Android Tablets

Made Simple

For Motorola XOOM, Samsung Galaxy Tab, Asus, Toshiba, and Other Tablets

Marziah Karch

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Android Tablets Made Simple

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ISBN-13 (pbk): 978-1-4302-3671-9

ISBN-13 (electronic): 978-1-4302-3672-6

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This book is dedicated to my husband, Harold, the best stay-at-home dad our kids could ever have; and to our kids, Pari and Kiyan. Their support makes it possible, and their praise makes it worthwhile. Yes, Harold, you can have a tablet now.

Contents at a Glance

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About the Author

Marziah Karch enjoys the challenge of explaining complex technology to beginning audiences. She is an education technologist for Johnson County Community College in the Kansas City metro area with over ten years of experience. She holds an MS in instructional design and has occasionally taught credit courses in interactive media.

Marziah also contributes to New York Times-owned About.com and has been the site's Guide to Google since 2006. Her first book was *Android for Work: Productivity for Professionals* (Apress, 2010). When she's not feeding her geek side with new gadgets or writing about technology, Marziah enjoys life in Lawrence, Kansas with her husband, Harold, and two children.

About the Technical Reviewer

Phil Nickelson spent more than 11 years as a copy editor, page designer, and news editor at a daily newspaper in Florida before taking the reins of Android Central in December, 2009. Phil's current weapon of choice: An HTC ThunderBolt, Samsung Infuse, or whatever he happens to be reviewing that week.

When he's not playing with phones, Phil enjoys hot baths and long walks on the beach. He lives in Florida with his wife, two daughters, and a 75-pound foxhound.

Acknowledgments

I'd like to thank my editors Steve, Kelly, Pat, James, and all the other staff at Apress that contributed to making this book a success. I'd also like to thank Phil for his technical review expertise.

A special thanks to Samsung for the use of a Galaxy Tab 10.1. Thanks also go to the friendly staff at the Best Buy store in Lawrence, Kansas for putting up with my constant questions and visits.

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A Day in the Life of an Android Tablet

6:00 am	My tablet alarm goes off. It automatically rings a little earlier on Wednesdays, because I get to work a little earlier. I notice there's a chance of rain, so I pack my umbrella.	Chapter 23
6:50 am	I head into work and listen to some tunes on Google Music as I drive.	Chapter 21
8:30 am	I've got an early meeting, so I grab my tablet and a Bluetooth keyboard to take a few notes with **Evernote**.	Chapter 3, 18 and 24
8:45 am	I notice I've got an email message, so I check to see if it's something I need to read right away or reply to later.	Chapter 8
10:00 am	I've got an appointment across town. I've never been there, so I use **Google Maps** and my tablet's GPS to find the quickest spot for the traffic conditions.	Chapter 11
10:30 am	My clients arrive, so I give my presentation on my tablet using the **PowerPoint** file I saved in my **Dropbox** folder.	Chapter 18
12:00 am	My meeting went well, so I spend some of my lunch hour decompressing. I plug in my headphones and listen to my favorite **Pandora** station while reading a Kindle book I purchased last week.	Chapter 17 and 21
1:00 pm	I start working on my next presentation. This time, I take some photos and make a video slide show for YouTube.	Chapters 19 and 21
2:00 pm	I get a quick video call from a colleague in New York. The front-facing camera is great for video chats.	Chapter 16
4:00 pm	I check the **Calendar** app to make sure I've met all my work obligations, and then head home to my family.	Chapter 10
5:30 pm	I look up a chicken recipe on the Internet and take my tablet with me to the kitchen to try it out.	Chapter 12
6:00 pm	While I'm in the kitchen cooking, I sneak in a quick TV show on **Netflix.**	Chapter 19
7:00 pm	The kids borrow the tablet to play a few rounds of **Angry Birds** before bed.	Chapter 22
10:00 pm	I check on my family and friends on **Facebook**, and then I put my tablet on its charging cradle, knowing it will wake me up again in the morning.	Chapter 15

Chapter 1

What Is Android: Choosing the Right Tablet

Android followed the iPhone to the market, yet it has surged in popularity. Android is already found on phones by virtually every phone manufacturer, and it is available on every major US wireless company, plus most of the regionals. It's flexible, fun, and boasts thousands of apps. It doesn't hurt that Google released the OS for free.

In this chapter, you'll learn about the history of the Android OS. You'll also learn how Android has evolved beyond the phone and into tablets. In the next chapter, you'll learn how to pick the right tablet for you.

The History of Android

Back in 2005, two years before Apple would revolutionize the phone world with the iPhone, Google bought a small, two-year-old company founded by Andy Rubin. Rubin was best known at the time for starting Danger, Inc., which created the T-Mobile–branded Sidekick phones. Rubin's new company, Android, also included Richard Minor from Orange (a UK phone company), Chris White from WebTV, and Andy McFadden from WebTV and Moxi. Originally, Rubin approached Google for possible startup money, but Google instead ended up acquiring Android and the talented team behind it.

What was so different about Android? Previous phone operating systems were either made by the device manufacturer or licensed to them for a fee. Rubin's idea was to give away the operating system and find some other way to make money. Since Google gives away most of its Web products for free and makes money from advertising, the idea resonated with Google.

On November 5, 2007, Google announced the Android OS and the Open Handset Alliance, a group of companies that would help develop it. Open Handset Alliance members include phone carriers, software developers, device manufacturers, and component makers.

Android has a very different philosophy compared to Apple and the iPhone. Anyone can use Android in devices for free, anyone can modify Android, and anyone can develop apps for it without the complicated pre-approval process required of iPhone apps.

Google also seeded the Android app market by holding developer contests with cash prizes. So, by the time the first Android phone arrived in stores, there was a selection of apps already available for download. The picture on the right shows the G1, the 2008 model that became the first Android phone to hit the market.

Today, Android has moved beyond the phone. It's powering e-book readers, photo frames, Google TV, netbooks, and even car stereos. Its low cost and easy customization lend it to all sorts of applications for portable devices.

The most important of these Android devices for this book is, of course, the Android tablet. You might wonder why it took so long for Android tablets to hit the market, especially after Apple introduced the iPad. There were Android tablets available, but they required modified versions of Android; and, with the exception of the Samsung Galaxy Tab, they never had much of a market. Why? Google was counting on Honeycomb.

Android Honeycomb

Android operating system releases are all given dessert code names. The names are also in alphabetical order, so you can tell which release is more recent. A and B are reserved names, so the Android versions released to the public are Android 1.0 (no code name), Cupcake (1.5), Donut (1.6), Éclair (2.0 and 2.1), Froyo (2.2), Gingerbread (2.3), and Honeycomb (3.0 and 3.1). The next release is Ice Cream Sandwich, which was introduced in October 2011.

Android Honeycomb is the most significant release for tablet users because it's the only release Google explicitly intended for use on tablets, and it has full access to the Android Market. I'll discuss the Android Market in more depth in Chapter 13: "The Android Market." Ice Cream Sandwich was mainly intended to bring the Honeycomb tablet features to phone users.

That isn't to say that there weren't devices that tried to hit the market before Honeycomb. ViewSonic had the G-tablet. Samsung released the Galaxy Tab, and Archos introduced a whole line of Android tablets in different sizes. At the time of writing, there are plans to release at least one more pre-Honeycomb device, the HTC Flyer, although it will eventually upgrade to Honeycomb.

The problem is that pre-Honeycomb tablets don't scale well: apps and widgets are simply larger instead of really taking advantage of the space available, they often require a lot of OS tweaking to work, and third-party apps don't always behave well. The scalability problem hasn't been entirely resolved in non-tablet apps, but it has improved.

HTC and Sense

Manufacturers are free to tweak Android any way they see fit; and in the mobile world, that's meant a lot of new user interfaces.

HTC makes a variety of Android phones, and it plans on releasing the Flyer at about the time this book will go to press. One of the advertised features of the Flyer is that it will use a new version of the HTC Sense UI (User interface).

Sense UI is based around widgets. Widgets are small, always-on applications that run on your phone or tablet home screen for specific purposes, like showing weather information or posting Twitter updates. This is similar to Windows Gadgets on desktop computers. You can learn more about widgets in Chapter 6: "Icons, Widgets, and Tabs."

When Android 1.6 was only offering three screens for customization, Sense offered seven. The screens centered on common activities, such as work and social media, and HTC created several custom widgets to make using phone activities easier. Sense also ties some information together, such as combining phone contact information and Facebook.

Other Uses for Android

One of the more interesting uses for Android has been in devices that aren't phones. Android powers e-book readers and netbooks (and it could even power your microwave). Google also introduced the Android-based Google TV, which is being upgraded to run Honeycomb.

Android Readers

The Barnes and Noble Nook Color Reader may not look like an Android device, but it is. The Nook's version of Android has been heavily modified, although there's a small hacker community dedicated to restoring such devices to a more standard version of Android. Other e-readers that use Android include the Springboard Alex, enTourage eDGe, and Velocity Cruz. Amazon.com offers the Android-powered Kindle Fire tablet.

You might wonder what the difference is between a reader and a tablet. The Nook even runs apps, so the difference seems to mainly be the spelling. However, most devices that advertise themselves as readers are centered on reading. They're often tied to a specific bookstore and are less powerful. Some of them also have a screen designed to be less responsive to touch, so that you won't accidentally lose your place in a book. The Kindle Fire is the big exception to this rule. It packs as much processing power as larger tablets.

Multimedia Players

Samsung publicly introduced its Galaxy Player line in 2011. Devices in this line are essentially Galaxy phones without the phone. They're also a bit unique in their ability to run apps. At the time of writing, Galaxy Player devices are the only non-phones running Gingerbread to get Google's blessing to use the Android Market (although HTC is also introducing a tablet that runs Gingerbread and uses the Sense UI).

Other companies have introduced multimedia players that range from pocket sized to 10-inch tablet sized, although none of them have made a huge market splash.

Netbooks

The 2010 Consumer Electronics Show was full of companies hoping to sell netbooks and trying to use the free Android OS to give themselves a competitive edge for pricing. By the time 2011 had rolled around, most companies had given up on Android as a netbook OS. However, the ASUS EeePad Transformer may reverse that trend, depending on whether you consider it to be a netbook or a tablet with a keyboard.

> **CAUTION:** I'll warn you against using Android as a netbook OS. At the time of publication, Android doesn't run well on systems without touchscreens, and such devices don't work as well as a netbook running an OS designed for full-sized computers, such as Ubuntu Linux or Microsoft Windows. Google is developing the Chrome OS for netbook users.

Google TV

Google introduced a platform for integrating TV and Internet programming called Google TV. The "remote" uses a keyboard instead of just a series of buttons, and it includes Google's Chrome Web browser.

This is part of a new generation of TVs that are Internet-connected and run apps. Rather than passively accepting programming, you can use connected TVs to find streaming programs, check the weather, browse the Web, listen to music, or update your Facebook status.

The Google TV platform runs on a modified version of Android, and Google plans on introducing an app market for the platform and upgrading Google TV to run Android 3.1 by the time this book goes to press.. Sony, Logitech, Samsung, and other companies introduced Google TV devices, although they've yet to take off with consumers either.

Microwaves, Washing Machines, and Printers (Oh My!)

Touch Revolution makes an Android-powered touch interface for other companies called the NIM1000. Touch Revolution is an *original design manufacturer* (*ODM*), which means it creates products for other companies to brand as their own. You'll never see Touch Revolution on the interface, but a representative told me that its technology was being used to create Android-powered interfaces for medical devices and the computers on the back of airline seats. The picture on the right shows an Android-powered microwave the company used for a demonstration in 2010. Parrot used Android to power ASTEROID, an automobile car stereo system. It also used Android in high-end digital photo frames.

Companies picked Android because it's easily customizable and free. Touch Revolution also felt Android was better designed than Windows CE. To prove the versatility of its design, Touch Revolution demonstrated an Android-powered washing machine, microwave, printer, and enterprise phone set. That doesn't mean anyone will *actually* use Android to determine the length of the spin cycle. In fact, in 2011 the major manufacturers were skipping the Android and programming "smart" appliances using their own proprietary systems. However, people are still likely to use Android interfaces on devices that have nothing in common with phones.

Google introduced the **Android @ Home** project in 2011. This is Google's framework for creating smart appliances that communicate using Android. Who knows? Your next refrigerator may very well send your Android tablet an email to let you know you should buy more milk. Speaking of tablets, if you don't own one already, the next section will help you find the perfect Android tablet.

Choosing the Right Android Tablet

As mentioned earlier, the first version of Android that Google intended for tablet use is version 3.0, code-named *Honeycomb*. Honeycomb is designed around larger screen sizes and allows apps to do things like offer expandable menus. As an incentive for tablet makers to adopt Honeycomb, Google restricted access to the Android Market to phones only. (The UK version of the Galaxy Tab can make phone calls, which is likely how Samsung got around the restriction.) Google also later made exceptions for the Samsung Galaxy Player, which is a phone-sized media player, and the HTC Flyer, which is also known in the US as the EVO View 4G.

That doesn't mean there aren't a few tablets out there that run on previous versions of Android. The original Samsung Galaxy Tab, some Archos tablets, and the HTC Flyer are all tablets that run on Android 2.2 or earlier.

The problem is that these previous versions of Android require a lot of modification by the device manufacturers. Google won't certify all of them to use the Android Market, so some of them need an alternative app market. That cuts down on the number of available apps. Many also have modified user interfaces, and that may mean apps need to be customized, which further erodes the number of available apps.

Android is free and open-source, but Honeycomb has some hefty minimum hardware requirements. Many tablets that don't support Honeycomb may simply be incapable of the upgrade.

Modified Honeycomb

There are a few tablets that are capable of running Honeycomb, but will sport a modified user interface. This will likely include the HTC EVO 4G. It's not available at the time of writing, but HTC has announced that the device will upgrade from Gingerbread to run a version of Honeycomb modified to look more like HTC Sense phones. The Notion Ink Adam runs a modified version of Android called Eden. The Samsung Galaxy Tab 10.1

shipped with Honeycomb and offer an upgrade to a modified interface. The Kindle Fire uses a heavily modified interface that isn't recognizable as Android.

It's difficult to purchase an Android phone without some sort of modified interface, and device makers think it distinguishes their brand for consumers. The problem is that a modified interface also slows down upgrades and makes developers work harder to tweak apps for different versions of Android. The good news for now is that there are plenty of Android Honeycomb tablets that offer a "pure Google" experience, and Google is making it easier to write apps that handle different versions of Android.

Deciphering Screen Size

You'll likely see screen size listed in one of two ways: a single measurement in inches, such as "10 inches," or a measure of pixel resolution, such as "1280 x 720." It's important to understand both of these measurements and what they mean.

The first measurement of screen size in inches refers to the diagonal measurement of a screen. This is the same way TV and computer monitors are usually measured; and while it gives you an idea of the size, this measurement can seem misleading when you view two screens with identical diagonal measurements, but different aspect ratios.

> **NOTE:** Some people find that screens with 16:9 aspect ratios seem smaller than screens with 4:3 ratios, even if their diagonal measurements are the same.

Figure 1–1 illustrates how diagonal measurements can distort the true size of a screen. Most screens for phones measure between three and five inches, while most tablet screens measure between seven and twelve inches. Laptops measure between ten and seventeen inches, with ten inches considered "netbook" sized and seventeen inches considered pretty large.

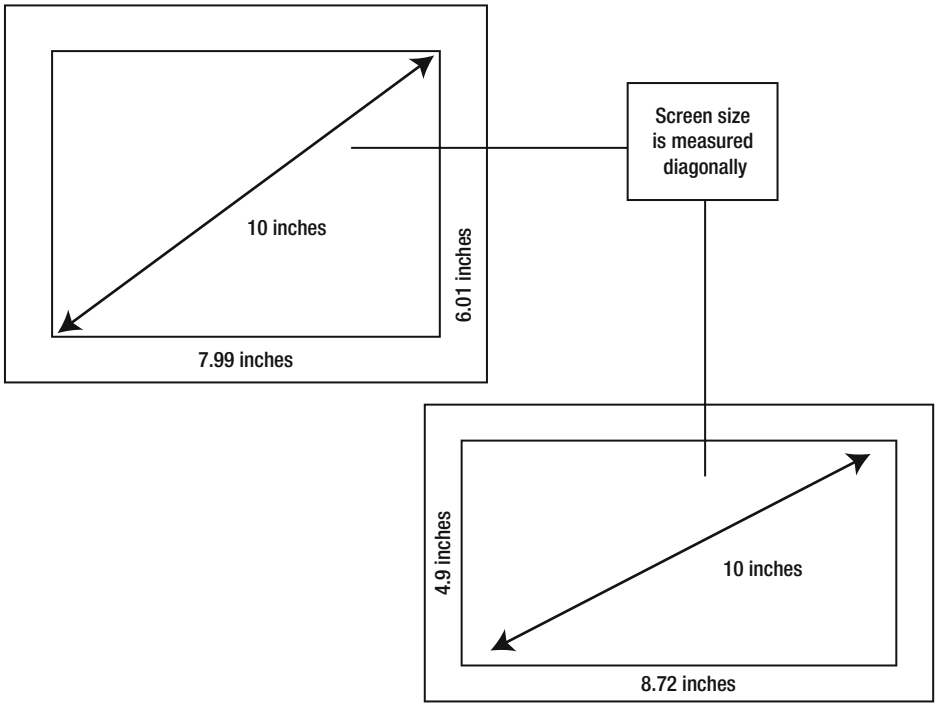

Figure 1–1. *Screen sizes are measured diagonally. One screen's aspect ratio is 4:3, and one is 16:9*

Pixel Resolution

The other measure of screen size is the pixel resolution of the screen. You could have a twenty-inch screen on your tablet (that's huge), but it won't provide a great experience if it still has the resolution of a standard-definition TV.

Pixel resolution is the total number of pixels a screen displays, and usually that number is given as a simple measurement of the pixels in the width and height of a display, such as 640x480. The smaller your screen, the fewer pixels it needs to create a satisfying picture. However, even small screens benefit from higher resolution displays. Text is easier to read in eBooks, and movies and pictures look much sharper with those extra pixels.

Android doesn't assume all screens have the same size, aspect ratio, or resolution, so there's a lot of room for variety. Here are a few common standards to give you a point of reference:

- **320 x 240:** This is a common smartphone resolution, called *HVGA* (for *half* VGA, though it's more correctly called *QVGA* for *quarter* VGA). You'll find this on many older or low-end Android smartphones.

- **640 x 480:** This standard is known as *VGA* (*Video Graphics Array*), and it was originally a standard for computer monitors, though it's now considered very low quality. This size is close to the same size as standard definition TV broadcasts. (Technically TV video is 720 x 480 or 720 x 540, but the pixels on analog TVs were not square shaped like those on computer and tablet displays.)

- **800 x 480:** *WVGA* (*Wide VGA*) is a common phone resolution that is giving way to *qHD*.

- **800 x 600:** This is called *SVGA* for *Super* VGA. It's another computer standard that has gone out of fashion with higher resolution displays.

- **960 x 540:** This is a standard for some displays because it's half the pixels in either direction of an HD display. It's a *quarter of the resolution* of HD because you'd have to put four of these displays together to have the same resolution as a 1080 HDTV display. For this reason, it's also known as *qHD*.

- **1280 x 720:** This is one common standard for HDTVs. The other, higher standard is 1920 x 1080. In both cases, HDTV usually talks about the second number, 720 or 1080, when measuring resolution.

- **1024 x 786:** This is a computer standard known as *XGA* for *Extended Graphics Array*.

- **1440 x 960:** This is the widescreen version of *XGA* known as *WXGA*.

- **2560 x 2048:** This is *QSXGA* for *Quad Super Extended Graphics Array*, and it's like the Cadillac of current standard computer screen resolutions. No tablets are shipping with anywhere near this resolution at the time of writing, although I'm sure some eventually will.

Touchscreen Sensitivity

Before you buy a tablet, you should play with one in the store and check to see how sensitive the screen is to your touch. You may find that some screens are really sensitive, and some require a stylus or fingernail to react to your touch.

There are two basic technologies used for most tablets, **resistive** and **capacitive** touchscreens. In general, resistive touchscreens are more accurate, but usually require a stylus or fingernail and a small amount of physical pressure. Capacitive touchscreens respond very well to bare fingers, a metallic stylus, or any other conductive object, but they can't be used with non-conductive gloves.

The rationale for using a resistive touchscreen in Android is in devices that are intended primarily as e-book readers. The less responsive screen makes it harder to accidentally

turn pages while reading. If you're looking for an all-purpose tablet, your best bet is to stick with capacitive touchscreens.

Screen Contrast

You may not plan on taking your tablet out into bright sunlight and curling up with a good e-book in a lawn chair or hammock; but even if you stay indoors, you'll still likely run into glare from windows, which can render a low-contrast display totally unreadable.

When you buy a traditional e-reader like the Amazon Kindle, it has an amazing high contrast display using a technology called *E Ink*. The problem is that E Ink doesn't do well with color, has a slow refresh rate, and isn't backlit–so it's pretty limited.

Pixel Qi (pronounced "Pixel Chee") is a company that makes a special form of LCD screen that can display either with or without a backlight. This not only saves battery life, but it means you can still check your email or read a map in direct sunlight.

At the time of writing, there are only a few Android tablets that offer screens by Pixel Qi, but that may change in the future. Screens by Pixel Qi add to the price, but they may be worth it. The Kindle Fire does not offer Pixel Qi screen, which may be one of the reasons the battery life is only advertised as eight hours.

Cameras

If you want to take pictures or hold video chats, you'll want a camera (or two) on the tablet. We'll discuss the specifics of cameras in a later chapter, but here are a few things to examine as you make purchasing choices.

Most tablets have one camera, but some have two or even three. The camera on the back of the tablet is for taking pictures, and the camera on the front is for video chat. In some cases, there might be two cameras on the back to take 3D photos and video images.

Be sure to look at the camera pixel resolution. Most cameras list their resolution in units of *megapixels*. A megapixel is a unit of one million pixels.

> **NOTE:** A general rule of thumb is that the more megapixels, the better the camera, though this is not always true. If your camera has lousy optics, each extra megapixel could just represent one million more blurry pixels. Test the quality of pictures in the store before you buy instead of relying on the stats on the side of the box.

In general, you'll want to look at tablets with at least 5 megapixel cameras on the back. If you want 3D pictures or video, look for a tablet with two cameras. It's much harder to fake 3D after you've already taken a picture, so it's important to get a tablet that offers the feature out of the box.

The front camera can be smaller since you're only using it for video chat. In this case, .3 to 1.5 megapixel cameras will do just fine. The back camera(s) should have a flash. Some tablets may even have a single camera that you swivel around from front to back, in which case you should look for a 5 megapixel camera.

You should also check out the quality of video capture. Most tablets with 5 megapixel cameras are capable of high-definition video capture, even if the tablet isn't capable of playing the video back at full resolution.

If photos are totally unimportant, you might be able to find a lower cost option with a poorer quality camera; however, you should look for tablets that have some sort of camera, even if you don't think you'll need one. You may want to try an augmented reality app or take a quick picture to use for contact icons, and you can't add a camera later.

Memory

RAM is the working memory for your tablet. It works the same on tablets as it does on other computers, by temporarily storing working files to speed processing along. It's also used to run the OS on your device. When your tablet has plenty of RAM, it runs faster and can handle multitasking and larger apps. When your tablet has less RAM, it slows down because the slower hard drive storage has to store these working files. In some cases, there might not be enough RAM to properly run Android.

The Motorola Xoom has 1 GB of RAM. That's a great minimum starting point for tablets running Android Honeycomb, and it's currently all that's available on the market. Remember that Google wrote Honeycomb with Xoom hardware in hand, so be very cautious when looking at any tablet with hardware specs below that of the Xoom.

Internal Storage

In addition to RAM, your tablet will have internal storage space and possibly removable storage space. Internal storage allows you to install apps and store files, and removable storage allows you to expand this capacity. On computers, this internal storage was traditionally through a hard disk, but most tablets use a *solid-state drive* (*SSD*), like USB thumb-drives. Solid-state drives don't need to spin, so they're instantly available when you turn on your device.

Looking at the Xoom as a starting point, the minimum internal space you'd want to see is 16 gigabytes of space. A tablet with less space will work; however, if you use your tablet heavily, eventually you'll fill up the drive with books, pictures, apps, and files.

In addition, SD storage is a way to add capacity for your tablet if you find you're filling up all the space. Not all tablets offer SD storage, so you'll have to check to see if it's offered for the tablet you'd like to purchase. Motorola rushed the Xoom to market without SD storage, but started offering free upgrades in late September of 2011.

CAUTION: You can make up for a lack of internal storage by buying a larger SD card, but not all apps can be installed on SD cards. You may still run into storage problems even with the extra removable space.

HDMI

Do you want to use your tablet to project movies, slideshows, or presentations? If so, then you should look for a tablet with HDMI out. *HDMI* stands for *High Definition Multimedia Interface*, and it's the cable used by most modern HDTVs and many computer monitors and projectors to stream pictures and sound. Some tablets and phones with HDMI output are even Dolby-certified to stream in 5.1 and 7.1 surround sound. That makes your tablet a portable piece of home theater equipment.

The HDMI output is different from the USB output, which brings us to the next item.

USB

The USB connection in most tablets can be used to sync with a computer for transferring files and photos. You can also use your tablet with the **doubleTwist** app to transfer your music from your iTunes library, although you may want to skip the USB connection and store your iTunes library in the cloud with Google Music. I'll discuss this in more detail in Chapter 21**:** "Listening to Music."

Nearly every tablet will have a USB connection. But when you shop for tablets, you may want to make sure it's a standard connection, so you can use third party cords and other accessories.

You'll also want to check to see if you can use the USB port to charge the tablet. In many cases, such as the Motorola Xoom, the answer is going to be "no." The Galaxy Tab 10.1 does offer this feature. Third-party USB battery backups are useless for any device that can't charge via USB.

Accessories

Some accessories, like microphone headsets and Bluetooth headsets, are pretty universal (if your tablet has Bluetooth). Others, like charging docks, are specific to your device. Take a look at the available accessories for any tablet you're eyeing, just to make sure it offers at least a keyboard, case, and charging dock. You may not think you need a keyboard, but you may change your mind later, and it's nice to know you still have options.