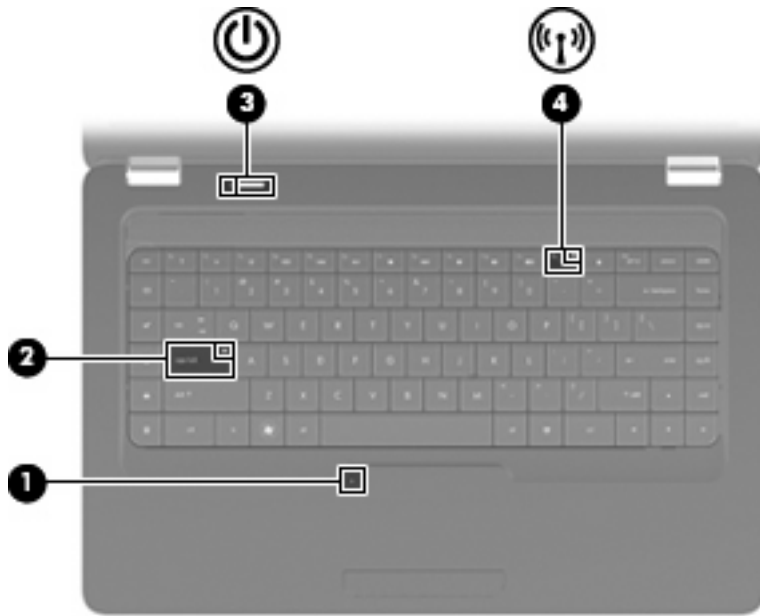
Component	Description
(1) TouchPad light	To turn the TouchPad on and off, quickly double-tap the TouchPad light. <ul style="list-style-type: none">• Off: TouchPad is on.• Amber: TouchPad is off.
(2) TouchPad zone	Moves the pointer and selects or activates items on the screen.
(3) Left TouchPad button	Press the left side of the TouchPad button to execute functions performed by the left button on an external mouse.
(4) Right TouchPad button	Press the right side of the TouchPad button to execute functions performed by the right button on an external mouse.

There is an unmarked scroll zone inside the right edge of the TouchPad. To scroll up and down using the TouchPad vertical scroll zone, slide your finger up or down inside the right edge of the TouchPad.

For more information about TouchPad features, refer to [Using the TouchPad on page 23](#).


Lights

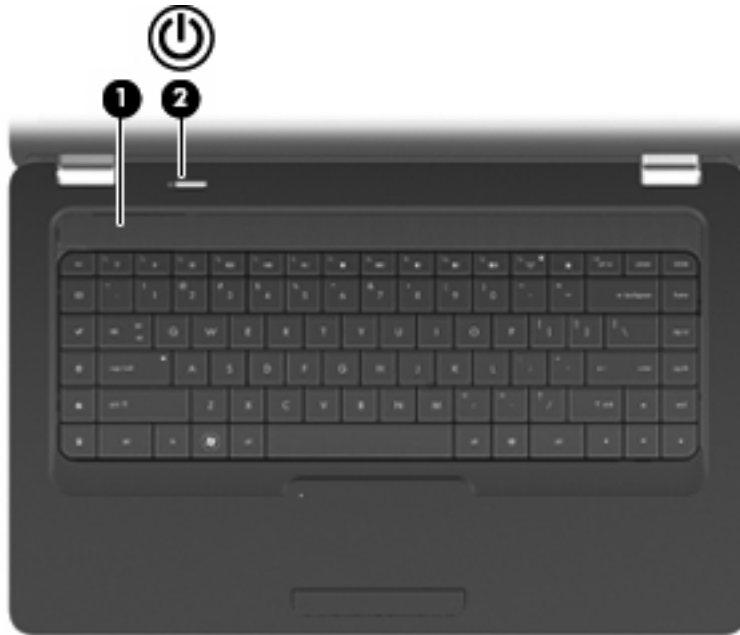
 **NOTE:** Your computer may look slightly different from the illustration in this section.



Component	Description
(1) TouchPad light	<ul style="list-style-type: none"> • Off: TouchPad is on. • Amber: TouchPad is off.
(2) Caps lock light	On: Caps lock is on.
(3) Power light	<ul style="list-style-type: none"> • On: The computer is on. • Blinking: The computer is in the Suspend state. • Off: The computer is off or in Hibernation.
(4) Wireless light	<ul style="list-style-type: none"> • White: An integrated wireless device, such as a wireless local area network (WLAN) device and/or a Bluetooth® device, is on. • Amber: All wireless devices are off.


Button and speakers

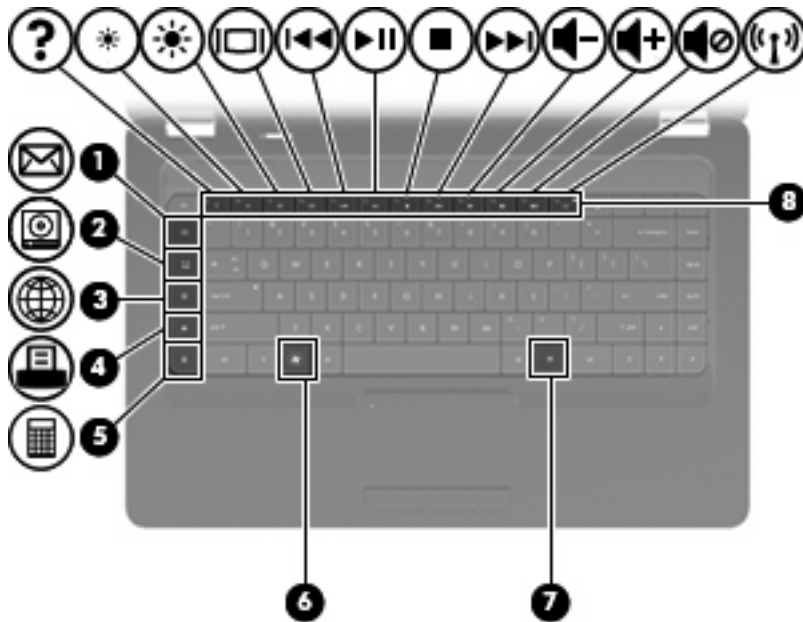
 **NOTE:** Your computer may look slightly different from the illustration in this section.



Component	Description
(1) Speaker grill	Two integrated speakers produce sound.
(2) Power button	<ul style="list-style-type: none">• When the computer is off, press the button to turn on the computer.• When the computer is on, press the button briefly to initiate Suspend.• When the computer is in the Suspend state, press the button briefly to exit Suspend.• When the computer is in Hibernation, press the button briefly to exit Hibernation. <p>If the computer has stopped responding and operating system shutdown procedures are ineffective, press and hold the power button for at least 5 seconds to turn off the computer.</p> <p>To learn more about your power settings, select Computer > Control Center > System > Power Management.</p>

Keys


 **NOTE:** Your computer may look slightly different from the illustration in this section.

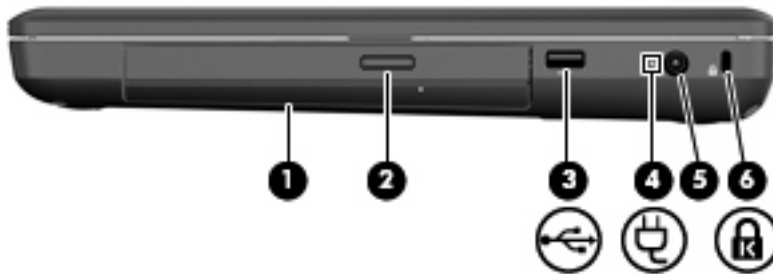


Component	Description
(1) Send e-mail key	Opens a new e-mail in your default e-mail client.
(2) Media application key	Launches your default media player.
(3) Web browser key	Launches your default web browser.
(4) Print key	Sends the currently-active document to the default printer.
(5) Calculator key	Launches the calculator application.
(6) Start menu key	Displays the Linux Start menu.
(7) Application key	Displays a shortcut menu for items where the cursor is positioned.
(8) Action keys	Execute frequently-used system actions.

Refer to [Using the keyboard on page 21](#) for information about using action keys.


Right side

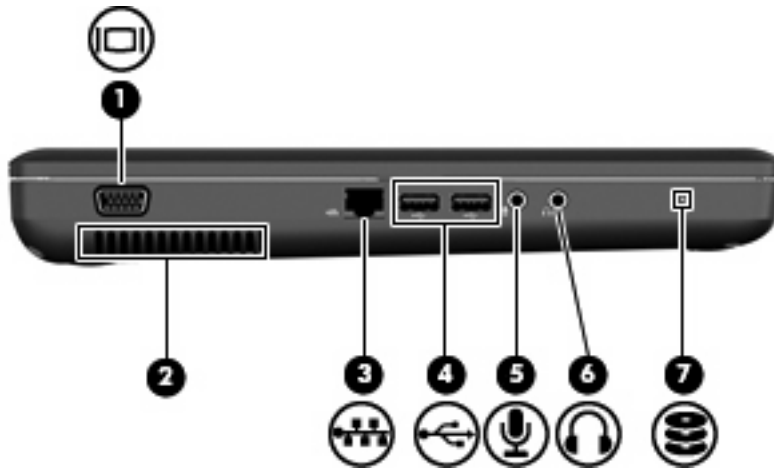
 **NOTE:** Your computer may look slightly different from the illustration in this section.



Component	Description
(1) Optical drive (select models only)	Reads and writes to an optical disc.
(2) Optical drive light (select models only)	Blinking: The optical drive is being accessed.
(3) USB port	Connects an optional USB device.
(4) AC adapter light	<ul style="list-style-type: none">Blinking white: The computer is in the Suspend state.White: The computer is connected to external power.Amber: The computer is charging.Off: The computer is not connected to external power.
(5) Power connector	Connects an AC adapter.
(6) 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.

Left side

 **NOTE:** Your computer may look slightly different from the illustration in this section.



Component	Description
(1) External monitor port	Connects an external VGA monitor or projector.
(2) 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.
(3) RJ-45 (network) jack	Connects a network cable.
(4) USB ports (2)	Connect an optional USB device.
(5) Audio-in (microphone) jack	Connects an optional computer headset microphone, stereo array microphone, or monaural microphone.
(6) Audio-out (headphone) jack	Produces sound when connected to optional powered stereo speakers, headphones, earbuds, a headset, or television audio. WARNING! To reduce the risk of personal injury, adjust the volume before putting on 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 headphone jack, the computer speakers are disabled.
(7) Drive light	On: The hard drive is in use.

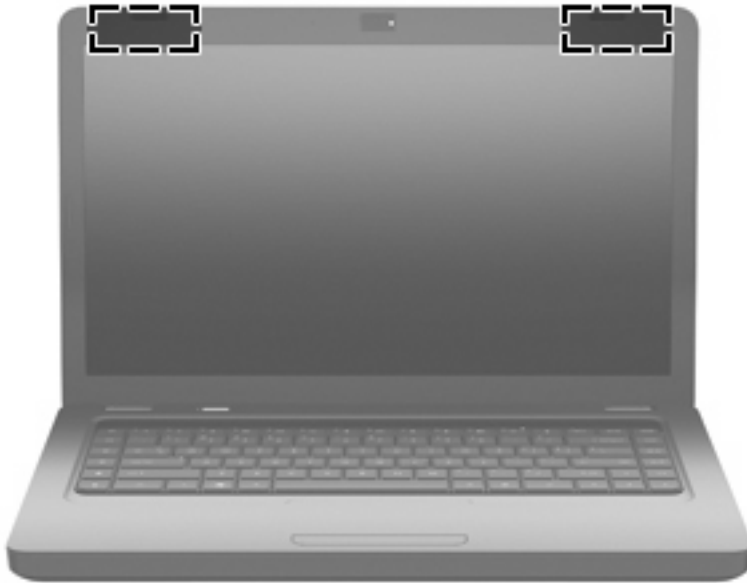
Display




Component	Description
(1) Internal microphone (select models only)	Records sound.
(2) Webcam (select models only)	Records video and captures still photographs.
(3) Webcam light (select models only)	On: The webcam is in use.

Wireless antennas

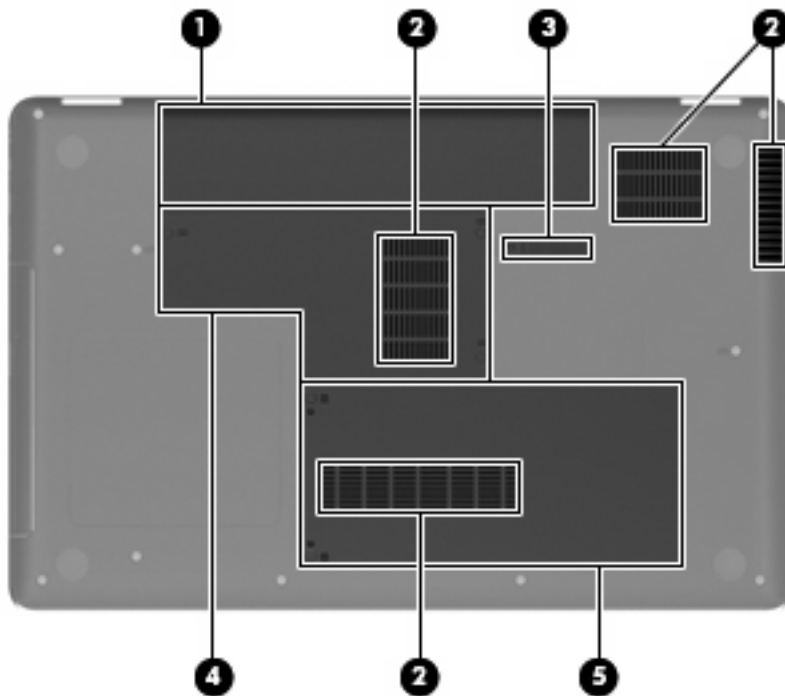
Your computer model has two antennas that send and receive signals from one or more wireless devices. These antennas are not visible from the outside of the computer.



 **NOTE:** For optimal transmission, keep the areas immediately around the antennas (shown in the previous illustration) free from obstructions.

To see wireless regulatory notices, refer to the section of the *Regulatory, Safety and Environmental Notices* that applies to your country or region. These notices are located in Help.

Bottom



Component	Description
(1) Battery bay	Holds the battery.
(2) Vents (4)	Enable 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.
(3) Battery release latch	Releases the battery from the battery bay.
(4) Memory module compartment	Contains the two memory module slots.
(5) Hard drive bay	Holds the hard drive.

Additional hardware



Component	Description
(1) Power cord*	Connects an AC adapter to an AC outlet.
(2) AC adapter	Converts AC power to DC power.
(3) Battery*	Powers the computer when the computer is not plugged into external power.


*Batteries and power cords vary in appearance by region and country.

3 Networking

- [Using an Internet service provider \(ISP\)](#)
- [Identifying wireless and network status icons](#)
- [Creating a wireless connection](#)
- [Using a WLAN](#)
- [Using Bluetooth wireless devices \(select models only\)](#)
- [Connecting to a local area network \(LAN\)](#)


Your computer may support one or both of the following types of Internet access:

- **Wireless**—For mobile Internet access, you can use a wireless connection. Refer to [Connecting to an existing WLAN on page 17](#) or [Setting up a new WLAN on page 17](#).
- **Wired**—You can access the Internet by connecting to a wired network. For information on connecting to a wired network, refer to [Connecting to a local area network \(LAN\) on page 19](#).




 **NOTE:** Internet hardware and software features vary depending on computer model and your location.

Using an Internet service provider (ISP)

Before you can connect to the Internet, you must establish an ISP account. Contact a local ISP to purchase Internet service and a modem. The ISP can help set up the modem, install a network cable to connect your wireless computer to the modem, and test the Internet service.

 **NOTE:** Your ISP will give you a user ID and password to access the Internet. Record this information and store it in a safe place.

Identifying wireless and network status icons

Icon	Name	Description
	Wireless (connected)	Indicates that one or more wireless devices are on.
	Network Connection icon status (connected)	Indicates that the wired network is connected and active. If both wired and wireless connections are active, the operating system uses the wired connection because it is faster.
	Network Connection icon status (disconnected)	Indicates that wired and wireless networks are not connected.


Creating a wireless connection

Your computer is equipped with a wireless local area network (WLAN) device.

Turning wireless devices on and off

Using the wireless button

Use the wireless button to turn both the wireless network controller and the Bluetooth controller off or on simultaneously. They can be controlled individually through Control Center or Setup Utility.

 **NOTE:** Refer to [Getting to know your computer on page 3](#) for information on identifying the location of the wireless button on your computer.

Using the operating system controls

To enable or disable a wireless and/or wired network device:


1. Right-click the **Network Connection** icon in the notification area, at the far right of the taskbar.
2. To enable or disable one of the following devices, select or clear one of the following options:
 - **Enable Networking** (all network devices)
 - **Enable Wireless**

Using a WLAN

A wireless connection connects the computer to Wi-Fi networks, or WLANs. A WLAN is composed of other computers and accessories that are linked by a wireless router or a wireless access point.

Connecting to an existing WLAN

1. Be sure that the WLAN device is on.


 **NOTE:** Refer to [Getting to know your computer on page 3](#) for information on identifying the location of the wireless button and wireless light on your computer.

2. Click the **Network Connection** icon in the notification area, at the far right of the taskbar.

Available wireless networks are listed under **Wireless Networks**.

3. Click the correct wireless network.

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

 **NOTE:** To connect to a network that is not automatically detected, click the **Network Connection** icon and select **Connect to Hidden Wireless Network**. Enter the ESSID information, and set encryption parameters.

NOTE: If no WLANs are listed, and your network is not hidden, you are out of range of a wireless router or access point.

If you do not see the network you want to connect to, right-click the **Network Connection** icon in the notification area, at the far right of the taskbar, and click **Edit Connections**.


Setting up a new WLAN

Required equipment:

- A broadband modem (either DSL or cable) **(1)** and high-speed Internet service purchased from an Internet service provider (ISP)
- A wireless router (purchased separately) **(2)**
- The wireless computer **(3)**

The illustration below shows an example of a wireless network installation that is connected to the Internet.



 **NOTE:** Some cable modems include a built-in router. Check with your ISP to see if you need a separate router.

NOTE: When setting up a wireless connection, be sure that your computer and wireless router are synchronized. To synchronize your computer and wireless router, turn your computer and wireless router off and then back on.

As your network grows, additional wireless and wired computers can be connected to the network to access the Internet.

For help in setting up your WLAN, refer to the information provided by your router manufacturer or your ISP.

Protecting your WLAN

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. If you are concerned about the security of your computer in a hotspot, limit your network activities to e-mail that is not confidential and basic Internet surfing.

Wireless radio signals travel outside the network, so other WLAN devices can pick up unprotected signals. You can take the following precautions to protect your WLAN:

- **Firewall**—Checks both data and requests for data that are sent to your network, and discards any suspicious items. Firewalls are available in both software and hardware. Some networks use a combination of both types.
- **Wireless encryption**—Wi-Fi Protected Access (WPA and WPA2) encrypts and decrypts data transmitted over the network. WPA uses Temporal Key Integrity Protocol (TKIP) to dynamically generate a new key for every packet. It also generates different sets of keys for each computer on the network. Wired Equivalent Privacy (WEP) encrypts data before it is transmitted using a WEP key. Without the correct key, others will not be able to use the WLAN.

Roaming to another network

When you move your computer within range of another WLAN, the operating system attempts to connect to that network. If the attempt is successful, your computer is automatically connected to the new network. If the operating system does not recognize the new network, follow the same procedure you used initially to connect to your WLAN.

Using Bluetooth wireless devices (select models only)

A Bluetooth device provides short-range wireless communications that replace the physical cable connections that traditionally link electronic devices such as the following:

- Computers
- Phones
- Audio devices

The strength of Bluetooth is in synchronizing information transfers between your computer and wireless devices. The inability to consistently connect two or more computers to share the Internet through Bluetooth is a limitation of Bluetooth and the operating system.

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

Connecting to a local area network (LAN)

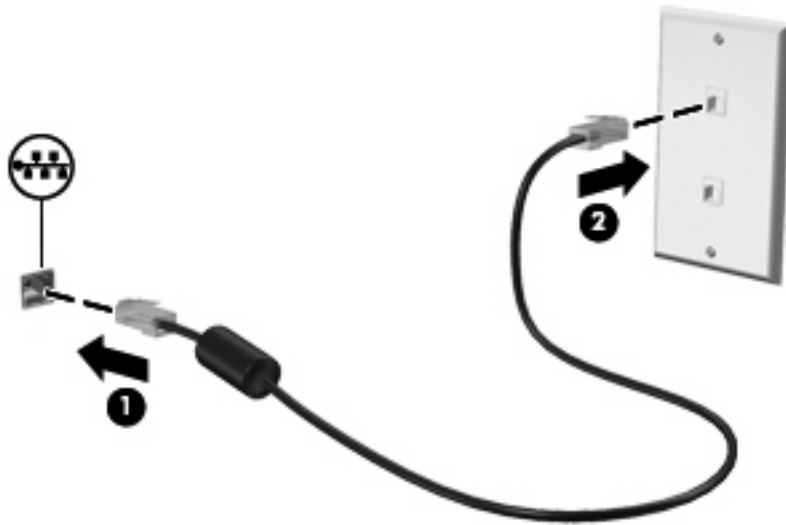
Connecting to a local area network (LAN) requires an 8-pin, RJ-45 network cable (purchased separately). If the network cable contains noise suppression circuitry **(1)**, which prevents interference from TV and radio reception, orient the circuitry end of the cable **(2)** toward the computer.



To connect the network cable:

1. Plug the network cable into the network jack **(1)** on the computer.

2. Plug the other end of the cable into a network wall jack (2).



⚠ **WARNING!** To reduce the risk of electric shock, fire, or damage to the equipment, do not plug a modem or telephone cable into the RJ-45 (network) jack.


4 Pointing devices and keyboard

- [Using the keyboard](#)
- [Using the TouchPad](#)

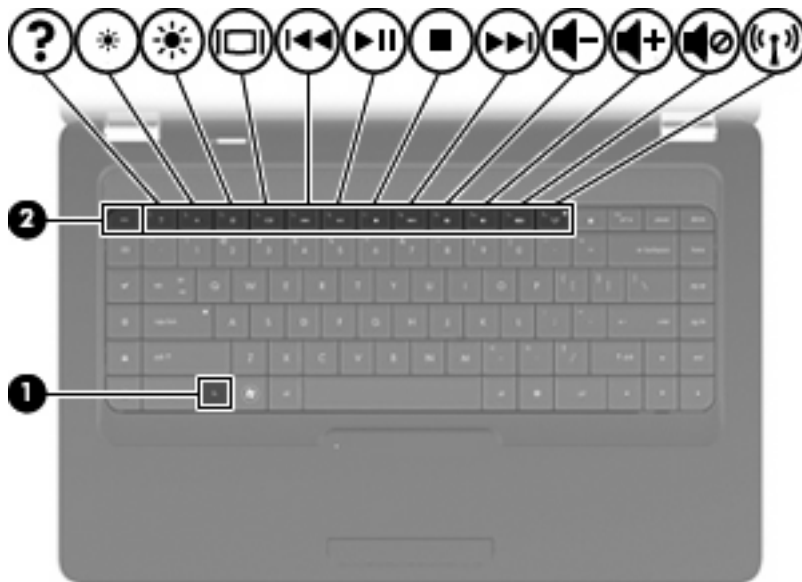
Using the keyboard


Action keys are customized actions that are assigned to specific keys at the top of the keyboard. The icons on the **f1** through **f12** keys represent the action key functions.












To use an action key, press and hold this key to activate the assigned function.

 **NOTE:** Depending on the program you are using, pressing **fn** (1) and one of the action keys (2) opens a specific shortcut menu within that program.

The action key feature is enabled at the factory. If you disable this feature in the Setup Utility, you will need to press **fn** and an action key to activate the assigned function (refer to [Setup Utility \(BIOS\) on page 56](#)).



Function	Action key
	Press f1 to open Help. Help provides tutorials, answers to questions, and product updates.


Function	Action key
	Press and hold f2 to decrease the screen brightness level incrementally.
	Press and hold f3 to increase the screen brightness level incrementally.
	<p>Press f4 to switch the screen image among display devices connected to the computer. For example, if a monitor is connected to the computer, pressing this key alternates the screen image from the computer display to the monitor display to simultaneous display on both the computer and the monitor.</p> <p>Most external monitors receive video information from the computer using the external VGA video standard. The f4 key can also alternate images among other devices that are receiving video information from the computer.</p>
	Press f5 to play the previous track of a CD.
	Press f6 to play, pause, or resume a track of an audio CD.
	Press f7 to stop the audio playback of a CD.
	Press f8 to play the next track of an audio CD.
	Press and hold f9 to decrease speaker volume incrementally.
	Press and hold f10 to increase speaker volume incrementally.
	Press f11 to mute or restore speaker sound.
	<p>Press f12 to turn the wireless feature on or off.</p> <p>NOTE: This key does not establish a wireless connection. To establish a wireless connection, a wireless network must also be set up.</p>

Refer to (1) through (5) in [Keys on page 7](#) for information on using the application quick-launch keys.

Using the TouchPad

To turn the TouchPad on and off, quickly double-tap the TouchPad light. When the TouchPad light is amber, the TouchPad is off.

To move the pointer, slide one finger across the TouchPad in the direction you want the pointer to go. Use the left and right TouchPad buttons like the buttons on an external mouse. To scroll up and down using the TouchPad vertical scroll zone, slide your finger up or down over the lines.

 **NOTE:** If you are using the TouchPad to move the pointer, you must lift your finger off the TouchPad before moving it to the scroll zone. Simply sliding your finger from the TouchPad to the scroll zone does not activate the scrolling function.

NOTE: In addition to the pointing devices included with your computer, you can use an external USB mouse (purchased separately) by connecting it to one of the USB ports on the computer.

Setting pointing device preferences

To customize settings for pointing devices, such as button configuration, click speed, and pointer options, select **Computer > Control Center > Mouse**.

5 Multimedia

- [Using the media activity controls](#)
- [Audio](#)
- [Webcam \(select models only\)](#)
- [Video](#)


Your computer may include the following:

- Integrated speakers
- Integrated microphones
- Integrated webcam
- Preinstalled multimedia software
- Multimedia buttons or keys
- Optical drive

Using the media activity controls

Depending on your computer model, you may have the following media activity controls that allow you to play, pause, fast forward, or rewind a media file:

- Media buttons
- Media hotkeys
- Media action keys

 **NOTE:** Refer to [Getting to know your computer on page 3](#) and [Pointing devices and keyboard on page 21](#) for information about your computer's media activity controls.

Audio


Your computer enables you to use a variety of audio features:


- Play music.
- Record sound.
- Download music from the Internet.
- Create multimedia presentations.
- Transmit sound and images with instant messaging programs.
- Stream radio programs (select models only).
- Create or “burn” audio CDs.

Adjusting the volume

Depending on your computer model, you can adjust the volume using the following:

- Volume buttons
- Volume action keys
- Volume keys

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

 **NOTE:** Volume can also be controlled through the operating system and some programs.

NOTE: Refer to [Getting to know your computer on page 3](#) and [Pointing devices and keyboard on page 21](#) for information on what type of volume controls your computer has.


Checking your audio functions

To check the system sound on your computer, follow these steps:

1. Select **Computer > Control Center**.
2. Click **Sound**.
3. Select the **Devices** tab, and then click the **Test** button in order to test each sound.

To check the recording functions of the computer, follow these steps:

1. Select **Computer > Control Center**.
2. Click the **Devices** tab and then click the **Test** button next to **Sound capture**.

 **NOTE:** For best results when recording, speak directly into the microphone and record sound in a setting free of background noise.


To confirm or change the audio settings on your computer, right-click the **Sound** icon in the notification area, at the far right of the taskbar.

Webcam (select models only)

Some computers include an integrated webcam, located at the top of the display. With the preinstalled software, Cheese, you can use the webcam to take a photo or record a video. You can preview and save the photo or video recording.

The webcam software enables you to experiment with the following features:

- Capturing and sharing video
- Streaming video with instant message software (software sold separately)
- Taking still photos

 **NOTE:** For details about using your webcam, click the Help menu in the Cheese software.

Video

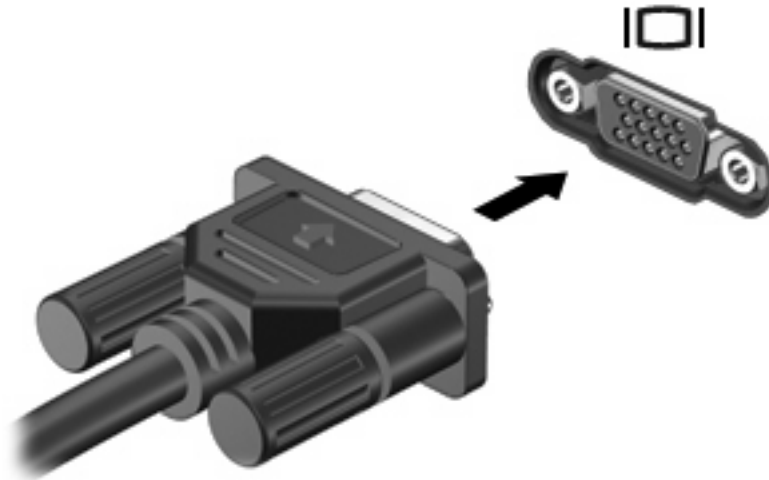
Your computer has the following external video port:


- VGA

VGA

The external monitor port, or VGA port, is an analog display interface that connects an external VGA display device such as an external VGA monitor or a VGA projector to the computer.

- ▲ To connect a VGA display device, connect the device cable to the external monitor port.



 **NOTE:** Press **f4** to switch the image between the display devices connected to the computer.

6 Power management

- [Shutting down the computer](#)
- [Setting power options](#)
- [Using battery power](#)
- [Using external AC power](#)

Shutting down the computer


△ **CAUTION:** Unsaved information will be lost when the computer is shut 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 need to replace the battery or access components inside the computer
- When you are connecting an external hardware device that does not connect to a USB port
- When the computer will be unused and disconnected from external power for an extended period

To shut down the computer, follow these steps:

 **NOTE:** If the computer is in the Suspend state or in Hibernation, you must first exit Suspend or Hibernation before shut down is possible.

1. Save your work and close all open programs.
2. Select **Computer > Shutdown > Shut Down**.

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

- Press **ctrl+alt+delete**, and then click **Shut Down**.
- Press and hold the power button for at least 5 seconds.
- Disconnect the computer from external power, and then remove the battery.

Setting power options

Using power-saving states

The computer has two power-saving states enabled at the factory: Suspend and Hibernation.

When Suspend is initiated, the power light blinks and the screen clears. Your work is saved to memory, letting you exit the Suspend state faster than exiting Hibernation. If the computer is in the Suspend state for an extended period or if the battery reaches a critical battery level while in the Suspend state, the computer initiates Hibernation.

When Hibernation is initiated, your work is saved to a hibernation file on the hard drive and the computer turns off.

△ **CAUTION:** To prevent possible audio and video degradation, loss of audio or video playback functionality, or loss of information, do not initiate Suspend or Hibernation while reading from or writing to a disc.

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

Initiating and exiting Suspend

The system is set at the factory to initiate Suspend after a period of inactivity when running on battery power or external power.

Power settings and timeouts can be changed using Power Management in Control Center.

With the computer on, you can initiate Suspend in any of the following ways:

- Briefly press the power button.
- Close the display.

📄 **NOTE:** This only works when the computer is running on battery power.

- Select **Computer > Shutdown > Suspend**.
- Click the **Power** icon, located on the far right of the taskbar, and then click **Suspend**.

To exit Suspend:

- ▲ Briefly press the power button.

When the computer exits Suspend, the power light turns on and your work returns to the screen where you stopped working.

Initiating and exiting Hibernation

The system is set at the factory to initiate Hibernation after a period of inactivity when running on battery power or on external power, or when the battery reaches a critical battery level.

Power settings and timeouts can be changed using Power Management in Control Center.

With the computer on, you can initiate Hibernation in any of the following ways:

- Briefly press the power button.
- Select **Computer > Shutdown > Hibernate**.
- Click the **Power** icon, located on the far right of the taskbar, and then click **Hibernate**.

To exit Hibernation:

- ▲ Briefly press the power button.

When the computer exits Hibernation, the power light turns on and your work returns to the screen where you stopped working.

Using the Power icon

The **Power** icon is located in the notification area, at the far right of the taskbar. The **Power** icon allows you to quickly access power settings, view remaining battery charge, and select a different power plan.

- To display the percentage of remaining battery charge, left-click the **Power** icon.
- To access Power Management Preferences, right-click the **Power** icon, and then click **Preferences**.

Using power management

Power management is a collection of system settings that manages how the computer uses power. Power management can help you conserve power or maximize performance. You can customize power management settings.

Viewing the current power management settings

- ▲ Right-click the **Power** icon in the notification area at the far right of the taskbar, and then click **Preferences**.


Changing the current power management settings

1. Right-click the **Power** icon in the notification area at the far right of the taskbar, and then click **Preferences**.
2. Change the settings on the **On AC Power** tab, **On Battery Power** tab, and **General** tab, as needed.

Using 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 a charged battery is in the computer and the computer is plugged into external AC power, the computer runs on AC power.

If the computer contains a charged battery and is running on external AC power supplied through the AC adapter, the computer switches to battery power if the AC adapter is disconnected from the computer.

 **NOTE:** When you disconnect AC power, the display brightness is automatically decreased to save battery life. For information on increasing or decreasing display brightness, refer to [Pointing devices and keyboard on page 21](#).

You can keep a battery in the computer or in storage, depending on how you work. Keeping the battery in the computer whenever the computer is plugged into AC power charges the battery and also protects your work in case of a power outage. However, a battery in the computer slowly discharges when the computer is off and unplugged from external power.

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

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.

Displaying the remaining battery charge

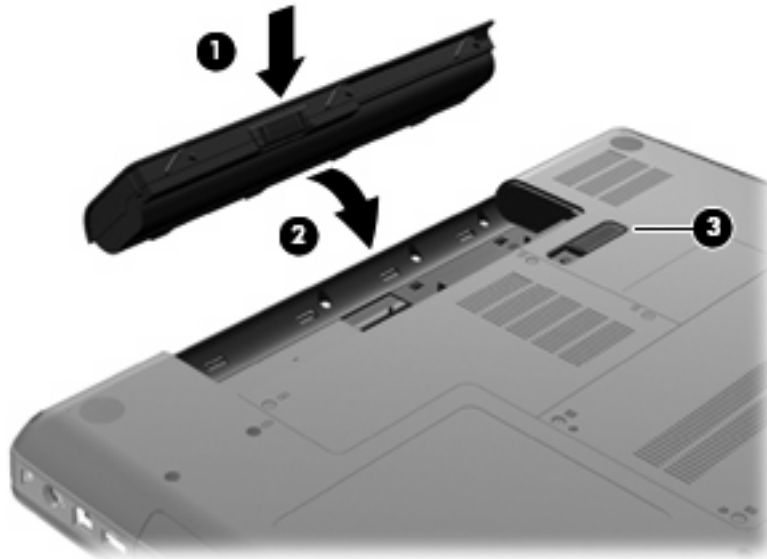
- ▲ Move the pointer over the **Power** icon in the notification area at the far right of the taskbar.

Inserting or removing the battery

To insert the battery:

- ▲ Insert the battery (1) into the battery bay (2) until it is seated.

The battery release latch (3) automatically locks the battery into place.

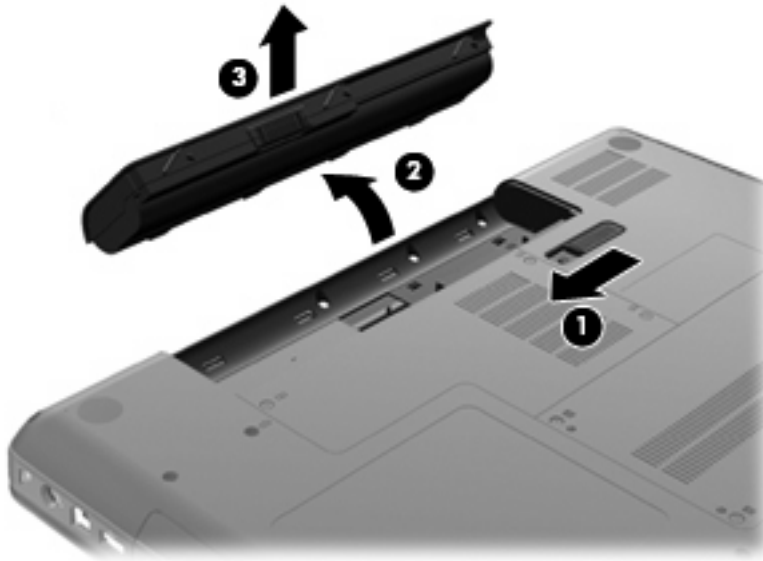


To remove the battery:

- △ **CAUTION:** Removing a battery that is the sole power source for the computer can cause loss of information. To prevent loss of information, save your work and initiate Hibernation or shut down the computer through the operating system before removing the battery.

1. Turn the computer upside down on a flat surface, with the battery bay toward you.
2. Slide the battery release latch (1) to release the battery

3. Pivot the battery (2) upward and remove it from the computer (3).



Charging a battery

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

The battery charges whenever the computer is plugged into external power through an AC adapter or an optional power adapter.

The battery charges whether the computer is off or in use, but it charges faster when the computer is off.

Charging may take longer if a battery is new, has been unused for 2 weeks or more, or is much warmer or cooler than room temperature.

To prolong battery life and optimize the accuracy of battery charge displays, follow these recommendations:

- If you are charging a new battery, charge it fully before turning on the computer.

📝 NOTE: If the computer is on while the battery is charging, the battery meter in the notification area may show 100 percent charge before the battery is fully charged.

- Allow the battery to discharge below 5 percent of a full charge through normal use before charging it.
- If the battery has been unused for one month or more, calibrate the battery instead of simply charging it.

Maximizing battery life

To maximize battery life:

1. Select **Computer > Control Center > Power Management**.
2. Under the **On Battery Power** tab, adjust the slider to the right of **Put computer to sleep when inactive for:** to 30 minutes.
3. Adjust the slider to the right of **Put display to sleep when inactive for:** to 15 minutes, and select the check box next to **Reduce backlight brightness**.
4. Click the check box next to **Dim display when idle**.
5. Click **Close**.

Managing low battery levels

The information in this section describes the alerts and system responses set at the factory. Some low-battery alerts and system responses can be changed using Power Management in Control Center. Preferences set using Power Management do not affect lights.

Identifying low battery levels

When a battery that is the sole power source for the computer reaches a low or critical battery level, the following behavior occurs:

- If Hibernation is enabled and the computer is on or in Suspend, the computer initiates Hibernation.
- If Hibernation is disabled and the computer is on or in Suspend, the computer remains briefly in Suspend, 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 one of the following devices:
 - AC adapter
 - Optional docking or expansion device
 - Optional power adapter purchased as an accessory from HP

Resolving a low battery level when a charged battery is available

1. Turn off the computer or initiate Hibernation.
2. Replace the discharged battery with a charged battery.
3. Turn on the computer.

Resolving a low battery level when no power source is available

- Initiate Hibernation.
- 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. Replace the discharged battery with a charged battery, or connect the AC adapter to the computer and to external power.
2. Exit Hibernation by briefly pressing the power button.

Conserving battery power


- Turn off wireless and local area network (LAN) connections and exit modem applications when you are not using them.
- Disconnect unused external devices that are not plugged into an external power source.
- Decrease brightness.
- Initiate Suspend or Hibernation, or shut down when you are not using the computer.

Storing a battery

△ **CAUTION:** To reduce the risk of damage to a battery, do not expose it to high temperatures for extended periods of time.

If a computer will be unused and unplugged from external power for more than 2 weeks, remove the battery and store it separately.

To prolong the charge of a stored battery, place it in a cool, dry place.

 **NOTE:** A stored battery should be checked every 6 months. If the capacity is less than 50 percent, recharge the battery before returning it to storage.

Calibrate a battery before using it if it has been stored for one month or more.

Disposing of a used battery

⚠ WARNING! To reduce the risk of fire or burns, do not disassemble, crush, or puncture; do not short external contacts; do not dispose of in fire or water.

Refer to the *Regulatory, Safety, and Environmental Notices* for battery disposal information.

Replacing the battery

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.

You can find details about the battery by clicking the **Battery** icon in the notification area on the far right of the taskbar.

📝 NOTE: To ensure that you always have battery power when you need it, HP recommends purchasing a new battery when the storage capacity indicator turns green-yellow.

Using external AC power

📝 NOTE: For information on connecting to AC power, refer to the *Quick Setup* poster provided in the computer box.

External AC power is supplied through an approved AC adapter or an optional docking or 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 battery while you are onboard aircraft.

- When you are charging or calibrating a battery
- When you are installing or modifying system software
- When writing information to a CD

When you connect the computer to external AC power, the following events occur:

- The battery begins to charge.
- If the computer is turned on, the battery meter icon in the notification area changes appearance.

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

- The computer switches to battery power.
- The display brightness is automatically decreased to save battery life.

Testing an AC adapter

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 light is off.

To test the AC adapter:

1. Shut down the computer.
2. Remove the battery from the computer.
3. Connect the AC adapter to the computer, and then plug it into an AC outlet.
4. Turn on the computer.
 - If the power light turns **on**, the AC adapter is functioning properly.
 - If the power light remains **off**, the AC adapter is not functioning and should be replaced.

Contact technical support for information on obtaining a replacement AC power adapter.

7 Drives

- [Handling drives](#)
- [Replacing or upgrading the hard drive](#)
- [Using optical drives \(select models only\)](#)

Handling drives

Drives are fragile computer components that must be handled with care. Refer to the following cautions before handling drives. Additional cautions are included with the procedures to which they apply.

Observe these precautions:

- Before you move a computer that is connected to an external hard drive, initiate Suspend and allow the screen to clear, or properly disconnect the external hard drive.
- Before handling a drive, discharge static electricity by touching the unpainted metal surface of the drive.
- Do not touch the connector pins on a removable drive or on the computer.
- Handle a drive carefully; do not drop a drive or place items on it.
- Before removing or inserting a drive, shut down the computer. If you are unsure whether the computer is off, in Suspend, or in Hibernation, turn the computer on, and then shut it down through the operating system.
- Do not use excessive force when inserting a drive into a drive bay.
- Do not type on the keyboard or move the computer while an optical drive is writing to a disc. The write process is sensitive to vibration.
- When the battery is the only source of power, be sure that the battery is sufficiently charged before writing to media.
- Avoid exposing a drive to temperature or humidity extremes.
- Avoid exposing a drive to liquids. Do not spray the drive with cleaning products.
- Remove media from a drive before removing the drive from the drive bay, or traveling with, shipping, or storing a drive.

- If a drive must be mailed, place the drive in a bubble-pack mailer or other suitable protective packaging and label the package “FRAGILE.”
- 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.

Replacing or upgrading the hard drive

△ **CAUTION:** To prevent information loss or an unresponsive system:

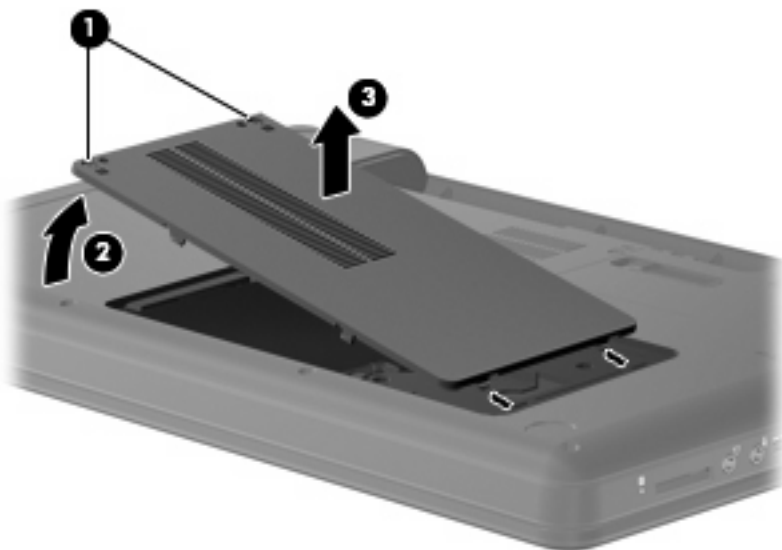
Shut down the computer before removing the hard drive from the hard drive bay. Do not remove the hard drive while the computer is on, in the Suspend state, or in Hibernation.

If you are not sure whether the computer is off or in Hibernation, turn the computer on by pressing the power button. Then shut down the computer through the operating system.

Removing the hard drive

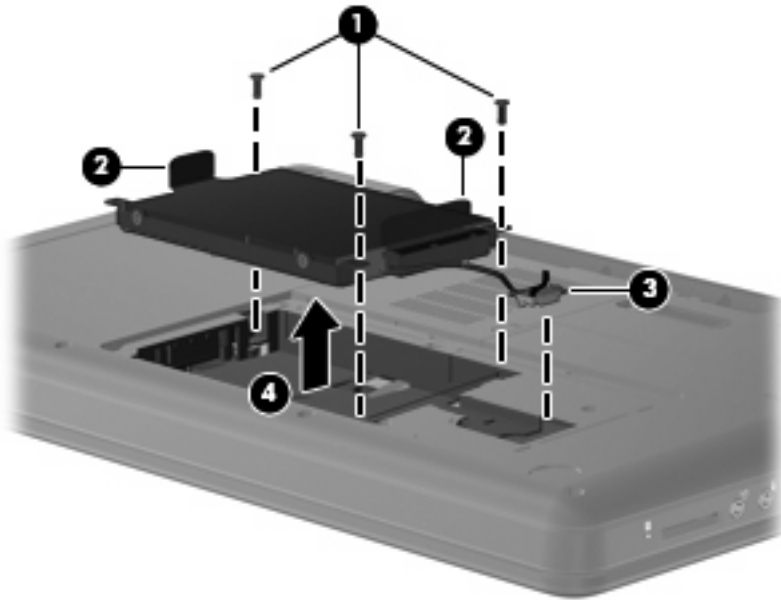
To remove the hard drive:

1. Save your work.
2. Shut down the computer and close the display.
3. Disconnect all external devices connected to the computer.
4. Unplug the power cord from the AC outlet.
5. Turn the computer upside down on a flat surface.
6. Remove the battery from the computer.
7. With the hard drive bay toward you, loosen the two hard drive cover screws (1).
8. Lift the left side of the hard drive cover (2), then lift the cover up and to the left (3) and remove it.



9. Remove the three screws (1) that secure the hard drive to the computer.

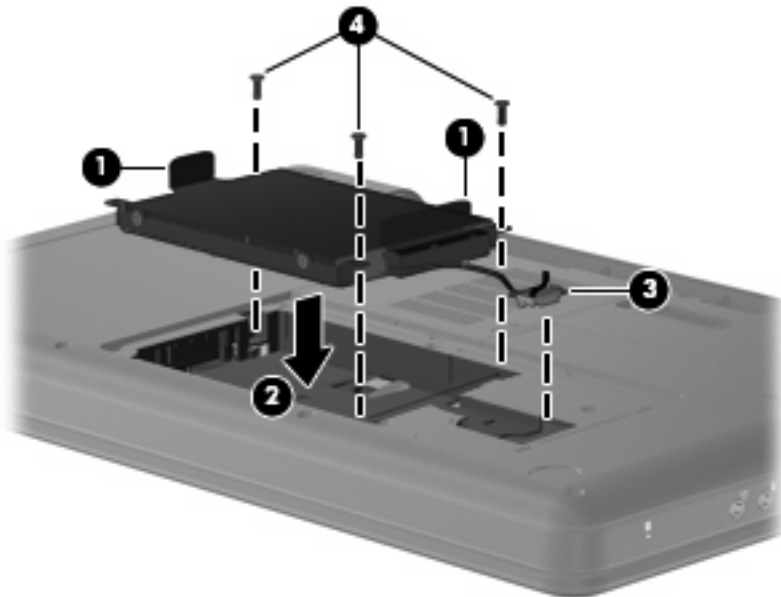
10. Grasp the tabs (2) on the hard drive, and then disconnect the hard drive cable (3) from the system board.
11. Remove the hard drive (4) from the hard drive bay.



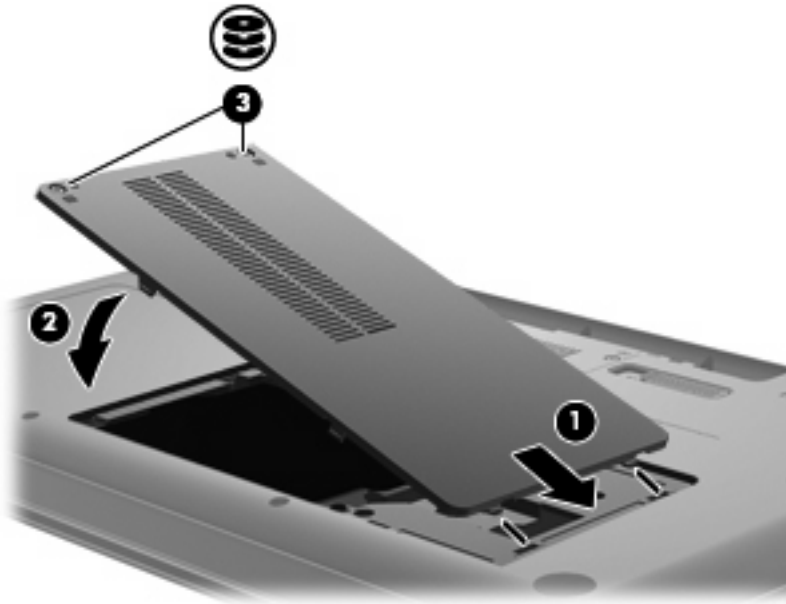
Installing the hard drive

To install the hard drive:

1. Grasp the tabs (1) on the hard drive and lower the hard drive (2) into the hard drive bay, then press down on the hard drive to be sure that the drive is firmly seated.
2. Connect the hard drive cable (3) to the system board, and then replace the three screws (4) that secure the hard drive to the computer.



3. Align the tabs (1) on the hard drive cover with the notches on the computer.
4. Close the cover (2).
5. Tighten the hard drive cover screws (3).



6. Replace the battery.
7. Turn the computer right-side up.
8. Reconnect external power and external devices.
9. Turn on the computer.

Using optical drives (select models only)


Identifying the installed optical drive

- ▲ Select **Computer > More Applications**, and then select the **Audio & Video** group at the left sidebar.

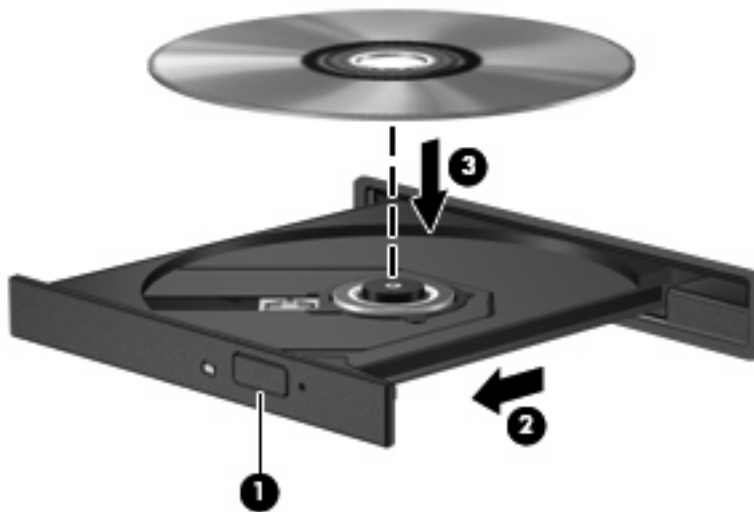
A list of all the devices installed in your computer, including your optical drive, is displayed.

Playing a CD


1. Turn on the computer.
2. Press the release button (1) on the drive bezel to release the disc tray.
3. Pull out the tray (2).
4. Hold the disc by the edges to avoid touching the flat surfaces and position the disc label-side up over the tray spindle.

 **NOTE:** If the tray is not fully accessible, tilt the disc carefully to position it over the spindle.

5. Gently press the disc (3) down onto the tray spindle until the disc snaps into place.




6. Close the disc tray.

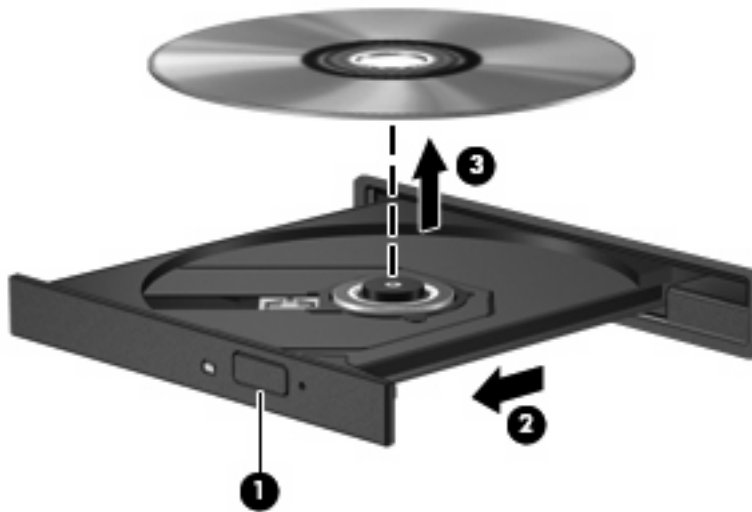
 **NOTE:** After you insert a disc, a short pause is normal. If you have not selected a media player, an AutoPlay dialog box opens. It prompts you to select how you want to use the media content.

Removing a CD

1. Press the release button (1) on the drive bezel to release the disc tray, and then gently pull out the tray (2) until it stops.

2. Remove the disc (3) from the tray by gently pressing down on the spindle while lifting the outer edges of the disc. Hold the disc by the edges and avoid touching the flat surfaces.

 **NOTE:** If the tray is not fully accessible, tilt the disc carefully as you remove it.



3. Close the disc tray, and then place the disc in a protective case.

8 External devices

- [Using a USB device](#)
- [Using optional external devices](#)

Using a USB device

Universal Serial Bus (USB) is a hardware interface that can be used to connect an optional external device, such as a USB keyboard, mouse, drive, printer, scanner, or hub. Devices can be connected to the system.

Some USB devices may require additional support software, which is usually included with the device. For more information about device-specific software, refer to the manufacturer's instructions.

The computer has 3 USB ports, which support USB 1.0, USB 1.1, and USB 2.0 devices. An optional USB hub provides additional USB ports that can be used with the computer.


Connecting a USB device

△ **CAUTION:** To prevent damage to a USB connector, use minimal force to connect a USB device.

- ▲ To connect a USB device to the computer, connect the USB cable for the device to the USB port.



You will hear a sound when the device has been detected.

 **NOTE:** When you connect a USB device, you may see a message in the notification area to let you know that the device is recognized by the system.

Removing a USB device


△ **CAUTION:** To prevent damage to a USB connector, do not pull on the cable to remove the USB device.

CAUTION: To prevent loss of information or an unresponsive system, use the following procedure to safely remove a USB device.

To remove a USB device:

1. Open File Browser by selecting **Computer > Nautilus**.
2. Click the **Eject** icon next to the name of the USB device in the **Places** list on the left pane of File Browser.
3. Remove the device.

Using optional external devices

 **NOTE:** For more information about required software and drivers, or to learn which computer port to use, refer to the manufacturer's instructions.

To connect an external device to the computer:

△ **CAUTION:** To reduce the risk of damage to the equipment when connecting a powered device, be sure that the device is turned off and the AC power cord is unplugged.

1. Connect the device to the computer.
2. If you are connecting a powered device, plug the device power cord into a grounded AC outlet.
3. Turn on the device.

To disconnect an unpowered external device, turn off the device, and then disconnect it from the computer. To disconnect a powered external device, turn off the device, disconnect it from the computer, and then unplug the AC power cord.

Using optional external drives

Removable external drives expand your options for storing and accessing information. A USB drive can be added by connecting the drive to a USB port on the computer.

USB drives include the following types:

- 1.44-megabyte diskette drive
- Hard drive module (a hard drive with an adapter attached)
- MultiBay device

9 Memory modules

The computer has one memory module compartment, which is located on the bottom of the computer. The memory capacity of the computer can be upgraded by adding a memory module to the vacant expansion memory module slot or by upgrading the existing memory module in the primary memory module slot.

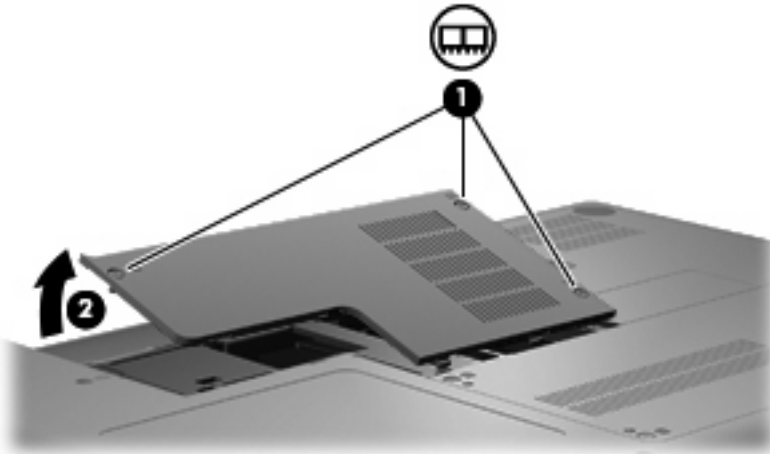
-
- ⚠ **WARNING!** To reduce the risk of electric shock and damage to the equipment, unplug the power cord and remove all batteries before installing a memory module.
 - ⚠ **CAUTION:** Electrostatic discharge (ESD) can damage electronic components. Before beginning any procedure, ensure that you are discharged of static electricity by touching a grounded metal object.
 - 📝 **NOTE:** To use a dual-channel configuration when adding a second memory module, be sure that both memory modules are identical.
-

To add or replace a memory module:

1. Save your work.
2. Shut down the computer and close the display.

If you are not sure whether the computer is off or in Hibernation, turn the computer on by pressing the power button. Then shut down the computer through the operating system.
3. Disconnect all external devices connected to the computer.
4. Unplug the power cord from the AC outlet.
5. Turn the computer upside down on a flat surface.
6. Remove the battery from the computer.
7. Loosen the memory module compartment screws **(1)**.

8. Lift the memory module compartment cover (2) away from the computer.



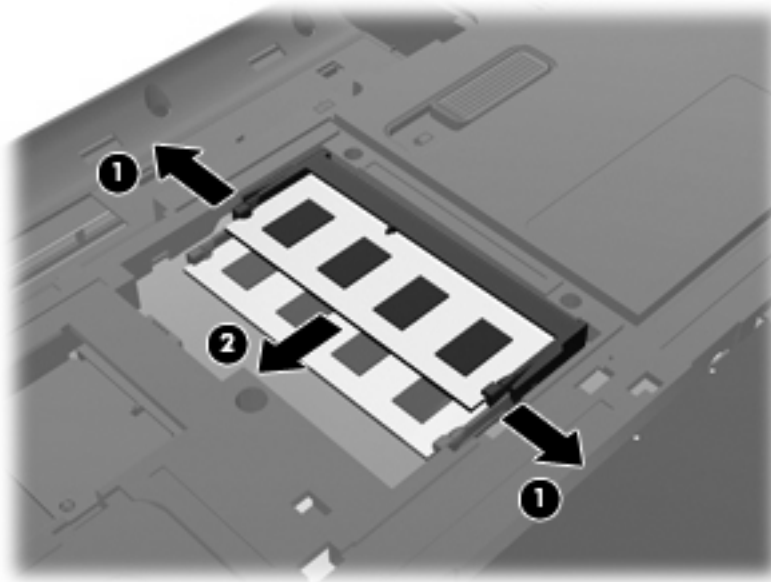
9. If you are replacing a memory module, remove the existing memory module:

- a. Pull away the retention clips (1) on each side of the memory module.

The memory module tilts up.

△ **CAUTION:** To prevent damage to the memory module, hold the memory module by the edges only. Do not touch the components on the memory module.

- b. Grasp the edge of the memory module (2), and gently pull the module out of the memory module slot.

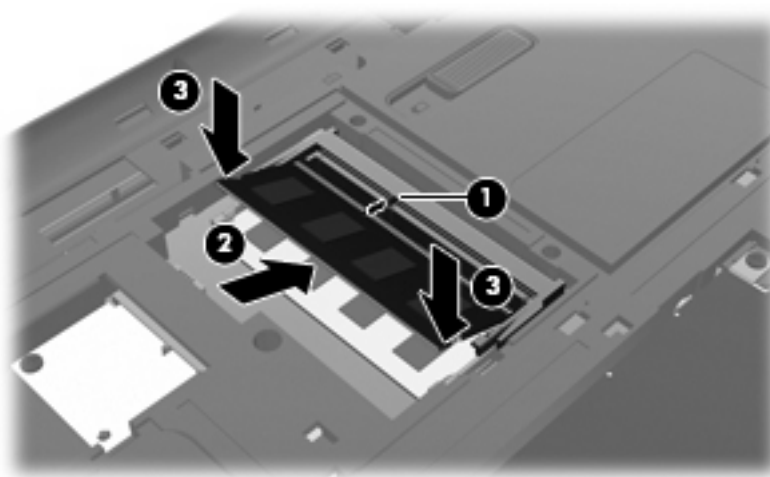


- c. To protect a memory module after removal, place it in an electrostatic-safe container.

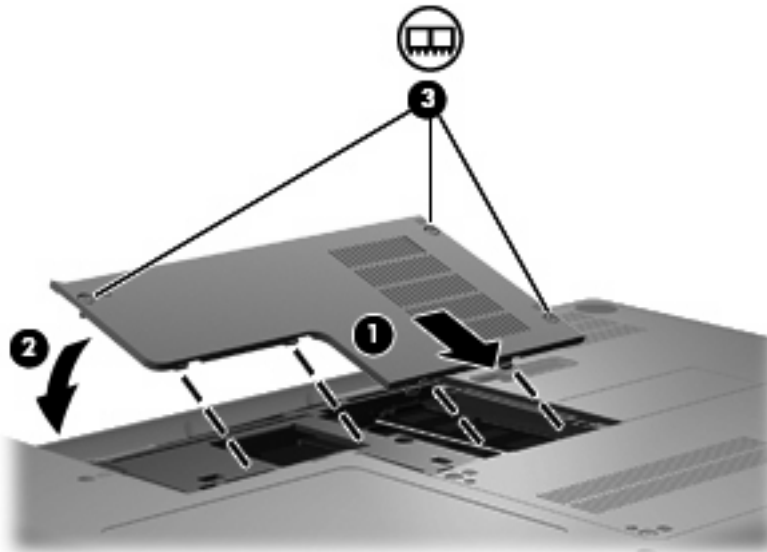
10. Insert a new memory module:

△ **CAUTION:** To prevent damage to the memory module, hold the memory module by the edges only. Do not touch the components on the memory module, and do not bend the memory module.

- a. Align the notched edge (1) of the memory module with the tab in the memory module slot.
- b. With the memory module at a 45-degree angle from the surface of the memory module compartment, press the module (2) into the memory module slot until it is seated.
- c. Gently press the memory module (3) down, applying pressure to both the left and right edges of the memory module, until the retention clips snap into place.



11. Align the tabs (1) on the memory module compartment cover with the notch on the computer.
12. Close the cover (2).
13. Tighten the memory module compartment screws (3).




14. Replace the battery.
15. Turn the computer right-side up.

16. Reconnect external power and external devices.
17. Turn on the computer.

10 Security

- [Protecting the computer](#)
- [Using passwords](#)

Protecting the computer

 **NOTE:** Security solutions are designed to act as deterrents, but they may not deter software attacks or prevent the computer from being mishandled or stolen.

Security features provided with your computer can protect the computer, personal information, and data from a variety of risks. The way you use your computer will determine which security features you need to use.


The operating system offers certain security features. Additional security features are listed in the following table. Most of these additional security features can be configured in Setup Utility.

To protect against	Use this security feature
Unauthorized use of the computer	Power-on authentication using passwords.
Unauthorized access to Setup Utility (f10)	Administrator password in Setup Utility*
Unauthorized access to the contents of a hard drive	DriveLock password in Setup Utility*
Unauthorized reset of Setup Utility (f10) passwords	Stringent security feature in Setup Utility*
Unauthorized startup from an optical drive, diskette drive, or internal network adapter	Boot options feature in Setup Utility*
Unauthorized access to data	<ul style="list-style-type: none">• Firewall software• Operating system updates
Unauthorized access to Setup Utility settings and other system identification information	Administrator password in Setup Utility*
Unauthorized removal of the computer	Security cable slot (used with an optional security cable)

*Setup Utility is a utility accessed by pressing f10 when the computer is turned on or restarted. When using Setup Utility, you must use the keys on your computer to navigate and make selections.

Using passwords

A password is a group of characters that you choose to secure your computer information. Several types of passwords can be set, depending on how you want to control access to your information. Passwords can be set in the operating system or in Setup Utility that is preinstalled on the computer.

 **NOTE:** To reduce the risk of being locked out of the computer, record each password and store it in a secure place.

Setting passwords in the operating system

Operating system passwords	Function
Root password	Protects access to an operating system root-level account.
User password	Protects access to an operating system user account.

11 Backup and Recovery

Recovery after a system failure is as good as your most recent backup. As you add new software and data files, you should continue to back up your system on a regular basis to maintain a reasonably current backup.

Performing a system recovery

Recovery allows you to repair or restore the computer to its original factory state. Recovery works from a dedicated recovery partition on the hard drive. This type of recovery restores the computer to its factory condition without using recovery discs.

-
- △ **CAUTION:** Using Recovery completely erases hard drive contents and reformats the hard drive. All files you have created and any software installed on the computer are permanently removed. The recovery tool reinstalls the original operating system and HP programs and drivers that were installed at the factory. Software, drivers, and updates not installed by HP must be manually reinstalled. Personal files must be restored from a backup.
-

To restore the computer from the partition, follow these steps:

1. If possible, back up all personal files.
2. Restart the computer.
3. Using the arrow keys, select **Recovery**, and then press [enter](#).
4. Follow the on-screen instructions.

Backing up your information

You should back up your computer files on a regular schedule to maintain a current backup. You can manually back up your information to an optional external drive, a network drive, or discs. Back up your system at the following times:

- At regularly scheduled times
- Before the computer is repaired or restored
- Before you add or modify hardware or software

12 Setup Utility (BIOS)

- [Starting Setup Utility](#)
- [Using Setup Utility](#)

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 includes settings for the types of peripherals installed, the startup sequence of the computer, and the amount of system and extended memory.

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

Starting Setup Utility

- ▲ Turn on or restart the computer. While the “Press the ESC key for Startup Menu” message is displayed in the lower-left corner of the screen, press [esc](#). When the Startup Menu is displayed, press [f10](#).

Using Setup Utility

Changing the language of Setup Utility

1. Start Setup Utility.
2. Use the arrow keys to select **System Configuration > Language**, and then press [enter](#).
3. Use the arrow keys to select a language, and then press [enter](#).
4. When a confirmation prompt with your language selected is displayed, press [enter](#).
5. To save your change and exit Setup Utility, use the arrow keys to select **Exit > Exit Saving Changes**, and then press [enter](#).

Your change takes effect immediately.

Navigating and selecting in Setup Utility

Setup Utility does not support the TouchPad. Navigation and selection are by keystroke.

- To choose a menu or a menu item, use the arrow keys.
- To choose an item in a list or to toggle a field—for example an Enable/Disable field—use either the arrow keys or [f5](#) and [f6](#).

- To select an item, press [enter](#).
- To close a text box or return to the menu display, press [esc](#).
- To display additional navigation and selection information while Setup Utility is open, press [f1](#).


Displaying system information

1. Start Setup Utility.
2. Select the **Main** menu. System information such as the system time and date, and identification information about the computer is displayed.
3. To exit Setup Utility without changing any settings, use the arrow keys to select **Exit > Exit Discarding Changes**, and then press [enter](#).

Restoring factory default settings in Setup Utility

1. Start Setup Utility.
2. Use the arrow keys to select **Exit > Load Setup Defaults**, and then press [enter](#).
3. When the Setup Confirmation is displayed, press [enter](#).
4. To save your change and exit Setup Utility, use the arrow keys to select **Exit > Exit Saving Changes**, and then press [enter](#).

The Setup Utility factory settings take effect when the computer restarts.

 **NOTE:** Your password, security, and language settings are not changed when you restore the factory settings.

Exiting Setup Utility

- To exit Setup Utility and save your changes from the current session:
If the Setup Utility menus are not visible, press [esc](#) to return to the menu display. Then use the arrow keys to select **Exit > Exit Saving Changes**, and then press [enter](#).
- To exit Setup Utility without saving your changes from the current session:
If the Setup Utility menus are not visible, press [esc](#) to return to the menu display. Then use the arrow keys to select **Exit > Exit Discarding Changes**, and then press [enter](#).

A Troubleshooting and support

- [Troubleshooting](#)
- [Contacting customer support](#)
- [Labels](#)


Troubleshooting

The following sections describe several common issues and solutions.

The computer is unable to start up

If the computer does not turn on when you press the power button, the following suggestions may help you determine why the computer does not start up:

- If the computer is plugged into an AC outlet, plug another electrical device into the outlet to be sure that the outlet is providing adequate power.

 **NOTE:** Use only the AC adapter provided with the computer or one approved by HP for this computer.

- If the computer is plugged into an external power source other than an AC outlet, plug the computer into an AC outlet using the AC adapter. Be sure that the power cord and AC adapter connections are secure.

The computer screen is blank

If the screen is blank but you have not turned off the computer, one or more of these settings may be the cause:

- The computer may be in the Suspend state or in Hibernation. To exit Suspend or Hibernation, briefly press the power button. Suspend and Hibernation are energy-saving features that turn off the display. Suspend and Hibernation can be initiated by the system while the computer is on but is not in use, or when the computer has reached a low battery level. To change these and other power settings, right-click the **Power** icon in the notification area at the far right of the taskbar, and then click **Preferences**.
- The computer may not be set to display the image on the computer screen. To transfer the image to the computer screen, press **f4**. On most models, when an optional external display, such as a monitor, is connected to the computer, the image can be displayed on the computer screen or the external display, or on both devices simultaneously. When you press **f4** repeatedly, the image alternates among the computer display, one or more external displays, and simultaneous display on all devices.

Software is functioning abnormally

If the software is unresponsive or responds abnormally, restart the computer by clicking **Computer > Shutdown > Restart**. If you cannot restart the computer using this procedure, refer to the next section, [The computer is on but not responding on page 59](#).

The computer is on but not responding

If the computer is turned on but is not responding to software or keyboard commands, try the following emergency shutdown procedures, in the sequence provided, until shutdown occurs:

△ **CAUTION:** Emergency shutdown procedures result in the loss of unsaved information.

- Press **ctrl+alt+delete**, and then click **Shut Down**.
- Press and hold the power button for at least 5 seconds.
- Disconnect the computer from external power and remove the battery.

The computer is unusually warm

It is normal for the computer to feel warm to the touch while it is in use. But if the computer feels *unusually* warm, it may be overheating because a vent is blocked.

If you suspect that the computer is overheating, allow the computer to cool to room temperature. Then be sure to keep all vents free from obstructions while you are using the computer.

△ **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 contact 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).

📄 **NOTE:** The fan in the computer starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during operation.

An external device is not working

Follow these suggestions if an external device does not function as expected:

- Turn on the device according to the manufacturer's instructions.
- Be sure that all device connections are secure.
- Be sure that the device is receiving electrical power.
- Be sure that the device, especially if it is older, is compatible with the operating system.
- Be sure that the correct drivers are installed and updated.


The wireless network connection is not working

If a wireless network connection is not working as expected, follow these suggestions:

- To enable or disable a wireless and/or wired network device, right-click the **Network Connection** icon in the notification area at the far right of the taskbar. To enable devices, select the check box from the menu option. To disable the device, clear the check box.
- Be sure that the wireless device is turned on.
- Be sure that the computer wireless antennas are free from obstructions.
- Be sure that the cable or DSL modem and its power cord are properly connected and that the lights are on.
- Be sure that the wireless router or access point is properly connected to its power adapter and to the cable or DSL modem, and that the lights are on.
- Disconnect and then reconnect all cables, and turn the power off and then back on.

The optical disc tray does not open for removal of a CD

1. Insert the end of a paper clip (1) into the release access in the front bezel of the drive.
2. Press in gently on the paper clip until the disc tray is released, and then pull out the tray (2) until it stops.
3. Remove the disc (3) from the tray by gently pressing down on the spindle while lifting the outer edges of the disc. Hold the disc by the edges and avoid touching the flat surfaces.

 **NOTE:** If the tray is not fully accessible, tilt the disc carefully as you remove it.



4. Close the disc tray and place the disc in a protective case.

The computer does not detect the optical drive

If your operating system does not detect an installed device, the device driver software may be missing or corrupted.

1. Remove any discs from the optical drive.
2. Click **Computer** and then click **System Monitor**.
3. On the **Hardware** tab, identify the Storage Controller in the **Type** column.
4. Click the triangle next to the devices until you locate your optical drive. If the drive is listed, it should be functioning correctly.

A disc does not play

- Save your work and close all open programs before playing a CD.
- Log off the Internet before playing a CD.
- Be sure that you insert the disc properly.
- Be sure that the disc is clean. If necessary, clean the disc with filtered water and a lint-free cloth. Wipe from the center of the disc to the outer edge.
- Check the disc for scratches. If you find scratches, treat the disc with an optical disc repair kit available at many electronics stores.
- Disable Suspend mode before playing the disc.

Do not initiate Hibernation or Suspend while playing a disc. Otherwise, you may see a warning message asking if you want to continue. If this message is displayed, click **No**. After you click No, the computer may behave in either of the following ways:


- Playback may resume.

– or –

- The playback window in the multimedia program may close. To return to playing the disc, click the **Play** button in your multimedia program to restart the disc. In rare cases, you may need to exit the program and then restart it.

A movie is not visible on an external display

1. If both the computer display and an external display are turned on, press **f4** one or more times to switch between the 2 displays.
2. Configure the monitor settings to make the external display primary:
 - a. Right-click on a blank area of the computer desktop, and select **Screen resolution**.
 - b. Specify a primary display and a secondary display.


 **NOTE:** When using both displays, the DVD image will not appear on any display designated as the secondary display.

The process of burning a disc does not begin, or it stops before completion

- Be sure that all other programs are closed.
- Turn off Suspend mode and Hibernation.
- Be sure that you are using the right kind of disc for your drive.
- Be sure that the disc is inserted properly.
- Select a slower write speed and try again.
- If you are copying a disc, save the information on the source disc to your hard drive before trying to burn the contents to a new disc, and then burn from your hard drive.


Contacting customer support

If the information provided in this guide does not address your questions, you can contact HP Customer Support at: <http://www.hp.com/go/contactHP>.

 **NOTE:** For worldwide support, click **Contact HP worldwide** on the left side of the page, or go to http://welcome.hp.com/country/us/en/wwcontact_us.html.

Here you can:

- Chat online with an HP technician.

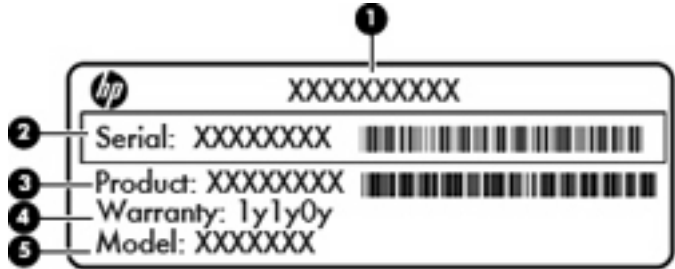
 **NOTE:** When technical support chat is not available in a particular language, it is available in English.

- E-mail HP Customer Support.
- Find HP Customer Support worldwide telephone numbers.
- Locate an HP service center.

Labels

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

- Serial number label—Provides important information, including the following:



Component	
(1)	Product name
(2)	Serial number (s/n)
(3)	Part number/Product number (p/n)
(4)	Warranty period
(5)	Model description

Have this information available when you contact technical support. The serial number label is affixed inside the battery bay.

- Regulatory label—Provides regulatory information about the computer. The regulatory label is affixed inside the battery bay.
- Wireless certification label or labels (select models only)—Provide information about optional wireless devices and the approval markings of some of the countries or regions in which the devices have been approved for use. If your computer model includes one or more wireless devices, one or more certification labels are included with your computer. You may need this information when traveling internationally. Wireless certification labels are affixed inside the battery bay.

B Routine care

- [Cleaning the display](#)
- [Cleaning the TouchPad and keyboard](#)

Cleaning the display

△ **CAUTION:** To prevent permanent damage to the computer, never spray water, cleaning fluids, or chemicals on the display.

To remove smudges and lint, frequently clean the display with a soft damp, lint-free cloth. If the screen requires additional cleaning, use premoistened antistatic wipes or an antistatic screen cleaner.

Cleaning the TouchPad and keyboard

Dirt and grease on the TouchPad can cause the pointer to jump around on the screen. To avoid this, clean the TouchPad with a damp cloth, and wash your hands frequently when using the computer.

⚠ **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.

Clean the keyboard regularly to prevent keys from sticking, and to remove dust, lint, and particles that can become trapped beneath the keys. A can of compressed air with a straw extension can be used to blow air around and under the keys to loosen and remove debris.

C Specifications

- [Input power](#)
- [Operating environment](#)


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 supplied and approved by HP for use with this computer.

The computer can operate on DC power within the following specifications.

Input power	Rating
Operating voltage and current	18.5 V dc @ 3.5 A - 65W

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

NOTE: The computer operating voltage and current can be found on the system regulatory label inside the battery bay of the computer.

Operating environment

Factor	Metric	U.S.
Temperature		
Operating (writing to optical disc)	5°C to 35°C	41°F to 95°F
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

D 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, unplug it after being properly grounded and before removing a cover.
- 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 of the component.
- If you remove a component, place it in an electrostatic-safe container.

If you need more information about static electricity or assistance with component removal or installation, contact Customer Support.

Index

- A**
 - AC adapter light, identifying 8
 - AC adapter, identifying 13
 - action keys
 - identifying 7
 - volume 26
 - airport security devices 39
 - antennas 11
 - application key, identifying 7
 - audio features 25
 - audio functions, checking 26
 - audio-in (microphone) jack, identifying 9
 - audio-out (headphone) jack, identifying 9
- B**
 - backup 53
 - battery
 - charging 33
 - conserving power 35
 - disposing 36
 - life 34
 - low battery levels 34
 - storing 35
 - battery bay, identifying 12
 - battery power 30
 - battery release latch, identifying 12
 - battery temperature 35
 - battery, identifying 13
 - battery, replacing 32
 - bays
 - battery 12
 - hard drive 12
 - Bluetooth device 19
 - Bluetooth label 63
 - buttons
 - power 6
 - TouchPad 4
 - volume 26
- C**
 - cables
 - LAN 19
 - USB 44
 - calculator key, identifying 7
 - caps lock light, identifying 5
 - charging batteries 33
 - checking audio functions 26
 - compartments
 - memory module 12
 - components
 - additional hardware 13
 - bottom 12
 - display 10
 - left-side 9
 - right-side 8
 - top 4
 - connecting to a WLAN 17
 - connector, power 8
 - conservation, power 35
 - cord, power 13
 - corporate WLAN connection 17
 - critical battery level 34
- D**
 - default settings, restoring 57
 - drive media 29
 - drives
 - external 46
 - handling 38
 - hard 46
 - optical 8
- E**
 - electrostatic discharge 69
 - external devices 46
 - external drive 46
 - external monitor port 27
 - external monitor port, identifying 9
- F**
 - factory settings, restoring 57
 - firewall 18
- H**
 - hard drive
 - external 46
 - installing 40
 - removing 39
 - hard drive bay, identifying 12
 - hard drive light, identifying 9
 - headphone jack, identifying 9
 - Hibernation
 - exiting 29
 - initiated during critical battery level 34
 - initiating 29
 - hubs 44
- I**
 - icons
 - network 16
 - wired network 16
 - wireless 16
 - input power 67
 - integrated webcam light, identifying 10
 - integrated webcam, identifying 10
 - internal microphones, identifying 10
 - Internet connection setup 17
 - issues, resolving 58

J

jacks

- audio-in (microphone) 9
- audio-out (headphone) 9
- RJ-45 (network) 9

K

keys

- action 7
- application key 7
- calculator 7
- media application 7
- print 7
- send e-mail 7
- start menu 7
- volume 26
- web browser 7

L

labels

- Bluetooth 63
- regulatory 63
- serial number 63
- wireless certification 63
- WLAN 63

latch, battery release 12

lights

- caps lock 5
- hard drive 9
- optical drive 8
- power 5, 8
- TouchPad 4
- webcam 10
- wireless 5

local area network (LAN)

- connecting cable 19

low battery level 34

M

media application key, identifying 7

media controls 24

memory module

- inserting 48
- removing 48

memory module compartment

- identifying 12
- removing cover 48
- replacing cover 49

microphone jack, identifying 9

monitor port, external 9

mouse, external

- setting preferences 23

N

network cable

- connecting 19
- noise suppression circuitry 19

network connection icons 16

noise suppression circuitry

- network cable 19

O

operating environment 67

operating system, passwords set in 52

optical disc

- playing 42
- removing 42

optical drive light, identifying 8

optical drive, identifying 8

optional external devices, using 46

P

passwords

- set in operating system 52

ports

- external monitor 9, 27
- USB 8, 9, 44
- VGA 9, 27

power

- conserving 35

power button, identifying 6

power connector, identifying 8

power cord, identifying 13

power light, identifying 5

print key, identifying 7

product name and number, computer 63

public WLAN connection 17

R

readable media 29

recovery 53

regulatory information

- regulatory label 63
- wireless certification labels 63

RJ-45 (network) jack,

- identifying 9

S

security cable slot, identifying 8

security, wireless 18

send e-mail key, identifying 7

serial number 63

serial number, computer 63

setup of WLAN 17

Setup Utility

- changing the language 56

displaying system

- information 57

exiting 57

navigating 56

restoring default settings 57

selecting 56

starting 56

shut down 28

slots

- memory module 12

- security cable 8

speakers, identifying 6

start menu key, identifying 7

storing battery 35

Suspend

- exiting 29

- initiating 29

system information, displaying 57

T

temperature 35

TouchPad

- buttons 4

- identifying 4, 23

- light 4, 5

- setting preferences 23

- zone 4

traveling with the computer 35, 63

troubleshooting

- disc burning 62

- disc play 61

- external display 61

- optical disc tray 60

- optical drive detection 61

turning off the computer 28

U

unresponsive system 28

USB cable, connecting 44

- USB devices
 - connecting 44
 - description 44
 - removing 46
- USB hubs 44
- USB ports, identifying 8, 9, 44

V

- vents, identifying 9, 12
- VGA port
 - connecting 27
 - identifying 9
- video, using 27
- volume
 - adjusting 26
 - buttons 26
 - keys 26

W

- web browser key, identifying 7
- webcam
 - light 10
 - using 26
- wireless antennas 11
- wireless button
 - identifying 22
 - using 16
- wireless certification label 63
- wireless devices, types 16
- wireless encryption 18
- wireless icon 16
- wireless light 16
- wireless light, identifying 5
- wireless network (WLAN)
 - connecting 17
 - corporate WLAN
 - connection 17
 - described 16
 - device 63
 - equipment needed 17
 - label 63
 - public WLAN connection 17
 - security 18
- writable media 29