HP ProBook Notebook PC

User Guide

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First Edition: May 2010

Document Part Number: 617330-001

Product notice

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

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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1 Features

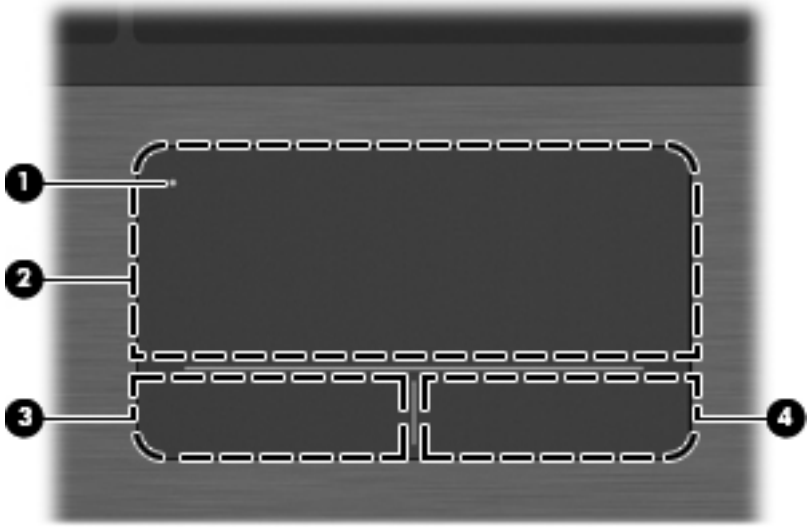
Identifying hardware

Components included with the computer may vary by region and model. The illustrations in this chapter identify the standard features on most computer models.

To see a list of hardware installed in the computer, select **Computer > Control Center > YaST > Hardware Information**.

Top components

TouchPad



Component		Description
(1)	TouchPad off indicator	To turn the TouchPad on and off, quickly double-tap the TouchPad off indicator. **NOTE:** When the TouchPad is active, the light is off.
(2)	TouchPad*	Moves the pointer and selects or activates items on the screen.
(3)	Left TouchPad control*	Functions like the left button on an external mouse.
(4)	Right TouchPad control*	Functions like the right button on an external mouse.

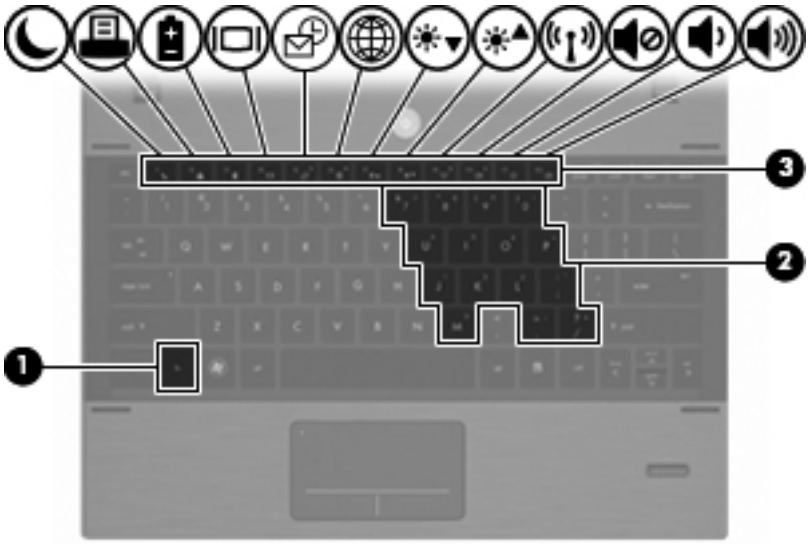
Lights

Component		Description
(1)	TouchPad off indicator	• Off: the TouchPad is on. • Amber: the TouchPad is off. To switch between active and inactive, quickly double-tap the TouchPad off indicator.
(2)	Caps lock light	On: Caps lock is on.
(3)	E-mail client light	Blinking: Launching Evolution e-mail client.
(4)	Web browser light	Blinking: Launching Firefox browser.
(5)	Power light	• On: The computer is on. • Blinking: The computer is in the Suspend state. • Off: The computer is off or in Hibernation.
(6)	Wireless light	• White: An integrated wireless device, such as a wireless local area network (WLAN) device and/or a Bluetooth® device (select models only), is on. • Amber: All wireless devices are off.
(7)	Sound mute light	• On: The speaker sound is muted. • Off: The speaker sound is not muted.

Power button

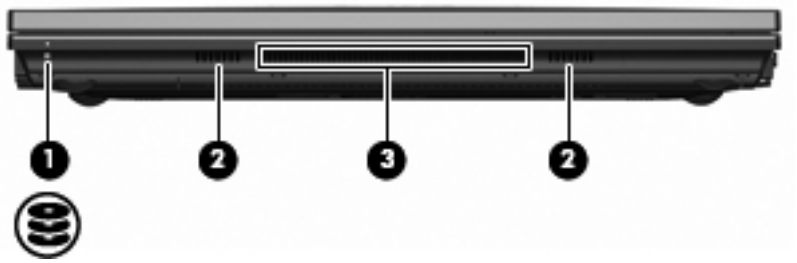
Component	Description
Power button	• When the computer is off, press the button to turn on the computer. • When the computer is on, press the button to shut down the computer. • When the computer is in the Suspend state, press the button briefly to exit Suspend. • When the computer is in Hibernation, press the button briefly to exit Hibernation. 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. To learn more about your power settings, select **Computer > Control Center > System > Power Management**.

Keys



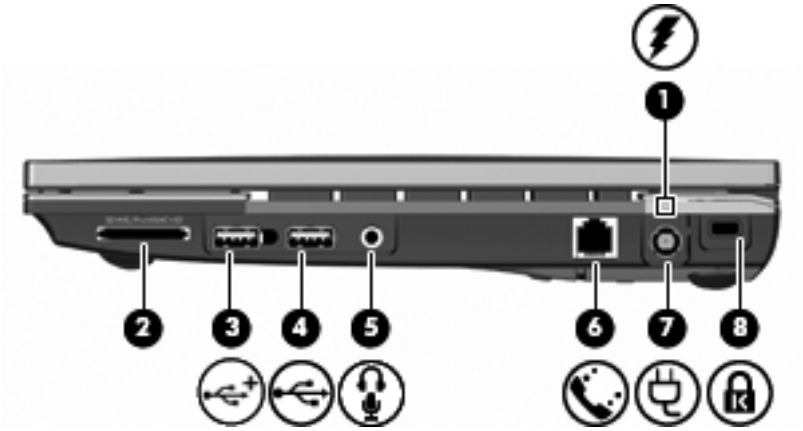
Component		Description
(1)	fn key	Executes frequently used system functions when pressed in combination with a function key.
(2)	Embedded numeric keypad keys	To enable the embedded numeric keypad keys, press the fn and num lk keys simultaneously. The embedded numeric keypad keys can then be used like the keys on an external numeric keypad. To disable the embedded numeric keypad keys, press the fn and num lk keys simultaneously again.
(3)	Function keys	Execute frequently used system functions when pressed in combination with the fn key.

Front components



Component		Description
(1)	Drive light	White: The hard drive is being accessed.
(2)	Speakers (2)	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.

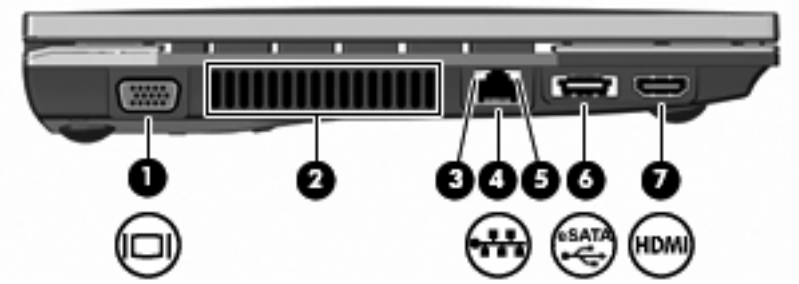
Right-side components



Component		Description
(1)	Battery light	• Amber: A battery is charging. • White: A battery is close to full charge capacity. • Off: If the computer is plugged into an external power source, the light turns off when all batteries in the computer are fully charged. If the computer is not plugged into an external power source, the light stays off until the battery reaches a low battery level.
(2)	Media Card Reader	Supports the following optional digital card formats: • Memory Stick (MS) • Memory Stick Pro (MSP) • Memory Stick Duo (adapter required) • Memory Stick Duo Pro (adapter required) • MultiMediaCard (MMC) • MultiMediaCard Plus • Secure Digital (SD) Memory Card • SD High Capacity (HC) Memory Card • microSD Memory Card (adapter required) • xD-Picture Card (XD)
(3)	Powered USB port	Provides power to a USB device, such as an optional external MultiBay or an optional external optical drive, if used with a powered USB cable.
(4)	USB port	Connects optional USB devices.
(5)	Audio-out (headphone)/Audio-in (microphone) jack	Produces sound when connected to optional powered stereo speakers, headphones, ear buds, a headset, or television audio. Also connects an optional headset microphone. **NOTE:** When a device is connected to the headphone jack, the computer speakers are disabled. **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*.

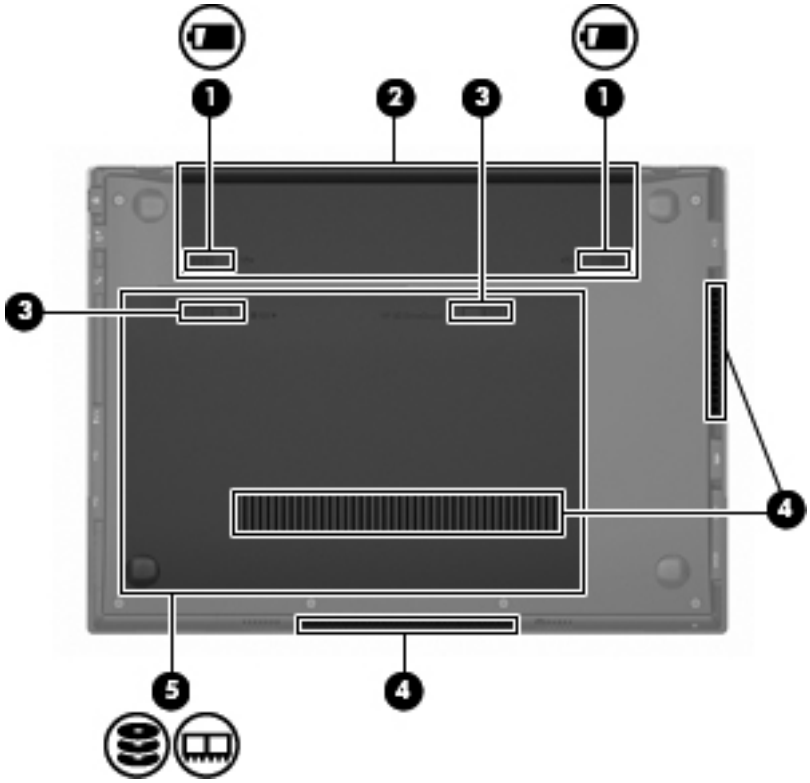
Component		Description
(6)	RJ-11 (modem) jack	Connects a modem cable.
(7)	Power connector	Connects an AC adapter.
(8)	Security cable slot	Attaches an optional security cable to the computer. **NOTE:** The security cable is designed to act as a deterrent, but it may not prevent the computer from being mishandled or stolen.

Left-side components



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)	Network activity light	Amber: Data is being transmitted over the network.
(4)	RJ-45 (network) jack	Connects a network cable.
(5)	Network connection light	Green: The computer is connected to the network.
(6)	USB/eSATA port	Connects a high-performance eSATA component, such as an eSATA external hard drive, or connects an optional USB device.
(7)	HDMI port	Connects an optional video or audio device, such as a high definition television, or any compatible digital or audio component.

Bottom components



Component		Description
(1)	Battery release latches (2)	Release the battery from the battery bay.
(2)	Battery bay	Holds the battery and the subscriber identity module (SIM).
(3)	Service access door release latches (2).	Release the service access door.
(4)	Vents (3)	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.
(5)	Service access bay	Provides access to the hard drive, 2 memory module slots, and the wireless local area network (WLAN) module.

Display components

Component		Description
(1)	Internal display switch	Initiates Hibernation, the Suspend state, the screen saver, or turns off the display if the display cover is closed while the power is on.
(2)	Internal microphone	Records sound.
(3)	Webcam light (select models only)	On: The webcam is in use.
(4)	Webcam (select models only)	Records audio and video and captures still photographs.

Wireless antennas

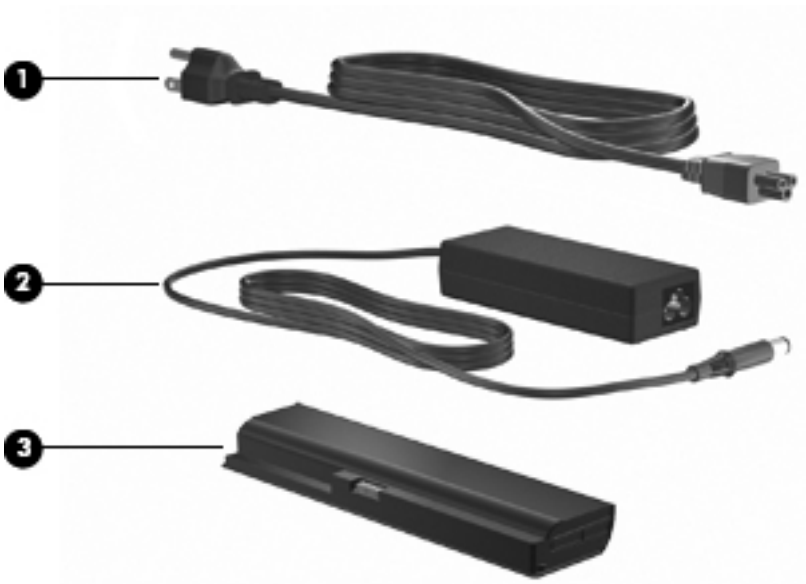
Your computer has at least two antennas that send and receive signals from one or more wireless devices. These antennas are not visible from the outside of the computer.

Component		Description
(1)	WWAN antennas (2)* (select models only)	Send and receive wireless signals to communicate with wireless wide-area networks (WWANs).
(2)	WLAN antennas (2)*	Send and receive wireless signals to communicate with wireless local area networks (WLANs).

* For optimal transmission, keep the area immediately around the antennas 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 and Support.

Additional hardware components



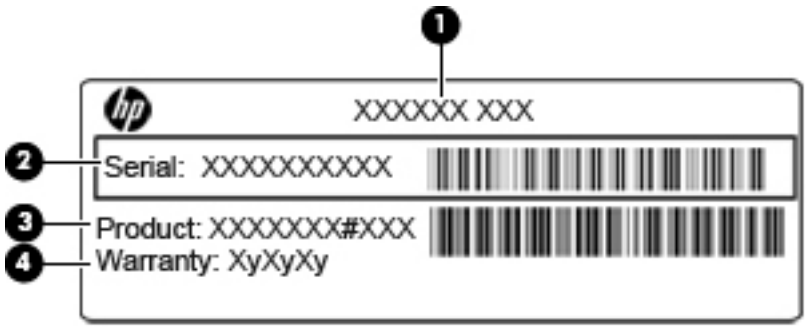
Component		Description
(1)	Power cord*	Connects an AC adapter to an AC outlet.
(2)	AC adapter	Converts AC power to DC power.
(3)	Battery	Powers the computer when the computer is not plugged into external power.

*Power cords vary in appearance by country or region.

Identifying the labels

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

- Service tag—Provides important information, including the following:



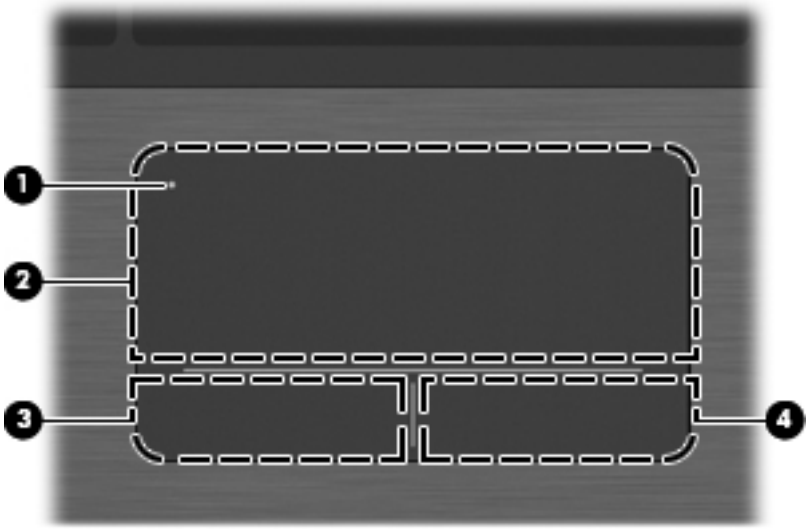
  - Product name **(1)**. This is the product name affixed to the front of the computer.
  - Serial number (s/n) **(2)**. This is an alphanumeric identifier that is unique to each product.

- Part number/Product number (p/n) **(3)**. This number provides specific information about the product's hardware components. The part number helps a service technician to determine what components and parts are needed.
- Warranty period **(4)**. This number describes the duration of the warranty period for the computer.

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

- Regulatory label—Provides regulatory information about the computer. The regulatory label is affixed inside the battery bay.
- Modem approval label—Provides regulatory information about the modem and lists the agency approval markings required by some of the countries in which the modem has been approved for use. You may need this information when traveling internationally. The modem approval label is affixed under the service access door.
- Wireless certification label(s)—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. An optional device may be a wireless local area network (WLAN) device or an optional Bluetooth® device (select models only). 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.
- SIM label (select models only)—Provides the ICCID (Integrated Circuit Card Identifier) of your SIM. This label is affixed under the service access door.

2 Pointing devices and keyboard



Component		Description
(1)	TouchPad off indicator	• When the TouchPad is active, the light is off. • When the TouchPad is inactive, the light is amber. To switch between active and inactive, quickly double-tap the TouchPad off indicator.
(2)	TouchPad	Moves the pointer and selects or activates items on the screen.
(3)	Left TouchPad control	Use the left side of the TouchPad control like the left button on an external mouse.
(4)	Right TouchPad control	Use the right side of the TouchPad control like the right button on an external mouse.

Using pointing devices

Setting pointing device preferences

Use Mouse Properties or TouchPad to customize settings for pointing devices, such as button configuration, click speed, and pointer options.

To access Mouse Properties, select **Computer > Control Center > Mouse**.

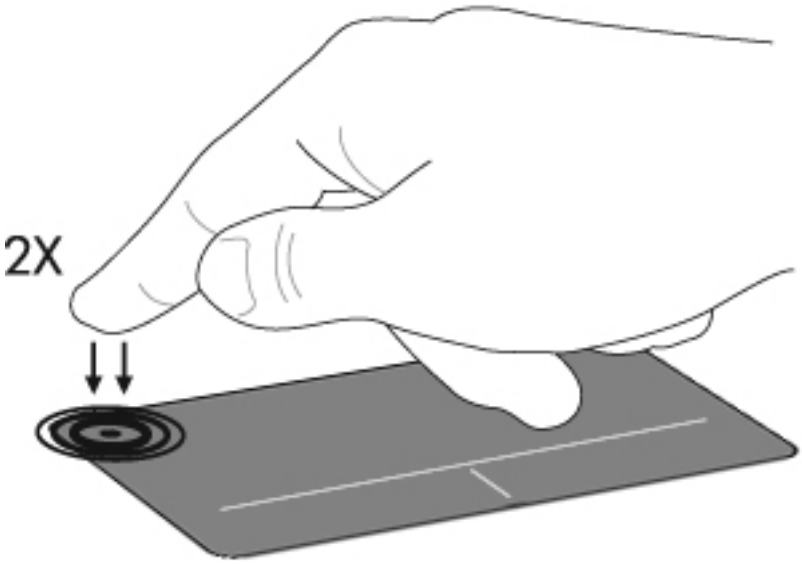
To access TouchPad properties, select **Computer > Control Center > TouchPad**.

Using the TouchPad

Turning the TouchPad on and off

The TouchPad is turned on at the factory. When the TouchPad is active, the light is off.

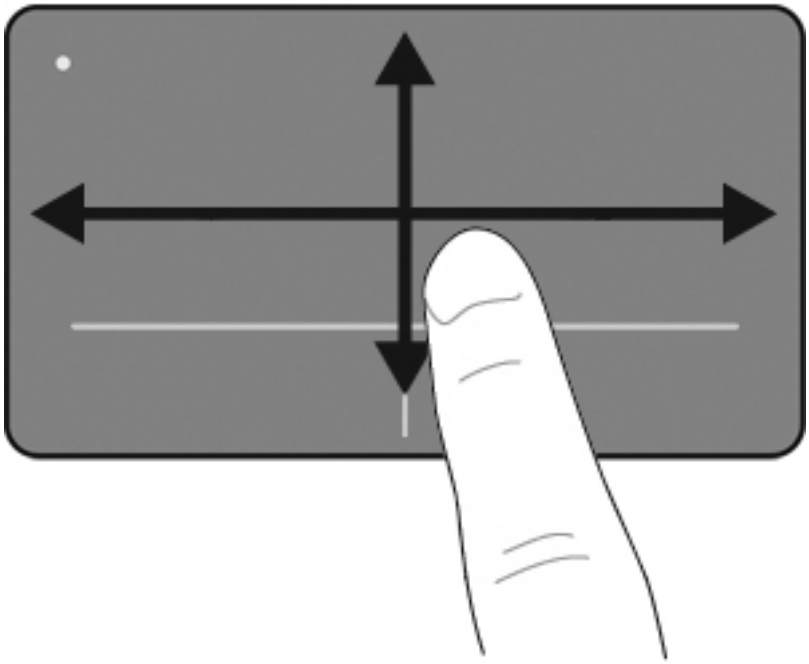
To turn the TouchPad on or off, quickly double-tap the TouchPad off indicator.



Navigating

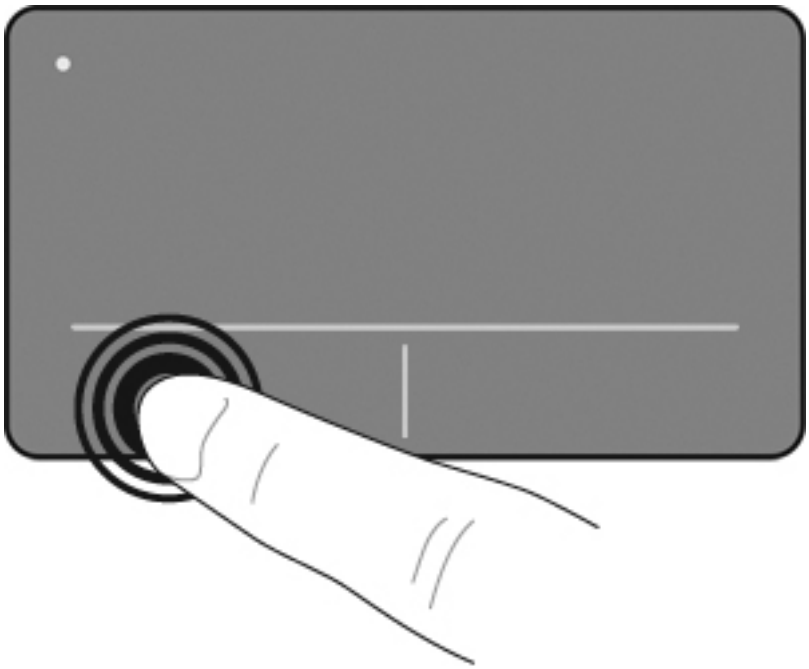
To move the pointer, touch and slide your finger across the TouchPad surface in the direction you want the pointer to go. Use the left and right TouchPad controls like the corresponding controls on an external mouse. The scroll zone is the area above the TouchPad controls. To scroll up and down using the TouchPad, touch and slide one or two fingers up or down over the scroll zone.

NOTE: If you are using the TouchPad to move the pointer, you must lift your finger off the TouchPad before starting to scroll.



Selecting

Use the left and right TouchPad controls like the corresponding controls on an external mouse.



Connecting an external mouse

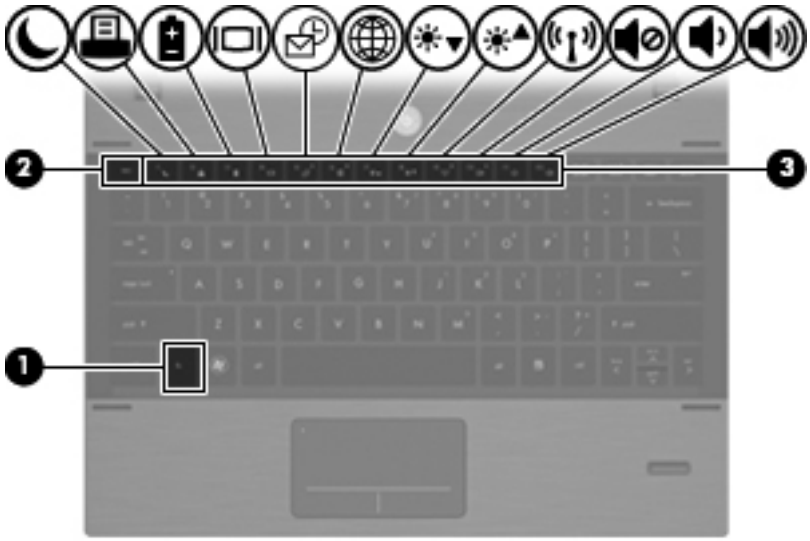
You can connect an external USB mouse to the computer using one of the USB ports on the computer. A USB mouse can also be connected to the system using the ports on an optional docking device or expansion product.

Using the keyboard

Using hotkeys

Hotkeys are combinations of the fn key **(1)** and either the esc key **(2)** or one of the function keys **(3)**.

The icons on the f1 through f12 keys represent the hotkey functions. Hotkey functions and procedures are discussed in the following sections.



Function	Hotkey
Initiate Suspend	fn+f1
Open the Print Options window	fn+f2
Show battery power information	fn+f3
Switch the screen image	fn+f4
Open the e-mail client	fn+f5
Open the Web browser	fn+f6
Decrease screen brightness	fn+f7
Increase screen brightness	fn+f8
Turn wireless features on and off	fn+f9
Mute or restore speaker sound	fn+f10
Decrease speaker volume	fn+f11
Increase speaker volume	fn+f12

To use a hotkey command on the computer keyboard, follow either of these steps:

- Briefly press the fn key, and then briefly press the second key of the hotkey command.

  – or –

- Press and hold down the fn key, briefly press the second key of the hotkey command, and then release both keys at the same time.

Initiating Suspend

△ **CAUTION:** To reduce the risk of information loss, save your work before initiating Suspend. In the event of a power failure, you could lose unsaved information.

Press fn+f1 to initiate Suspend.

When Suspend is initiated, your information is stored in system memory, the monitor(s) and hard disk are turned off, and power is conserved. While the computer is in the Suspend state, the power lights blink. Use Suspend to save power when you will be away from the computer for a short time. When you return to the computer, the desktop is restored. The computer must be on before you can initiate Suspend.

To exit Suspend, briefly press the power button or press any key on the keyboard.

Opening the Print Options window

Press fn+f2 (or Ctrl+P) to launch the print option of the application on the current active window.

Displaying battery status

Press fn+f3 to display the battery status.

Switching the screen image

Press fn+f4 to switch the screen image among display devices connected to the system. For example, if a monitor is connected to the computer, pressing fn+f4 alternates the screen image from computer display to monitor display to simultaneous display on both the computer and the monitor.

Most external monitors receive video information from the computer using the external VGA video standard. The fn+f4 hotkey can also alternate images among other devices receiving video information from the computer.

The following video transmission types, with examples of devices that use them, are supported by the fn+f4 hotkey:

- LCD (computer display)
- External VGA (most external monitors)
- HDMI (televisions, camcorders, DVD players, VCRs, and video capture cards with HDMI ports)
- Composite video (televisions, camcorders, DVD players, VCRs, and video capture cards with composite-video-in jacks)

NOTE: Composite video devices can be connected to the system only by using an optional docking device.

Opening the default e-mail application

Press fn+f5 to open the default e-mail application.

Opening the default Web browser

Press fn+f6 to open the default Web browser.

Decreasing screen brightness

Press fn+f7 to decrease screen brightness. Hold down the hotkey to decrease the brightness level incrementally.

Increasing screen brightness

Press fn+f8 to increase screen brightness. Hold down the hotkey to increase the brightness level incrementally.

Turning wireless features on and off

Press fn+f9 to turn the wireless feature on or off. Note that this hotkey cannot be used to establish a wireless connection.

Muting and restoring speaker sound

Press fn+f10 to mute speaker sound. Press the hotkey again to restore speaker sound.

Decreasing speaker volume

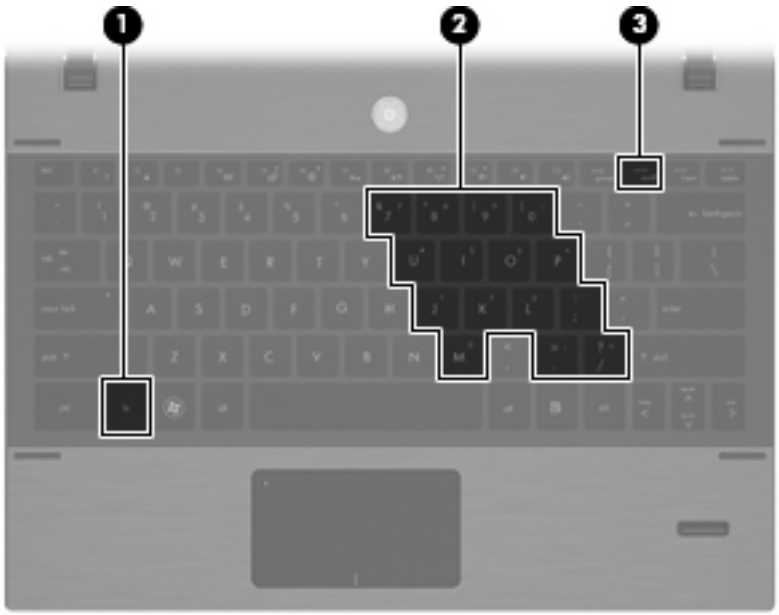
Press fn+f11 to decrease speaker volume. Hold down the hotkey to decrease speaker volume incrementally.

Increasing speaker volume

Press fn+f12 to increase speaker volume. Hold down the hotkey to increase speaker volume incrementally.

Using keypads

The computer has an embedded numeric keypad and also supports an optional external numeric keypad or an optional external keyboard that includes a numeric keypad.



Component		Description
(1)	fn key	Enables/disables the embedded numeric keypad when pressed in combination with the num lk key.

Component		Description
(2)	Embedded numeric keypad	When the keypad has been enabled, it can be used like an external numeric keypad.
(3)	num lk key	Enables/disables the embedded numeric keypad when pressed in combination with the fn key.

Using the embedded numeric keypad

The 15 keys of the embedded numeric keypad can be used like the keys on an external keypad. When the embedded numeric keypad is turned on, each key on the keypad performs the function indicated by the icon in the upper-right corner of the key.

Enabling and disabling the embedded numeric keypad

Press fn+num lk to enable the embedded numeric keypad. Press fn+num lk again to return the keys to their standard keyboard functions.

NOTE: The embedded numeric keypad will not function while an external keyboard or numeric keypad is connected to the computer, an optional docking device, or an optional expansion product.

Switching key functions on the embedded numeric keypad

You can temporarily alternate the functions of keys on the embedded numeric keypad between their standard keyboard functions and their keypad functions by using the fn key or the fn+shift key combination.

- To change the function of a keypad key to keypad functions while the keypad is off, press and hold the fn key while pressing the keypad key.
- To use the keypad keys temporarily as standard keys while the keypad is on:
  - Press and hold the fn key to type in lowercase.
  - Press and hold fn+shift to type in uppercase.

Using an optional external numeric keypad

Keys on most external numeric keypads function differently according to whether num lock is on or off. (Num lock is turned off at the factory.) For example:

- When num lock is on, most keypad keys type numbers.
- When num lock is off, most keypad keys function like the arrow, page up, or page down keys.

To turn num lock on or off on an external keypad as you work:

▲ Press the num lk key on the external keypad, not on the computer.

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.

3 Multimedia

Multimedia features

Your computer includes multimedia features that allow you to listen to music and view pictures. Your computer may include the following multimedia components:

- Integrated speakers for listening to music
- Integrated microphone for recording your own audio
- Integrated webcam (select models only) that allows you to capture and share video
- Preinstalled multimedia software that allows you to play and manage your music and pictures
- Hotkeys that provide fast access to volume control

NOTE: Your computer may not include all of the components listed.

The following sections explain how to identify and use the multimedia components included with your computer.

Identifying your multimedia components

The following illustration and table describe the multimedia features of the computer.

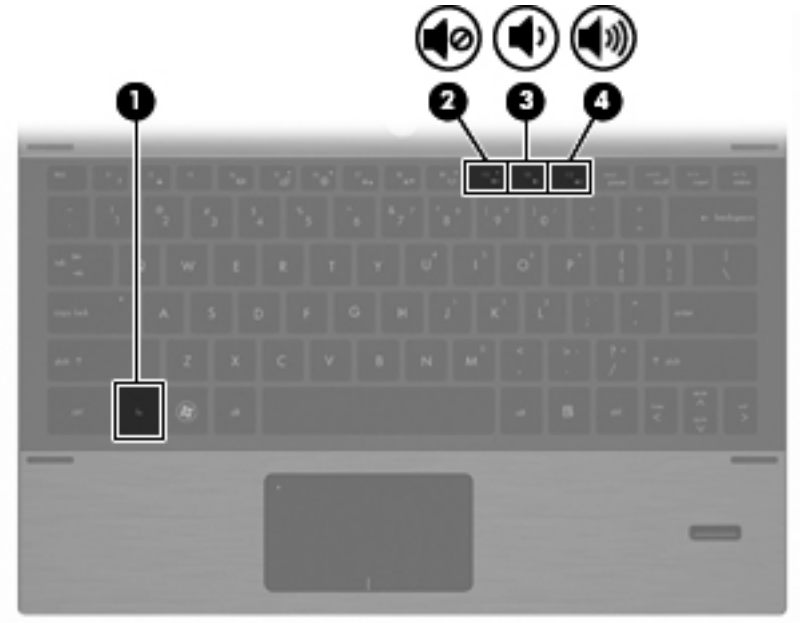
Component		Description
(1)	Internal microphone	Records sound.

Component		Description
(2)	Webcam (select models only)	Records audio and video and captures still photographs.
(3)	Audio-out (headphone) jack/Audio-in (microphone) jack	Produces sound when connected to optional powered stereo speakers, headphones, ear buds, or a headset. Also connects an optional headset microphone. **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.
(4)	Speakers (2)	Produce sound.

Adjusting the volume

You can adjust the volume using the following controls:

- A computer volume hotkey—A combination of the fn key **(1)** and either the f10 **(2)**, f11 **(3)**, or f12 **(4)** function key:
  - To mute or restore volume, press fn+f10.
  - To decrease volume, press fn+f11.
  - To increase volume, press fn+f12.



- Operating system volume control:
  a. Click the **Volume** icon in the notification area, at the far right of the taskbar.
  b. Increase or decrease the volume by moving the slider up or down.

– or –

▲ Right-click the **Volume** icon to view volume options, such as Mute, Volume Control, and Preferences.

Multimedia software

Your computer includes preinstalled multimedia software that allows you to play music and view pictures. The following sections provide details about preinstalled multimedia software and installing multimedia software from a disc.

Accessing your preinstalled multimedia software

To access your preinstalled multimedia software:

▲ Select **Computer > More Applications**, and then open the multimedia program you want to use.

Installing multimedia software from a disc

NOTE: To install multimedia software from a disc, you must connect an external optical drive (purchased separately) to the computer. The computer provides one powered USB port on the right side of the computer. This port provides power to an external optical drive when used with a powered USB cable. An external optical drive connected to the other USB port on the computer must be connected to AC power.

To install any multimedia software from a CD or DVD, follow these steps:

1. Insert the disc into a connected external optical drive.
2. When the installation wizard opens, follow the on-screen instructions.
3. Restart the computer if you are prompted to do so.

Audio

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

- Play music using your computer speakers and/or connected external speakers
- Record sound using the internal microphone or connect an external microphone
- Download music from the Internet
- Create multimedia presentations using audio and images
- Transmit sound and images with instant messaging programs
- Stream radio programs (select models only) or receive FM radio signals
- Create or “burn” audio CDs using an external optical drive

Connecting external audio devices

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*.

To connect external devices such as external speakers, headphones, or a microphone, refer to the information provided with the device. For best results, remember the following tips:

- Be sure that the device cable is securely connected to the correct jack on your computer. (Cable connectors are normally color-coded to match the corresponding jacks on the computer.)
- Be sure to install any drivers required by the external device.

NOTE: A driver is a required program that acts like a translator between the device and the programs that use the device.

Checking your audio functions

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

1. Select **Computer > Control Center > System > Sound**.
2. Click **Sound**.
3. When the Sound window opens, click the **Sounds** tab.
4. Under the **Sounds** tab, select the **Device** tab.
5. Under Sound Events, click a **Test** button for a corresponding sound event to test system sound.

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

1. Select **Computer > More Applications > Sound Recorder**.
2. Click **Record**, and then speak into the microphone. Save the file to your desktop.
3. To play the sound, select **Computer > More Applications**.
4. Open an audio player, such as Helix Banshee, and play back the sound.

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 on the taskbar.

Connecting an HDMI device

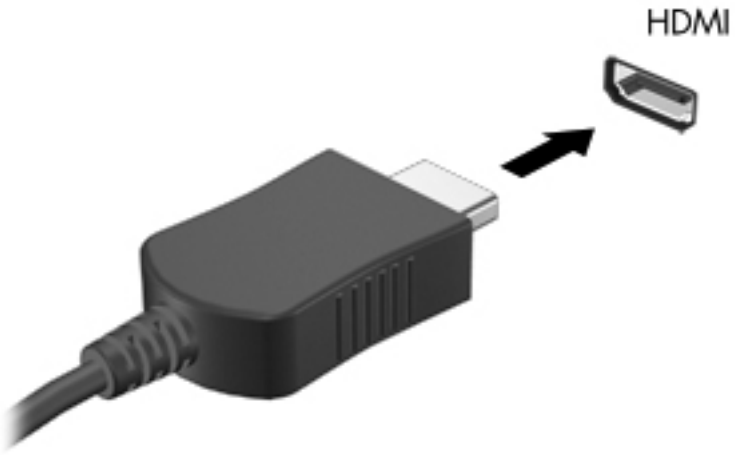
Select computer models include an HDMI (High Definition Multimedia Interface) port. The HDMI port connects the computer to an optional video or audio device, such as a high-definition television, or any compatible digital or audio component.

The computer can support one HDMI device connected to the HDMI port, while simultaneously supporting an image on the computer display or any other supported external display.

NOTE: To transmit video signals through the HDMI port, you need an HDMI cable (purchased separately), available from most electronics retailers.

To connect a video or audio device to the HDMI port:

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 video device, according to the device manufacturer's instructions.
3. Press f4 on the computer to switch the image between the display devices connected to the computer.

Video

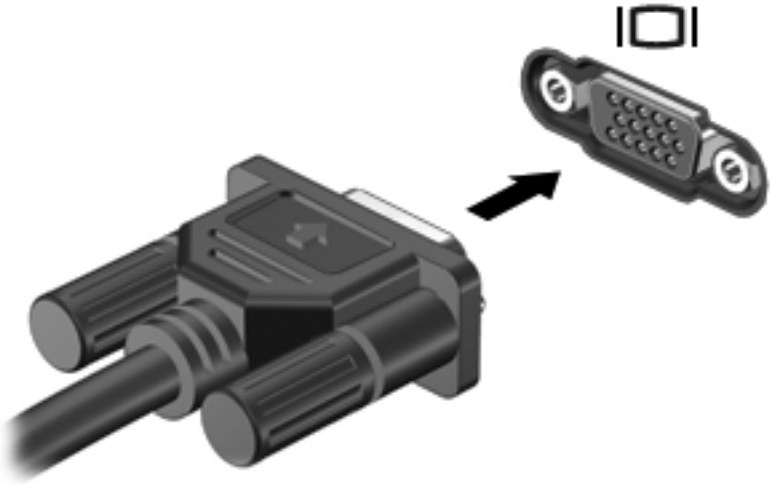
Your computer enables you to use a variety of video features:

- Play games over the Internet
- Edit pictures and video to create presentations
- Connect external video devices

Connecting an external monitor or projector

The external monitor port connects an external display device such as an external monitor or a projector to the computer.

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



NOTE: If a properly connected external display device does not display an image, press fn+f4 to transfer the image to the device. Repeatedly pressing fn+f4 alternates the screen image between the computer display and the device.

External optical drive (purchased separately)

An external optical drive (purchased separately) expands the functionality of the computer. An external optical drive allows you to read data discs, play music, and watch movies.

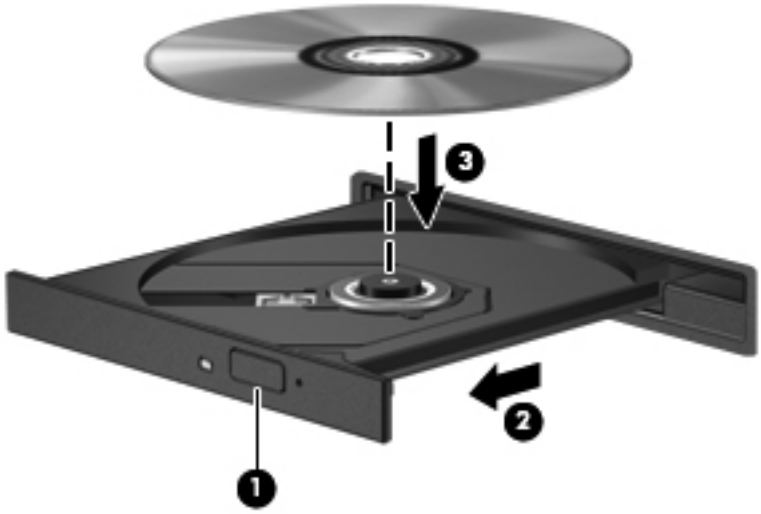
Playing music

NOTE: Be sure that the external optical drive is connected to your computer before beginning these steps.

1. Turn on the computer.
2. Press the release button **(1)** on the external optical drive bezel to release the disc tray.
3. Pull out the tray **(2)**.
4. Hold the disc by the edges 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.
7. Select **Computer > More Applications**.
8. You will be prompted to play or copy the disc.

NOTE: After you insert a disc, a short pause is normal.

If Suspend or Hibernation is accidentally initiated during playback of a disc:

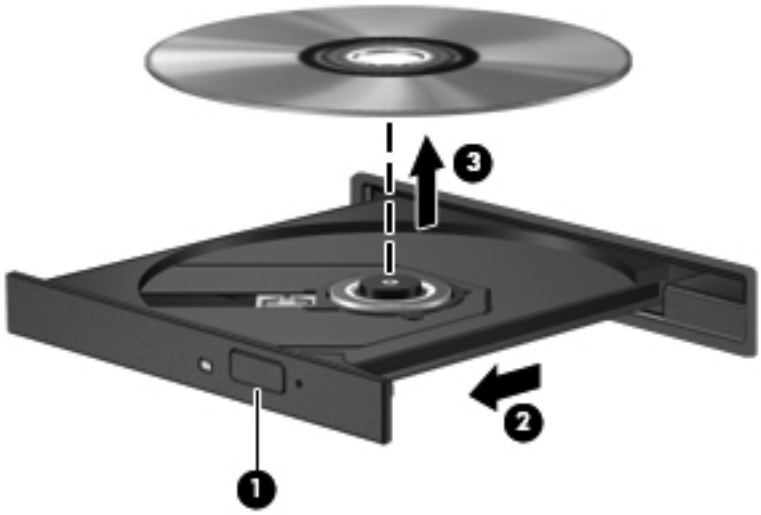
- Your playback may be interrupted.
- You may see a warning message asking if you want to continue. If this message is displayed, click **No**.
- You may need to restart the CD or DVD to resume playback.

Removing an optical disc (CD or DVD)

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 place the disc in a protective case.

Webcam (select models only)

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

Your computer may include an integrated webcam, located at the top of the display. With the preinstalled software, you can use the webcam to take a photo, record a video, or make an audio recording. You can preview the photo, video recording, or audio recording, and save it on your computer hard drive.

NOTE: Cheese is installed, and designed for use with the integrated webcam. To access Cheese, click **Computer > More Applications**.

NOTE: For information about using software designed for use with the integrated webcam, refer to the online Help for that software.

4 Power management

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 Suspend faster than exiting 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 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 Suspend state or in Hibernation.

Initiating and exiting Suspend

The system is set at the factory to initiate Suspend after 15 minutes of inactivity when running on battery power and 30 minutes of inactivity when running on 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:

- Click **Computer**, click **Shutdown**, 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

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.
- Click **Computer**, click **Shutdown**, and then click **Hibernation**.
- Click the **Power** icon located on the far right of the task bar, and then click **Hibernation**.

▲ To exit Hibernation:

Briefly press the power button.

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 then select a different power plan.

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

▲ Click the **Power** icon, located on the far right of the taskbar, and then click **Preferences**.

Changing the current power management settings

1. Click the **Power** icon, located on the far right of the taskbar, and then click **Preferences**.
2. Change the **Running on AC**, **Running on Battery**, and **General** settings, as needed.

Using external AC power

External AC power is supplied through one of the following devices:

⚠ **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.

- Approved AC adapter
- Optional docking device (select models only) or expansion product

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

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

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

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. To increase display brightness, press the fn+f8 hotkey or reconnect the AC adapter.

Connecting the AC adapter

⚠ **WARNING!** To reduce the risk of electric shock or damage to the equipment:

Plug the power cord into an AC outlet that is easily accessible at all times.

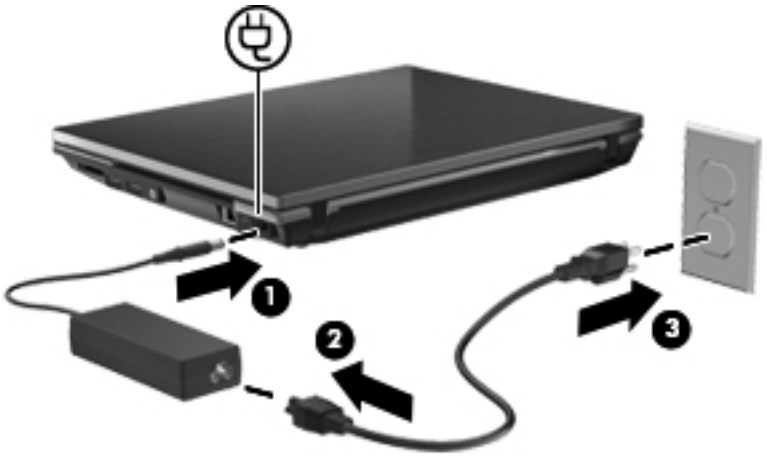
Disconnect power from the computer by unplugging the power cord from the AC outlet (not by unplugging the power cord from the computer).

If provided with a 3-pin attachment plug on the power cord, plug the cord into a grounded (earthed) 3-pin outlet. Do not disable the power cord grounding pin, for example, by attaching a 2-pin adapter. The grounding pin is an important safety feature.

To connect the computer to external AC power:

1. Plug the AC adapter into the power connector **(1)** on the computer.
2. Plug the power cord into the AC adapter **(2)**.
3. Plug the other end of the power cord into an AC outlet **(3)**.

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



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 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: The display brightness is decreased to save battery life when you disconnect AC power. To increase display brightness, use the fn+f8 hotkey or reconnect the AC adapter.

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.

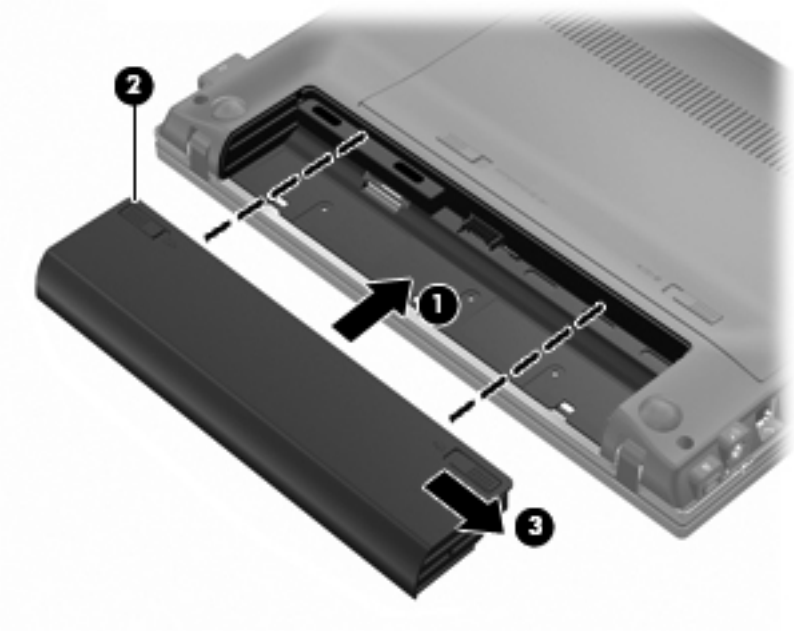
Inserting or removing the battery

△ **CAUTION:** Removing a battery that is the sole power source can cause loss of information. To prevent loss of information, initiate Hibernation or shut down the computer before removing the battery.

To insert the battery:

1. Turn the computer upside down on a flat surface, with the battery bay toward you.
2. Insert the battery into the battery bay **(1)** until it is seated.

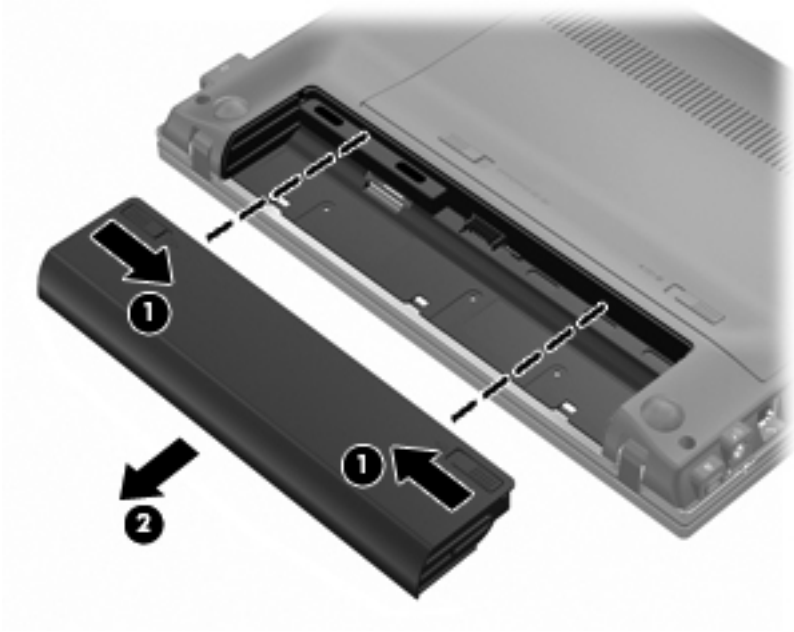
   The battery release latches **(2)** automatically lock the battery into place.



To remove the battery:

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

3. Remove the battery **(2)**.



Charging a battery

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

The battery charges whenever the computer is plugged into external power through an AC adapter, an optional power adapter, an optional expansion product, or an optional docking device (select models only).

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.
- Charge the battery until the battery light turns off.

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.

The battery light displays charge status:

- On: The battery is charging.
- Blinking: The battery has reached a low battery level or critical battery level and is not charging.
- Off: The battery is fully charged, in use, or not installed.

Maximizing battery discharge time

Battery discharge time varies, depending on the features you use while on battery power. Maximum discharge time gradually shortens as the battery storage capacity naturally degrades.

Tips for maximizing battery discharge time:

- Lower the brightness on the display.
- Remove the battery from the computer when it is not being used or charged.
- Store the battery in a cool, dry location.
- Select the Powersave setting in Power Management.

To select the Powersave setting in Power Management:

1. Click **Computer**, click **Control Center**, and then click **Power Management**.
2. Under the **General** tab, click **System Settings**.
3. Under **Battery Powered**, select **Powersave**.
4. Click **Finish**.

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 battery level, the battery light blinks.

If a low battery level is not resolved, the computer enters a critical battery level, and the battery light continues to blink.

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

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

Resolving a low battery level

△ **CAUTION:** To reduce the risk of losing information when the computer reaches a critical battery level and has initiated Hibernation, do not restore power until the power lights turn off.

Resolving a low battery level when external power is available

▲ Connect one of the following devices:

- AC adapter
- Optional expansion product or docking device (select models only)
- Optional power adapter

Resolving a low battery level when a charged battery is available

1. Turn off the computer or initiate Hibernation.
2. Remove the discharged battery, and then insert a charged battery.
3. Turn on the computer.

Resolving a low battery level when no power source is available

- Initiate Hibernation.

  – or –

  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. Insert a charged battery or plug the computer into external power.
2. Exit Hibernation by pressing the power button.

Calibrating a battery

Calibrate a battery under the following conditions:

- When battery charge displays seem inaccurate
- When you observe a significant change in battery run time.

Even if a battery is heavily used, it should not need to be calibrated more than once a month. It also is not necessary to calibrate a new battery.

Step 1: Fully charge the battery

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

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

To fully charge the battery:

1. Insert the battery into the computer.
2. Connect the computer to an AC adapter, optional power adapter, optional expansion product, or optional docking device (select models only), and then plug the adapter or device into external power.

   The battery light on the computer turns on.
3. Leave the computer plugged into external power until the battery is fully charged.

   The battery light on the computer turns off.

Step 2: Disable Hibernation and Suspend

1. Click the **Power** icon, located on the far right of the taskbar, and then click **Preferences**.
2. Under the **Running on AC** and **Running on Battery** tabs, record the current values for the following settings:
   - **Put the display to Suspend when the computer is inactive for:**
   - **Put the computer to Suspend when it is inactive for:**
3. Change all 4 settings to **Never**.
4. Click **Close**.

Step 3: Discharge the battery

The computer must remain on while the battery is being discharged. The battery can discharge whether or not you are using the computer, but the battery will discharge faster while you are using it.

- If you plan to leave the computer unattended during the discharge, save your information before beginning the discharge procedure.
- If you use the computer occasionally during the discharge procedure and have set energy-saving timeouts, expect the following performance from the system during the discharge process:
  - The monitor will not turn off automatically.
  - Hard drive speed will not decrease automatically when the computer is idle.
  - System-initiated Hibernation will not occur.

To discharge the battery:

1. Unplug the computer from its external power source, but do *not* turn off the computer.
2. Run the computer on battery power until the battery is discharged. The battery light begins to blink when the battery has discharged to a low battery level. When the battery is discharged, the battery light turns off, and the computer shuts down.

Step 4: Fully recharge the battery

To recharge the battery:

1. Plug the computer into external power and maintain external power until the battery is fully recharged. When the battery is recharged, the battery light on the computer turns off.

   You can use the computer while the battery is recharging, but the battery will charge faster if the computer is off.
2. If the computer is off, turn it on when the battery is fully charged and the battery light has turned off.

Step 5: Reenable Hibernation and Suspend

△ **CAUTION:** Failure to reenable Hibernation after calibration may result in a full battery discharge and information loss if the computer reaches a critical battery level.

1. Click the **Power** icon, located on the far right of the taskbar, and then click **Preferences**.
2. Under the **Running on AC** and **Running on Battery** tabs, reset the previously recorded values for the following settings:
   - **Put the display to Suspend when the computer is inactive for:**
   - **Put the computer to Suspend when it is inactive for:**
3. Click **Close**.

Conserving battery power

- Select Powersave in Power Management under System Settings.
- Turn off wireless and local area network (LAN) connections and exit modem programs when you are not using them.
- Disconnect external devices that are not plugged into an external power source, when you are not using them.
- Stop, disable, or remove any external media cards that you are not using.
- Use the fn+f7 and fn+f8 hotkeys to adjust screen brightness as needed.
- If you leave your work, initiate Suspend or Hibernation, or shut down the computer.
- Remove the battery from the computer when it is not being used or charged.
- Purchase another battery to extend overall battery operating time.
- Store the battery in a cool, dry location.

Storing a battery

△ **CAUTION:** To prevent 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 six 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 a battery; short the external contacts on a battery; or dispose of a battery in fire or water. Do not expose a battery to temperatures above 60˚C (140˚F). Replace the battery only with a battery approved for this computer.

Refer to the *Regulatory, Safety and Environmental Notices* for battery disposal information. These notices are located on the user guide CD included with your computer.

Replacing the battery

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

Battery Check notifies you to replace the battery when an internal cell is not charging properly, or when the battery storage capacity has reached a “weak” condition. A message refers you to the HP Web site for more information about ordering a replacement battery. If the battery is possibly covered by an HP warranty, instructions include a warranty ID.

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.

Testing an AC adapter

Test the AC adapter if the computer exhibits any of the following symptoms:

- The computer will not turn on when connected to the AC adapter.
- The display does not turn on when the computer is connected to the AC adapter and external power.
- The power light is off when the computer is connected to the AC adapter.

To test the AC adapter:

1. Remove the battery from the computer.
2. Connect the AC adapter to the computer and to an AC outlet.
3. 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.

Shutting down the computer

CAUTION: Unsaved information will be lost when the computer is shut down.

The Shutdown 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 of time

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 shutdown is possible.

1. Save your work and close all open programs.
2. Click **Computer**, click **Shutdown**, and then click **Shutdown**.

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 and hold the power button for at least 5 seconds.
- Disconnect the computer from external power and remove the battery.

5 Drives

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.

△ **CAUTION:** To reduce the risk of damage to the computer, damage to a drive, or loss of information, observe these precautions:

Before you move a computer that is connected to an external hard drive, right-click the drive icon on the desktop and select **Unmount**. You will be prompted that the drive has been unmounted. It is now safe to unplug the external hard drive and move the computer.

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 the Suspend state, 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 optional external 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. The airport security devices that check carry-on luggage, such as conveyor belts, use X-rays instead of magnetism and will not damage a drive.

Replacing a hard drive

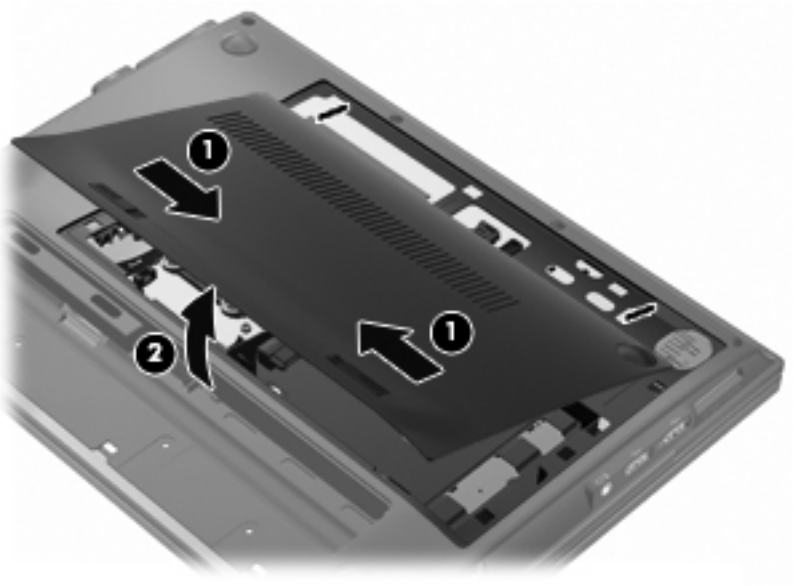
△ **CAUTION:** To prevent information loss or an unresponsive system:

Shut down the computer before removing the hard drive from the service access 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 briefly pressing the power button. Then shut down the computer through the operating system.

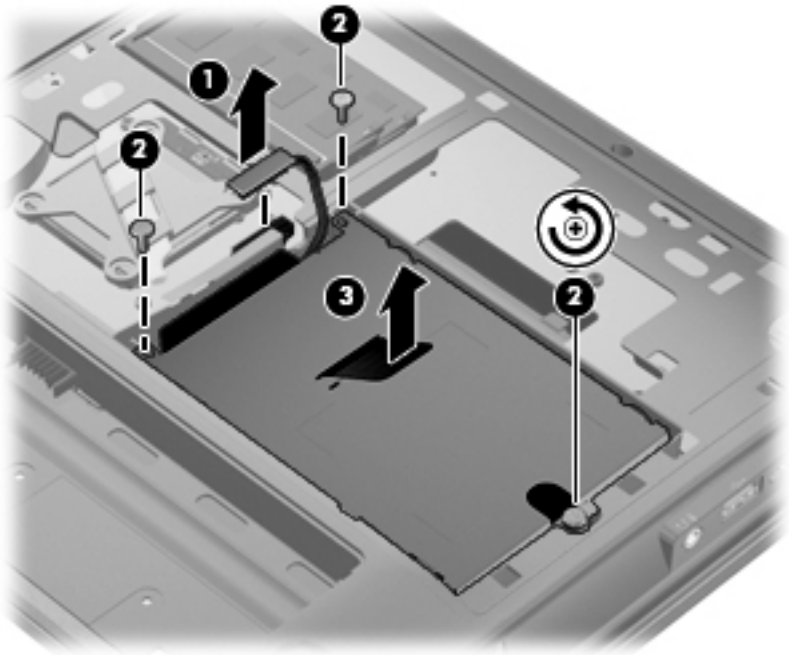
To remove a hard drive:

1. Save your work.
2. Shut down the computer and close the display.
3. Disconnect all external hardware devices connected to the computer.
4. Unplug the power cord from the AC outlet.
5. Turn the computer upside down on a flat surface, with the battery bay toward you.
6. Remove the battery.
7. Slide the service access door latches **(1)** inward. Slide the service access door toward the battery bay. Then lift up the forward edge of the service access door and remove the door **(2)**.



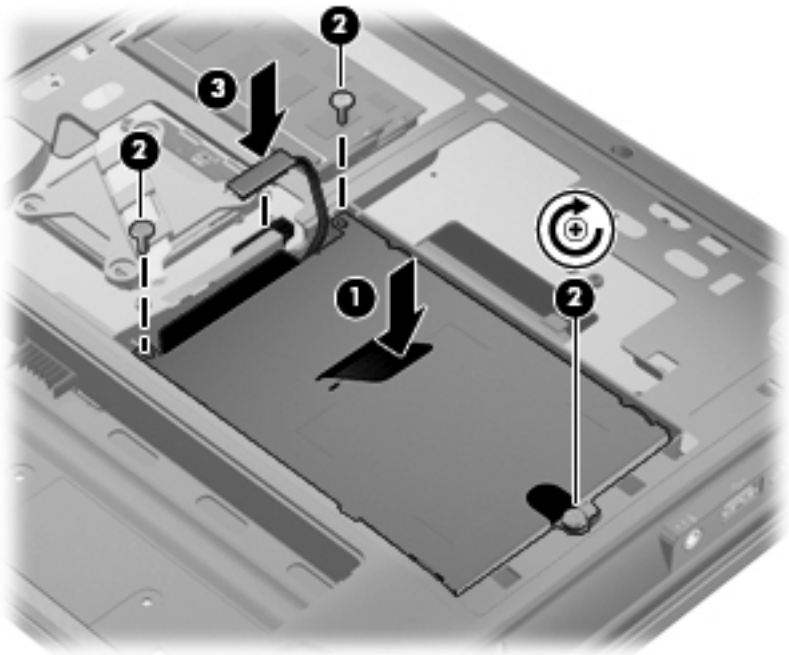
8. Disconnect the hard drive connector cable **(1)**.
9. Remove the 3 hard drive screws **(2)**.

10. Pull up the hard drive tab **(3)**, and then lift the hard drive out of the service access bay.



To install a hard drive:

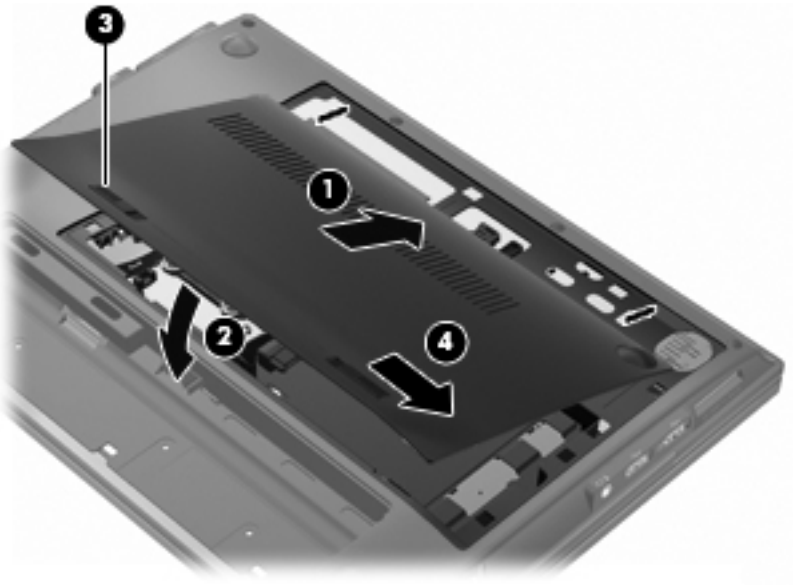
1. Pull up the hard drive tab **(1)** and insert the hard drive into the service access bay.
2. Tighten the 3 hard drive screws **(2)**.
3. Connect the hard drive connector cable **(3)**.



4. Align the tabs on the service access door **(1)** with the notches in the service access bay, and replace the door.
5. Press down on the door **(2)** until the until the release latch **(3)** clicks.

6. Slide the lock latch **(4)** to the right to lock the door into place.

NOTE: You can identify the lock latch by the red marking on the latch.



7. Replace the battery.
8. Turn the computer right-side up.

6 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.

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.

Your computer has 3 USB ports that support USB 1.0, USB 1.1, and USB 2.0 devices. You can also add an optional docking device or USB hub to provide additional USB ports for use with your 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.

Once the USB device has been detected, an icon is placed on the desktop.

Removing a USB device

△ **CAUTION:** To prevent loss of information or an unresponsive system, stop a USB device before removing it.

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

Refer to the USB device user documentation for complete instructions on device removal.

Using USB legacy support

USB legacy support (enabled by default) permits the following actions:

- Using a USB keyboard, mouse, or hub connected to a USB port on the computer during startup or in an MS-DOS-based program or utility
- Starting or restarting from an optional external MultiBay or an optional USB bootable device

USB legacy support is enabled at the factory. To disable or enable USB legacy support:

1. Open Computer Setup by turning on or restarting the computer, and then pressing f10 while the “F10 = ROM Based Setup” message is displayed in the lower-left corner of the screen.
2. Use the arrow keys to select **System Configuration > Device configurations**, and then press enter.
3. Use the arrow keys to enable or disable USB legacy support, and then press f10.
4. To save your preferences and exit Computer Setup, use the arrow keys to select **File > Save Changes and Exit**. Then, follow the on-screen instructions.

Your preferences go into effect when the computer restarts.

Using an eSATA device

An eSATA port connects an optional high-performance eSATA component, such as an eSATA external hard drive.

Some eSATA devices may require additional support software, which is usually included with the device. For more information about device-specific software, refer to the software manufacturer’s instructions. These instructions may be provided with the software, on disc, or on the manufacturer’s Web site.

NOTE: The eSATA port also supports an optional USB device.

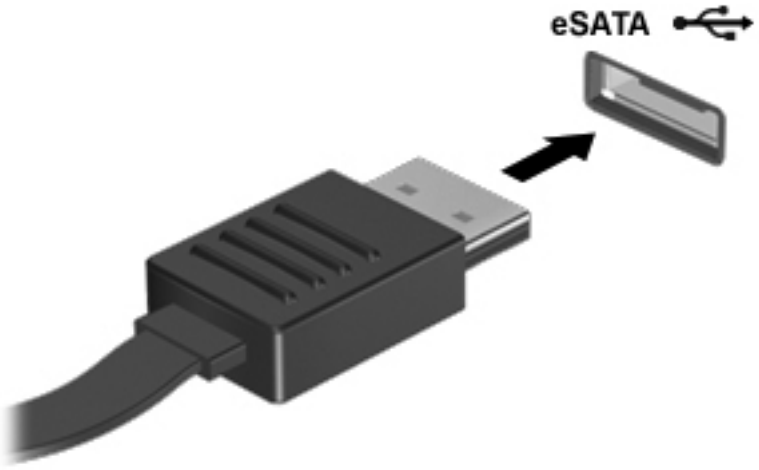
Connecting an eSATA device

△ **CAUTION:** To prevent damage to an eSATA port connector, use minimal force to connect an eSATA device.

To connect an eSATA device to the computer:

1. Plug in the power to the eSATA external device.

2. Connect the eSATA cable for the device to the eSATA port. Once connection has been established, the system auto-mounts the eSATA device and an icon is placed on the desktop.



Stopping and removing an eSATA device

△ **CAUTION:** To prevent loss of information or an unresponsive system, stop the eSATA device before removing it.

CAUTION: To prevent damage to an eSATA connector, do not pull on the cable to remove the eSATA device.

To stop and remove an eSATA device from the computer:

▲ On the desktop, right-click on the device icon and select **Unmount**.

NOTE: Wait 10 seconds for the system to finish the operation, and then disconnect the eSATA cable and remove the device.

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.

NOTE: HP external USB optical drives should be connected to the powered USB port.

USB drives include the following types:

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

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

To connect an external drive to the computer:

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

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

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

When a powered drive is connected to the powered USB port, its power cord is not required.

Using an optional external optical drive

An external optical drive connects to a USB port on the computer and enables you to use optical discs (CDs and DVDs).

If Suspend or Hibernation is initiated during playback of a disc, you may experience the following behaviors:

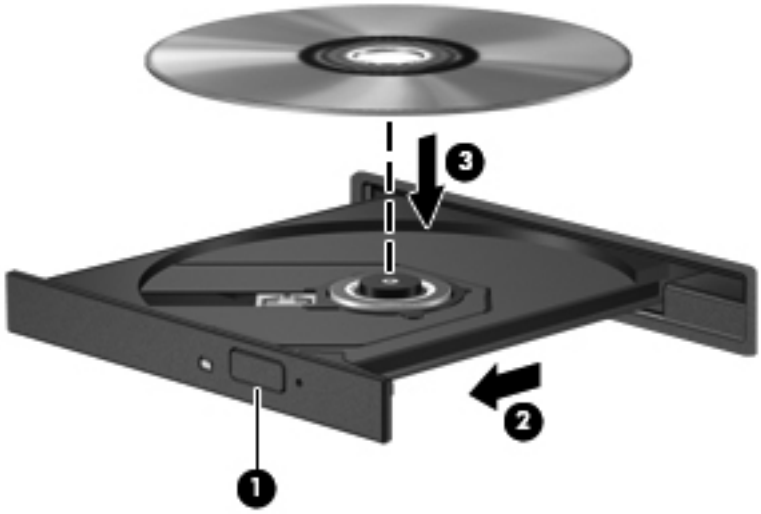
- Your playback may be interrupted.
- You may see a warning message asking if you want to continue. If this message is displayed, click **No**.
- You may need to restart the CD or DVD to resume audio and video playback.

Inserting an optical disc (CD or DVD)

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.

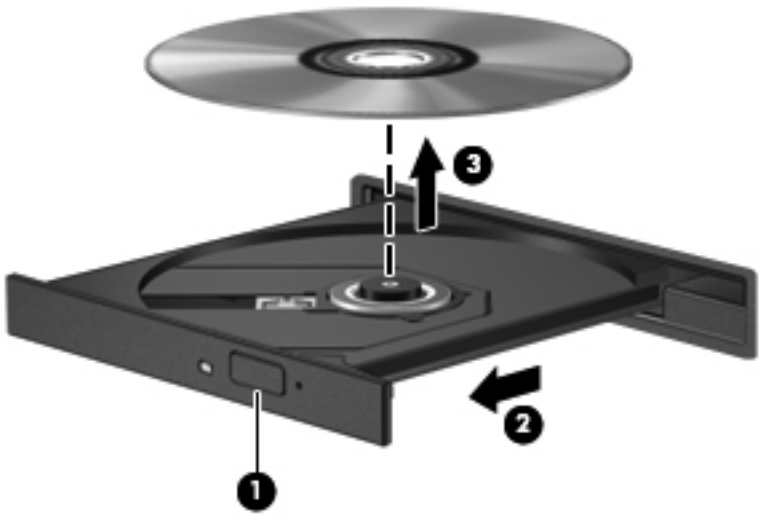
Removing an optical disc (CD or DVD)

There are 2 ways to remove a disc, depending on whether the disc tray opens normally or not.

When the disc tray opens

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.

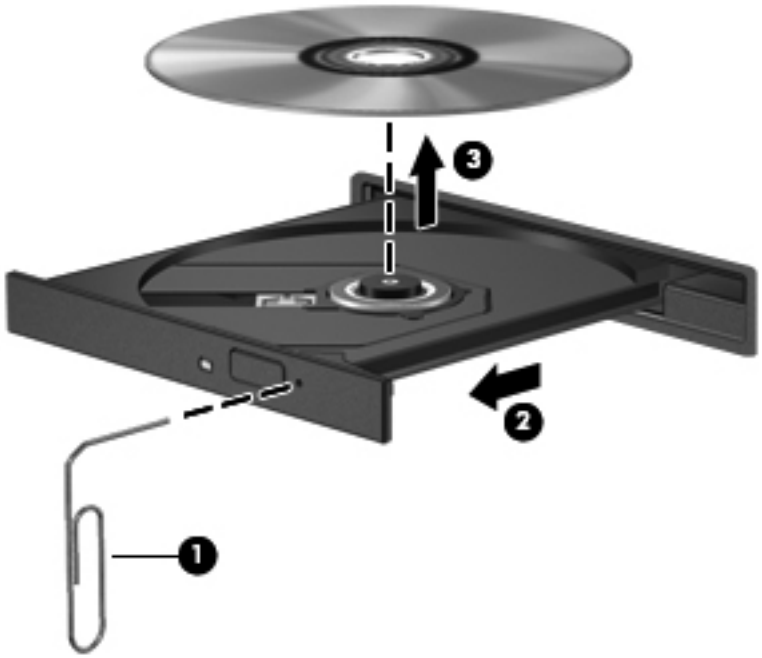


3. Close the disc tray and place the disc in a protective case.

When the disc tray does not open

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 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.

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.

7 External media cards

Using Media Card Reader cards

Optional digital cards provide secure data storage and convenient data sharing. These cards are often used with digital media–equipped cameras and PDAs as well as with other computers.

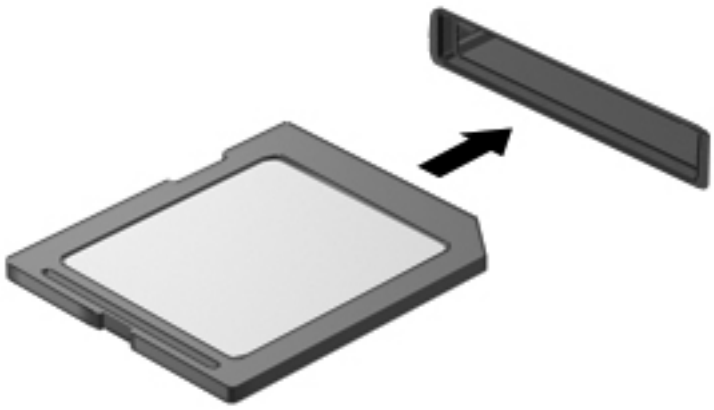
The Media Card Reader supports the following formats:

- Memory Stick
- Memory Stick Pro
- Memory Stick Duo (adapter required)
- Memory Stick Duo Pro (adapter required)
- MultiMediaCard
- MultiMediaCard Plus
- Secure Digital (SD) Memory Card
- Secure Digital (SD) High Capacity Memory Card
- Micro Secure Digital (SD) Memory Card (adapter required)
- xD-Picture Card

Inserting a digital card

△ **CAUTION:** To prevent damage to the digital card connectors, use minimal force to insert a digital card.

1. Hold the digital card label-side up, with the connectors facing the computer.
2. Insert the card into the Media Card Reader, and then push in on the card until it is firmly seated.



You will hear a sound when the device has been detected, and a menu of available options may be displayed.

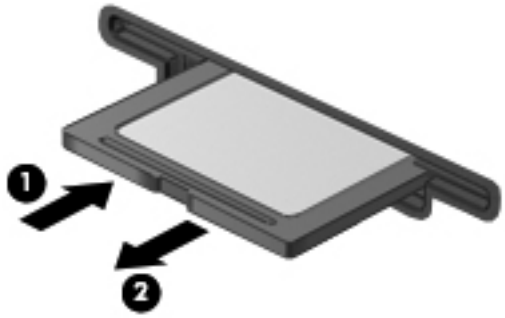
Removing a digital card

△ **CAUTION:** To prevent loss of data or an unresponsive system, be sure that you are not accessing the digital card before removal.

1. Save your information and close all programs associated with the digital card.

   NOTE: Refer to the digital card user documentation for complete instructions on safe card removal.

2. Press in on the digital card **(1)**, and then remove it from the slot **(2)**.



8 Memory modules

The computer has two memory module slots, which are located on the bottom of the computer, inside the service access door. The memory capacity of the computer can be upgraded by replacing the existing memory module or adding a second memory module.

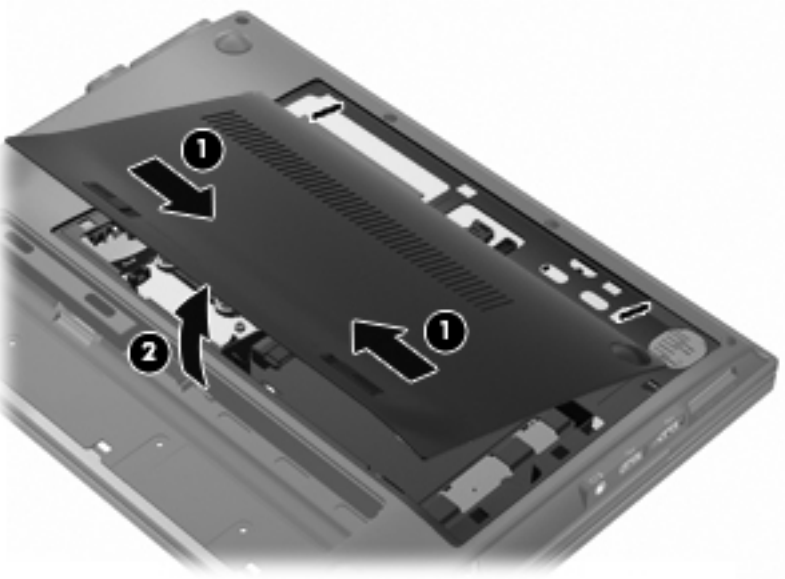
⚠ **WARNING!** To reduce the risk of electric shock and damage to the equipment, unplug the power cord and remove all batteries before installing a memory module.

△ **CAUTION:** Electrostatic discharge (ESD) can damage electronic components. Before beginning any procedure, touch a grounded metal object to be sure that you are discharged of static electricity.

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 briefly 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.
7. Slide the service access door latches **(1)** inward. Slide the service access door toward the battery bay. Then lift up the forward edge of the service access door and remove the door **(2)**.



8. Remove the existing memory module:

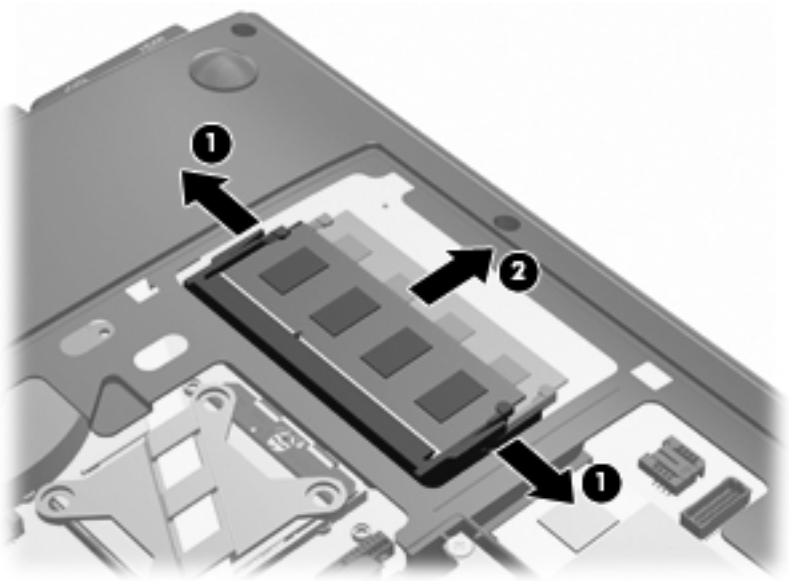
   a. Pull apart the retention clips **(1)** at the sides of the memory module.

      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.

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



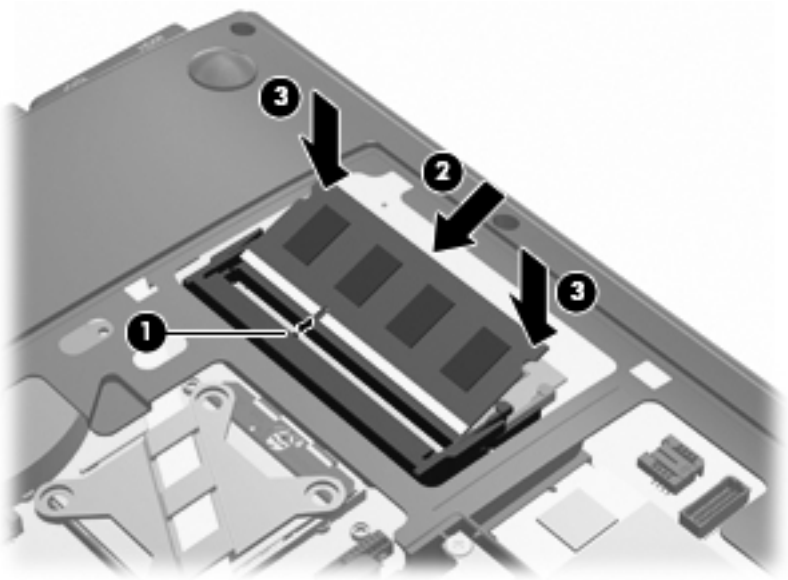
9. Insert a new memory module:

   a. Align the notched edge **(1)** of the memory module with the tab in the memory module slot.

   △ **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.

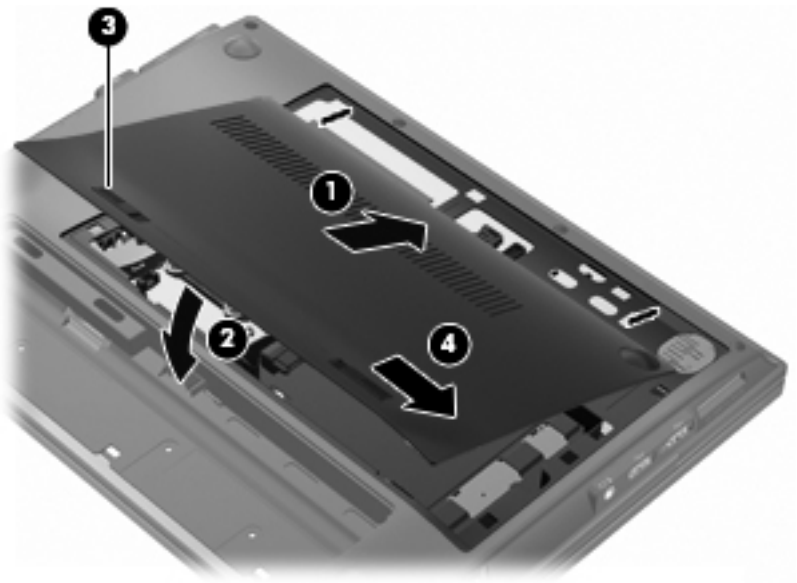
   b. With the memory module at a 45-degree angle from the surface of the memory module compartment, press the module **(2)** into the memory module slot until it is seated.

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.



10. Align the tabs on the service access door **(1)** with the notches in the service access bay.
11. Slide the service access door down **(2)** until the release latch **(3)** clicks.
12. Slide the lock latch **(4)** to the right until it locks.

NOTE: You can identify the lock latch by the red marking on the latch.



13. Replace the battery.
14. Turn the computer right-side up.
15. Reconnect external power and external devices.
16. Turn on the computer.

9 Security

NOTE: Some of the features described in this chapter may not be supported by your computer or your operating system.

Protecting the computer

NOTE: Security solutions are designed to act as deterrents. These deterrents may not prevent a product 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 the Computer Setup utility (referred to hereafter as Computer Setup).

To protect against	Use this security feature
Unauthorized use of the computer	Power-on authentication using passwords or smart cards
Unauthorized access to Computer Setup (f10)	Setup password in Computer Setup*
Unauthorized access to the contents of a hard drive	DriveLock password in Computer Setup*
Unauthorized reset of Computer Setup (f10) passwords	Stringent security feature in Computer Setup*
Unauthorized startup from an optical drive, diskette drive, or internal network adapter	Boot options feature in Computer Setup*
Unauthorized access to data	• Firewall software • Operating system updates
Unauthorized access to Computer Setup settings and other system identification information	Setup password in Computer Setup*
Unauthorized removal of the computer	Security cable slot (used with an optional security cable)

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

Using passwords

Most security features use passwords. Whenever you set a password, write down the password and store it in a secure location away from the computer. Note the following password considerations:

- Setup, power-on, and DriveLock passwords are set in Computer Setup and are managed by the system BIOS.
- The embedded security password can be enabled in Computer Setup to provide BIOS password protection. The embedded security password is used with the optional embedded security chip.
- Operating system passwords are set only in the operating system.

- If you forget the setup password set in Computer Setup, you will not be able to access the utility.
- If you have the stringent security feature enabled in Computer Setup and you forget the setup password, the computer is inaccessible and can no longer be used. Call technical support or your authorized service provider for additional information.
- If you forget the setup password set in Computer Setup, you cannot turn on the computer or exit Hibernation. Call technical support or your authorized service provider for additional information.
- If you forget both the user password and the master DriveLock password set in Computer Setup, the hard drive that is protected by the passwords is permanently locked and can no longer be used.

You can use the same password for a Computer Setup feature and for an operating system security feature. You can also use the same password for more than one Computer Setup feature.

Use the following tips for creating and saving passwords:

- When creating passwords, follow requirements set by the program.
- Write down your passwords and store them in a secure place away from the computer.
- Do not store passwords in a file on the computer.

The following tables list commonly used operating system and Computer Setup passwords and describe their functions.

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.
*For information about setting an operating system root password or an operating system user password, click **Computer > Help and Support**.	

Setting passwords in Computer Setup

Computer Setup passwords	Function
Setup password	Protects access to Computer Setup.
DriveLock master password	Protects access to the internal hard drive that is protected by DriveLock. It is also used to remove DriveLock protection. This password is set under DriveLock Passwords during the enable process.
DriveLock user password	Protects access to the internal hard drive that is protected by DriveLock, and is set under DriveLock Passwords during the enable process.

Setup password

The Computer Setup setup password protects the configuration settings and system identification information in Computer Setup. After this password is set, it must be entered to access Computer Setup and to make changes using Computer Setup.

Note the following characteristics of the setup password:

- It is not interchangeable with an operating system root password, although both passwords can be identical.
- It is not displayed as it is set, entered, changed, or deleted.
- It must be set and entered with the same keys. For example, a setup password set with keyboard number keys will not be recognized if you enter it thereafter with embedded numeric keypad number keys.
- It can include any combination of up to 32 letters and numbers and is not case sensitive.

Managing a setup password

A setup password is set, changed, and deleted in Computer Setup.

To manage, set, change, or delete this password, follow these steps:

1. Open Computer Setup by turning on or restarting the computer, and then pressing f10 while the “F10 = ROM Based Setup” message is displayed in the lower-left corner of the screen.
2. Use the arrow keys to select **Security > Setup Password**, and then press enter.
   - To set a setup password, type your password in the **New password** and **Verify new password** fields, and then press f10.
   - To change a setup password, type your current password in the **Old password** field, type a new password in the **New password** and **Verify new password** fields, and then press f10.
   - To delete a setup password, type your current password in the **Old password** field, and then press f10.
3. To save your preferences, use the arrow keys to select **File > Save changes and exit**. Then follow the instructions on the screen.

Your preferences go into effect when the computer restarts.

Entering a setup password

At the **Setup password** prompt, type your setup password (using the same kind of keys you used to set the password), and then press enter. After 3 unsuccessful attempts to enter the setup password, you must restart the computer and try again.

Using Computer Setup DriveLock

△ **CAUTION:** To prevent the DriveLock-protected hard drive from becoming permanently unusable, record the DriveLock user password and the DriveLock master password in a safe place away from your computer. If you forget both DriveLock passwords, the hard drive will be permanently locked and can no longer be used.

DriveLock protection prevents unauthorized access to the contents of a hard drive. DriveLock can be applied only to the internal hard drive(s) of the computer. After DriveLock protection is applied to a drive, a password must be entered to access the drive. The drive must be inserted into the computer, not into an optional docking device or external MultiBay, in order for it to be accessed by the DriveLock passwords.

To apply DriveLock protection to an internal hard drive, a user password and a master password must be set in Computer Setup. Note the following considerations about using DriveLock protection:

- After DriveLock protection is applied to a hard drive, the hard drive can be accessed only by entering either the user password or the master password.
- The owner of the user password should be the day-to-day user of the protected hard drive. The owner of the master password may be either a system administrator or the day-to-day user.
- The user password and the master password can be identical.
- You can delete a user password or master password only by removing DriveLock protection from the drive. DriveLock protection can be removed from the drive only with the master password.

Setting a DriveLock password

To access the DriveLock settings in Computer Setup, follow these steps:

1. Open Computer Setup by turning on or restarting the computer, and then pressing f10 while the “F10 = ROM Based Setup” message is displayed in the lower-left corner of the screen.
2. Use the arrow keys to select **Security > DriveLock passwords**, and then press enter.
3. Select the location of the hard drive you want to protect, and then press f10.
4. Use the arrow keys to select **Enable** in the **Protection** field, and then press f10.
5. Read the warning. To continue, press f10.
6. Type your user password in the **New password** and **Verify new password** fields, and then press f10.
7. Type your master password in the **New password** and **Verify new password** fields, and then press f10.
8. To confirm DriveLock protection on the drive you have selected, type `DriveLock` in the confirmation field, and then press f10.
9. To exit DriveLock settings, use the arrow keys to select **Esc**.
10. To save your preferences, use the arrow keys to select **File > Save changes and exit**. Then follow the instructions on the screen.

Your preferences go into effect when the computer restarts.

Entering a DriveLock password

Be sure that the hard drive is inserted into the computer (not into an optional docking device or external MultiBay).

At the **DriveLock Password** prompt, type your user or master password (using the same kind of keys you used to set the password), and then press enter.

After 2 incorrect attempts to enter the password, you must shut down the computer and try again.

Changing a DriveLock password

To access the DriveLock settings in Computer Setup, follow these steps:

1. Open Computer Setup by turning on or restarting the computer, and then pressing f10 while the “F10 = ROM Based Setup” message is displayed in the lower-left corner of the screen.
2. Use the arrow keys to select **Security > DriveLock passwords**, and then press enter.

3. Use the arrow keys to select the location of the internal hard drive, and then press f10.
4. Use the arrow keys to select the field for the password you want to change. Type your current password in the **Old password** field, and then type the new password in the **New password** field and in the **Verify new password** field. Then press f10.
5. To save your preferences, use the arrow keys to select **File > Save changes and exit**. Then follow the instructions on the screen.

Your preferences go into effect when the computer restarts.

Removing DriveLock protection

To access the DriveLock settings in Computer Setup, follow these steps:

1. Open Computer Setup by turning on or restarting the computer, and then pressing f10 while the “F10 = ROM Based Setup” message is displayed in the lower-left corner of the screen.
2. Use the arrow keys to select **Security > DriveLock passwords**, and then press enter.
3. Use the arrow keys to select the location of the internal hard drive, and then press f10.
4. Use the arrow keys to select **Disable** in the **Protection** field, and then press f10.
5. Type your master password in the **Old password** field. Then press f10.
6. To save your preferences, use the arrow keys to select **File > Save changes and exit**. Then follow the instructions on the screen.

Your preferences go into effect when the computer restarts.

Using Computer Setup security features

Securing system devices

From the Boot options menu or the Port options menu in Computer Setup, you can disable or enable system devices.

To disable or reenable system devices in Computer Setup, follow these steps:

1. Open Computer Setup by turning on or restarting the computer, and then pressing f10 while the “F10 = ROM Based Setup” message is displayed in the lower-left corner of the screen.
2. Use the arrow keys to select **System Configuration > Boot options** or **System Configuration > Port options**. Then press enter and use the arrow keys to select the options you want.
3. To confirm your preferences, press f10.
4. To save your preferences, use the arrow keys to select **File > Save changes and exit**. Then follow the instructions on the screen.

Your preferences go into effect when the computer restarts.

Using Computer Setup stringent security

△ **CAUTION:** To prevent the computer from becoming permanently unusable, record your configured setup password or smart card PIN in a safe place away from your computer. Without these passwords or PIN, the computer cannot be unlocked.

The stringent security feature enhances power-on security by forcing user authentication with your configured setup password or smart card PIN before granting access to the system.

Setting stringent security

To enable stringent security in Computer Setup, follow these steps:

1. Open Computer Setup by turning on or restarting the computer, and then pressing f10 while the “F10 = ROM Based Setup” message is displayed in the lower-left corner of the screen.
2. Use the arrow keys to select **Security > Password options**, and then press enter.
3. Use the arrow keys to select **Enable** in the **Stringent security** field.
4. Read the warning. To continue, press f10.
5. To enable the feature each time the computer is turned on, press f10.
6. To save your preferences, use the arrow keys to select **File > Save changes and exit**. Then follow the instructions on the screen.

Your preferences go into effect when the computer restarts.

Removing stringent security

To remove stringent security in Computer Setup, follow these steps:

1. Open Computer Setup by turning on or restarting the computer, and then pressing f10 while the “F10 = ROM Based Setup” message is displayed in the lower-left corner of the screen.
2. Use the arrow keys to select **Security > Password options** and then press enter.
3. Use the arrow keys to select **Disable** in the **Stringent security** field, and then press f10.
4. To save your preferences, use the arrow keys to select **File > Save changes and exit**. Then follow the instructions on the screen.

Your preferences go into effect when the computer restarts.

Viewing Computer Setup System Information

The System Information feature in Computer Setup provides 2 types of system information:

- Identification information about the computer model.
- Specification information for the processor, cache and memory size, and system ROM.

To view this general system information, follow these steps:

1. Open Computer Setup by turning on or restarting the computer, and then pressing f10 while the “F10 = ROM Based Setup” message is displayed in the lower-left corner of the screen.
2. Use the arrow keys to select **File > System Information**, and then press enter.

NOTE: To prevent unauthorized access to this information, you must create a setup password in Computer Setup.

Using firewall software

When you use the computer to access e-mail, a network, or the Internet, unauthorized persons may be able to gain access to information about you, the computer, and your personal files. Use the firewall software preinstalled on the computer to protect your privacy:

▲ Select **Computer > Control Center > YaST > Security and Users > Firewall**.

Firewall features include information on logging and reporting, and automatic alarms to monitor all incoming and outgoing traffic. Refer to the firewall documentation or contact your firewall manufacturer for more information.

NOTE: Under some circumstances a firewall can block access to Internet games, interfere with printer or file sharing on a network, or block authorized e-mail attachments. To temporarily solve the problem, disable the firewall, perform the task that you want to perform, and then reenable the firewall. To permanently resolve the problem, reconfigure the firewall.

Setting up automatic online updates

NOTE: You must have a network connection in order to receive automatic online updates.

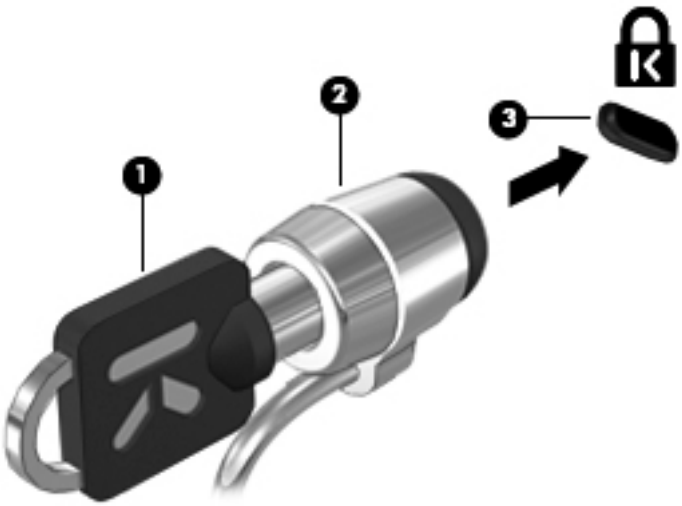
To set up automatic online updates:

1. Select **Computer > Control Center > YaST > Software > Online Update Configuration**.
2. Select the **Enable Automatic Update** check box.
3. Select your preferred options for the automatic online update.

Installing a security cable

NOTE: A security cable is designed to act as a deterrent, but it may not prevent the computer from being mishandled or stolen.

1. Loop the security cable around a secured object.
2. Insert the key **(1)** into the cable lock **(2)**.
3. Insert the cable lock into the security cable slot on the computer **(3)**, and then lock the cable lock with the key.



NOTE: The location of the security cable slot varies by computer model.

10 Computer Setup

Starting Computer Setup

Computer Setup is a preinstalled, ROM-based utility that can be used even when the operating system is not working or will not load.

NOTE: Some of the Computer Setup menu items listed in this guide may not be supported by your computer or your operating system.

NOTE: Pointing devices are not supported in Computer Setup. You must use the keyboard to navigate and make selections.

NOTE: An external keyboard connected by USB can be used with Computer Setup only if USB legacy support is enabled.

To start Computer Setup, follow these steps:

1. Turn on or restart the computer.
2. Before your operating system opens and while the “F10=ROM Based Setup” message is displayed in the lower-left corner of the screen, press f10.

Using Computer Setup

Navigating and selecting in Computer Setup

The information and settings in Computer Setup are accessed from the File, Security, Diagnostics, and System Configuration menus.

1. Open Computer Setup by turning on or restarting the computer, and then pressing f10 while the "F10 = ROM Based Setup" message is displayed in the lower-left corner of the screen.

   Because Computer Setup is not operating system based, it does not support the TouchPad. Navigation and selection are by keystroke:

   - To choose a menu or a menu item, use the arrow keys.
   - To select an item, press enter.
   - To close open dialog boxes and return to the main Computer Setup screen, press esc.
   - To view navigation information, press f1.
   - To change the language, press f2.
2. Select the **File**, **Security**, **Diagnostics**, or **System Configuration** menu.
3. To exit Computer Setup, choose one of the following methods:

   - To exit Computer Setup without saving your preferences, use the arrow keys to select **File > Ignore Changes And Exit**. Then follow the instructions on the screen.
   - To save your preferences and exit Computer Setup, use the arrow keys to select **File > Save Changes And Exit**. Then follow the instructions on the screen.

Your preferences go into effect when the computer restarts.

Restoring factory settings in Computer Setup

To return all settings in Computer Setup to the values that were set at the factory, follow these steps:

1. Open Computer Setup by turning on or restarting the computer, and then pressing f10 while the "F10 = ROM Based Setup" message is displayed in the lower-left corner of the screen.
2. Use the arrow keys to select **File > Restore Defaults**, and then press enter.
3. When the confirmation dialog box opens, press f10.
4. To save your preferences and exit Computer Setup, use the arrow keys to select **File > Save Changes And Exit**. Then follow the instructions on the screen.

Your preferences go into effect when the computer restarts.

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

Computer Setup menus

The menu tables in this section provide an overview of Computer Setup options.

NOTE: Some of the Computer Setup menu items listed in this guide may not be supported by your computer or your operating system.

File menu

NOTE: Some of the menu items listed in this section may not be supported by your computer or your operating system.

Select	To do this
System information	• View identification information for the computer. • View specification information for the processor, cache and memory size, and system ROM.
Restore Defaults	Replace the configuration settings in Computer Setup with the original factory settings. (Password settings and security settings are not changed when you restore the factory settings.)
Ignore Changes And Exit	Cancel any changes entered during the current session. Then exit and restart the computer.
Save Changes And Exit	Save any changes entered during the current session. Then exit and restart the computer. Your changes go into effect when the computer restarts.

Security menu

NOTE: Some of the menu items listed in this section may not be supported by your computer or your operating system.

Select	To do this
Setup Password	Enter, change, or delete a setup password.
Password Options	• Enable/disable stringent security. • Enable/disable the password requirement on computer restart.
DriveLock Passwords	• Enable/disable DriveLock on any computer hard drive. • Enter, change, or disable DriveLock on an optional MultiBay hard drive. **NOTE:** DriveLock settings are accessible only when you enter Computer Setup by turning on (not restarting) the computer.
System IDs	Enter a user-defined computer asset tracking number and ownership tag.
Disk Sanitizer	Run Disk Sanitizer to destroy all existing data on the primary hard drive. The following options are available: • Fast: Runs the Disk Sanitizer erase cycle once. • Optimum: Runs the Disk Sanitizer erase cycle 3 times. • Custom: Allows you to select the desired number of Disk Sanitizer erase cycles from a list. **CAUTION:** If you run Disk Sanitizer, the data on the primary hard drive is destroyed permanently.

Diagnostics menu

NOTE: Some of the menu items listed in this section may not be supported by your computer or your operating system.

Select	To do this
HDD Self-Test Options	Run a comprehensive self-test on any hard drive in the system or on any optional MultiBay hard drive.
Memory Check	Run a comprehensive check on system memory.

System Configuration menu

NOTE: Some of the menu items listed in this section may not be supported by your computer or your operating system.

Select	To do this
Language	Change the Computer Setup language.
Boot options	• Set an f9, f10, and f12 delay when starting up. • Enable/disable CD-ROM boot. • Enable/disable floppy boot. • Enable/disable internal network adapter boot. • Enable/disable MultiBoot, which sets a boot order that can include most boot devices in the system. • Set the Express Boot Popup delay in seconds. • Set the boot order. ◦ 1st boot device: USB CD-ROM ◦ 2nd boot device: USB floppy ◦ 3rd boot device: USB SuperDisk ◦ 4th boot device: Notebook hard drive ◦ 5th boot device: USB hard disk ◦ 6th boot device: Network controller
Device Configurations	• Swap the functions of the fn key and left ctrl key. • Enable/disable USB legacy support. When enabled, USB legacy support allows the following: ◦ Use of a USB keyboard in Computer Setup even when a your operating system is not running. ◦ Startup from bootable USB devices, including a hard drive, diskette drive, or optical drive connected by a USB port to the computer. • Enable/disable BIOS DMA data transfers. • Enable/disable fan always on while connected to an AC outlet. • Enable/disable data execution prevention. • Enable/disable LAN power saving mode. • Enable/disable SATA Native Mode. • Enable/disable Dual Core CPU. • Enable/disable HDD translation mode.

Select	To do this
Built-in device options	• Enable/disable embedded WLAN Device Radio. • Enable/disable embedded Bluetooth Device Radio. • Enable/disable Network Interface Controller (NIC) • Enable/disable LAN/WLAN Switching. • Enable/disable Wake on LAN. • Enable/disable the integrated camera (webcam)
Port options	• Enable/disable USB port. • Enable/disable ExpressCard slot.

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