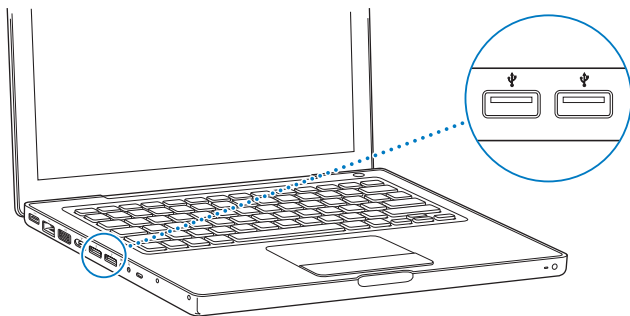


- A mini-DVI video out port for connecting your MacBook to an external display by using a Mini-DVI to DVI adapter or a Mini-DVI to VGA adapter. Use a Mini-DVI to Video adapter to connect a video device that requires a composite or S-video connection. All adapters are sold separately. See “Using External Video Support” on page 65.
- A slot-loading optical drive for playing CDs and DVDs and burning CDs. If you have a SuperDrive, you can burn DVDs as well. See “Using Your Optical Drive” on page 69.
- Sudden Motion Sensor technology that helps protect the internal hard disk if your MacBook is dropped or shaken. See “Understanding Sudden Motion Sensor” on page 74.
- A MacBook battery that provides convenient, at-a-glance battery status. See “Using Your Battery” on page 74.
- A security slot so that you can make sure your MacBook stays where it should. See “Securing Your MacBook” on page 78.

Using Universal Serial Bus (USB) Devices

Your MacBook comes with two USB 2.0 (Ψ) ports, also referred to as high-speed USB, which you can use to connect many types of external devices, including iPods, printers, scanners, digital cameras, game pads, joysticks, keyboards, and floppy disk drives. Your USB 2.0 ports are compatible with earlier USB devices. In most cases, you can connect and disconnect a USB device while the computer is running. After you connect the device, it is ready to use. You don't need to restart or reconfigure your computer.



To use a USB device with your computer, connect the device to the computer. Your computer automatically detects newly connected devices and loads the correct software to work with the device.

Note: If your MacBook can't find the correct software when you connect a USB device, you can either install the software that came with the device or go to the website of the device manufacturer to locate and install the correct software.

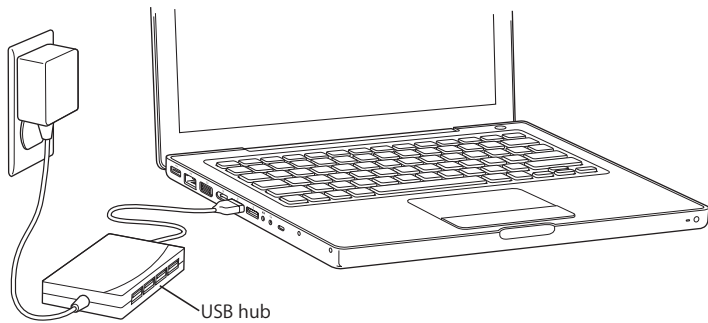
Understanding USB Devices and Battery Power

You can use USB devices, such as joysticks and keyboards, that are powered by the MacBook USB connection instead of by a separate power adapter. However, these types of USB devices can cause your MacBook battery to be depleted faster. If the device will be connected for an extended period, it is a good idea to connect the MacBook power adapter.

Using Multiple USB Devices at the Same Time

You can purchase a USB hub to connect multiple USB devices to your computer. The USB hub connects to an open USB port on your computer and provides additional USB ports (usually four or seven). High-speed hubs can support USB 2.0 high-speed devices as well as USB 1.1 compatible devices. USB 1.1 hubs don't allow high-speed USB devices to operate at their maximum data speed. Most USB hubs have a power adapter and should be plugged into an outlet.

Note: If you are using a chain of USB devices and hubs, some USB devices might not work when connected through a combination of USB 2.0 high-speed hubs and USB 1.1 full-speed or low-speed hubs. For example, you might not see an external USB hard disk on your desktop. To avoid this problem, don't connect USB devices with different speeds together. Connect your high-speed hub directly to your computer and connect high-speed devices to it. Connect a full-speed or low-speed hub directly to your computer and connect similar speed devices to it.



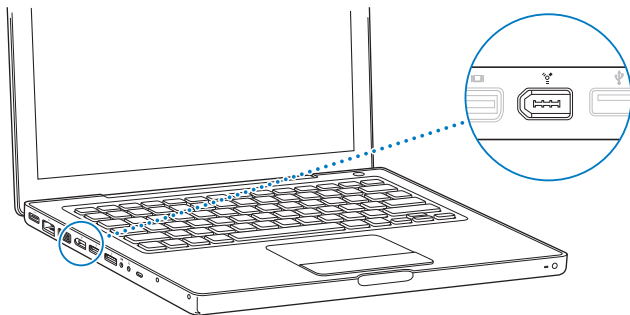
Getting More Information About USB

More information about USB is available in Mac Help. Choose Help > Mac Help in the menu bar and search for “USB.” You can also find information on the Apple USB website at www.apple.com/usb. For information about USB devices available for your computer, check the Macintosh Products Guide at www.apple.com/guide.

Connecting with FireWire

Your computer has one FireWire 400 (⌘) port. With FireWire, you can easily connect and disconnect external high-speed devices—such as high definition video (HDV) or digital video (DV) cameras and hard disks—without restarting your computer.

You can connect a standard 6-pin FireWire device directly to the FireWire 400 (⌘) port. The port provides power to connected devices, so the devices don’t need a separate power plug.



These are some of the things you can do with FireWire:

- Connect an HDV or DV camera and capture, transfer, and edit high-quality video directly on your computer using video-editing software such as iMovie HD, Final Cut Express, or Final Cut Studio (sold separately).
- Connect an external FireWire hard disk drive and use it to back up data or transfer files.
- Start up from an external FireWire hard disk. Connect an external FireWire hard disk drive (with Mac OS X v10.4.6 or later installed on it), open the Startup Disk pane of System Preferences, and click the FireWire hard disk icon. Restart your computer.
- Transfer files between your MacBook and another FireWire-equipped computer using FireWire Target Disk Mode. See “Connecting Your MacBook to Another Computer Using FireWire” on page 59 for more information.

Using FireWire Devices

To use a FireWire device with your computer, connect the device to the computer and install any software that came with the device. Your computer automatically detects newly connected devices.

Note: If your MacBook can't find the correct software when you connect a FireWire device, you can either install the software that came with the device or go to the website of the device manufacturer to locate and install the correct software.

Understanding FireWire Devices and Battery Power

You can use FireWire devices, such as certain external hard disk drives, that are powered by the MacBook FireWire connection instead of by a separate power adapter. However, these FireWire devices can cause your MacBook battery to be depleted faster. If a device will be connected for an extended period, it is a good idea to connect the MacBook power adapter.

Note: The FireWire (⚡) port is designed to support power for FireWire devices (up to 7 watts maximum). You can connect multiple devices to each other and connect the chain of devices to the FireWire port on your computer, but only one device should get power from the computer. The rest of the devices in the chain should be powered by separate power adapters. Connecting more than one FireWire device that gets power from the port can cause problems. If a problem occurs, shut down the computer, disconnect the FireWire devices, and restart your computer.

Connecting Your MacBook to Another Computer Using FireWire

If you want to transfer files between your MacBook and another FireWire-equipped computer, or if you have a problem that prevents your computer from starting up, you can use FireWire Target Disk Mode to connect to another computer. When you start up your MacBook in FireWire Target Disk Mode, the other computer can access your MacBook as if it were an external hard disk.

Note: When using FireWire Target Disk Mode, it's a good idea to connect your power adapter to the MacBook.

To connect your MacBook to another computer in FireWire Target Disk Mode:

- 1 Make sure that your MacBook is shut down.
- 2 Use a FireWire cable to connect your MacBook to another FireWire-equipped computer.
- 3 Start up your MacBook and immediately hold down the T key.

Your MacBook display will show the FireWire logo. The other computer's display shows the MacBook internal hard disk icon. You can now drag and drop files between the computers.

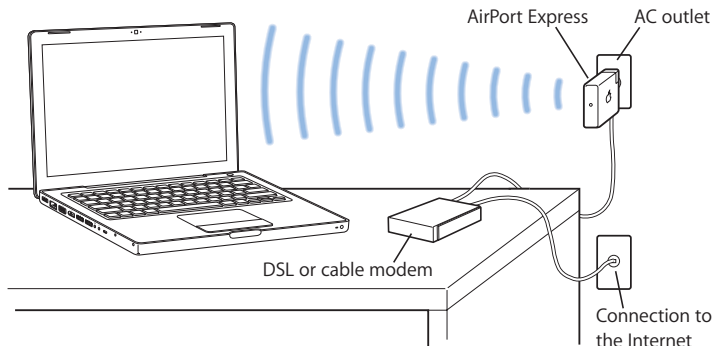
- 4 When you finish transferring files, drag the MacBook hard disk icon to the Trash (Eject icon).
- 5 Press the power (⏻) button on the MacBook to shut it down, and then disconnect the FireWire cable.

Getting More Information About FireWire

More information about FireWire is available in Mac Help. Choose Help > Mac Help in the Finder menu bar and search for “FireWire.” You can also find information on the Apple FireWire website at www.apple.com/firewire.

How AirPort Provides Wireless Internet Access

With AirPort Extreme technology, your MacBook makes a wireless connection to an AirPort Express, AirPort Extreme Base Station, or any 802.11b- or 802.11g-compliant product that is connected to the phone line, a DSL or cable modem, or a local area network (LAN) with Internet access.



Getting More Information About AirPort Extreme

To purchase an AirPort Extreme Base Station or AirPort Express, go to the online Apple Store at www.apple.com/store or contact your Apple Authorized Reseller.

More information about AirPort Extreme and AirPort Express is available in AirPort Help. Choose Help > Mac Help, and then choose Library > AirPort Help. You can also find information on the Apple AirPort website at www.apple.com/airportexpress and www.apple.com/airportextreme.

Using Bluetooth Wireless Technology

Your MacBook comes with Bluetooth wireless technology. With Bluetooth, you can make short-range wireless connections between desktop and portable computers, personal digital assistants (PDAs), mobile phones, camera phones, printers, digital cameras, and wireless input devices, such as the Apple Wireless Keyboard and Apple Wireless Mouse (available for purchase from the online Apple Store at www.apple.com/store).

Bluetooth wireless technology eliminates the need for many cables that traditionally connect devices together. Bluetooth enabled devices can connect to each other wirelessly at a distance of up to 33 feet (10 meters).

With Bluetooth wireless technology, you can do the following:

- Use your MacBook to communicate with a compatible Bluetooth enabled mobile phone. Your phone can act as a modem to connect you to a wireless service provider, at a speed of up to 56 kilobits per second (kbit/s), so you can use your mobile phone to access the Internet.
- Synchronize with your handheld Bluetooth enabled PDA. Using iSync, you can perform a HotSync operation without cables or send your business card or calendar events directly to a colleague's PDA.
- Exchange files between Bluetooth enabled computers and devices—even Mac to PC.
- Use a Bluetooth wireless printer, keyboard, mouse, or headset.

Setting Up a Bluetooth Device

Before you can use a Bluetooth device with your MacBook, you need to set up the device to work with your computer. After you set up the device, it is paired with your computer, and you can see it in the Devices pane of Bluetooth preferences. You pair your computer with the device only once, and they remain paired until you delete the pairing.

To set up a Bluetooth device:

- 1 Choose Set up Bluetooth Device from the Bluetooth (⌘) status menu.
- 2 Follow the onscreen instructions for the type of device you want to set up.

If the Bluetooth (⌘) status menu isn't in the menu bar, open System Preferences and click Bluetooth. Click Settings and then select "Show Bluetooth status in the menu bar."

To delete a pairing with a device:

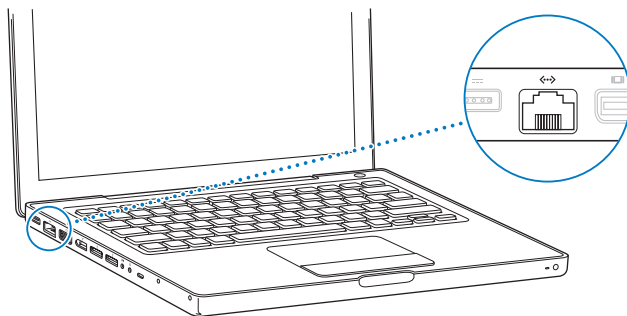
- 1 Open System Preferences and click Bluetooth.
- 2 Click Devices and select the device in the list.
- 3 Click Delete.

Getting More Information About Bluetooth Wireless Technology

You can find out more about using Bluetooth wireless technology by opening the Bluetooth File Exchange application (located in the Utilities folder within the Applications folder) and choosing Help > Bluetooth Help. You can also find information on the Apple Bluetooth website at www.apple.com/bluetooth.

Connecting with Ethernet

Your computer comes with built-in Gigabit Ethernet (↔) networking capability, which you can use to connect to a network or to a DSL or cable modem.



Connecting to a network gives you access to other computers and potentially to network printers, modems, email, and the Internet. You can use Ethernet to share files between two computers or set up a small network. The Ethernet port on your MacBook automatically detects other Ethernet devices. You don't need an Ethernet crossover cable when connecting to other Ethernet devices.

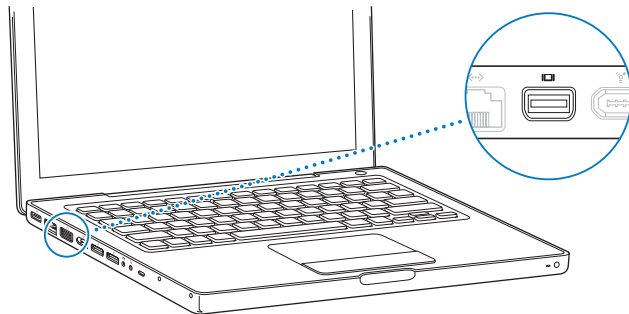
Getting More Information About Using Ethernet

More information, including setting up an Ethernet network and transferring files using Ethernet, is available in Mac Help. Choose Help > Mac Help and search for “Ethernet” or “network.”


For information about networking products you can use with your MacBook, check the Macintosh Products Guide at www.apple.com/guide.


Using External Video Support

Your computer has an external monitor (mini-DVI) port that allows you to connect a display or projector with a DVI or VGA port. Use the Apple Mini-DVI to DVI Adapter (sold separately) to connect your MacBook to a DVI monitor or projector. Use the Apple Mini-DVI to VGA Adapter (sold separately) to connect your MacBook to a VGA monitor or projector.



You can also display images on a TV, record images on a VCR, or play DVDs on your TV by connecting an Apple Mini-DVI to Video Adapter for use with composite and S-video connectors. You can purchase the adapters from an Apple Store retail location, the online Apple Store at www.apple.com/store, or an Apple Authorized Reseller.

When an external monitor or TV is connected, you can either have the same image appear on both the built-in display and the external monitor (known as *video mirroring*) or use the external monitor to extend the size of the Mac OS desktop (known as *dual-display* or *extended desktop mode*). By default, your MacBook starts up in dual-display mode. Press the F7 () key to switch between dual-display and video-mirroring modes.

If you want sound to come from an external display, such as a projector or TV, you need to connect an audio cable (not included) from the computer's headphone () port to that device.

Note: Because of the display limitations of most TVs, images displayed on a TV screen are of lower quality than those on the built-in display or an external monitor.

Connecting an External Display or Projector

To connect an external display or projector with a DVI or VGA connector to your computer:

- 1 Turn on the external display or projector.
- 2 Make sure the display cable is connected to the external display or projector.
- 3 Connect the display cable to your MacBook using the appropriate adapter (the Apple Mini-DVI to DVI Adapter or the Apple Mini-DVI to VGA Adapter). Your MacBook automatically detects the external display.
- 4 Adjust the resolution on an external display by using the Displays pane of System Preferences or by using the Displays icon in the menu bar.

Note: Your MacBook supports external display resolutions up to 1920 x 1200 on Apple DVI displays and up to 1600 x 1200 on VGA displays.

Using Your MacBook with the Display Closed

You can use your MacBook with the display closed if the computer is connected to an external monitor, keyboard, and mouse.

Important: To use your MacBook with the display closed, the MacBook must be plugged into a functioning power outlet.

To operate your computer with an external monitor attached and the display closed:

- 1 Connect a USB keyboard and mouse to your MacBook.
- 2 Connect the power adapter to the MacBook and a power outlet. Check that the power adapter light is on.
- 3 Close the MacBook display to put the computer to sleep.
- 4 Follow the steps in the previous section to connect your MacBook to an external display.
- 5 Wait a few seconds and then press any key on the external keyboard to wake the MacBook.

Connecting a TV, VCR, or Other Video Device

To connect a TV or video device that requires a composite or S-video connection:

- 1 Connect the Apple Mini-DVI to Video Adapter (sold separately) to the Mini-DVI port on your MacBook.
- 2 Connect the device to the adapter.
- 3 If you want to send the sound from your MacBook to the device, connect a miniplug-to-RCA cable (not included) from the headphone (🔊) port on your MacBook to the audio input ports on your device.
- 4 Turn on the external device.

- 5 To detect the TV or other external device, hold down the Command (⌘) key and press the F2 key. You can also open the Displays pane of System Preferences and click the Detect Displays button.
- 6 To adjust how the image is displayed on the device, use the Displays pane of System Preferences.

Getting More Information About Using an External Monitor or TV

More information about using and configuring an external monitor is available in Mac Help. Choose Help > Mac Help from the menu bar and search for “external monitor.”

Connecting Speakers and Other Audio Devices

Your MacBook comes with three built-in speakers, a built-in microphone, an audio line in/optical digital audio in port, and a headphone/optical digital audio out (🎧) port.

You can connect external speakers, headphones, and other sound output devices to the headphone (🎧) port. The headphone port is also an S/PDIF stereo 3.5 mini-phono jack. When devices are plugged in, sound won't come through your built-in speakers. Unplug any headphones or speakers to hear the computer speakers.

You can record sound onto your hard disk using the built-in microphone located next to the built-in iSight camera. You can also connect external microphones or other audio equipment to the audio line in port. The audio line in port is also an S/PDIF stereo 3.5 mini-phono jack, which doesn't provide power to a connected device, so you must use self-powered peripherals. Using a Toslink jack-to-miniplug adapter, you can use a Toslink cable to connect Digital Audio Tape (DAT) decks or digital instruments to input and mix your own music.

For applications that can record sounds, such as iMovie HD, use the Sound pane of System Preferences to select the audio input device you want to use, including microphones connected through USB.

The volume controls on your keyboard allow you to easily adjust the output volume. You can also adjust both the input and output volume from the Sound pane of System Preferences.

For more information about using or troubleshooting sound on your computer, choose Help > Mac Help and search for “sound.”

Using Your Optical Drive

Your MacBook includes an optical drive—either a Combo drive or a SuperDrive.

With your optical drive, you can:

- Install or use software from CDs and DVDs.
- Play music and multimedia files from CDs.
- Write music, documents, and other digital files to CD-R and CD-RW discs.
- Play DVD movies and read most DVD discs.

If you have a SuperDrive, you can also record information on blank DVD±R and DVD±RW discs.

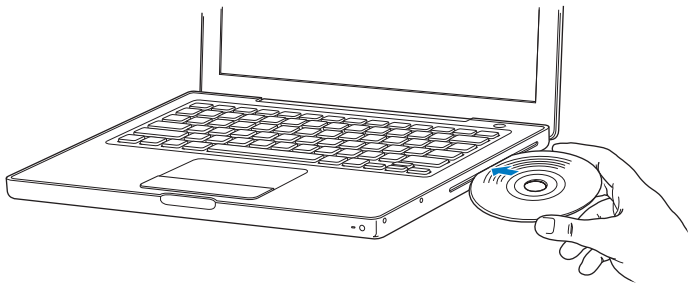
Important: The optical drive on your MacBook supports standard circular 12 cm discs. Irregularly shaped discs or discs smaller than 12 cm are not supported. These types of discs can become lodged in the drive.

Inserting a CD or DVD Disc

To install or use software from a CD or DVD disc:

- 1 With the computer turned on, insert the disc (with the label facing up) into the drive slot until you feel the drive catch the disc and take it the rest of the way in.

You might need to insert the disc nearly all the way before the drive takes it the rest of the way. This is normal.



- 2 When the icon for the disc appears on the desktop, the disc is ready to use.

Ejecting a Disc

To eject a disc, do one of the following:

- Drag the disc icon to the Trash (Eject icon).
- Press and hold the Media Eject (⏏) key on the keyboard until the disc ejects.

Allow the disc to fully eject before removing or reinserting it.

If you can't eject the disc, quit any applications that might be using the disc and try again. If that doesn't work, restart the computer while holding down the trackpad button.

Playing DVDs

To play a DVD-Video on your MacBook, insert the DVD disc. DVD Player opens automatically. You'll find DVD Player provides easy-to-use controls for starting, stopping, and viewing DVDs.



If your MacBook is connected to a TV so that you can watch a DVD-Video on the TV screen, select 720 x 480 NTSC (in the United States) or 720 x 576 PAL (in Europe and other regions) in the Displays pane of System Preferences.

You can easily connect your MacBook to your stereo system. Use a miniplug-to-RCA cable (not included) to connect the headphone (🎧) port on your MacBook to the audio input ports on your stereo.

Recording CD-R and CD-RW Discs

Your MacBook can record data to CD-R and CD-RW discs. If you have a SuperDrive, you can record your own digital movies on blank recordable DVD±R and DVD±RW discs. You can also record other kinds of digital data, such as backing up files onto a recordable DVD disc.

To record data on CD-R, CD-RW, DVD±R, or DVD±RW discs:

- 1 Insert a blank recordable CD or DVD (SuperDrive only) disc into the optical drive.
- 2 In the dialog that appears, enter a name for the disc and select the format you want to use.
- 3 Double-click the disc icon that appears on your desktop, and then drag files and folders to it.
- 4 Click the Burn Disc icon beside the disc name in the Finder sidebar.

You can also record music to CD or DVD discs right from your iTunes library.

To record music from your iTunes library:

- 1 Click the iTunes icon in the Dock.
- 2 Select the playlist or songs you want to record.
- 3 Insert a blank CD or DVD (SuperDrive only) disc.
- 4 At the top of the iTunes window, click Burn CD.

Important: If your battery runs down when you are burning a CD, the burn can fail and you will not be able to use the CD disc again. To prevent this, always use your power adapter when burning a CD.

If you have a SuperDrive, you can record your own digital movies on a blank recordable DVD disc. You can also record other kinds of digital data. For example, you can back up files to recordable DVD discs. With applications like iDVD, you can create your own customized digital media project, burn it on a blank recordable DVD disc, and play it on most standard DVD players.

To burn an iDVD project onto a blank DVD±R or DVD±RW disc:

- 1 Open iDVD and open your iDVD project.
- 2 Click the Burn button.
- 3 When prompted, insert a blank recordable DVD disc into the drive.
- 4 Click the Burn button again.

For more information, open iDVD and choose Help > iDVD Help.

Important: If your battery runs down when you are burning a DVD, the burn can fail and you will not be able to use the DVD disc again. To prevent this, always use your power adapter when burning a DVD.

Getting More Information

For more information about DVD Player and iTunes, see these resources:

- For information about how to use DVD Player, choose Help > DVD Player Help from within DVD Player.
- For information about how to use iTunes to record music files on a CD or DVD disc, choose Help > "iTunes and Music Store Help" from within iTunes.

Understanding Sudden Motion Sensor

Your MacBook has Sudden Motion Sensor technology, which helps protect the hard disk from damage if the computer is dropped or shaken.

Sudden Motion Sensor protection doesn't affect hard disk performance during regular MacBook operation. Occasionally, unusually strong vibrations might activate the Sudden Motion Sensor technology at a time when your MacBook is writing or reading data intensively (such as when playing or recording video or audio). If you notice dropped frames or sound elements, make sure that your MacBook is in a stable environment without vibration or abrupt movement.

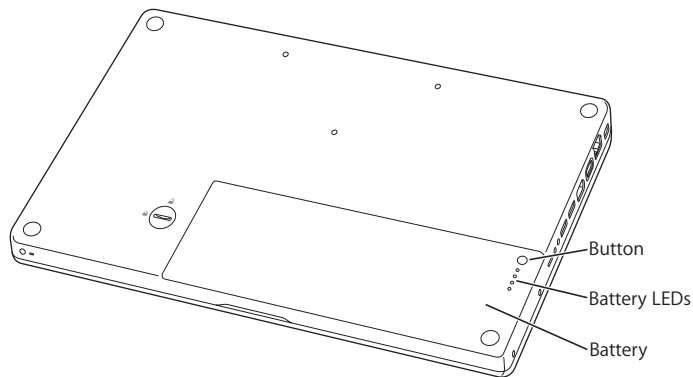
Using Your Battery

When the external power adapter is not connected, your computer draws power from its battery. The length of time that you can run your MacBook varies, depending on the applications you use and the external devices connected to your MacBook. Turning off features such as AirPort Extreme or Bluetooth wireless technology can help conserve battery charge. For more information about using your battery, see "Understanding Battery Conservation Tips" on page 77.

You can determine the charge left in your battery by looking at the battery level indicator lights on the battery itself. Press the button next to the lights, and the lights glow briefly to show how much charge is left in the battery. You can check the charge with the battery in or out of the MacBook.

If your battery runs low while you are working, attach your power adapter and let the battery recharge. To replace a low battery with a charged one when your computer isn't connected to a power adapter, shut down your computer.

Important: If only one indicator light is on, very little charge is left. If no lights are visible, the battery is completely drained and the computer will not start up unless the power adapter is connected. Plug in the power adapter to let the battery recharge, or replace the drained battery with a fully charged battery (see “Removing the Battery” on page 80).



If the battery icon in the Finder menu bar is set to show the percentage of charge, sometimes the battery won't show a full 100 percent charge when the power adapter is attached. This is normal behavior; battery life is maximized if charging is not continuously cycled on and off when the battery's charge capacity is between 95 and 100 percent. When the battery level eventually drops below 95 percent, it will charge all the way up to 100 percent.

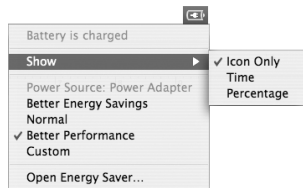
Removing and Replacing the Battery

For instructions on removing and replacing the battery, see “Removing the Battery” on page 80 and “Replacing the Battery” on page 86.

Note: Dispose of batteries according to your local environmental laws and guidelines. For more information, see “Disposal and Recycling Information” on page 132.

Charging a Battery

When the power adapter is connected to your computer, the battery recharges whether the computer is off, on, or in sleep. However, the battery recharges more quickly if the computer is off or in sleep. When the computer is on, you can monitor the battery charge level using the Battery status icon in the menu bar.



The battery charge level displayed is based on the amount of power left in the battery with the applications, peripheral devices, and system settings (display brightness, Energy Saver settings, and so on) you are currently using. To conserve battery power, close applications and disconnect peripheral devices not in use, and adjust your Energy Saver settings (see the next section).

Understanding Battery Conservation Tips

The amount of work time your MacBook battery can provide before you need to recharge depends on the applications and peripheral devices you're currently using and the steps you take to conserve power while you work.

For the best conservation of battery power, do the following:

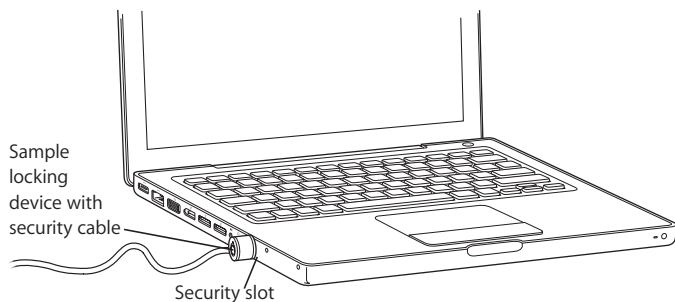
- Disconnect bus-powered USB or FireWire devices when they are not in use.
- Quit open applications that you are not using.
- Turn off AirPort or Bluetooth when they are not in use. (Use the AirPort and Bluetooth status icons in the menu bar. If these icons don't appear in the menu bar, you can turn them on in the Network and Bluetooth panes of System Preferences.)
- Remove CD and DVD discs when they are not in use.
- Reduce screen brightness using the brightness controls on the MacBook keyboard.
- Set the hard disk to spin down after a short time. In the Energy Saver pane of System Preferences, select the "Put the hard disk to sleep when possible" option.
- Set your MacBook to sleep after inactivity of five minutes or less.
- Your MacBook is preset to automatically reduce its processing speed during periods of low processing activity when using battery power, thus reducing power usage. The setting that determines this is the Normal option in the Optimization pop-up menu of the Energy Saver pane of System Preferences. During periods of high processing activity, your computer will automatically switch to a higher processing speed. To conserve the most battery life, choose Better Battery Life from the Optimization pop-up menu. However, choosing this option may affect your computer's performance. To set your computer to use its highest processing speed at all times, choose Better Performance.

Getting More Information About Your MacBook Battery

More information is available in Mac Help. Choose Help > Mac Help and search for “battery.” You can also find information about extending the life of your battery at www.apple.com/batteries/notebooks.html.

Securing Your MacBook

You can purchase a security cable lock to protect your MacBook. With a lock, you can secure your computer to a desk or table.



Getting More Information About Security Options

More information about the software security features of your MacBook, including multiple user passwords and file encryption, is available in Mac Help. Choose Help > Mac Help and search for “security” or “multiple users.”